THE WORLD OF LAPP

Food & Beverage

LAPP GROUP

Legend for icons

INDUSTRIES

- Automation
- e-Mobility
- Food & Beverage
- Mechanical and Plant Engineering
- Oil & Gas
- Rail
- Solar Energy
- Wind Energy

PRODUCT CHARACTERISTICS

- Suitable for outdoor use
- Good chemical resistance
- Flame-retardant
- Wide clamping range
- Halogen-free
- Heat-resistant
- Cold-resistant
- Corrosion-resistant
- Maximum vibration protection
- Mechanical resistance
- Assembly time
- Low weight
- Oil-resistant
- Optimum strain relief
- Space requirement
- Power chain
- Clean room
- Robust
- Acid-resistant
- Reliability
- Integrated SKINTOP® cable gland
- Voltage
- Connector with standard housing unit
- Interference signals
- Temperature-resistant
- Torsion-resistant
- Torsion load
- UV-resistant
- Waterproof
- Variety of approval certifications

Please note: the purpose of the icons is to provide you with a quick overview and a rough indication of the product features to which the corresponding information relates. You can find details of product characteristics in the “technical data” sections on the product pages.

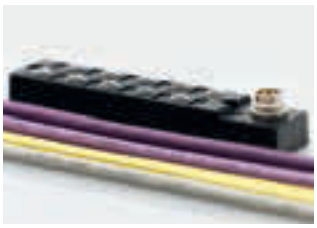
Content

	Company information	2
	Lapp Systems GmbH – your system partner with development expertise	4
	Lapp solutions for Food & Beverage	5
	Cables and connectors for the food industry	6
	Definition of Food & Beverage zones	10
	Consortia, working groups and organisations	14
	Testing expertise at the Lapp laboratory	16
	Examples of product portfolios Food & Beverage technology	18
	ÖLFLEX® Power and control cables	20
	UNITRONIC® Data communication systems	39
	ETHERLINE® Data communication systems for ETHERNET technology	47
	HITRONIC® Optical transmission systems	51
	EPIC® Industrial connectors	52
	SKINTOP® Cable glands	60
	SILVYN® Protective cable conduit systems and cable carrier systems	74
	FLEXIMARK® Marking systems	77
	Tools and cable accessories	80
	Appendix: The Lapp Group worldwide Lapp products in motion	84

Eight brands, one promise: uncompromising quality – worldwide

ÖLFLEX®
Power and control cables

ÖLFLEX® has become synonymous with power and control cables. Our flexible and oil-resistant cables satisfy the highest demands and can withstand even the very toughest conditions.



UNITRONIC®
Data communication systems

Our high-quality UNITRONIC® data network cables and field bus components provide a forward-looking solution for all applications in industrial machinery and plant engineering. From transmission of simple control signals to field bus signals in complex network structures – we offer a dependable cabling and connection solution for almost every situation.

ETHERLINE®
Data communication systems for ETHERNET technology

Our ETHERLINE® branded products open up a secure, fast and reliable path to the future of Ethernet applications. The systems are made up of durable and robust cables and connection components for passive network technology, and deliver an effective solution for almost any application, particularly in an industrial environment.

HITRONIC®
Optical transmission systems

HITRONIC® fibre optic cables make transmitting large data volumes easy: fault free, bug proof and at almost light speed. Even electromagnetic radiation does not interfere with the transmission. The HITRONIC® range includes the ideal solution for indoor or outdoor use, for demanding conditions, and even for use in power chains.

EPIC®
Industrial connectors

EPIC® industrial connectors can be found everywhere in industrial machinery and plant engineering, for measuring, control and drives. EPIC® is a flexible system of housings, inserts and contacts: all extremely robust, absolutely safe and simplicity itself to assemble.

SKINTOP®
Cable glands

Simply feed in the cable and twist. That's it. Our SKINTOP® cable glands provide secure connections in no time. The universal systems are simple but effective. They secure and centre the cable, hermetically seal it and guarantee optimum strain relief.

SILVYN®
Protective cable conduit systems and cable carrier systems

The universal range of SILVYN® protection and guidance systems protect cables effectively against dust, moisture, mechanical, thermal and chemical influences. The versatile SILVYN® CHAIN range of energy supply chains also protects and guides cables in dynamic applications.

FLEXIMARK®
Marking systems

The requirement: permanent marking. The solution: FLEXIMARK®. These sophisticated systems mean that a clear overview inside a control cabinet is no longer just a pipe dream. From simple labels for manual marking through to electronic markings, the FLEXIMARK® range is guaranteed to be permanent.

Reliably connecting the world

We want to help you become even more productive and successful. This is why we work tirelessly on optimising our processes. We do everything to make sure we always find the best solution for you and also provide you with quick, efficient and effective support.

No matter where you are – we are always by your side. Our plants, sales companies, partners and, above all, our competent teams of advisers ensure we offer you a comprehensive service on every continent. We do not simply distribute cable technology, we also manufacture our products ourselves – which represents another advantage for you. As a manufacturer with 17 of our own production facilities, you will benefit from our expertise in the development, design and manufacture of cables, system products and cable accessories. Thanks to this expertise, we can guarantee that Lapp will provide you with the quality that you require and that you demand.

You can always rely on quality from Lapp – wherever you are in the world. This is also embodied by our strong brands.

100
sales partners

8
strong brands

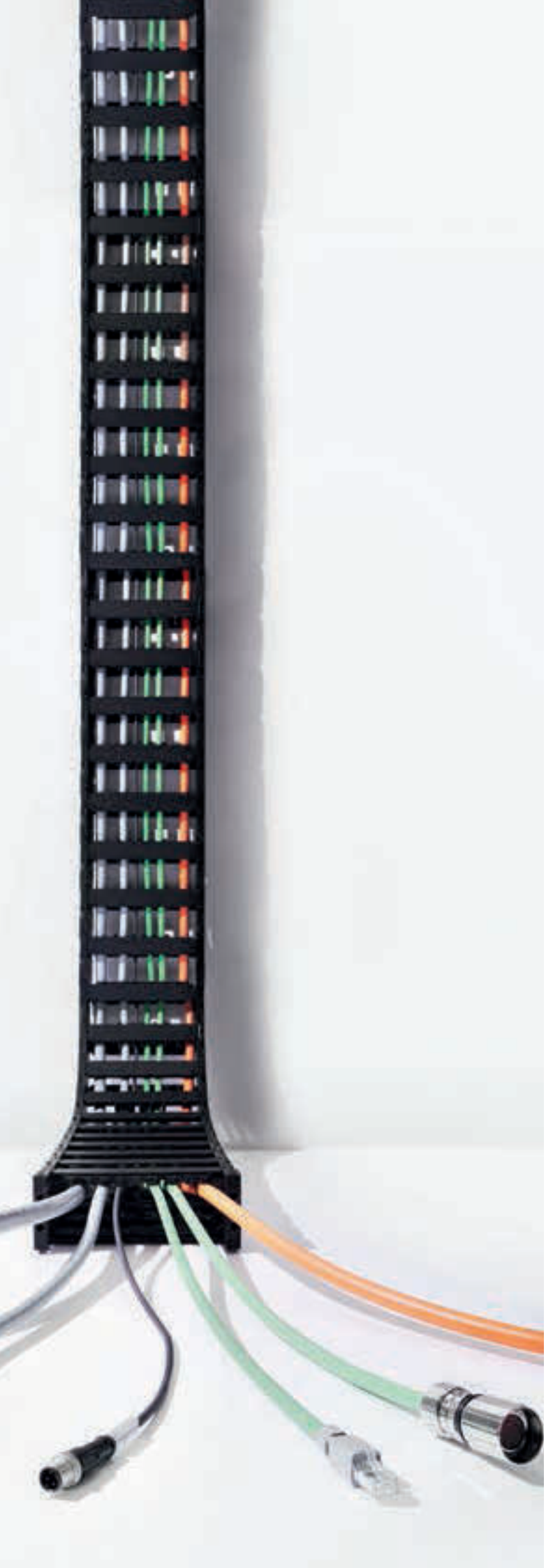
1
innovation after another

Employees from
152
countries

More than
40,000
standard products

40
proprietary sales companies

3,440
employees



Lapp Systems GmbH – your system partner with development expertise

From consultation on system development to production, testing, logistics and aftersales services, Lapp Systems offers you everything from a single source. We are fast, flexible and represented worldwide thanks to our anchoring in the Lapp Group.

Facts and figures
- Founded in 1983
- 100% subsidiary of Lapp Holding AG
- 300 employees at 3 production sites

Certification
- ISO TS 16949:2009
- ISO 9001:2008
- ISO 50001:2011
- Implementation of ISO 14001

OUR SERVICES

System assembly
Individual cable systems and assemblies for industrial applications.

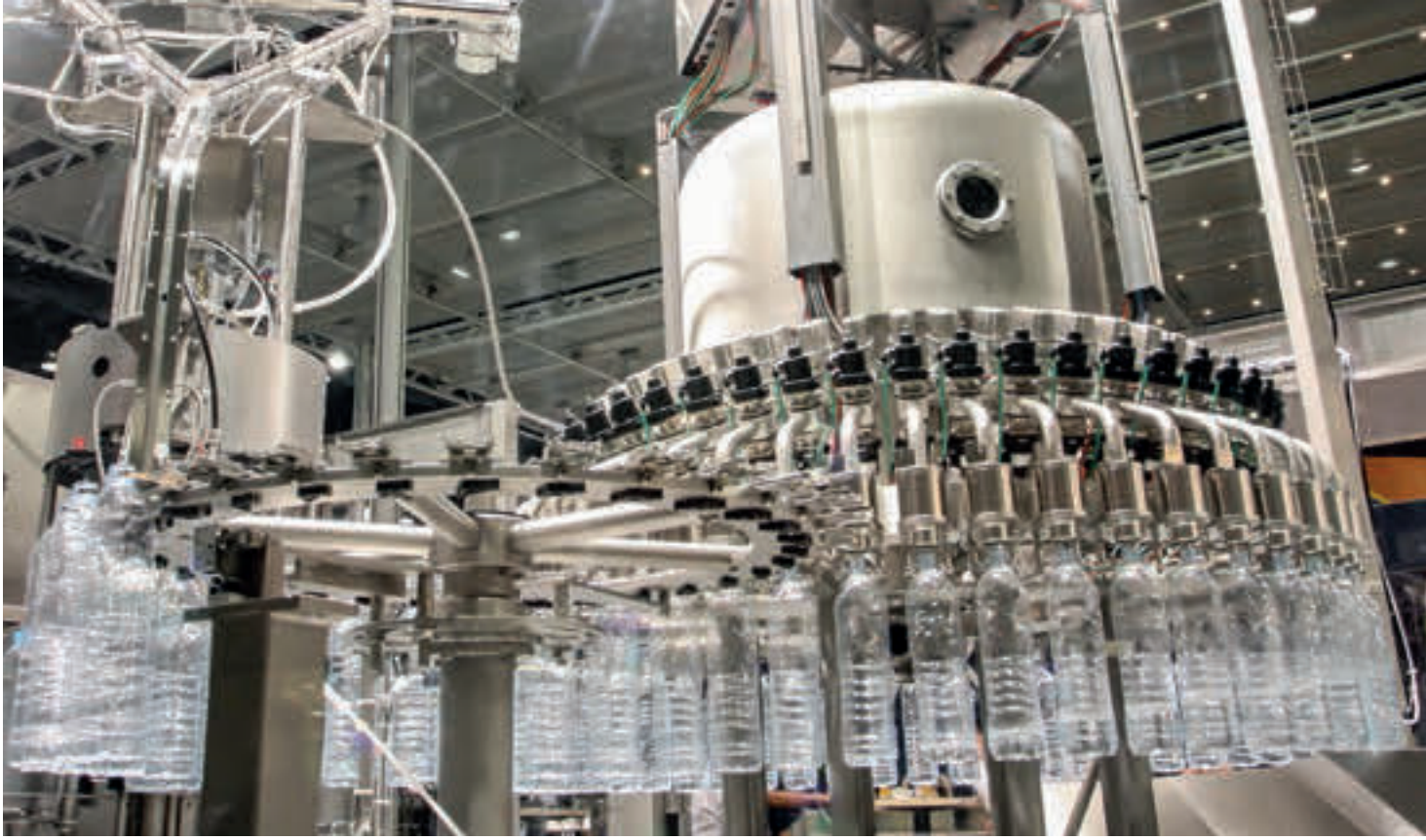
Power chains
Power chain assembly optimally tailored to and manufactured for your application.

e-Mobility
Our strengths: charging cables, high-voltage cabling and cable harnesses.

Spiral cables
We offer tailored solutions as a leading manufacturer of spiral and helical cables.

Servo cables
Assembled servo cable systems, manufactured from high-quality, in-house branded products.

Fibre optic cables
Special lengths and individual assemblies ready for immediate installation.



Lapp solutions for Food & Beverage

Radek Kasparik
Market Manager
Food & Beverage/Packaging

There are few industries which are as multi-faceted and demanding when it comes to the requirements and operating conditions as the food and beverage industry. The strict hygiene and cleanliness requirements that exist in the food processing segment also apply to its machineries and electrical components.

There are complex requirements for cables and accessories in the food and beverage industry, as well as in bottling and food packaging plants. They must be resistant to a whole host of chemical, thermal and physical stresses so that they can fulfil their functions reliably even when used in refrigerated areas and damp environments. Hygiene takes top priority when it comes to food production. As a result, resistance to aggressive industrial cleaning and alkali agents which are commonly used during cleaning processes becomes particularly important.

As a long-term partner to the mechanical and plant engineering industry, Lapp has a comprehensive range of standard and specialised products that meet the requirements of the food and beverage industry. Our proven and tested range of products consists of a solution for almost any application. Our in-house laboratory and testing facilities are also an important source of support.

We have been collaborating with many different partners throughout the entire food and beverage industry and are familiar with the specific requirements of this industry. In this way, we can develop a credible solution for each application related to:

- Dairy processing/dairy technology
- Meat and fish processing
- Baking and confectionery processing
- Bottling plants
- Packaging machines
- Beverage carton manufacturing

Cables and connectors for the food industry

Andreas Bauer
is Head of Product Management
for system products at U.I. Lapp GmbH

Wherever food is affacted, hygiene is at the top of the agenda. Production facilities should therefore be designed according to the principles of hygienic design. Cables, connectors and housing bushings play an important role. Minimising downtime, ensuring quality, protecting employees – while these are priorities in all industrial sectors, they are particularly important in food production. In the food and beverage industry, once the processing of perishable foodstuffs ceases, it leads to profit losses as well as high costs as a result of waste disposal and the need to restart production.

Quality is another important factor for the industry – if the quality is insufficient, consumers become dissatisfied and it could also put their health at risk. It is therefore important that the production facilities are regularly cleaned to remove dirt and germs. This is often done using steam jets and either acidic or alkaline cleaning agents, aggressive cleaning agents in a dry process or the most recent innovation: dry ice. In each case, the facilities are exposed to highly strenuous conditions, the details of which can vary greatly. Therefore, all components need to be designed in such a way that, even under such diversified degrees of stress, they remain permanently sealed and functional, while being made from shapes and materials which do not provide a breeding ground for germs.

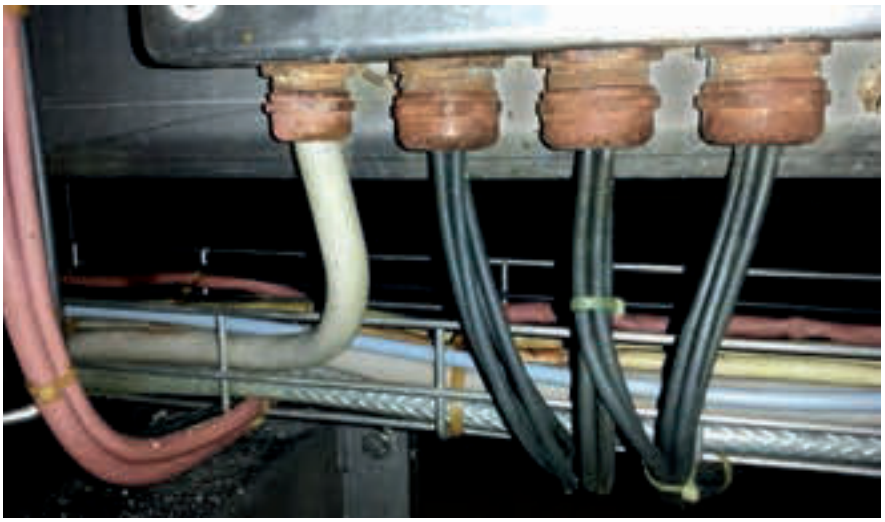
Three hygiene zones

The first prerequisite is that the right components are selected for the Hygienic Design Zone, Splash Zone and Non-Product Zone when constructing the facilities, and that these components are used correctly. Industrial working groups such as “Safe Food Factory” in the Benelux states are compiling recommendations for this. Broadly speaking, the closer a component comes to foodstuffs, the higher the requirements.

Robust against cleaning agents and foodstuffs

The strictest hygiene requirements are placed on the Hygienic Design Zone and the Splash Zone – these areas need to be thoroughly cleaned at regular intervals. The components in the machines and facilities in these zones are subject to product-specific hygiene regulations. Depending on the food to be processed and the materials and design of the facility, various cleaning options can be used to avoid food contamination and keep the facility in good condition for as long as possible. Aggressive cleaning agents, such as corrosive acids and alkalines in various concentrations, are used in several working steps according to how dirty the facility is. They can be used in a dry process by applying them and wiping them off or as a low- or high-pressure cleaning solution. Visual residues are removed manually or in a pre-rinsing process, organic matter is removed using an alkaline cleaning agent, inorganic residues using acid-based agents and micro-organisms are destroyed using disinfectants with a rinse between each step.
Dry-ice blasting is a trend, and it acts as an alternative for users who do not want to use a cleaning agent. Dry-ice particles at temperatures of -78 °C are applied to extremely dirty components, e.g. boilers or the insides of ovens, at a pressure of two to six bar. The dirt freezes and becomes brittle so that it can be quickly and safely removed.

In practice, the machines and facilities are cleaned several times a day (depending on the foodstuffs being produced), which has a major impact on efficiency. Cleaning also incurs high costs as it requires the use of either your own staff or cleaning and hygiene service providers. At the component level, hygienic design decreases the time needed to clean machine and facility components. If components are easier to clean, this will also have a positive effect on the concentration of the cleaning agent and



In the food and beverage industry, cables and cabling components are subjected to particularly strenuous conditions. If unsuitable components are used, then screw joints could corrode and the cable insulation could swell, as can be seen in the image. The components would lose some of their functionality and it could result in hazardous situations.

disinfectant for each facility. This reduces cost and saves the environment. Lower concentrations of cleaning agents and disinfectants also have a positive impact on the durability of the materials, which reduces the risk of downtime.

The fact is that whether you are cleaning using high pressure, aggressive chemicals or dry ice, only a few materials can withstand this treatment over an extended period of time. The top choice is stainless steel, which is used almost exclusively, particularly in the Hygienic Design Zone. Tubes and cables were also once laid in stainless steel pipes, but this is an expensive method, so equipment manufacturers and their customers prefer an open installation of cables and conduits wherever possible. These installations also need to be able to withstand the cleaning procedures, otherwise there is a risk that a cable could lose its insulation.

To give a drastic example, if unsuitable components are used, the screw joints could corrode and the cable insulation could swell (see image above). The components would lose some of their functionality and it could result in hazardous situations. Another cause of wear is often the food being processed. As such, the focus should be shifted away from the resistance to cleaning agents and disinfectants themselves. Bio-oils, fats, fruit acids, lactic acids, etc. can have a significant impact on the components' long-term functionality. To give an example, in a bakery, outgassing from the dough had caused a PVC sheath on a standard cable to swell and become brittle. This could have caused a short circuit or electric shocks, and the staff were in acute danger. The plastic also could have fallen into the dough. The cables needed to be replaced, which led to lengthy downtime. This could have been avoided if ÖLFLEX® ROBUST cables had been used.

Choosing suitable components and their proper use can have direct impacts on the safety of staff and the final product quality. We have gained a wealth of experience in our international laboratories over the past few years. Around 100 different cleaning agents and more than 700 other substances, such as oils, fats and emulsions, have already been tested on our product materials. Customer-specific tests are the most important here. From experience, we know that differing results can often be expected due to changing requirements, e.g. the concentration of the substances or varying temperatures. If the results are transferable, we can use them as an excellent basis for product recommendations. Customer-specific tests are also beneficial in other respects. In addition to cables, marking systems – such as the FLEXIMARK® LCK wrapping labels – also underlie resistance tests. The benefits of this include a minimal clearance volume and a high resistance to substances with an acid and alkaline base.

Loops along the cables trap dirt and are tough to clean, so they should be avoided in food production.

Best practice: loose cabling

The Safe Food Factory working group is tasked with discussing how such hazards can be prevented. One important aspect is the type of installation: cables are often bundled more tightly together than they ought to be. Loose cabling with a bit of space would be better for easy cleaning. However, technical inspectors normally put great emphasis on the use of fixed installations – a happy medium needs to be found. The members of the working group also recommend not using overly long cables. Cables are often installed with a reserve. Although this is convenient, it is dangerous from an electrical perspective (in terms of bundling). The cables also form loops that catch dirt and are tough to clean. Generally speaking, cables should be kept as far away as possible from the areas requiring thorough cleaning. The use of hybrid cables – in which several cables are combined into one – is also beneficial as there are fewer gaps where impurities can later settle. There are contradictory requirements in the USA: on the one hand, companies who want to export to the USA face the NFPA requirements for maximum fire protection. On the other hand, the FDA is critical of cables with reduced flame-propagation since some fire-retardant additives are prone to outgassing and can therefore contaminate raw materials. As such, the overriding requirement needs to be determined on an individual basis.

The application is the crucial factor

It is not always possible to keep cables out of the Hygienic Design Zone, for example those found in temperature or capacitive level sensors in a fermenter. These cables need special protection, if not in stainless steel pipes, then in protective conduits. This also makes them easier to clean. Nevertheless, there is a further complication when it comes to major temperature fluctuations: condensation may form and collect in the protective conduit, which is not hygienic in the long term. In this case, a highly resistant cable in an open installation connected to a suitable cable gland is the better choice. However, there is not a universal “best solution” – each individual case needs to be considered. Lapp’s application engineers can help you to find the best solution. For users, it is important to bear in mind how individual components interact. We therefore recommend choosing a supplier who can offer competent advice on all connection technology with an extensive product portfolio of cables, connectors and accessories that comply with hygienic design requirements. Hygienic design is increasingly in demand. It has brought about major progress in terms of quality, safety and efficiency in the food and beverage industry. According to this principle, facilities should be constructed in such a way that germs cannot take hold in the first place. The facilities should also be very robust and easier and quicker to clean.

At first glance, components in hygienic design, and specially designed accessories, are often seen as a way to increase prices – which is why they have not been universally implemented in practice. The focus soon shifts to the higher expenditure in comparison to standard products rather than the long-term benefits. But it is worth noting that the higher the components' quality and level of suitability, the lower the running costs will be because these components are more durable and easier to clean. By contrast, unsuitable components could cause enormous damage.
A breeding ground for germs caused by a crack in a component that is not compliant with hygienic design could mean expensive unplanned maintenance or even downtime for the facility operator. Contaminated food would need to be thrown out or, in a worst-case scenario, recalled. In addition to the direct costs, this could lead to long-term damage for the brand.

No germs allowed

The SKINTOP® HYGIENIC cable gland is one of the products that meets the particularly stringent hygienic design requirements. It follows the general design principles of DIN EN 1672-2 for the food industry and is certified according to the latest EHEDG testing.

It does not provide any surfaces for contaminants to attack. All seals are fixed tightly to the cable and connection point with no gaps. Instead of an O-ring, it has a radial moulded seal above the connection thread, a sealing ring below the domed cap nut and a specially formed conduit sealing ring on the cable. It has smooth surfaces and no edges, meaning that remaining food cannot settle there and can easily be washed off. Furthermore, the cable gland – just like the SILVYN® FG (NM) cable conduit and the ÖLFLEX® ROBUST cable – meet the ECOLAB® requirements relating to resistance to cleaning agents and disinfectants.

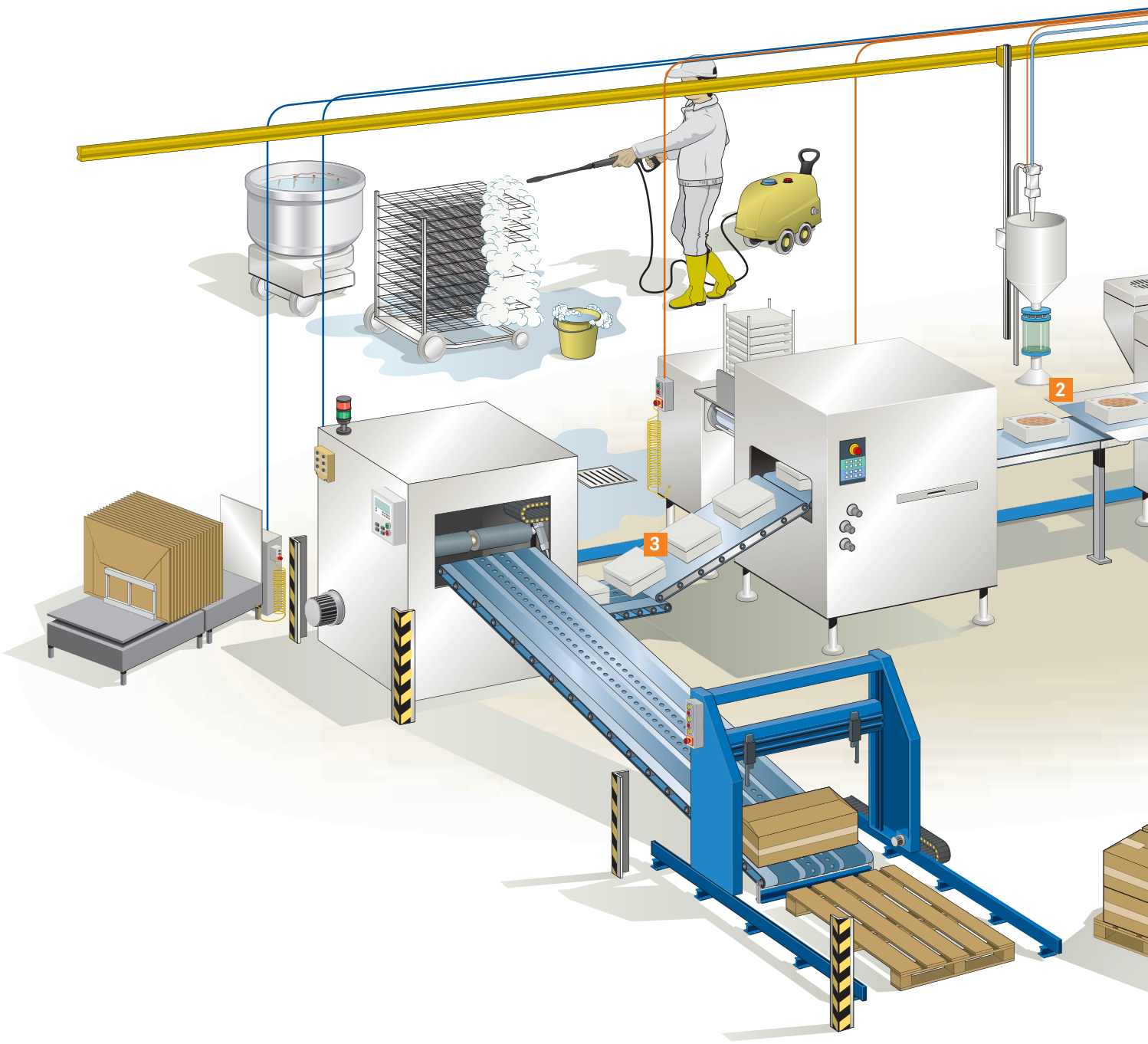
Designers of facilities and components do not always need to reinvent the wheel, but when making decisions it is important that they bear the precise operating conditions in mind. Specialised products are not always necessary. Existing mechanical engineering and plant manufacturing products can by all means be used for many applications in the food industry, for example the classic ÖLFLEX® ROBUST, a series of cables that can withstand both machine oils in industrial manufacturing and cleaning agents in food production.

This also applies to a wide selection of accessories and other cables with sheath materials designed by Lapp and made from PVC, TPE and PUR, some of them have also received a ECOLAB® certification. Good and comprehensive advice from experts who know the industry is invaluable here.

Signal colour blue protects against losses

If you do not want to use expensive, rigid stainless steel pipes to lay cables in the product or Splash Zone, you may be interested in the SILVYN® FG NM protective conduit with the matching SILVYN® HYGIENIC conduit gland. The flexible and dimensionally stable soft PVC protective conduit with an inner spiral and the gland are both suitable for coming into contact with food – and thus for use in the Hygienic Design Zone – and are easy to clean. The conduit has no grooves in which residue can settle, unlike conduits used in mechanical engineering. It is blue – if a piece of plastic somehow fell into the food, it would be easier to detect it this way because there are no natural raw ingredients with such an intense blue colour. This is also the case for the cable ties and fastening openings, which are especially designed for the food industry. They are also blue and contain an admixture of metal. This means that a missing cable tie, for instance, can be retrieved very easily using a metal detector or an X-ray unit.

Download here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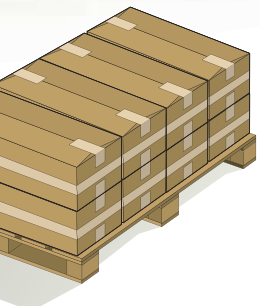
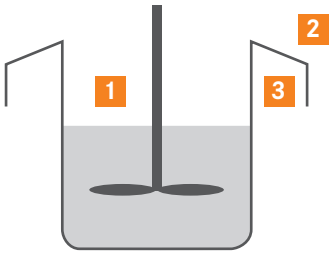
Definition of Food & Beverage zones





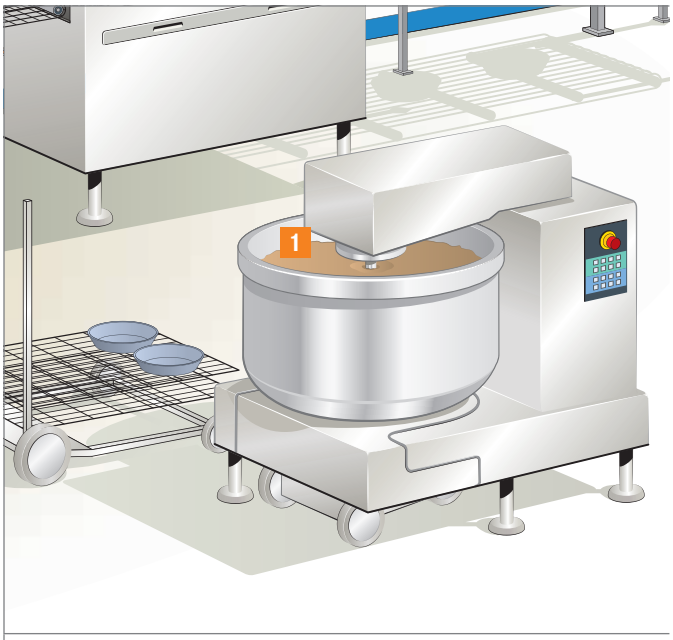
The 3 zones in Food & Beverage production and machineries

1 **Hygienic Design Zone**
Food is in direct contact with equipment and electrical components

2 **Splash Zone**
Drips or splashes of food could not return to the food manufacturing process, causing contamination

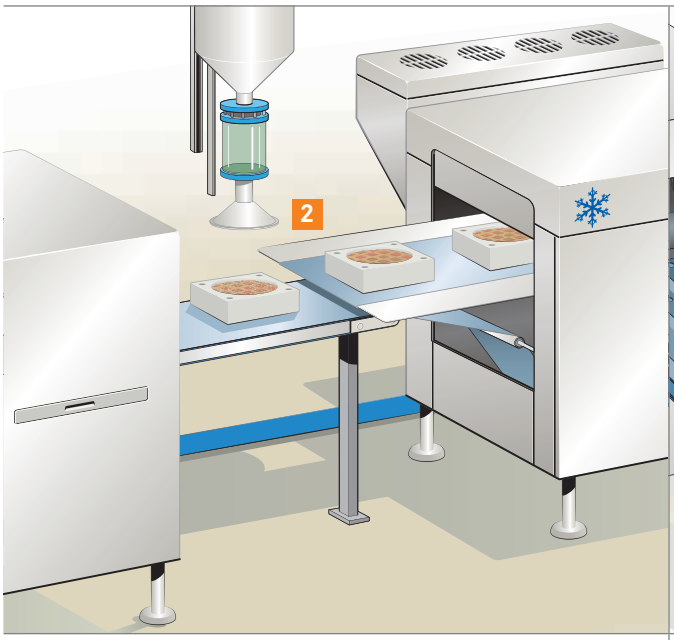
3 **Non-Product Zone**
No contact with food

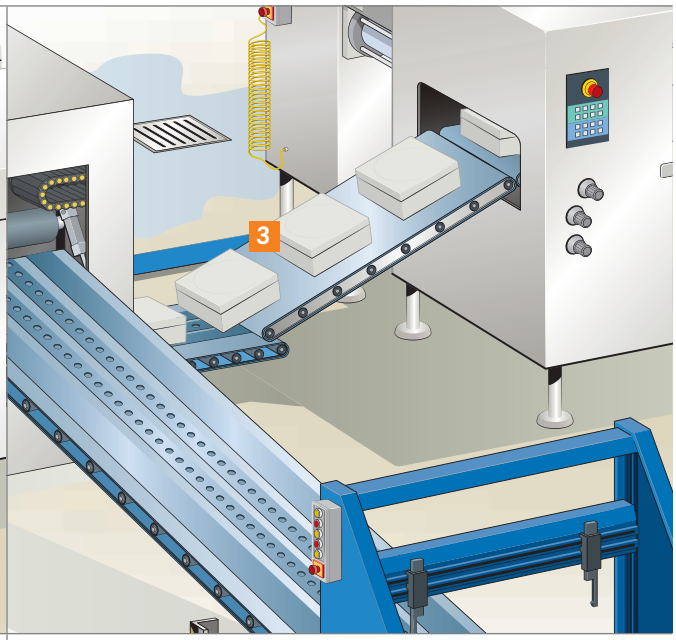
Definition of Food & Beverage zones



1 Hygienic Design Zone (product zone)

Practical example	• Zone that comes into direct contact with food (permanently or through contact with the components in the machines). Contact with cables is avoided as far as possible here. According to the principle of hygienic design, these cables should usually be laid in stainless steel pipes or protective conduits in potential contact areas. • The components in the machines and facilities are subject to product-specific hygiene regulations. Depending on the food to be processed and the materials and design of the facility, various cleaning options can be used to avoid food contamination and keep the facility in good condition for as long as possible. These options include dry cleaning using brushes, various stages of low- or high-pressure wet cleaning or the use of dry-ice blasting equipment.
Requirements/recommendations set out in the standards	• Hygienic design standards are observed (e.g. EHEDG, DIN EN ISO 14159, DIN EN 1672-2, NSF) • Approved or food-safe substances are mainly observed (e.g. in keeping with the FDA's recommendations or DIN EN ISO)
Our approach to the solution	• Hygienic designs minimise the risk of microbiological, chemical and physical contamination, so the use of design approaches on all machine components has significant benefits. Simple cable glands, e.g. in hygiene control cabinets, often form a potential breeding ground for germs which can be avoided through the use of specialised cable glands.
Product portfolio/examples	• SKINTOP® HYGIENIC (SC) • SILVYN® HYGIENIC/SILVYN® FG (NM) • UNITRONIC® SENSOR HD M12 • Detectable cable ties (Detect/TY-RAP®)





2 Splash Zone	3 Non-Product Zone
• Unlike in the product zone, drops or flecks of food can no longer get back into the food production process and cause contamination. • The components in the machines and facilities are subject to product-specific hygiene regulations. Depending on the food to be processed and the materials and design of the facility, various cleaning options can be used to avoid food contamination and keep the facility in good condition for as long as possible. These include dry cleaning using brushes, various stages of low- or high-pressure wet cleaning or the use of dry-ice blasting equipment.	• In contrast to the product zone and Splash Zone, there is no contact with food. • The components in the machines and facilities are not subject to product-specific hygiene regulations here. Nevertheless, the service team must thoroughly clean all areas in each individual case. Foaming and rinsing individual components in the facilities, for instance, can be difficult in practice. Depending on the structure (e.g. modular) and size of the facilities, components can be partially cleaned as part of the facility or with the substances used in the product or Splash Zone.
• Approved or food-safe substances are also mainly observed (e.g. in keeping with the FDA's recommendations or DIN EN ISO)	• Components with chemical, thermal and mechanical resistance are observed on an individual basis. Adequate protection types for components in facilities are also observed.
• At the component level, hygienic designs decrease the time needed to clean machine and facility components. If components are easier to clean, this will also have a positive effect on the concentration of the cleaning agent and disinfectant for each facility. This reduces the cost and saves the environment. Lower concentrations of cleaning agents and disinfectants have a positive impact on the durability of materials, which reduces the risk of downtime. There seems to be a trend towards generally extending hygienic design concepts to all facility components and zones.	• Pockets of dirt are avoided through the use of proper cable installation types. Here it is worth not permanently binding cable bunches in order to make mechanical cleaning easier and to avoid the formation of loops. As a member of the Safe Food Factory body, our specialists are happy to offer one-to-one advice on how to install cables. Robust materials which can withstand substances typically used for cleaning and other production-related media (e.g. alkalines, acids, bio-oils, fats, hot water, cleaning agents and disinfectants) in the long-term are taken into account.
• ÖLFLEX® ROBUST series • ETHERLINE® ROBUST series • SKINTOP® HYGIENIC (SC)/SKINTOP® INOX (SC) • EPIC® ULTRA series/EPIC® ULTRA COVER	• ÖLFLEX® CLASSIC 110 series • ÖLFLEX® HEAT series • SKINTOP® ST-M/SKINTOP® MULTI • FLEXIMARK® LCK

Consortia, working groups and organisations

EHEDG

The European Hygienic Engineering & Design Group (EHEDG) is a consortium of machine and component manufacturers as well as experts from the food industry, research institutes and health authorities. The organisation was founded in 1989 with the intention of increasing awareness of hygiene when processing and packaging food. The EHEDG's main task is to play a part in hygienic design and construction in all areas of food production, and thus to guarantee the safe production of food. The EHEDG also supports European legislation and its call for hygienic handling, processing and packaging of food using hygienic machines in a hygienic environment (European Commission Machinery Directive 2006/42/EC, EN 1672-2 and EN ISO 14159 for hygiene requirements).

The EHEDG and the US organisation 3-A Sanitary Standards Inc. have a joint mission: to promote hygiene in food production and processing, and thus pursue the joint aim of improving food safety. The two organisations exchange drafts of guidelines and standards before they publish them so that both institutions can evaluate and comment on them prior to publication.

The EHEDG is also active in regions outside of Europe. Its members are spread across 55 countries, including Brazil, China, Japan and the Russian Federation.

Our SKINTOP® HYGIENIC cable gland has been tested and certified in keeping with the latest Guideline No. 2, Test No. 477/12/12.09.2014 – Type EL CLASS 1 AUX. In contrast to earlier test methods, the current guideline includes a practical test in addition to a pure design review.

3-A

3-A Sanitary Standards, Inc. is a US independent non-profit corporation dedicated to advancing hygienic equipment design for the food, beverage and pharmaceutical industries. 3-A has joined forces with the EHEDG to exchange drafts of guidelines and standards before they publish them so that both institutions can evaluate and comment on them prior to publication.

Observing hygienic design concepts outlined by the EHEDG or 3-A is thus a significant benefit to export-oriented companies. The more consistently design recommendations are incorporated into components in machines and facilities, the more efficient and durable a facility becomes.

ECOLAB®

ECOLAB® is a global leader in technologies and services relating to water, hygiene and energy. Around the world, companies operating in the fields of gastronomy, food processing, catering, healthcare, industry and the oil and gas market choose ECOLAB® products and services to keep their working environment clean and safe, to work more efficiently and to achieve sustainability targets. In order to clean and disinfect processing equipment for food and beverage technology, ECOLAB® offers a complete range of cleaning agents and EPA-registered cleaners as well as disinfectants for cleaning in place (CIP), cleaning out of place (COP), outer foam or manual cleaning.

A number of our products have already been tested and certified in line with the F&E/P3-E No. 40-1 test method (based on 9-2014 – REV 2 and REV 3) to ensure that they can withstand our customers' cleaning requirements.

Safe Food Factory

In the Benelux states, a working group called "Safe Food Factory" has been established in order to compile recommendations for selecting and installing facilities and components in the food and beverage industry. Safe Food Factory is an initiative set up by Dutch companies and the EHEDG. It sees itself as an international platform where industry, guidelines and practice come together.

A variety of industry representatives form a sub-group for a certain topic, where they work on special questions. For the topic of cabling, the participants included Lapp Benelux, Bosch Packaging Technology, Gouda Holland, the Niedax Group, Rittal, Anamet Europa, NIZO, food and beverage manufacturers FrieslandCampina and Heineken, as well as many cleaning service providers.

They discussed best practices, carried out practical tests and developed recommendations at more than ten meetings. Prior to being published, a commission of representatives from potential user companies such as BAT, Jacobs Douwe Egberts, Nestlé and Unilever tested the new guideline.

As a member of this working group, our experts are happy to advise you on the latest insights into the best cabling, installation type, choice of accessories, cleaning and chemical resistance from the Lapp product portfolio.

FDA

The Food and Drug Administration (FDA) is an agency within the US Department of Health and Human Services. As such, it is in charge of protecting public health by assuring the safety, effectiveness, quality and security of human and veterinary drugs, vaccines and other biological products and medical devices.

The FDA is also responsible for the safety and security of most of the USA's food supply, all cosmetics, dietary supplements and products that give off radiation. The FDA's Code of Federal Regulations Title 21 Part 177 Subpart C (Substances for Use Only as Components of Articles Intended for Repeated Use) defines the requirements placed on and the list of materials approved for use.

Solely approved materials which are allowed to come into direct contact with food are used in SKINTOP® HYGIENIC (SC), SILVYN® FG (NM) and UNITRONIC® SENSOR HD M12 S/A assemblies.

NSF

The NSF develops public health standards and certifications that help protect consumer products, the global food and water supply and the environment. Founded in 1944 as the National Sanitation Foundation, it changed its name to NSF International in 1990 as it expanded its services beyond sanitation and into global markets. NSF 51 is a set of regulations for plastic, materials and components used in food production equipment.

The SILVYN® FG (NM) protective conduit is made of approved materials that are allowed to come into direct contact with food.

DIN EN ISO 14159

This standard defines the hygiene requirements for machine design. Title: "Safety of machinery – Hygiene requirements for the design of machinery"

SKINTOP® INOX (SC) was developed based on this standard, particularly in terms of its design and material. It offers good value for money and is suitable for use in the Splash Zone and Non-Product Zone. SKINTOP® HYGIENIC is designed in compliance with the regulations defined for cable glands and has been tested and certified by the EHEDG. It is perfect for use in the product and Splash Zone.

DIN EN 1672-2

This standard defines the basic guidelines for product design and hygiene requirements for food machines. Title: "Food processing machinery – Basic concepts – Part 2: Hygiene requirements"

SKINTOP® INOX (SC) and SKINTOP® HYGIENIC were developed based on the guidelines defined in the standard. SKINTOP® HYGIENIC has been tested and certified by the EHEDG.

EC 2002/72

"Commission Directive 2002/72/EC of 6 August 2002 relating to plastic materials and articles intended to come into contact with foodstuffs" concerns plastic materials and items which come into contact with food.

The SKINTOP® INOX (SC), SKINTOP® HYGIENIC (SC) and SILVYN® HYGIENIC glands comply with this directive.

DIN EN ISO 14644-1

This standard defines cleanrooms, associated areas and corresponding classifications. In food production and packaging, more and more cleanrooms are being used to avoid contamination through particles and to make food last for as long as possible. The cleanroom is an alternative to packaging in a controlled atmosphere in which various gases can be used. Unlike the pharmaceutical sector or semiconductor market, a compact specialised system module is used more frequently than a cleanroom for the entire manufacturing process in the food and beverage industry for financial reasons. Title: "Cleanrooms and associated controlled environments – Part 1: Classification of air cleanliness by particle concentration"

A number of products in the ÖLFLEX® and UNITRONIC® family have been tested and certified by the Fraunhofer Institute for Manufacturing Engineering and Automation IPA and observe the requirements for cleanroom classifications in the food industry. Our experts are happy to advise you based on your individual needs.

Testing expertise at the Lapp laboratory

“Warning – test running!” states the sign – we’re still allowed to take a quick look though. Between X-ray fluorescence analysis, a stripping test device and a refrigerator for cold impact tests lies a strange cosmos. A visit to the Lapp laboratory.

They say you can’t make an omelette without breaking eggs. And you also can’t test a product without some flashing, glowing, swooshing and whirring along the way. Here the products from the Lapp Group are tested behind closed doors for everyday suitability. And sometimes a regular day turns into years here – for example if a cable needs to be tested for ageing properties. But how on earth can you artificially age a cable in a laboratory? The answer: in a heating cabinet that can simulate many months in a matter of days.

Up to 40 different tests are performed on a single cable, depending on where it will be used. If the location is an oil platform then drilling mud from Scandinavia will also sometimes be used. “There are enough challenges”, says Michael Hagenmüller. He is the head of the laboratory and has also subjected the SKINTOP® HYGIENIC to rigorous testing.

In this case it was necessary to monitor construction and measures, check the threads, test for anti-twist protection, check strain relief and ensure that the connector is watertight and dust-proof – among other things. A negative pressure is produced for 8 hours at a time and talcum powder is added. At the end there cannot be even a single speck of dust. Only then does it pass the test.

Not rocket science? Think again! At another station the cables, connectors and cable glands are tested for chemical resistance. That might not be “rocket science” – but with the critical eyes of Laura Erdmann present, it strangely sort of is. After all, when she’s not here, Laura Erdmann is studying aerospace engineering. She painstakingly prepares the material tests – and braces herself for long test phases. The ECOLAB® test, for instance, takes four weeks.

ECOLAB® is a leader in the area of industrial cleaning products for hotels, restaurants, hospitals and of course also food manufacturers and breweries. In these places, chemicals are normally used to clean machinery. The ECOLAB® certification attests to the fact that the Lapp products are resistant to these cleaning agents and disinfectants.

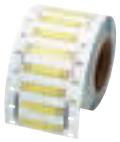
“For the customers, what we’re doing here is extremely important. They can rest assured that the figures listed in our catalogues have been tested and verified”, explains Hagenmüller who has already set up or helped set up various laboratories for Lapp in Stuttgart, Singapore and other places in the world.

At the moment, he is working on an idea on how the Lapp laboratory can continue setting standards for the sector in future.

INFOBOX ECOLAB® TESTING
For the ECOLAB® certificate, products are fully immersed in up to 6 different test solutions for 28 days. They are visually monitored every 2 days: for soaked or brittle surfaces, colour changes and defects such as cracks. If no tags are visible after 4 weeks and the products pass the following functional tests, the product can be classed as resistant.

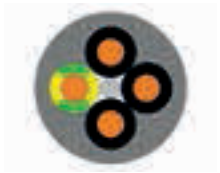
Examples of product portfolios
Food & Beverage technology

	Cables – Control, Signal	Data Transmission
1 Hygienic Design Zone	Contact with cables and connectors is avoided as far as possible in this special zone. According to the principle of hygienic design, these cables should be laid, wherever possible, in stainless steel pipes or protective conduits in potential permanent contact areas. Examples of use include capped cables in stirring units and mixers or as an interface to optical capacitive level sensors. Our specialists are happy to advise you on your specific applications.	
2 Splash Zone	 ÖLFLEX® ROBUST 200  ÖLFLEX® CLASSIC 400 CP, 440	 ETHERLINE® ROBUST  UNITRONIC® BUS PB  ETHERLINE® PN Cat.5e Y
3 Non-Product Zone	 ÖLFLEX® SERVO FD 796 CP  ÖLFLEX® HEAT 180 EWKF  ÖLFLEX® CLASSIC 110, 110 CH	 ETHERLINE® P Cat.5e, 6, 7  UNITRONIC® PUR CP

Connectors	Cable Glands		Conduits	Marking + Acc.
	 SKINTOP® HYGIENIC	 SKINTOP® HYGIENIC SC	 SILVYN® HYGIENIC  SILVYN® FG  SILVYN® FG NM	 Detectable cable ties DETECT TY-RAP®
 EPIC® ULTRA  EPIC® ULTRA Protective Cover	 SKINTOP® INOX  SKINDICHT® CN-M	 SKINTOP® INOX SC  SKINDICHT® SM CrNi M	 SILVYN® ELT	 FLEXIMARK® Wrapping labels LCK  FLEXIMARK® Stainless steel FCC
 EPIC® H-B  EPIC® MC module  EPIC® LS1 D6  EPIC® LS1 A3	 SKINDICHT® SHV-M-VITON®  SKINTOP® MS-M BRUSH  SKINDICHT® SM-M  SKINTOP® ST-M  SKINTOP® MS-M	 SKINTOP® CUBE  SKINTOP® MULTI  SKINTOP® COLD	 SILVYN® SPLIT  SILVYN® RILL PA 6  SILVYN® SSUE	 FLEXIMARK® Cablelabel PUR  Basic Tie cable tie

ÖLFLEX® CLASSIC 110

VDE-registered oil-resistant PVC control cable for a wide range of applications



Info

- VDE certificate of conformity with factory surveillance
- More than 140 versions with up to 100 cores

Benefits

- Wide range of standardized lengths and individual cuts
- Very broad range of items, versions with up to 100 cores

Application range

- For fixed installation as well as occasional flexing at free, non-continuously recurring movement without tensile load
- Dry or damp rooms that are subject to medium mechanical loads
- Dairy and cheese technology
- Packaging machines
- Deighing and dosing systems
- Mills for grains and cereals
- In power chains for a travelling distance up to 5 m and 0,2 ... 1 million bending cycles, for following dimensions: 0,5 to 2.5mm² and 2 to 7 conductors

Product features

- Flame-retardant according to IEC 60332-1-2
- Good chemical resistance, see catalogue appendix T1
- Oil-resistant according to DIN EN 50290-2-22 (TM54)

Norm references / approvals

- VDE reg. no. 7030 for the following dimensions:
  up to 2.5 mm²: 2 - 65 cores
  from 4 mm²: 2 - 7 cores
  from 25 mm²: 2 - 5 cores

Design

- Finely stranded bare copper wires
- PVC core insulation LAPP P8/1
- Cores twisted in layers
- PVC sheath, grey (RAL 7001)

Technical data

Classification
ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description: # Control cable

Core identification code
Black with white numbers acc. to VDE 0293-1

Conductor design
Fine wire according to DIN EN 60228 (VDE 0295), class 5 / IEC 60228 class 5

Torsion application in WTG
TW-0 & TW-1, refer to appendix T0

Minimum bending radius
Occasional flexing: 10 x outer diameter
In power chains: 15 x outer diameter
Fixed installation: 4 x outer diameter

Nominal voltage
U_0/U: 300/500 V

Test voltage
4000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
Occasional flexing: -15°C to +70°C
In power chains: -5°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Number of cores and mm² per conductor	Standard lengths (m) and standard packaging							Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
		25	50	100	200	300	500	1000			
ÖLFLEX® CLASSIC 110											
1119752	2 X0.5			100	200	300	500	1000	4.8	9.6	35
1119003	3 G0.5			100	200	300	500	1000	5.1	14.4	42
1119753	3 X0.5			100	200	300	500	1000	5.1	14.4	42
1119004	4 G0.5			100	200	300	500	1000	5.7	19.2	54
1119754	4 X0.5			100	200	300	500	1000	5.7	19.2	54
1119005	5 G0.5			100	200	300	500	1000	6.2	24	63
1119755	5 X0.5			100	200	300	500	1000	6.2	24	63
1119007	7 G0.5		50	100	200	300	500	1000	6.7	33.6	81
1119757	7 X0.5		50	100	200	300	500	1000	6.7	33.6	81
1119010	10 G0.5		50	100	200	300	500	1000	8.6	48	116
1119012	12 G0.5		50	100	200	300	500	1000	8.9	58	131
1119014	14 G0.5		50	100			500	1000	9.5	67	153
1119018	18 G0.5		50	100			500	1000	10.5	86.4	188
1119021	21 G0.5		50	100			500	1000	11.7	101	221
1119025	25 G0.5		50	100			500	1000	12.4	120	261
1119030	30 G0.5		50	100			500	1000	13.3	144	304
1119035	35 G0.5		50	100			500	1000	14.5	168	356
1119040	40 G0.5		50	100			500	1000	15.4	192	400
1119052	52 G0.5		50	100			500		17.3	250	517
1119061	61 G0.5		50	100			500		18.5	293	603
1119065	65 G0.5		50	100			500		19.6	312	644

Article number	Number of cores and mm² per conductor	Standard lengths (m) and standard packaging							Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
		25	50	100	200	300	500	1000			
1119080	80 G0.5		50	100			500		21.1	384	780
1119100	100 G0.5		50	100			500		23.6	480	975
1119802	2 X0.75			100	200	300	500	1000	5.4	14.4	45
1119103	3 G0.75			100	200	300	500	1000	5.7	21.6	55
1119803	3 X0.75			100	200	300	500	1000	5.7	21.6	55
1119104	4 G0.75			100	200	300	500	1000	6.2	28.8	66
1119804	4 X0.75			100	200	300	500	1000	6.2	28.8	66
1119105	5 G0.75		50	100	200	300	500	1000	6.7	36	79
1119805	5 X0.75		50	100	200	300	500	1000	6.7	36	79
1119107	7 G0.75		50	100	200	300	500	1000	7.3	50	101
1119807	7 X0.75		50	100	200	300	500	1000	7.3	50	101
1119109	9 G0.75		50	100	200	300	500	1000	9.4	65	137
1119110	10 G0.75		50	100	200	300	500	1000	9.6	72	150
1119112	12 G0.75		50	100	200	300	500	1000	9.9	86	171
1119812	12 X0.75		50	100	200	300	500	1000	9.9	86	171
1119115	15 G0.75		50	100			500	1000	10.9	108	209
1119117	15 X0.75		50	100			500	1000	10.9	108	209
1119116	16 G0.75		50	100			500	1000	11.1	115.2	220
1119118	18 G0.75		50	100			500	1000	11.7	130	244
1119121	21 G0.75		50	100			500	1000	13.0	151	286
1119125	25 G0.75		50	100			500	1000	13.8	180	337
1119126	26 G0.75		50	100			500	1000	14.2	187.2	350
1119134	34 G0.75		50	100			500	1000	15.9	245	448
1119141	41 G0.75		50	100			500	1000	17.4	296	538
1119150	50 G0.75		50	100			500		19.2	360	648
1119151	51 G0.75		50	100			500		19.2	367	646
1119161	61 G0.75		50	100			500		20.5	439	779
1119165	65 G0.75		50	100			500		21.8	468	832
1119180	80 G0.75		50	100			500		23.6	576	1019
1119200	100 G0.75		50	100			500		26.4	718	1271
1119852	2 X1.0			100	200	300	500	1000	5.7	19.2	53
1119203	3 G1.0			100	200	300	500	1000	6.0	28.8	65
1119853	3 X1.0			100	200	300	500	1000	6.0	28.8	65
1119204	4 G1.0		50	100	200	300	500	1000	6.5	38.4	79
1119854	4 X1.0		50	100	200	300	500	1000	6.5	38.4	79
1119205	5 G1.0		50	100	200	300	500	1000	7.1	48	94
1119855	5 X1.0		50	100	200	300	500	1000	7.1	48	94
1119206	6 G1.0		50	100	200	300	500	1000	8.0	58	113
1119207	7 G1.0		50	100	200	300	500	1000	8.0	67	126
1119857	7 X1.0		50	100	200	300	500	1000	8.0	67	126
1119208	8 G1.0		50	100	200	300	500	1000	9.5	77	149
1119209	9 G1.0		50	100	200	300	500	1000	10.0	86	164
1119210	10 G1.0		50	100	200	300	500	1000	10.2	96	180
1119212	12 G1.0		50	100	200	300	500	1000	10.5	115	205
1119862	12 X1.0		50	100	200	300	500	1000	10.5	115	205
1119214	14 G1.0		50	100			500	1000	11.2	134	238
1119216	16 G1.0		50	100			500	1000	11.8	153.6	266
1119218	18 G1.0		50	100			500	1000	12.7	173	320
1119868	18 X1.0		50	100			500	1000	12.7	173	320
1119220	20 G1.0		50	100			500	1000	13.4	192	330
1119870	20 X1.0		50	100			500	1000	13.4	192	330
1119225	25 G1.0		50	100			500	1000	14.7	240	408
1119226	26 G1.0		50	100			500	1000	15.1	249	424
1119234	34 G1.0		50	100			500	1000	17.1	326	551
1119236	36 G1.0		50	100			500	1000	17.4	346	578
1119241	41 G1.0		50	100			500	1000	18.8	394	661
1119250	50 G1.0		50	100			500		20.6	480	797
1119256	56 G1.0		50	100			500		21.4	538	888
1119261	61 G1.0		50	100			500		22.1	586	958
1119265	65 G1.0		50	100			500		23.6	624	1033
1119280	80 G1.0		50	100			500		25.3	768	1251
1119300	100 G1.0		50	100			500		28.3	960	1560
1119902	2 X1.5			100	200	300	500	1000	6.3	29	68
1119303	3 G1.5	25	50	100	200	300	500	1000	6.7	43	84
1119903	3 X1.5		50	100	200	300	500	1000	6.7	43	84
1119304	4 G1.5	25	50	100	200	300	500	1000	7.2	58	104
1119904	4 X1.5		50	100	200	300	500	1000	7.2	58	104
1119305	5 G1.5	25	50	100	200	300	500	1000	8.1	72	128
1119905	5 X1.5		50	100	200	300	500	1000	8.1	72	128
1119306	6 G1.5		50	100	200	300	500	1000	8.4	86.4	157
1119307	7 G1.5	25	50	100	200	300	500	1000	8.9	101	166
1119907	7 X1.5		50	100	200	300	500	1000	8.9	101	166
1119308	8 G1.5		50	100			500	1000	10.6	115	210
1119313	8 X1.5		50	100			500	1000	10.6	116	210
1119309	9 G1.5		50	100			500	1000	11.4	130	221
1119310	10 G1.5		50	100			500	1000	11.6	143	243
1119311	11 G1.5		50	100			500	1000	11.6	158	258
1119312	12 G1.5	25	50	100			500	1000	12.0	173	279
1119912	12 X1.5		50	100			500	1000	12.0	173	279
1119314	14 G1.5		50	100			500	1000	12.7	202	323
1119316	16 G1.5		50	100			500	1000	13.4	230.4	361
1119318	18 G1.5	25	50	100			500	1000	14.4	259	407
1119321	21 G1.5		50	100			500	1000	15.7	302	469
1119325	25 G1.5	25	50	100			500	1000	16.9	360	560
1119326	26 G1.5		50	100			500	1000	17.3	374.4	582

Power and control cables

LAPP GROUP

Various applications • PVC sheath and numbered cores

Article number	Number of cores and mm² per conductor	Standard lengths (m) and standard packaging							Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
		25	50	100	200	300	500	1000			
1119332	32 G1.5		50	100			500	1000	18.7	461	704
1119334	34 G1.5		50	100			500	1000	19.4	490	746
1119341	41 G1.5		50	100			500	1000	21.3	591	895
1119350	50 G1.5		50	100			500		23.5	720	1089
1119361	61 G1.5		50	100			500		25.2	878	1309
1119365	65 G1.5		50	100			500		26.7	936	1398
1119952	2 X2.5	25	50	100	200	300	500	1000	7.5	48	101
1119403	3 G2.5	25	50	100	200	300	500	1000	8.1	72	132
1119404	4 G2.5	25	50	100	200	300	500	1000	8.9	96	163
1119405	5 G2.5	25	50	100	200	300	500	1000	10.0	120	200
1119407	7 G2.5	25	50	100			500	1000	11.1	168	267
1119412	12 G2.5	25	50	100			500	1000	14.8	288	445
1119414	14 G2.5		50	100			500	1000	15.8	336	515
1119418	18 G2.5	25	50	100			500	1000	17.8	432	648
1119425	25 G2.5	25	50	100			500	1000	20.8	600	890
1119434	34 G2.5		50	100			500	1000	24.4	816	1208
1119450	50 G2.5		50	100			500		29.4	1200	1754
1119503	3 G4.0	25	50	100			500	1000	9.9	115	201
1119504	4 G4.0	25	50	100			500	1000	10.8	154	249
1119505	5 G4.0	25	50	100			500	1000	12.1	192	294
1119507	7 G4.0	25	50	100			500	1000	13.4	269	407
1119511	11 G4.0		50	100			500	1000	17.6	422	634
1119512	12 G4.0		50	100			500	1000	18.1	461	660
1119603	3 G6.0	25	50	100			500	1000	11.7	172.8	289
1119604	4 G6.0	25	50	100			500	1000	13.0	230	365
1119605	5 G6.0	25	50	100			500	1000	14.5	288	447
1119607	7 G6.0	25	50	100			500	1000	16.0	403	600
1119613	3 G10.0	25	50	100			500	1000	14.6	288	466
1119614	4 G10.0	25	50	100			500	1000	16.2	384	590
1119615	5 G10.0	25	50	100			500	1000	18.1	480	722
1119617	7 G10.0	25	50	100			500	1000	20.0	672	968
1119624	4 G16.0		50	100			500		18.8	614	1087
1119625	5 G16.0		50	100			500		21.2	768	1370
1119627	7 G16.0		50	100			500		23.4	1075	1779
1119634	4 G25.0		50	100			500		23.5	960	1582
1119635	5 G25.0		50	100			500		26.4	1200	1998
1119636	7 G25.0		50	100			500		29.1	1680	2825
1119644	4 G35.0		50	100			500		26.4	1344	2106
1119645	5 G35.0		50	100			500		29.6	1680	2635

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® 191 refer to main catalogue

Accessories

- SKINTOP® CLICK refer to main catalogue

ÖLFLEX® CLASSIC 115 CY

Shielded PVC control cable with small outer diameter

Info

- EMC-compliant
- Thin and light, without inner sheath

Benefits

- Space-saving due to small cable diameters

Application range

- Dairy and cheese technology
- Packaging machines
- Deighing and dosing systems
- Mills for grains and cereals
- Office machines and systems for data processing

Product features

- Flame-retardant according to IEC 60332-1-2
- Good chemical resistance, see catalogue appendix T1
- High level of screening
  Low coupling resistance
  (max. 250 W/km at 30 MHz)

Similar products

- ÖLFLEX® ROBUST 215 C refer to page 30
- ÖLFLEX® CLASSIC 110 CY refer to main catalogue

Norm references / approvals

- Based on EN 50525-2-51

Design

- Finely stranded bare copper wires
- PVC core insulation LAPP P8/1
- Cores twisted in layers
- Plastic film wrapping
- Tin-plated copper braiding
- PVC sheath, grey (RAL 7001)

Accessories

- SKINTOP® BRUSH ADD-ON
  refer to page 64
- 3M Scotch™ 1183 screening tape
  refer to main catalogue
- SKINTOP® MS-M BRUSH
  refer to main catalogue
- SKINTOP® MS-HF-M BRUSH
  refer to main catalogue

Technical data

Classification
ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description:
Control cable

Core identification code
Black with white numbers acc. to VDE 0293-1

Conductor design
Fine wire according to VDE 0295, class 5 / IEC 60228 class 5

Minimum bending radius
Occasional flexing: 20 x outer diameter
Fixed installation: 6 x outer diameter

Nominal voltage
U_0/U: 300/500 V

Test voltage
Core/Core: 4000 V
Core/Shield: 2000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
Occasional flexing: -5°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® CLASSIC 115 CY				
1136752	2 X0.5	5.8	36	45
1136003	3 G0.5	6.1	43	59
1136753	3 X0.5	6.1	43	59
1136004	4 G0.5	6.5	49	71
1136754	4 X0.5	6.5	49	71
1136005	5 G0.5	7.0	57	86
1136755	5 X0.5	7.0	57	86
1136007	7 G0.5	7.5	69	105
1136757	7 X0.5	7.5	69	105
1136012	12 G0.5	9.9	104	200
1136762	12 X0.5	9.9	104	200
1136018	18 G0.5	11.5	141	275
1136768	18 X0.5	11.5	141	275
1136025	25 G0.5	13.4	211	350
1136775	25 X0.5	13.4	211	350
1136802	2 X0.75	6.2	43	56
1136103	3 G0.75	6.5	52	70
1136803	3 X0.75	6.5	52	70
1136104	4 G0.75	7.0	61	95
1136804	4 X0.75	7.0	61	95
1136105	5 G0.75	7.7	72	108
1136805	5 X0.75	7.7	72	108
1136107	7 G0.75	8.3	89	127
1136807	7 X0.75	8.3	89	127
1136112	12 G0.75	10.9	138	232
1136118	18 G0.75	12.7	211	315
1136125	25 G0.75	14.8	280	435
1136825	25 X0.75	14.8	280	435
1136852	2 X1.0	6.5	51	71
1136203	3 G1.0	6.8	62	86
1136853	3 X1.0	6.8	62	86
1136204	4 G1.0	7.3	74	98
1136854	4 X1.0	7.3	74	98
1136205	5 G1.0	8.1	88	121
1136855	5 X1.0	8.1	88	121

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
1136207	7 G1.0	8.8	112	147
1136857	7 X1.0	8.8	112	147
1136212	12 G1.0	11.5	185	285
1136218	18 G1.0	13.9	268	395
1136225	25 G1.0	15.9	354	486
1136902	2 X1.5	7.1	65	86
1136303	3 G1.5	7.5	82	112
1136903	3 X1.5	7.5	82	112
1136304	4 G1.5	8.2	100	135
1136904	4 X1.5	8.2	100	135
1136305	5 G1.5	8.9	119	148
1136905	5 X1.5	8.9	119	148
1136307	7 G1.5	9.9	154	192
1136907	7 X1.5	9.9	154	192
1136312	12 G1.5	13.0	268	365
1136318	18 G1.5	15.6	373	520
1136325	25 G1.5	17.9	530	734
1136334	34 G1.5	20.8	683	944
1136403	3 G2.5	8.9	118	151
1136404	4 G2.5	9.9	147	188
1136405	5 G2.5	11.0	176	270
1136407	7 G2.5	11.9	253	340
1136412	12 G2.5	16.0	355	540
1136418	18 G2.5	19.0	569	782
1136425	25 G2.5	22.2	827	1358
1136504	4 G4.0	11.6	248	305
1136507	7 G4.0	14.4	355	500
1136604	4 G6.0	14.2	343	440
1136607	7 G6.0	17.0	505	672
1136614	4 G10.0	17.2	495	680
1136615	5 G10.0	19.5	592	824
1136624	4 G16.0	20.2	800	1050
1136625	5 G16.0	22.6	895	1285
1136634	4 G25.0	25.1	1075	1413
1136635	5 G25.0	28.0	1400	1976
1136638	4 G35.0	28.0	1576	2070

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
Photographs are not to scale and do not represent detailed images of the respective products.

ÖLFLEX® 150

Oil-resistant multi-standard cable with H05VV5-F and AWM approval

Info

- Oil-resistant according to EN 50363-4-1: TM5
- Harmonised (HAR): H05VV5-F and UL recognized

Benefits

- Wide application range due to multiple certifications

Application range

- Dairy and cheese technology
- Packaging machines
- Deighing and dosing systems
- Mills for grains and cereals
- Plant engineering
  Industrial machinery
  Heating and air-conditioning systems
- Mainly used in dry, damp and wet interiors (including water-oil mixtures), but not for outdoor use
- For fixed installation under medium mechanical load conditions, and applications with occasional flexing at free, non-continuously recurring movement without tensile load or compulsory guidance
- Note: for the use of AWM (Appliance Wiring Material) cables in industrial machinery (USA) according to NFPA 79 Ed. 2012: please see the catalogue appendix table T29

Product features

- Flame-retardant according to IEC 60332-1-2 and UL 1581 §1061 Cable Flame Test
- Oil-resistant according to EN 50363-4-1: TM5

Norm references / approvals

- H05VV5-F (EN 50525-2-51)
- UL AWM Style 21098
  CSA AWM I A/B II A/B
- Multi-standard cables are designed in metric nominal cross sections in mm² **or** AWG/kcmil nominal sizes. The leading cross-section is specified in the table below, while the corresponding cross-section of the other system can be found in the appendix table T16 of this catalogue. For this corresponding secondary size, the conductor cross-section is generally larger.

Design

- Finely stranded bare copper wires
- PVC core insulation
- Cores twisted in layers
- PVC sheath, high oil-resistance, grey (RAL 7001)

Technical data

Classification
ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description:
Control cable

Core identification code
Black with white numbers acc. to VDE 0293-1

Conductor design
Fine wire according to VDE 0295, class 5 / IEC 60228 class 5

Minimum bending radius
Occasional flexing:
12.5 x outer diameter
Fixed installation: 4 x outer diameter

Nominal voltage
HAR U_0/U: 300/500 V
UL/CSA: 600 V

Test voltage
3000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
Occasional flexing:
HAR: -5°C to +70°C
UL/CSA: -5°C to +90°C
Fixed installation:
HAR: -40°C to +70°C
UL/CSA: -40°C to +90°C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® 150				
0015002	2 X 0.5	5.9	9.6	47
0015003	3 G 0.5	6.2	14.4	62.4
0015004	4 G 0.5	6.8	19.2	68.2
0015005	5 G 0.5	7.4	24	87.1
0015007	7 G 0.5	9.0	33.6	118.7
0015012	12 G 0.5	11.1	58	198
0015018	18 G 0.5	13.2	86.4	328
0015025	25 G 0.5	16.0	120	380.4
0015034	34 G 0.5	18.1	164	509
0015041	41 G 0.5	19.7	197	595
0015102	2 X 0.75	6.3	14.4	61
0015103	3 G 0.75	6.7	21.6	75.6
0015104	4 G 0.75	7.2	28.8	83.9
0015105	5 G 0.75	8.1	36	113.3
0015107	7 G 0.75	9.9	50	145
0015112	12 G 0.75	12.0	86	244.9
0015118	18 G 0.75	14.4	130	327.7
0015125	25 G 0.75	17.1	180	466.4
0015134	34 G 0.75	19.7	245	626.5
0015141	41 G 0.75	21.6	296	748
0015202	2 X 1.0	6.6	19.2	80
0015203	3 G 1.0	7.0	28.8	79
0015204	4 G 1.0	7.8	38.4	98.6
0015205	5 G 1.0	8.6	48	132.1
0015206	6 G 1.0	9.5	57.6	150

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
0015207	7 G 1.0	10.4	67	169.3
0015212	12 G 1.0	12.8	115	285.9
0015218	18 G 1.0	15.1	173	405.2
0015225	25 G 1.0	18.0	240	569.5
0015234	34 G 1.0	20.9	326	741.7
0015241	41 G 1.0	22.8	394	886
0015250	50 G 1.0	25.0	480	1072.2
0015302	2 X 1.5	7.6	28.8	95
0015303	3 G 1.5	8.3	43	109.8
0015304	4 G 1.5	9.0	58	145
0015305	5 G 1.5	10.1	72	168
0015307	7 G 1.5	12.5	101	224.2
0015312	12 G 1.5	15.1	173	361.7
0015318	18 G 1.5	18.0	259	518.3
0015325	25 G 1.5	21.4	360	729.9
0015334	34 G 1.5	25.0	490	946.6
0015341	41 G 1.5	27.2	591	1136
0015402	2 X 2.5	9.2	48	159
0015403	3 G 2.5	9.9	72	170
0015404	4 G 2.5	10.8	96	210
0015405	5 G 2.5	12.1	120	257
0015407	7 G 2.5	14.7	168	340
0015412	12 G 2.5	17.9	288	580
0015418	18 G 2.5	21.6	432	850
0015425	25 G 2.5	25.6	600	1166

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 600 m drum or 8 x 75 m rings)
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® 140* refer to main catalogue
- ÖLFLEX® 191 refer to main catalogue

Accessories

- SKINTOP® CLICK refer to main catalogue
- SKINTOP® ST-M refer to page 60
- SKINTOP® ST-M Small PU refer to main catalogue

ÖLFLEX® 150 CY

Shielded and oil-resistant multi-standard cable with H05VVC4V5-K and AWM approval

- Oil-resistant according to EN 50363-4-1: TM5
- Harmonised (HAR): H05VVC4V5-K and UL recognized
- EMC-compliant

Benefits

- Wide application range due to multiple certifications

Application range

- Dairy and cheese technology
- Packaging machines
- Deighing and dosing systems
- Mills for grains and cereals
- Plant engineering
  Industrial machinery
  Heating and air-conditioning systems
- In EMC-sensitive environments (electromagnetic compatibility)
- Mainly used in dry, damp and wet interiors (including water-oil mixtures), but not for outdoor use
- For fixed installation under medium mechanical load conditions, and applications with occasional flexing at free, non-continuously recurring movement without tensile load or compulsory guidance
- Note: for the use of AWM (Appliance Wiring Material) cables in industrial machinery (USA) according to NFPA 79 Ed. 2012: please see the catalogue appendix table T29

Product features

- Flame-retardant according to IEC 60332-1-2 and UL 1581 §1061 Cable Flame Test
- Oil-resistant according to EN 50363-4-1: TM5
- High level of screening
  Low coupling resistance
  (max. 250 W/km at 30 MHz)

Norm references / approvals

- H05VVC4V5-K (EN 50525-2-51)
- UL AWM Style 21098
  CSA AWM I A/B II A/B
- Multi-standard cables are designed in metric nominal cross sections in mm² **or** AWG/kcmil nominal sizes. The leading cross-section is specified in the table below, while the corresponding cross-section of the other system can be found in the appendix table T16 of this catalogue. For this corresponding secondary size, the conductor cross-section is generally larger.

Design

- Finely stranded bare copper wires
- PVC core insulation
- Cores twisted in layers
- PVC inner sheath, grey
- Tin-plated copper braiding
- PVC sheath, high oil-resistance, grey (RAL 7001)

Technical data

Classification
ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description: Control cable

Core identification code
Black with white numbers acc. to VDE 0293-1

Conductor design
Fine wire according to VDE 0295, class 5 / IEC 60228 class 5

Minimum bending radius
Occasional flexing: 20 x outer diameter
Fixed installation: 6 x outer diameter

Nominal voltage
HAR U_0/U: 300/500 V
UL/CSA: 600 V

Test voltage
3000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
Occasional flexing:
HAR: -5°C to +70°C
UL/CSA: -5°C to +90°C
Fixed installation:
HAR: -40°C to +70°C
UL/CSA: -40°C to +90°C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® 150 CY				
0015602	2 X 0.75	8.5	40	109
0015603	3 G 0.75	8.9	51	125
0015604	4 G 0.75	9.6	70	157
0015605	5 G 0.75	10.3	77	180
0015607	7 G 0.75	12.3	93	226
0015612	12 G 0.75	14.8	155	325
0015702	2 X 1.0	8.8	46.4	121
0015703	3 G 1.0	9.4	76	145
0015704	4 G 1.0	10.0	80	180
0015705	5 G 1.0	11.0	95	203
0015707	7 G 1.0	13.0	118	273

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
0015712	12 G 1.0	15.6	195	425
0015802	2 X 1.5	10.0	59.2	151
0015803	3 G 1.5	10.5	84	159
0015804	4 G 1.5	11.4	94.8	211
0015805	5 G 1.5	12.7	122	241
0015807	7 G 1.5	15.1	143	306
0015812	12 G 1.5	17.8	254	480
0015903	3 G 2.5	11.9	120	245
0015904	4 G 2.5	13.2	170	295
0015905	5 G 2.5	14.7	205	365
0015907	7 G 2.5	17.5	241	480

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 600 m drum or 8 x 75 m rings)
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® 140 CY* refer to main catalogue
- ÖLFLEX® 191 CY refer to main catalogue

Accessories

- SKINTOP® BRUSH ADD-ON refer to page 64
- SKINTOP® MS-SC-M refer to main catalogue
- SKINTOP® MS-M BRUSH refer to main catalogue
- SKINTOP® MS-HF-M SC refer to main catalogue
- SKINTOP® MS-HF-M BRUSH refer to main catalogue

ÖLFLEX® CONTROL TM

ÖLFLEX® Control Cable PVC 0.6/1kV UL TC-ER WTTC AWM600V WET OIL RES I+II CSA AWM

- Torsion-resistant for drip loops
- Wide application range (NFPA 70/NEC)/ compliance with NFPA 79 for industrial machinery
- Certification (UL) SUN. RES. pending

Benefits

- Wide application range due to multiple certifications
- Cost-saving, easy installation due to omission of closed cable systems (suitable for open wiring)

Application range

- Industrial machinery; plant engineering
- Dairy and cheese technology
- Packaging machines
- Deighing and dosing systems
- Mills for grains and cereals
- Oil presses
- Coaters and roasters
- TC-ER (Tray Cable Exposed Run) approval for open wiring between cable tray and industrial machines/plants acc. to NEC 336.10(7)
- Class 1, Div. 2 in accordance with NEC "National Electrical Code" Art. 336, 392, 501

Product features

- Flame-retardant according to CSA FT4 UL Vertical-Tray Flame Test
- Oil-resistant according to UL OIL RES I & II
- Water-resistant, UL 75°C wet rating
- Suitable for torsional applications which are typical for the loop in wind turbine generators (WTG)
- Technically suitable for outdoor use thanks to UV and ozone resistance

Norm references / approvals

- Multi-standard cables are designed in metric nominal cross sections in mm² **or** AWG/kcmil nominal sizes. The leading cross-section is specified in the table below, while the corresponding cross-section of the other system can be found in the appendix table T16 of this catalogue. For this corresponding secondary size, the conductor cross-section is generally larger.
- UL design certifications for US use:
  - (UL) TC-ER according to UL 1277 [UL file no.: E171371];
  - (UL) MTW according to UL 1063 [UL file no.: E155920];
  - (UL) WTTC according to UL 2277 [UL file no.: E323700];
  - UL AWM styles 2587 & 21098 (oil) according to UL 758 [UL file no.: E100338].

Attributes:
- UL OIL RES I/ II;
- 75°C wet, 90°C dry;
- Technically resistant to sunlight;
- NFPA 79 2012 + 2015 edition;
- FT4 flame retardance.

NEC (NFPA 70):
- Class I, Division 2 according to NEC article 501.

UL and CSA design certifications for use in Canada:
- c(UL) CIC/ TC FT4 [E171371];
- CSA AWM I/II A/B FT1;
- CSA C22.2 210.2.

Additionally:
- Impact and crush test according to UL 1277 (excluding 0.75 mm²)

Design

- Finely stranded bare copper wires
- Insulation: PVC with nylon coating (PA skin)
- Outer sheath: Specially formulated thermoplastic polymer
- Outer sheath colour: Grey

Technical data

Classification
ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description: Control cable

Core identification code
Black with white numbers

Conductor design
Fine-wire, bare copper strand

Torsion application in WTG
TW-0 & TW-2, refer to appendix T0

Minimum bending radius
Fixed/occasional flexing: 5/15xOD*

Nominal voltage
UL/CSA: 600 V (TC, MTW, CIC), WTTC 1000 V
UL AWM: 600 V
CSA AWM: 1000 V
IEC U_0/U: 600/1000 V

Test voltage
2000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
-40°C (static)/ -25°C (occasional flexing) to +90°C (AWM: +105°C)

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® CONTROL TM				
281803	3 G 1.0	7.4	28.8	82
281804	4 G 1.0	8.0	38.4	95
281805	5 G 1.0	8.6	48	112
281807	7 G 1.0	9.3	67	144
281812	12 G 1.0	12.0	115	247
281818	18 G 1.0	14.7	173	365
281825	25 G 1.0	16.7	240	464
281602	2 X 1.5	7.3	28.8	74
281603	3 G 1.5	8.1	43	100
281604	4 G 1.5	8.8	58	119
281605	5 G 1.5	9.5	72	141
281607	7 G 1.5	10.3	101	183
281609	9 G 1.5	11.9	129.6	247
281612	12 G 1.5	14.1	172.8	328

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
281618	18 G 1.5	16.4	259	403
281625	25 G 1.5	18.6	360	596
281403	3 G 2.5	8.9	72	125
281404	4 G 2.5	9.8	96	155
281405	5 G 2.5	10.7	120	185
281407	7 G 2.5	11.6	168	244
281203	3 G 4.0	10.6	115	165
281204	4 G 4.0	11.5	154	220
281205	5 G 4.0	12.6	192	269
281207	7 G 4.0	14.6	269	482
281004	4 G 6.0	14.5	231	382
281005	5 G 6.0	15.8	288	457
280804	4 G 10.0	17.7	384	615
280805	5 G 10.0	19.4	480	771
280604	4 G 16.0	22.5	615	864

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of "Metal price basis" and "Metal index"
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum / Please specify the preferred packaging (e.g. 1 x 610 m drum or 8 x 76 m rings)
Photographs are not to scale and do not represent detailed images of the respective products. / *OD = outer diameter

Similar products

- ÖLFLEX® TRAY II refer to main catalogue

Accessories

- SKINTOP® MS-M refer to page 62
- SKINTOP® ST-M refer to page 60
- SKINTOP® ST-M Small PU refer to main catalogue
- SKINTOP® BS-M METAL / SKINTOP® BSR-M METAL refer to main catalogue

ÖLFLEX® CONTROL TM CY

ÖLFLEX® Control Cable PVC Screened 0.6/1kV UL TC-ER WTTC AWM600V OIL RES CSA AWM

- Torsion-resistant for drip loops
- Wide application range (NFPA 70/NEC)/ compliance with NFPA 79 for industrial machinery
- EMC/shielded

Benefits

- Wide application range due to multiple certifications
- Cost-saving, easy installation due to omission of closed cable systems (suitable for open wiring)

Application range

- Industrial machinery; plant engineering
- Dairy and cheese technology
- Packaging machines
- Deighing and dosing systems
- Mills for grains and cereals
- Oil presses
- Coaters and roasters
- TC-ER (Tray Cable Exposed Run) approval for open wiring between cable tray and industrial machines/plants acc. to NEC 336.10(7)
- Class 1, Div. 2 in accordance with NEC "National Electrical Code" Art. 336, 392, 501

Product features

- Flame-retardant according to CSA FT4 UL Vertical-Tray Flame Test
- Oil-resistant according to UL OIL RES I & II
- Water-resistant, UL 75°C wet rating
- High level of screening Low coupling resistance (max. 250 W/km at 30 MHz)
- Suitable for torsional applications which are typical for the loop in wind turbine generators (WTG)

Norm references / approvals

- Multi-standard cables are designed in metric nominal cross sections in mm² **or** AWG/kcmil nominal sizes. The leading cross-section is specified in the table below, while the corresponding cross-section of the other system can be found in the appendix table T16 of this catalogue. For this corresponding secondary size, the conductor cross-section is generally larger.
- UL design certifications for US use:
  - (UL) TC-ER according to UL 1277 [UL file no.: E171371];
  - (UL) MTW according to UL 1063 [UL file no.: E155920];
  - (UL) WTTC according to UL 2277 [UL file no.: E323700];
  - UL AWM styles 2587 & 21098 (oil) according to UL 758 [UL file no.: E100338].

Attributes:
- UL OIL RES I/ II;
- 75°C wet, 90°C dry;
- Technically resistant to sunlight;
- NFPA 79 2012 + 2015 edition;
- FT4 flame retardance.

NEC (NFPA 70):
- Class I, Division 2 according to NEC article 501.

UL and CSA design certifications for use in Canada:
- c(UL) CIC/ TC FT4 [E171371];
- CSA AWM I/II A/B FT1;
- CSA C22.2 210.2.

Additionally:
- Impact and crush test according to UL 1277 (excluding 0.75 mm²)

Design

- Finely stranded bare copper wires
- Insulation: PVC with nylon coating (PA skin)
- Aluminium-coated foil
- Tin-plated copper braiding
- Outer sheath: Specially formulated thermoplastic polymer
- Outer sheath colour: Grey

Technical data

Classification
ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description: Control cable

Core identification code
Black with white numbers

Conductor design
Fine-wire, bare copper strand

Torsion application in WTG
TW-0 & TW-2, refer to appendix T0

Minimum bending radius
Fixed/occasional flexing: 5/20 x OD*

Nominal voltage
UL/CSA: 600 V (TC, MTW, CIC), WTTC 1000 V
UL AWM: 600 V
CSA AWM: 1000 V
IEC U_0/U: 600/1000 V

Test voltage
2000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
-40°C (static)/ -25°C (occasional flexing) to +90°C (AWM: +105°C)

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index [kg/km]	Weight [kg/km]
ÖLFLEX® CONTROL TM CY				
281803CY	3 G 1.0	8.1	49.5	119
281804CY	4 G 1.0	8.6	60.2	137
281805CY	5 G 1.0	9.3	81.4	149
281807CY	7 G 1.0	10.0	101.1	193
281812CY	12 G 1.0	12.8	161.4	330
281818CY	18 G 1.0	15.5	228.2	438
281825CY	25 G 1.0	17.5	326.4	574
281603CY	3 G 1.5	8.8	65	144
281604CY	4 G 1.5	9.4	81.9	173
281605CY	5 G 1.5	10.2	99.1	189

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index [kg/km]	Weight [kg/km]
281607CY	7 G 1.5	11.1	140.4	246
281612CY	12 G 1.5	15.0	225.2	426
281618CY	18 G 1.5	17.2	321.7	552
281403CY	3 G 2.5	9.7	105.7	180
281404CY	4 G 2.5	10.4	135.6	223
281405CY	5 G 2.5	11.5	160.3	268
281407CY	7 G 2.5	12.4	213	327
281204CY	4 G 4.0	12.3	198.5	315
281205CY	5 G 4.0	14.2	242.7	388
281004CY	4 G 6.0	15.3	284.236	552
280804CY	4 G 10.0	18.5	458.4	857

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of "Metal price basis" and "Metal index"
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 610 m drum or 8 x 76 m rings)
Photographs are not to scale and do not represent detailed images of the respective products. / *OD = outer diameter

Similar products

- ÖLFLEX® TRAY II CY refer to main catalogue

Accessories

- SKINTOP® MS-SC-M refer to main catalogue
- SKINTOP® MS-HF-M SC refer to main catalogue

ÖLFLEX® ROBUST 200

Tried-and-tested all-weather connection cable - resistant against a wide range of chemical media

- Excellent weather-resistance
- Good chemical resistance
- Voltage class 450/750 V

Benefits

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant to contact with bio-oils, fats, waxes and their emulsions with a plant, animal or synthetic basis
- Good resistance to ammonia compounds and biogases
- Good resistance to cold and hot water as well as water-soluble cleaning agents
- Suitable for frequent steam cleaning

Application range

- Machine tool building, washing equipment, slaughterhouses, composting plants, sewage works
- Food and beverage industry, especially for production and processing equipment of milk and meat products
- Agricultural equipment
- For indoor and outdoor use

Product features

- Good chemical resistance to ester-based hydraulic fluids
- Ozone-, UV- and weather-resistant according to EN 50396 and HD 605 S2
- Flexible at temperatures down to -40 °C
- Low-capacitance design
- Colour-coded up to 5 cores

Norm references / approvals

- Based on EN 50525-2-51
- Certified resistance to disinfectant and cleaning solutions used in food and beverage industry

Design

- Fine-wire, bare copper conductor
- Core insulation made of modified PP
- Cores twisted in layers
- Outer sheath made of special TPE
- Sheath colour: black

Technical data

Classification
ETIM 5.0 Class-ID: EC001578
ETIM 5.0 Class-Description: Flexible cable

Core identification code
Up to 5 cores: according to VDE 0293-308 (appendix T9)
From 6 cores: black with white numbers

Conductor design
Fine wire according to VDE 0295, class 5 / IEC 60228 class 5

Minimum bending radius
Occasional flexing: 10 x outer diameter
Fixed installation: 4 x outer diameter

Nominal voltage
U_0/U: 450/750 V

Test voltage
4000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
Occasional flexing: -40°C to +80°C
Fixed installation: -50°C to +80°C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® ROBUST 200				
0021800	2 X 1.0	8.0	19.2	65
0021801	3 G 1.0	8.4	29	79
0021802	4 G 1.0	9.2	38.4	96
0021803	5 G 1.0	10.0	48	113
0021805	2 X 1.5	8.6	29	78
0021806	3 G 1.5	9.1	43	97
0021807	4 G 1.5	9.9	58	122
0021808	5 G 1.5	10.8	72	146
0021809	7 G 1.5	13.5	101	208
0021810	2 X 2.5	9.8	48	114
0021811	3 G 2.5	10.4	72	144
0021812	4 G 2.5	11.5	96	181
0021813	5 G 2.5	13.1	120	222

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
0021814	7 G 2.5	15.9	168	312
0021816	3 G 4.0	12.4	115.2	215
0021817	4 G 4.0	14.0	154	273
0021818	5 G 4.0	15.8	192	333
0021822	4 G 6.0	15.7	230	378
0021823	5 G 6.0	17.2	288	463
0021825	4 G 10.0	19.4	384	570
0021826	5 G 10.0	21.4	480	770
0021828	4 G 16.0	22.4	614	885
0021829	5 G 16.0	24.6	768	1100
0021831	4 G 25.0	27.0	960	1365
0021833	4 G 35.0	29.7	1344	1773
0021836	4 G 50.0	36.2	1920	3454

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
Single lengths for dimensions: ≥ 4G16 max. 600 m; ≥ 4G25 max. 300 m; ≥ 4G50 max. 250 m
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- H07RN-F, enhanced version refer to main catalogue
- ÖLFLEX® ROBUST 210 refer to page 29
- ÖLFLEX® ROBUST 215 C refer to page 30

Accessories

- FLEXIMARK® Stainless steel kit refer to main catalogue
- SKINTOP® MS-M refer to page 62
- SKINTOP® ST-HF-M refer to main catalogue
- SKINTOP® BS-M METAL / SKINTOP® BSR-M METAL refer to main catalogue

ÖLFLEX® ROBUST 210

Tried-and-tested all-weather control cable resistant to a wide range of chemical media

- Excellent weather-resistance
- Good chemical resistance
- Reduced outer diameter

Benefits

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant to contact with bio-oils, fats, waxes and their emulsions with a plant, animal or synthetic basis
- Good resistance to ammonia compounds and biogases
- Good resistance to cold and hot water as well as water-soluble cleaning agents
- Suitable for frequent steam cleaning

Application range

- Machine tool building, washing equipment, slaughterhouses, composting plants, sewage works
- Food and beverage industry, especially for production and processing equipment of milk and meat products
- Agricultural equipment
- For indoor and outdoor use

Product features

- Good chemical resistance to ester-based hydraulic fluids
- Ozone-, UV- and weather-resistant according to EN 50396 and HD 605 S2
- Flexible at temperatures down to -40 °C
- Low-capacitance design
- Number cores

Norm references / approvals

- Based on VDE 0250 / 0285
- Certified resistance to disinfectant and cleaning solutions used in food and beverage industry

Design

- Fine-wire, bare copper conductor
- Core insulation made of modified PP
- Cores twisted in layers
- Outer sheath made of special TPE
- Sheath colour: black

Technical data

Classification
ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description: Control cable

Core identification code
Black with white numbers acc. to VDE 0293-1

Conductor design
Fine wire according to VDE 0295, class 5 / IEC 60228 class 5

Minimum bending radius
Occasional flexing: 15 x outer diameter
Fixed installation: 4 x outer diameter

Nominal voltage
U_0/U: 300/500 V

Test voltage
4000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
Occasional flexing: -40°C to +80°C
Fixed installation: -50°C to +80°C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® ROBUST 210				
0021880	2 X 0.5	4.9	10	27
0021881	3 G 0.5	5.2	15	33
0021882	3 X 0.5	5.2	15	33
0021883	4 G 0.5	5.8	19.2	41
0021884	4 X 0.5	5.8	19.2	41
0021885	5 G 0.5	6.3	24	49
0021886	5 X 0.5	6.3	24	49
0021888	7 G 0.5	6.9	33.6	64
0021889	7 X 0.5	6.9	33.6	64
0021890	10 G 0.5	8.8	48	92
0021891	12 G 0.5	9.1	58	106
0021892	18 G 0.5	10.8	86.4	151
0021893	25 G 0.5	12.7	120	210
0021897	2 X 0.75	5.5	14.4	35
0021898	3 G 0.75	5.8	21.6	43
0021899	3 X 0.75	5.8	21.6	43
0021900	4 G 0.75	6.3	28.8	49
0021901	4 X 0.75	6.3	28.8	49
0021902	5 G 0.75	6.9	36	66
0021903	5 X 0.75	6.9	36	66
0021904	7 G 0.75	7.5	50	85
0021905	7 X 0.75	7.5	50	85
0021907	12 G 0.75	10.1	86	144
0021908	18 G 0.75	12.0	130	208
0021909	25 G 0.75	14.1	180	288
0021910	34 G 0.75	16.3	245	386
0021911	41 G 0.75	17.8	296	464
0021912	50 G 0.75	19.6	360	560
0021913	2 X 1.0	5.8	19.2	42
0021914	3 G 1.0	6.1	28.8	49
0021915	3 X 1.0	6.1	28.8	49
0021916	4 G 1.0	6.6	38.4	63
0021917	4 X 1.0	6.6	38.4	63
0021918	5 G 1.0	7.3	48	78
0021919	5 X 1.0	7.3	48	78
0021920	7 G 1.0	8.1	67	107
0021921	10 G 1.0	10.4	96	154

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
0021922	12 G 1.0	10.7	115	178
0021923	18 G 1.0	12.9	173	262
0021924	25 G 1.0	15.0	240	357
0021925	34 G 1.0	17.5	326	484
0021926	41 G 1.0	19.2	394	582
0021927	50 G 1.0	21.0	480	703
0021928	2 X 1.5	6.4	29	56
0021929	3 G 1.5	6.8	43	72
0021930	3 X 1.5	6.8	43	72
0021931	4 G 1.5	7.4	58	91
0021932	4 X 1.5	7.4	58	91
0021933	5 G 1.5	8.3	72	108
0021934	5 X 1.5	8.3	72	108
0021936	7 G 1.5	9.0	101	149
0021937	7 X 1.5	9.0	101	149
0021938	10 G 1.5	11.8	143	215
0021940	12 G 1.5	12.2	173	234
0021941	18 G 1.5	14.6	259	369
0021942	25 G 1.5	17.2	360	510
0021943	34 G 1.5	19.8	490	683
0021945	50 G 1.5	24.0	720	999
0021946	2 X 2.5	7.6	48	86
0021947	3 G 2.5	8.3	72	115
0021949	4 G 2.5	9.0	96	131
0021951	5 G 2.5	10.1	120	178
0021953	7 G 2.5	11.2	168	241
0021954	12 G 2.5	15.1	288	405
0021963	3 G 4.0	10.1	115	180
0021964	4 G 4.0	11.1	157	228
0021965	5 G 4.0	12.4	192	280
0021966	7 G 4.0	13.6	269	377
0021967	4 G 6.0	13.3	230	332
0021968	5 G 6.0	14.8	288	407
0021969	4 G 10.0	16.5	384	541
0021970	5 G 10.0	18.4	480	620
0021971	4 G 16.0	18.8	614.4	806
0021972	4 G 25.0	23.5	960	1218
0021973	4 G 35.0	26.4	1344	1658

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication. / Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of "Metal price basis" and "Metal index"
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths / Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
Single lengths for dimensions: ≥ 4G16 max. 600 m; ≥ 4G25 max. 300 m; ≥ 4G50 max. 250 m / Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® ROBUST 200 refer to page 28
- ÖLFLEX® ROBUST 215 C refer to page 30

Accessories

- FLEXIMARK® Stainless steel kit refer to main catalogue
- SKINTOP® MS-M refer to page 62
- SKINTOP® ST-HF-M refer to main catalogue
- SKINTOP® BS-M METAL / SKINTOP® BSR-M METAL refer to main catalogue

ÖLFLEX® ROBUST 215 C

Tried-and-tested all-weather control cable - shielded and resistant to a wide range of chemical media

- Excellent weather-resistance
- Good chemical resistance
- EMC-compliant copper shielding

Benefits

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant to contact with bio-oils, fats, waxes and their emulsions with a plant, animal or synthetic basis
- Good resistance to ammonia compounds and biogases
- Good resistance to cold and hot water as well as water-soluble cleaning agents
- Suitable for frequent steam cleaning

Application range

- Machine tool building, washing equipment, slaughterhouses, composting plants, sewage works
- Food and beverage industry, especially for production and processing equipment of milk and meat products
- Agricultural equipment
- For indoor and outdoor use
- In EMC-sensitive environments (electromagnetic compatibility)

Product features

- Good chemical resistance to ester-based hydraulic fluids
- Ozone-, UV- and weather-resistant according to EN 50396 and HD 605 S2
- Flexible at temperatures down to -40 °C
- Low-capacitance design
- Number cores

Norm references / approvals

- Based on VDE 0250 / 0285
- Certified resistance to disinfectant and cleaning solutions used in food and beverage industry

Design

- Fine-wire, bare copper conductor
- Core insulation made of modified PP
- Cores twisted in layers
- Halogen-free plastic foil wrapping
- Tin-plated copper braiding
- Outer sheath made of special TPE
- Sheath colour: black

Technical data

Classification
ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description: Control cable

Core identification code
Black with white numbers acc. to VDE 0293-1

Conductor design
Fine wire according to VDE 0295, class 5 / IEC 60228 class 5

Minimum bending radius
Occasional flexing: 20 x outer diameter
Fixed installation: 6 x outer diameter

Nominal voltage
U_0/U: 300/500 V

Test voltage
Core/Core: 4000 V
Core/Shield: 2000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
Occasional flexing: -40°C to +80°C
Fixed installation: -50°C to +80°C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® ROBUST 215 C				
0022700	2 X 0.5	5.9	36	42
0022701	3 G 0.5	6.2	43	52
0022702	3 X 0.5	6.2	43	52
0022703	4 G 0.5	6.6	49	59
0022704	4 X 0.5	6.6	49	59
0022705	5 G 0.5	7.1	57	68
0022706	5 X 0.5	7.1	57	68
0022708	7 G 0.5	7.7	69	85
0022709	7 X 0.5	7.7	69	85
0022711	12 G 0.5	10.1	104	136
0022712	18 G 0.5	11.8	141	189
0022713	25 G 0.5	13.7	211	265
0022717	2 X 0.75	6.3	43	50
0022718	3 G 0.75	6.6	52	60
0022719	3 X 0.75	6.6	52	60
0022720	4 G 0.75	7.1	61	72
0022721	4 X 0.75	7.1	61	72
0022722	5 G 0.75	7.9	72	88
0022723	5 X 0.75	7.9	72	88
0022724	7 G 0.75	8.5	89	110
0022725	7 X 0.75	8.5	89	110
0022727	12 G 0.75	11.1	138	177
0022728	18 G 0.75	13.0	211	247
0022729	25 G 0.75	15.1	280	347
0022730	34 G 0.75	17.5	380	460
0022733	2 X 1.0	6.6	51	60
0022734	3 G 1.0	6.9	62	70
0022735	3 X 1.0	6.9	62	70
0022736	4 G 1.0	7.4	74	85

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
0022737	4 X 1.0	7.4	74	85
0022738	5 G 1.0	8.3	88	103
0022739	5 X 1.0	8.3	88	103
0022740	7 G 1.0	8.9	112	131
0022742	12 G 1.0	11.7	185	213
0022743	18 G 1.0	14.1	268	321
0022744	25 G 1.0	16.2	354	425
0022748	2 X 1.5	7.2	65	71
0022749	3 G 1.5	7.6	82	90
0022750	3 X 1.5	7.6	82	90
0022751	4 G 1.5	8.4	100	114
0022752	4 X 1.5	8.4	100	114
0022753	5 G 1.5	9.1	119	136
0022754	5 X 1.5	9.1	119	136
0022756	7 G 1.5	10.0	154	177
0022757	7 X 1.5	10.0	154	177
0022760	12 G 1.5	13.4	268	290
0022761	18 G 1.5	15.8	373	435
0022762	25 G 1.5	18.2	530	579
0022763	34 G 1.5	21.2	683	797
0022767	3 G 2.5	9.1	118	134
0022768	4 G 2.5	10.0	147	169
0022769	5 G 2.5	11.1	176	207
0022770	7 G 2.5	12.0	253	270
0022774	4 G 4.0	11.9	190	258
0022776	4 G 6.0	14.5	290	392
0022777	4 G 10.0	17.5	458	602
0022778	4 G 16.0	20.2	736.6	928
0022771	4 G 25.0	25.1	1126.7	1411
0022780	4 G 35.0	28.0	1540	1883

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum / Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
Single lengths for dimensions: ≥ 4G16 max. 600 m; ≥ 4G25 max. 300 m; ≥ 4G50 max. 250 m
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® CLASSIC 135 CH BK 0,6/1 kV refer to main catalogue

Accessories

- SKINTOP® BRUSH ADD-ON refer to page 64
- SKINTOP® MS-SC-M refer to main catalogue
- SKINTOP® MS-M BRUSH refer to main catalogue
- SKINTOP® MS-HF-M SC refer to main catalogue
- SKINTOP® MS-HF-M BRUSH refer to main catalogue

ÖLFLEX® CLASSIC 400 P

Abrasion-resistant and oil-resistant control cable with PUR sheath for increased application requirements

- High mechanical strength
- Good oil resistance
- The classic for multi-functional use

Benefits

- Durable under harsh conditions thanks to robust PUR sheath material
- Resistant to contact with many mineral oil-based lubricants, diluted acids, aqueous alkaline solutions and other chemical media
- Compatible with a multitude of acidic cleaning and disinfection agents
- Also available as DESINA®-compliant power cable with black outer sheath colour

Application range

- Machine tools
- Industrial machinery and machine tools
- Measurement, control and electrical applications
- Outdoor use is possible within the indicated operating temperature range
- Very suitable for oily wet areas within machinery and production lines that are subject to normal mechanical stress

Product features

- High oil resistance
- Abrasion-resistant and notch-resistant
- Low-adhesive surface
- Resistant to hydrolysis and microbes

Norm references / approvals

- Based on VDE 0285
- Certified resistance to disinfectant and cleaning solutions used in food and beverage industry

Design

- Fine-wire, bare copper conductor
- Core insulation: Special PVC
- Cores twisted in layers
- Special polyurethane sheath (PUR)
- Sheath colour: Silver grey (RAL 7001)
- DESINA®-compliant: Black (RAL 9005)

Technical data

Classification
ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description: Control cable

Core identification code
Black with white numbers acc. to VDE 0293-1

Conductor design
Fine wire according to VDE 0295, class 5 / IEC 60228 class 5

Minimum bending radius
Flexible use: 12.5 x outer diameter
Fixed installation: 4 x outer diameter

Nominal voltage
U_0/U: 300/500 V

Test voltage
4000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
Occasional flexing: -5°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® CLASSIC 400 P sheath colour: grey				
1312802	2 X 0.5	4.8	10	32
1312003	3 G 0.5	5.1	15	43
1312803	3 X 0.5	5.1	15	43
1312004	4 G 0.5	5.7	19.2	50
1312804	4 X 0.5	5.7	19.2	50
1312005	5 G 0.5	6.2	24	59
1312805	5 X 0.5	6.2	24	59
1312007	7 G 0.5	6.7	34	73
1312807	7 X 0.5	6.7	34	73
1312010	10 G 0.5	8.6	48	109
1312012	12 G 0.5	8.9	57.6	125
1312018	18 G 0.5	10.5	87	180
1312025	25 G 0.5	12.4	120	250
1312034	34 G 0.5	14.3	164	333
1312041	41 G 0.5	15.7	197	400
1312852	2 X 0.75	5.4	14.4	41
1312103	3 G 0.75	5.7	21.6	51
1312853	3 X 0.75	5.7	21.6	51
1312104	4 G 0.75	6.2	28.8	62
1312854	4 X 0.75	6.2	28.8	62
1312105	5 G 0.75	6.7	36	74
1312855	5 X 0.75	6.7	36	74
1312107	7 G 0.75	7.3	50	97
1312857	7 X 0.75	7.3	50	97
1312110	10 G 0.75	9.6	72	142
1312112	12 G 0.75	9.9	86.4	163
1312118	18 G 0.75	11.7	129.6	234
1312125	25 G 0.75	13.8	180	324
1312134	34 G 0.75	15.9	244.8	431
1312141	41 G 0.75	17.4	295.2	529
1312902	2 X 1.0	5.7	19.2	48
1312203	3 G 1.0	6.0	28.8	61
1312903	3 X 1.0	6.0	28.8	61
1312204	4 G 1.0	6.5	38.4	74

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
1312904	4 X 1.0	6.5	38.4	74
1312205	5 G 1.0	7.1	48	89
1312905	5 X 1.0	7.1	48	89
1312207	7 G 1.0	8.0	67	116
1312210	10 G 1.0	10.2	96	171
1312212	12 G 1.0	10.5	115	197
1312218	18 G 1.0	12.7	173	289
1312225	25 G 1.0	14.7	240	412
1312234	34 G 1.0	17.1	326.4	532
1312241	41 G 1.0	18.8	393.6	638
1312952	2 X 1.5	6.3	29	63
1312303	3 G 1.5	6.7	43	79
1312953	3 X 1.5	6.7	43	79
1312304	4 G 1.5	7.2	58	98
1312954	4 X 1.5	7.2	58	98
1312305	5 G 1.5	8.1	72	121
1312955	5 X 1.5	8.1	72	121
1312307	7 G 1.5	8.9	101	159
1312957	7 X 1.5	8.9	101	159
1312312	12 G 1.5	12.0	173	268
1312318	18 G 1.5	13.4	259.5	392
1312325	25 G 1.5	16.9	360	531
1312334	34 G 1.5	19.4	489.6	722
1312341	41 G 1.5	21.3	590.4	867
1312403	3 G 2.5	8.1	72	132
1312404	4 G 2.5	8.9	96	163
1312405	5 G 2.5	10.0	120	186
1312407	7 G 2.5	11.1	168	267
1312412	12 G 2.5	14.8	288	445
1312504	4 G 4.0	10.8	154	237
1312505	5 G 4.0	12.1	192	291
1312507	7 G 4.0	13.4	269	391
1312604	4 G 6.0	13.0	230.4	327
1312605	5 G 6.0	14.5	288	424
1312607	7 G 6.0	16.0	403	580

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
1312614	4 G 10.0	16.2	384	567
1312615	5 G 10.0	18.1	480	695
1312617	7 G 10.0	20.0	672	937
1312624	4 G 16.0	18.8	614.4	1064
ÖLFLEX® CLASSIC 400 P DESINA sheath colour: black				
1312970	4 G 1.5	7.2	58	98
1312981	7 G 1.5	8.8	101	159
1312983	11 G 1.5	11.6	158	228

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
1312973	4 G 2.5	8.9	96	163
1312974	4 G 4.0	10.8	154	237
1312975	4 G 6.0	13.0	230.4	350
1312976	4 G 10.0	16.2	384	567
1312978	4 G 25.0	23.5	960	1582

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
DESINA® is a registered trademark of the German Machine Tool Builders’ Association (VDW)
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® 408 P refer to main catalogue
- ÖLFLEX® 409 P refer to main catalogue
- ÖLFLEX® 440 P refer to main catalogue

Accessories

- SKINTOP® metric plastic cable glands refer to main catalogue

ÖLFLEX® CLASSIC 415 CP

Shielded, abrasion- and oil-resistant PUR control cable with reduced outer diameter

- Thin and light, without inner sheath
- EMC-compliant copper shielding

Benefits

- Space and weight-saving installation due to small cable diameters
- Durable under harsh conditions thanks to robust PUR sheath material
- Resistant to contact with many mineral oil-based lubricants, diluted acids, aqueous alkaline solutions and other chemical media
- Copper braiding complies with EMC requirements and screens the cable against electromagnetic interference

Application range

- Industrial machinery and machine tools
- Measurement, regulation and electrical applications
- Very suitable for oily wet areas within machine tools and transfer lines that are subject to normal mechanical stress
- Outdoor use is possible within the indicated temperature range

Product features

- High oil resistance
- Abrasion-resistant and notch-resistant
- EMC-compliant
- Low-adhesive surface
- Resistant to hydrolysis and microbes

Norm references / approvals

- Core based on VDE 0812/0285
- Sheath based on VDE 0250/0285

Design

- Fine-wire, bare copper conductor
- Core insulation: Special PVC
- Cores twisted in layers
- Plastic film wrapping
- Tin-plated copper braiding
- Special polyurethane sheath (PUR)
- Sheath colour: Silver grey (RAL 7001)

Technical data

Classification
ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description: Control cable

Core identification code
Black with white numbers acc. to VDE 0293-1

Conductor design
Fine wire according to VDE 0295, class 5 / IEC 60228 class 5

Minimum bending radius
Occasional flexing: 20 x outer diameter
Fixed installation: 6 x outer diameter

Nominal voltage
U_0/U: 300/500 V

Test voltage
Core/Core: 4000 V
Core/Shield: 2000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
Occasional flexing: -5°C to +70°C
Fixed installation: -40°C to +80°C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® CLASSIC 415 CP				
1314000	2 X 0.5	5.8	36	45
1314001	3 G 0.5	6.1	43	59
1314002	3 X 0.5	6.1	43	59
1314003	4 G 0.5	6.5	49	83
1314004	4 X 0.5	6.5	49	83
1314005	5 G 0.5	7.0	57	96
1314006	5 X 0.5	7.0	57	96
1314007	7 G 0.5	7.5	69	136
1314008	7 X 0.5	7.5	69	136
1314010	12 G 0.5	9.9	104	200
1314011	12 X 0.5	9.9	104	200
1314012	18 G 0.5	11.5	141	275
1314013	18 X 0.5	11.5	141	275
1314014	25 G 0.5	13.4	211	350
1314015	25 X 0.5	13.4	211	350
1314017	2 X 0.75	6.2	43	56
1314018	3 G 0.75	6.5	52	70
1314019	3 X 0.75	6.5	52	70
1314020	4 G 0.75	7.0	61	95
1314021	4 X 0.75	7.0	61	95
1314022	5 G 0.75	7.7	72	130
1314023	5 X 0.75	7.7	72	130
1314024	7 G 0.75	8.3	89	168
1314025	7 X 0.75	8.3	89	168
1314026	12 G 0.75	10.9	138	232
1314027	18 G 0.75	12.7	211	315
1314028	25 G 0.75	14.8	280	435
1314029	25 X 0.75	14.8	280	435
1314032	2 X 1.0	6.5	51	84
1314033	3 G 1.0	6.8	62	110
1314034	3 X 1.0	6.8	62	110
1314035	4 G 1.0	7.3	74	130
1314036	4 X 1.0	7.3	74	130
1314037	5 G 1.0	8.1	88	156

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
1314038	5 X 1.0	8.1	88	156
1314039	7 G 1.0	8.8	112	192
1314040	7 X 1.0	8.8	112	192
1314041	12 G 1.0	11.5	185	285
1314042	18 G 1.0	13.9	268	395
1314043	25 G 1.0	15.9	354	656
1314046	2 X 1.5	7.1	65	97
1314047	3 G 1.5	7.5	82	125
1314048	3 X 1.5	7.5	82	125
1314049	4 G 1.5	8.2	100	165
1314050	4 X 1.5	8.2	100	165
1314051	5 G 1.5	8.9	119	193
1314052	5 X 1.5	8.9	119	193
1314053	7 G 1.5	9.9	154	245
1314054	7 X 1.5	9.9	154	245
1314055	12 G 1.5	13.0	268	365
1314056	18 G 1.5	15.6	373	553
1314057	25 G 1.5	17.9	530	734
1314058	34 G 1.5	20.8	683	944
1314061	3 G 2.5	8.9	118	188
1314062	4 G 2.5	9.9	147	236
1314063	5 G 2.5	11.0	176	270
1314064	7 G 2.5	11.9	253	340
1314065	12 G 2.5	16.0	355	589
1314066	18 G 2.5	19.0	569	978
1314067	25 G 2.5	22.2	827	1358
1314068	4 G 4.0	11.6	248	305
1314070	7 G 4.0	14.4	355	500
1314071	4 G 6.0	14.2	343	440
1314073	7 G 6.0	17.0	505	672
1314074	4 G 10.0	17.2	535	710
1314075	4 G 16.0	20.2	800	1050
1314076	4 G 25.0	25.1	1075	1570
1314077	4 G 35.0	28.0	1576	2070

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum / Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® ROBUST 215 C refer to page 30
- ÖLFLEX® CLASSIC 400 CP refer to main catalogue

Accessories

- Conductor end sleeves refer to main catalogue
- SKINTOP® MS-SC-M refer to main catalogue
- SKINTOP® MS-HF-M SC refer to main catalogue

ÖLFLEX® ROBUST FD

Highly flexible, all-weather control cable with TPE sheath resistant to a wide range of chemical media

- Extended line for high loads in power chains
- Good chemical resistance

Benefits

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant to contact with bio-oils, fats, waxes and their emulsions with a plant, animal or synthetic basis
- Good resistance to ammonia compounds and biogases
- Good resistance to cold and hot water as well as water-soluble cleaning agents
- Suitable for frequent steam cleaning
- Low particle emission in flexing chain applications

Application range

- In power chains or moving machine parts
- Machine tool building, washing equipment, slaughterhouses, composting plants, sewage works
- Food and beverage industry, especially for production and processing equipment of milk and meat products
- Particularly in wet areas of machine tools and transfer lines
- Resistant to contact with plant, animal or synthetic-based organic oils, greases, waxes and the related emulsions

Product features

- Designed for 10 million alternating bending cycles and horizontal travel distances up to 100 metres
- Highly resistant to oil and chemicals
- Ozone-, UV- and weather-resistant according to EN 50396 and HD 605 S2
- Hydrolysis-resistant to warm and hot water
- Good chemical resistance to ester-based hydraulic fluids
- Flexible at temperatures down to -40 °C

Norm references / approvals

- Based on VDE 0250 / 0285
- Clean room classification for individual items on request
- Certified resistance to disinfectant and cleaning solutions used in food and beverage industry
- For use in power chains: Please comply with assembly guideline appendix T3

Design

- Extra-fine wire, tin-plated copper strands
- Core insulation made of TPE
- Cores twisted together in extremely short lay lengths
- Fleece wrapping
- Robust sheath made of special halogen-free TPE, black (RAL 9005)

Technical data

Classification
ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description: Control cable

Core identification code
black cores with printed white numbers (VDE 0293-1)

Conductor design
Extra-fine wire according to VDE 0295, class 6/IEC 60228 class 6

Minimum bending radius
For flexible use:
7.5 x cable diameter
(at temperatures < 70°C)
10 x cable diameter
(at a max. temperature of 105°C)
Fixed installation: 4 x outer diameter

Nominal voltage
U_0/U: 300/500 V

Test voltage
4000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Alternating bending cycles
10 million cycles

Temperature range
Flexing: -40°C to +105°C
Fixed installation: -50°C to +110°C
short-term: up to +120°C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® ROBUST FD				
0026501	3 G 0.75	6.9	21.6	51
0026502	4 G 0.75	7.7	28.8	69
0026503	5 G 0.75	8.6	36	87
0026504	7 G 0.75	10.4	50.4	127
0026505	12 G 0.75	12.2	86.4	182
0026506	18 G 0.75	14.9	129.6	277
0026507	25 G 0.75	18.5	180	421
0026509	3 G 1.0	7.4	28.8	63
0026510	4 G 1.0	8.2	38.4	82
0026511	5 G 1.0	9.2	48	105
0026516	7 G 1.0	11.1	67.2	157
0026517	12 G 1.0	13.3	115.2	226
0026518	18 G 1.0	15.9	172.8	345
0026521	3 G 1.5	8.9	43.2	90

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
0026522	4 G 1.5	9.9	57.6	118
0026523	5 G 1.5	11	72	149
0026524	7 G 1.5	13.4	100.8	233
0026525	12 G 1.5	15.8	172.8	322
0026526	18 G 1.5	18.9	259.2	494
0026527	25 G 1.5	23.5	360	695
0026531	4 G 2.5	11.8	96	181
0026532	5 G 2.5	12.9	120	228
0026533	7 G 2.5	15.7	168	329
0026534	12 G 2.5	18.7	288	491
0026541	4 G 4.0	13.8	153.6	261
0026551	4 G 6.0	14.8	230.4	356
0026561	4 G 10.0	20.1	384	596
0026571	4 G 16.0	23.8	614.4	910

Unless specified otherwise, the shown product values are nominal values at room temperature. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® FD 855 P refer to main catalogue

Accessories

- SILVYN® CHAIN cable protection and guiding systems

ÖLFLEX® ROBUST FD C

Highly flexible, shielded all-weather control cable with TPE sheath - resistant to a wide range of chemical media

- Extended line for high loads in power chains
- Good chemical resistance

Benefits

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant to contact with bio-oils, fats, waxes and their emulsions with a plant, animal or synthetic basis
- Good resistance to ammonia compounds and biogases
- Good resistance to cold and hot water as well as water-soluble cleaning agents
- Suitable for frequent steam cleaning

Application range

- Machine tool building, washing equipment, slaughterhouses, composting plants, sewage works
- Particularly in wet areas of machine tools and transfer lines
- Food and beverage industry, especially for production and processing equipment of milk and meat products
- Resistant to contact with plant, animal or synthetic-based organic oils, greases, waxes and the related emulsions
- Assembly lines, production lines, in all kinds of machines

Product features

- Ozone-, UV- and weather-resistant according to EN 50396 and HD 605 S2
- Designed for 10 million alternating bending cycles and horizontal travel distances up to 100 metres
- Highly resistant to oil and chemicals
- Hydrolysis-resistant to warm and hot water
- Good chemical resistance to ester-based hydraulic fluids
- Flexible at temperatures down to -40 °C

Norm references / approvals

- Based on VDE 0250 / 0285
- Certified resistance to disinfectant and cleaning solutions used in food and beverage industry
- For use in power chains: Please comply with assembly guideline appendix T3

Design

- Extra-fine wire, tin-plated copper strands
- Core insulation made of TPE
- Cores twisted together in extremely short lay lengths
- Fleece wrapping
- Inner sheath made of TPE
- Tin-plated copper braiding
- Robust sheath made of special halogen-free TPE, black (RAL 9005)

Technical data

Classification
ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description: Control cable

Core identification code
black cores with printed white numbers (VDE 0293-1)

Conductor design
Extra-fine wire according to VDE 0295, class 6 / IEC 60228 class 6

Minimum bending radius
For flexible use:
7.5 x cable diameter
(at temperatures < 70°C)
10 x cable diameter
(at a max. temperature of 105°C)
Fixed installation: 4 x outer diameter

Nominal voltage
U_0/U: 300/500 V

Test voltage
4000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Alternating bending cycles
10 million cycles

Temperature range
flexing: -40°C to +105°C
fixed installation: -50°C to +105°C
short-term: up to +120°C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® ROBUST FD C				
0026701	3 G 0.75	9.1	49.6	110
0026702	4 G 0.75	10.1	60.9	137
0026703	5 G 0.75	10.8	72.8	160
0026704	7 G 0.75	12.6	107.2	238
0026705	12 G 0.75	15	151.5	312
0026706	18 G 0.75	17.7	205.5	448
0026707	25 G 0.75	21.7	299.1	657
0026709	3 G 1.0	9.8	61.1	125
0026716	7 G 1.0	13.9	132.3	278
0026717	12 G 1.0	16.1	189.1	370
0026721	3 G 1.5	10.9	79.8	163
0026722	4 G 1.5	12.1	99.2	210

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
0026723	5 G 1.5	13.6	129.7	264
0026724	7 G 1.5	15.8	175.2	370
0026725	12 G 1.5	18.4	257.1	498
0026726	18 G 1.5	22.1	378.9	749
0026727	25 G 1.5	27.1	555.5	1042
0026731	4 G 2.5	14.4	161.5	307
0026732	5 G 2.5	15.5	188.3	361
0026733	7 G 2.5	18.3	252.6	512
0026734	12 G 2.5	21.9	406.5	730
0026741	4 G 4.0	16.2	227.3	412
0026751	4 G 6.0	17.2	306.7	519
0026761	4 G 10.0	23.3	513.6	853
0026771	4 G 16.0	27.2	809.6	1273

Unless specified otherwise, the shown product values are nominal values at room temperature. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® PETRO FD 865 CP refer to main catalogue

Accessories

- SKINTOP® MS-M BRUSH refer to main catalogue
- SKINTOP® MS-HF-M BRUSH refer to main catalogue
- SILVYN® CHAIN cable protection and guiding systems

ÖLFLEX® HEAT 180 EWKF

Silicone cables with increased mechanical strength

- Tried-and-tested notch-resistant EWKF quality

Benefits

- Longer service life in harsh conditions than conventional silicone cables
- Notch- and tear-resistant silicone compounds reduce damage resulting from mechanical stress
- Due to the use of special additives in EWKF silicone, armoured cable versions may not be required
- Good flexibility simplifies installation where space is limited
- The remaining SiO_2 ash has insulating properties after combustion

Application range

- Areas with high ambient temperatures and occasional mechanical stress
- Typical fields of application
  - Steel, ceramic and smelting works
  - Bakery equipment and industrial furnaces
  - Electric motor industry
  - Sauna/sunbed construction
  - Thermal and heating elements
  - Lighting technology
  - Ventilator engineering
  - Air-conditioning technology
  - Galvanisation technology
  - Plastic processing
  - Generator and transformer manufacturing
  - Wind power plant construction

Product features

- **EWKF formula:**Initial tear - continued tearing - notch resistance
- Halogen-free (IEC 60754-1), corrosiveness of the gases (IEC 60754-2), flame-retardant (IEC 60332-1-2)
- Good hydrolysis and UV resistance
- Resistant to a multitude of oils, alcohols, vegetable and animal fats and chemical substances
- Adequate ventilation must be ensured, since the mechanical properties of silicone cables prematurely decrease from +100°C in the absence of air

Norm references / approvals

- Based on EN 50525-2-83

Design

- Fine-wire, tin-plated copper conductor
- EWKF silicone-based core insulation
- Cores twisted together
- Notch-resistant outer sheath, EWKF silicone-based, black

Technical data

Classification
ETIM 5.0 Class-ID: EC001578
ETIM 5.0 Class-Description: Flexible cable

Core identification code
Coloured according to VDE 0293-308, see appendix T9
From 6 cores: black with white numbers

Conductor design
Fine wire according to VDE 0295 class 5 / IEC 60228 class 5

Minimum bending radius
Occasional flexing: 15 x outer diameter
Fixed installation: 4 x outer diameter

Nominal voltage
U_0/U: 300/500 V

Test voltage
2000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
-50°C to +180°C
(adequate ventilation required)

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® HEAT 180 EWKF				
0046500	2 X 0.75	6.4	15	49
0046501	3 G 0.75	6.9	22	60
00465023	4 G 0.75	7.6	29	76
00465033	5 G 0.75	8.5	36	96
0046506	2 X 1.0	6.8	20	56
0046507	3 G 1.0	7.1	29	68
00465083	4 G 1.0	7.9	39	88
00465093	5 G 1.0	8.8	48	110
0046110	7 G 1.0	9.5	67.2	137
0046511	2 X 1.5	8.0	29	77
0046512	3 G 1.5	8.4	43	94
00465133	4 G 1.5	9.5	58	117
00465143	5 G 1.5	10.4	72	143

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
0046115	7 G 1.5	11.0	101	180
0046116	12 G 1.5	14.9	173	319
0046117	16 G 1.5	17.1	230.4	424
0046119	24 G 1.5	21.0	345.6	637
0046520	2 X 2.5	9.4	48	110
0046521	3 G 2.5	9.8	72	146
00465223	4 G 2.5	11.1	96	181
00465233	5 G 2.5	12.4	120	222
0046131	3 G 4.0	11.5	114	213
00461323	4 G 4.0	12.5	152	267
00461333	5 G 4.0	13.9	190	334
0046141	3 G 6.0	13.2	174	297
00461423	4 G 6.0	14.7	232	381
00461433	5 G 6.0	16.5	290	481

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® HEAT 180 H05SS-F EWKF refer to main catalogue
- ÖLFLEX® HEAT 180 EWKF C refer to main catalogue

Accessories

- SILVYN® AS refer to main catalogue
- SKINDICHT® SHV-M refer to main catalogue
- SILVYN® EDU-AS refer to main catalogue
- KS 20 cable shears refer to main catalogue

ÖLFLEX® HEAT 180 MS

Certified silicone cables for North America (AWM recognized)

- MS = Multi-standard
  For use in the USA and Canada
- UL AWM Style 4476 (150 °C/600 V)
- Metric flexible conductor design

Benefits

- Certified for the USA and Canada for export-oriented appliance and apparatus manufacturers
- Thicker cable design meets the requirements of the FT-1 flame test and is therefore approved for the external connection of apparatus and appliances
- Good flexibility simplifies installation where space is limited
- The remaining SiO_2 ash has insulating properties after combustion

Application range

- Areas with high ambient temperatures where insulating and sheath materials of conventional cables will become brittle and perish after a short period
- Typical fields of application
  - Steel, ceramic and smelting works
  - Bakery equipment and industrial furnaces
  - Electric motor industry
  - Sauna/sunbed construction
  - Thermal and heating elements
  - Lighting technology
  - Ventilator engineering
  - Air-conditioning technology
  - Galvanisation technology
  - Plastic processing
  - Generator and transformer manufacturing
  - Wind power plant construction

Product features

- Halogen-free (IEC 60754-1), corrosiveness of the gases (IEC 60754-2)
- Flame-retardant according to IEC 60332-1-2, Cable Flame Test, CSA FT 1
- Good hydrolysis and UV resistance
- Resistant to a multitude of oils, alcohols, vegetable and animal fats and chemical substances
- Adequate ventilation must be ensured, since the mechanical properties of silicone cables prematurely decrease from +100°C in the absence of air

Norm references / approvals

- UL AWM 4476 and cUL AWM II A/B Construction B, external wiring
- UL File No. E63634

Design

- Fine-wire, tin-plated copper conductor
- Silicone-based core insulation
- Cores twisted together
- Silicone-based outer sheath, colour black

Technical data

Classification
ETIM 5.0 Class-ID: EC001578
ETIM 5.0 Class-Description: Flexible cable

Core identification code
Coloured according to VDE 0293-308, see appendix T9
From 6 cores: black with white numbers

Conductor design
Fine wire according to VDE 0295, class 5 / IEC 60228 class 5
(Refer to technical table T16 for the respective US conductor sizes in accordance with AWG)

Minimum bending radius
Occasional flexing: 15 x outer diameter
Fixed installation: 4 x outer diameter

Nominal voltage
U_0/U: 300/500 V
Operating voltage UL: 600 V

Test voltage
2000 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
According to VDE: -50°C to +180°C
UL/cUL: up to +150°C
(adequate ventilation required)

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® HEAT 180 MS				
0046600	2 X 0.5	7.4	9.8	72
0046601	3 G 0.5	7.8	14.7	83
00466023	4 G 0.5	8.5	19.6	99
00466033	5 G 0.5	9.2	24.5	119
0046604	7 G 0.5	9.9	34.3	142
0046612	2 X 1.0	8.2	19.2	93
0046613	3 G 1.0	8.7	28.8	110
00466143	4 G 1.0	9.4	38.4	133
00466153	5 G 1.0	10.3	48	160
0046616	7 G 1.0	11.1	67.2	195
0046617	12 G 1.0	14.9	115.2	345
0046618	2 X 1.5	8.8	28.8	113
0046619	3 G 1.5	9.3	43.2	135
00466203	4 G 1.5	10.1	57.6	165
00466213	5 G 1.5	11.1	72	200
0046622	7 G 1.5	12.0	100.8	246
0046623	12 G 1.5	16.1	172.8	437
0046625	18 G 1.5	18.8	259.2	613
0046626	25 G 1.5	22.9	360	904
0046628	2 X 2.5	9.6	48	146
0046629	3 G 2.5	10.2	72	178
00466303	4 G 2.5	11.1	96	220
00466313	5 G 2.5	12.2	120	269
0046633	3 G 4.0	11.5	115.2	246
00466343	4 G 4.0	12.6	153.6	307
00466353	5 G 4.0	14.2	192	389
0046636	3 G 6.0	14.9	172.8	396
00466373	4 G 6.0	16.4	230.4	495
00466383	5 G 6.0	18.0	288	608

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® HEAT 180 SiF A refer to main catalogue
- ÖLFLEX® HEAT 180 C MS refer to main catalogue

Accessories

- KS 20 cable shears refer to main catalogue

ÖLFLEX® HEAT 260 MC

Polytetrafluoroethylene cables for the most extreme loads

- Excellent chemical, thermal and electrical properties
- Thin, light and robust

Benefits

- Space-saving due to small cable diameters
- Stress crack resistant in case of frequent ambient temperature fluctuations
- Suitable for sensor technology due to good electrical and mechanical properties
- Low outgassing behaviour

Application range

- Conventional cables cannot be used in industrial environments with very high temperatures, aggressive chemical media and limited space
- ÖLFLEX® HEAT 260 has proven itself to be an effective solution in harsh environments such as painting facilities
- Typical fields of application
  - Industrial furnace construction
  - Foundries
  - Chemical industry
  - Power plant engineering
  - Painting plant technology
  - Heating elements
  - Plastic processing
  - Wind turbine engineering
- Sensor systems, e.g. fill level sensors

Product features

- ÖLFLEX® HEAT 260 made of PTFE
  - Outstanding resistance against acids, alkalis, solvents, lacquers, petrol, oils and many other chemical media
  - Flame-retardant
  - High dielectric strength and abrasion-resistance
  - Low water absorption
  - Resistant to microbes
  - Adhesion-free insulation materials
  - Weather- and ozone-resistant
  - Hydrophobic and dirt-repellent
  - High elongation capacity and tear resistance
  - Withstands contact with liquid nitrogen
  - Resistant against hydraulic fluids
- Flame-retardant according to IEC 60332-1-2

Design

- Fine-wire strand made of nickel-plated copper
- PTFE-based core insulation
- Cores twisted together
- PTFE-based outer sheath, black

Technical data

Classification
ETIM 5.0 Class-ID: EC001578
ETIM 5.0 Class-Description: Flexible cable

Core identification code
Coloured according to VDE 0293-308, see appendix T9

Conductor design
Fine wire according to VDE 0295 class 5 / IEC 60228 class 5

Minimum bending radius
Occasional flexing: 15 x outer diameter
Fixed installation: 4 x outer diameter

Nominal voltage
U_0/U: 300/500 V

Test voltage
2500 V

Protective conductor
G = with GN-YE protective conductor
X = without protective conductor

Temperature range
Fixed installation:
-190°C to +260°C
Short term: +300°C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
ÖLFLEX® HEAT 260 MC				
0091300	2 X 0.5	3.9	9.6	22
0091301	3 G 0.5	4.1	14.4	33
0091302	4 G 0.5	4.5	19.2	45
0091305	2 X 0.75	4.2	14.4	32
0091306	3 G 0.75	4.4	21.6	47
0091307	4 G 0.75	5.1	28.8	58
0091310	2 X 1.0	4.8	19.2	42
0091311	3 G 1.0	5.1	28.8	56
0091312	4 G 1.0	5.8	38.4	71
0091315	3 G 1.5	5.6	43.2	72
0091316	4 G 1.5	6.1	57.6	98
0091317	5 G 1.5	7.0	72	118
0091320	3 G 2.5	7.1	72	87
0091321	4 G 2.5	7.7	96	116
0091322	5 G 2.5	8.5	120	145

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Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® HEAT 205 MC refer to main catalogue

Accessories

- SILVYN® HIPROJACKET refer to main catalogue
- SILVYN® SSUE refer to main catalogue
- EASY STRIP stripping and cutting tool refer to main catalogue
- STAR STRIP stripping tool refer to main catalogue

ECOLAB EAC

NEW

UNITRONIC® ROBUST

Halogen-free data cable with colour code according to DIN 47100 - resistant to a wide range of chemical media

- Excellent weather-resistance
- Good chemical resistance

Benefits

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant to contact with bio-oils, fats, waxes and their emulsions with a plant, animal or synthetic basis
- Good resistance to ammonia compounds and biogases
- Good resistance to cold and hot water as well as water-soluble cleaning agents
- Suitable for frequent steam cleaning

Application range

- Machine tool building, washing equipment, slaughterhouses, composting plants, sewage works
- Food and beverage industry, especially for production and processing of milk and meat products
- For data processing, measurement and control engineering, safety-related systems and as an electronics cable
- For indoor and outdoor use

Product features

- Halogen-free materials
- Good chemical resistance to ester-based hydraulic fluids
- Ozone-, UV- and weather-resistant according to EN 50396 and HD 605 S2
- Halogen-free according to IEC 60754-1 (amount of halogen acidic gas) Corrosiveness of combustion gases according to EN 50267-2-3 (degree of acidity)
- Low smoke density according to IEC 61034-2

Norm references / approvals

- Based on VDE 0812
- Certified resistance to disinfectant and cleaning solutions used in food and beverage industry

Design

- Fine-wire/multi-wire (0.34 mm²) strand made of bare copper wires
- Core insulation made of special halogen-free compound
- Outer sheath made of special TPE
- Sheath colour: Black

Technical data

Classification
ETIM 5.0 Class-ID: EC000830
ETIM 5.0 Class-Description: Data cable

Core identification code
DIN 47100 without colour repetition, refer to table T9

Operating capacitance
C/C approx. 60 nF/km

Peak operating voltage
(not for power applications)
at 0.14 mm²: 350 V
at ≥ 0.25 mm²: 500 V

Insulation-specific contact resistance
> 20 GOhm x cm

Inductance
approx. 0.65 mH/km

Conductor design
Strands, fine-wire
0.34 mm²: 7-wire

Minimum bending radius
Occasional flexing: 10 x outer diameter
Fixed installation: 4 x outer diameter

Test voltage
At 0.14 mm²: 1200 V

Temperature range
Occasional flexing: -40°C to +90°C
Fixed installation: -50°C to +90°C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
UNITRONIC® ROBUST				
1032000	2 x 0.14	3.2	2.8	15
1032001	3 x 0.14	3.4	4.2	17
1032002	4 x 0.14	3.6	5.6	21
1032003	5 x 0.14	3.9	7	25
1032004	7 x 0.14	4.2	9.8	30
1032005	8 x 0.14	4.9	11.2	40
1032006	10 x 0.14	5.2	14	41
1032007	12 x 0.14	5.6	16.8	50
1032009	16 x 0.14	6.1	22.4	63
1032011	25 x 0.14	7.7	35	95
1032012	2 x 0.25	3.8	4.8	21
1032013	3 x 0.25	4	7.2	25
1032014	4 x 0.25	4.3	9.6	31
1032015	5 x 0.25	4.7	12	38
1032016	7 x 0.25	5.1	16.8	47

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
1032017	8 x 0.25	6.2	19.2	66
1032018	10 x 0.25	6.8	24	71
1032019	12 x 0.25	7	28.8	81
1032021	16 x 0.25	7.7	38.4	104
1032024	25 x 0.25	9.5	60	151
1032025	2 x 0.34	4.2	6.5	29
1032026	3 x 0.34	4.4	9.8	32
1032027	4 x 0.34	4.8	13.1	41
1032028	5 x 0.34	5.5	16.3	52
1032030	7 x 0.34	5.9	22.9	65
1032031	8 x 0.34	7.1	26.1	90
1032032	10 x 0.34	7.6	32.6	93
1032033	12 x 0.34	7.8	39.2	107
1032035	16 x 0.34	8.7	52.2	138
1032038	25 x 0.34	11.2	81.6	213

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Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINTOP® ST-HF-M refer to main catalogue
- KT 11 cable shears refer to main catalogue
- DATA STRIP stripping tool refer to main catalogue

NEW

ECOLAB EAC

UNITRONIC® ROBUST C

Halogen-free data cable with colour code according to DIN 47100 - resistant to a wide range of chemical media

- Excellent weather-resistance
- Good chemical resistance

Benefits

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant to contact with bio-oils, fats, waxes and their emulsions with a plant, animal or synthetic basis
- Good resistance to ammonia compounds and biogases
- Good resistance to cold and hot water as well as water-soluble cleaning agents
- Suitable for frequent steam cleaning

Application range

- Machine tool building, washing equipment, slaughterhouses, composting plants, sewage works
- Food and beverage industry, especially for production and processing of milk and meat products
- For data processing, measurement and control engineering, safety-related systems and as an electronics cable
- For indoor and outdoor use

Product features

- Halogen-free materials
- Good chemical resistance to ester-based hydraulic fluids
- Ozone-, UV- and weather-resistant according to EN 50396 and HD 605 S2
- Halogen-free according to IEC 60754-1 (amount of halogen acidic gas) Corrosiveness of combustion gases according to EN 50267-2-3 (degree of acidity)
- Low smoke density according to IEC 61034-2

Norm references / approvals

- Based on VDE 0812
- Certified resistance to disinfectant and cleaning solutions used in food and beverage industry

Design

- Fine-wire/multi-wire (0.34 mm²) strand made of bare copper wires
- Core insulation made of special halogen-free compound
- Tin-plated copper braiding
- Outer sheath made of special TPE
- Sheath colour: Black

Technical data

Classification
ETIM 5.0 Class-ID: EC000830
ETIM 5.0 Class-Description: Data cable

Core identification code
DIN 47100 without colour repetition, refer to table T9

Operating capacitance
C/C approx. 60 nF/km
C/S approx. 100 nF/km

Peak operating voltage
(not for power applications)
at 0.14 mm²: 350 V
at ≥ 0.25 mm²: 500 V

Insulation-specific contact resistance
> 20 GOhm x cm

Inductance
approx. 0.65 mH/km

Conductor design
Strands, fine-wire
0.34 mm²: 7-wire

Minimum bending radius
Occasional flexing: 10 x outer diameter
Fixed installation: 4 x outer diameter

Test voltage
At 0.14 mm²: 1200 V

Temperature range
Occasional flexing: -40 °C to +90 °C
Fixed installation: -50 °C to +90 °C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
UNITRONIC® ROBUST C				
1032050	2 x 0.14	3.9	9.3	25
1032051	3 x 0.14	4.1	10.8	28
1032052	4 x 0.14	4.3	13.5	34
1032053	5 x 0.14	4.6	15	38
1032055	7 x 0.14	4.9	19	46
1032056	8 x 0.14	5.8	22	60
1032057	10 x 0.14	6.1	25.8	63
1032058	12 x 0.14	6.3	28.9	70
1032061	25 x 0.14	8.4	56.1	128
1032062	2 x 0.25	4.5	12.7	33
1032063	3 x 0.25	4.7	16.3	40
1032064	4 x 0.25	5	18.8	46
1032065	5 x 0.25	5.6	22.5	57
1032067	7 x 0.25	6	28.6	69

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
1032068	8 x 0.25	7.1	33.6	92
1032069	10 x 0.25	7.5	42.8	101
1032070	12 x 0.25	7.7	47.7	111
1032073	25 x 0.25	10.6	86.5	202
1032074	2 x 0.34	4.9	15.7	44
1032075	3 x 0.34	5.1	20.4	54
1032076	4 x 0.34	5.7	23.6	66
1032077	5 x 0.34	6.2	28.2	78
1032079	7 x 0.34	6.8	36	95
1032080	8 x 0.34	7.8	45.3	127
1032081	10 x 0.34	8.3	53.9	137
1032082	12 x 0.34	8.5	60.7	152
1032084	16 x 0.34	9.4	77.9	191
1032086	25 x 0.34	11.9	115.7	288

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Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINTOP® ST-HF-M refer to main catalogue
- KT 11 cable shears refer to main catalogue
- DATA STRIP stripping tool refer to main catalogue

ECOLAB EAC

NEW

UNITRONIC® ROBUST C (TP)

Halogen-free data cable with colour code according to DIN 47100 - resistant to a wide range of chemical media

- Excellent weather-resistance
- Good chemical resistance

Benefits

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant to contact with bio-oils, fats, waxes and their emulsions with a plant, animal or synthetic basis
- Good resistance to ammonia compounds and biogases
- Good resistance to cold and hot water as well as water-soluble cleaning agents
- Suitable for frequent steam cleaning

Application range

- Machine tool building, washing equipment, slaughterhouses, composting plants, sewage works
- Food and beverage industry, especially for production and processing of milk and meat products
- For data processing, measurement and control engineering, safety-related systems and as an electronics cable
- For indoor and outdoor use

Product features

- Halogen-free materials
- Good chemical resistance to ester-based hydraulic fluids
- Ozone-, UV- and weather-resistant according to EN 50396 and HD 605 S2
- Halogen-free according to IEC 60754-1 (amount of halogen acidic gas) Corrosiveness of combustion gases according to EN 50267-2-3 (degree of acidity)
- Low smoke density according to IEC 61034-2

Norm references / approvals

- Based on VDE 0812
- Certified resistance to disinfectant and cleaning solutions used in food and beverage industry

Design

- Fine-wire/multi-wire (0.34 mm²) strand made of bare copper wires
- Core insulation made of special halogen-free compound
- Twisted pair (TP) structure
- Tin-plated copper braiding
- Outer sheath made of special TPE Outer sheath colour: black (RAL 9005)

Technical data

Classification
ETIM 5.0 Class-ID: EC000830
ETIM 5.0 Class-Description: Data cable

Core identification code
DIN 47100 without colour repetition, refer to table T9

Operating capacitance
C/C approx. 60 nF/km
C/S approx. 100 nF/km

Peak operating voltage
(not for power applications)
at 0.14 mm²: 350 V
at ≥ 0.25 mm²: 500 V

Insulation-specific contact resistance
> 20 GOhm x cm

Inductance
approx. 0.65 mH/km

Conductor design
Strands, fine-wire
0.34 mm²: 7-wire

Minimum bending radius
Occasional flexing: 10 x outer diameter
Fixed installation: 4 x outer diameter

Test voltage
At 0.14 mm²: 1200 V

Temperature range
Occasional flexing: -40°C to +90°C
Fixed installation: -50°C to +90°C

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
UNITRONIC® ROBUST C (TP)				
1032100	2 x 2 x 0.14	5.3	16.1	31
1032101	3 x 2 x 0.14	5.8	19	38
1032102	4 x 2 x 0.14	6.2	23.1	46
1032103	5 x 2 x 0.14	6.4	27.2	54
1032104	6 x 2 x 0.14	7.1	31.3	63
1032105	8 x 2 x 0.14	8.2	43.4	90
1032106	10 x 2 x 0.14	8.7	50.9	93
1032107	12 x 2 x 0.14	8.9	56.6	102
1032108	2 x 2 x 0.25	6.3	22.7	43
1032109	3 x 2 x 0.25	7.1	28.9	56
1032110	4 x 2 x 0.25	7.6	38.3	72
1032111	5 x 2 x 0.25	7.9	45.1	85
1032112	6 x 2 x 0.25	8.5	48.7	96
1032113	8 x 2 x 0.25	10.3	64.3	135
1032114	2 x 2 x 0.34	7.1	27.6	56
1032115	3 x 2 x 0.34	7.8	38.8	74
1032116	4 x 2 x 0.34	8.4	47.5	90

Article number	Number of cores and mm² per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
1032117	5 x 2 x 0.34	8.8	58.2	110
1032118	1 x 2 x 0.5	5.6	20.1	37
1032119	2 x 2 x 0.5	7.9	40.3	72
1032120	3 x 2 x 0.5	8.7	51.7	91
1032121	4 x 2 x 0.5	9.4	64.1	112
1032122	5 x 2 x 0.5	10.3	76.6	141
1032123	6 x 2 x 0.5	11.1	91.7	170
1032124	8 x 2 x 0.5	13.1	123.2	238
1032125	10 x 2 x 0.5	14.5	146.4	247
1032126	2 x 2 x 0.75	8.5	48.4	84
1032127	3 x 2 x 0.75	9.4	68.9	114
1032128	4 x 2 x 0.75	10.7	86.2	149
1032129	6 x 2 x 0.75	12.1	131.9	225
1032130	8 x 2 x 0.75	14.7	168.2	315
1032131	2 x 2 x 1.0	9	64.1	98
1032132	3 x 2 x 1.0	10.4	83.5	135
1032133	4 x 2 x 1.0	11.3	105.7	168

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Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINTOP® ST-HF-M refer to main catalogue
- KT 11 cable shears refer to main catalogue
- DATA STRIP stripping tool refer to main catalogue

UNITRONIC® 300 / UNITRONIC® 300 S

Control and signal cables with small conductor cross-sections - UL/CSA listed

- Designation of shielded version: Formerly “UNITRONIC® 300 CY”, now “UNITRONIC® 300 S”
- Other sizes on request
- Especially for 20 AWG and 18 AWG: Up to 60 cores can be produced with standard core colour code; up to 100 cores with non-standard colour code, e.g. including green-yellow PE

Benefits

- Wide application range due to multiple certifications
- Cost-saving, easy installation due to omission of closed cable systems (suitable for open wiring)

Application range

- Control and signal cables for internal and external wiring
- Process control; electrical equipment; industrial machinery; low-voltage control
- For the North American market
- Thanks to the DIRECT BURIAL approval, direct burial of versions with the nominal conductor cross-sections 18 AWG and 16 AWG is normatively permitted in the USA

Product features

- CMG (for USA and Canada) and PLTC (for USA) for tray use in North America (24 AWG does not have PLTC certification)
- PLTC-ER & ITC-ER (“-ER” = Exposed Run: According to NEC/NFPA 70 in the USA for unprotected transitions of the cable outside of trays max. 1.8 m or 6 ft. in length per transition) for 18 AWG and 16 AWG
- DIRECT BURIAL certification for 18 AWG & 16 AWG for normatively permitted, direct burial in the USA
- Suitable for torsional applications

Norm references / approvals

- UL: CMG per UL 444; PLTC-ER per UL 13 (18 AWG + 16 AWG); PLTC (not for 24 AWG); ITC-ER per UL 2250 (18 AWG + 16 AWG); UL AWM Style 2464
- According to NEC/NFPA 70, 2014 HANDBOOK, ARTICLE 501, II., 501.10, (B), (1), apart from “Flexible Connections”, suitability for Class I, Division 2 in the USA for all versions with ITC-ER as per NEC 2014 ARTICLE 727.4 and in conjunction with additional UL listed components as well as for all versions with PLTC or PLTC-ER in line with the prerequisites for use of NEC 2014 ARTICLE 725 and in conjunction with tray use and use of additional UL listed components
- Canada: c(UL) CMG FT4, CSA AWM I/II A/B FT1
- Oil-resistant according to UL OIL RES I

Design

- Fine-wire strand made of tin-plated copper wires
- Core insulation made of PVC compound
- UNITRONIC® 300 S: Overall shielding with foil, drain wire and tin-plated copper braiding (75% coverage)
- Outer sheath: Specially designed PVC
- Outer sheath colour: Dark grey (similar to RAL 7005)

Technical data

Classification
ETIM 5.0 Class-ID: EC000104
ETIM 5.0 Class-Description: Control cable

Core identification code
refer to table T9

Conductor design
Fine wire

Torsion application in WTG
TW-0 & TW-1, refer to appendix T0

Minimum bending radius
During installation: 4 x outer diameter
Shielded: 6 x outer diameter

Nominal voltage
according to UL rating: 300 V
IEC: not for power applications

Test voltage
1500 V

Temperature range
Occasional flexing: -25°C to +105°C (AWM for USA: +80°C)
Fixed installation: -40°C to +105°C (AWM for USA: +80°C)

Article number	Article designation	Number of cores and AWG size	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
UNITRONIC® 300					
301602	UNITRONIC® 300	2 x AWG16	6.7	25	83
301802	UNITRONIC® 300	2 x AWG18	6.1	18.3	61
302006	UNITRONIC® 300	6 x AWG20	7.5	29.5	97
302204	UNITRONIC® 300	4 x AWG22	5	13.7	33
302210	UNITRONIC® 300	10 x AWG22	7	34.896	67
UNITRONIC® 300 S					
301602S	UNITRONIC® 300 S	2 x AWG16	7.6	50.6	101
301606S	UNITRONIC® 300 S	6 x AWG16	9.9	105.7	210
301802S	UNITRONIC® 300 S	2 x AWG18	6.8	37.2	75
301803S	UNITRONIC® 300 S	3 x AWG18	7.3	49.1	85
301804S	UNITRONIC® 300 S	4 x AWG18	7.9	59.6	104
302002S	UNITRONIC® 300 S	2 x AWG20	6.3	28.3	60
302004S	UNITRONIC® 300 S	4 x AWG20	7.3	40.2	88
302006S	UNITRONIC® 300 S	6 x AWG20	8.4	55.1	119
302206S	UNITRONIC® 300 S	6 x AWG22	6.4	35.7	68

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring 152 m; drum 305 m / Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- ÖLFLEX® TRAY II refer to main catalogue
- ÖLFLEX® TRAY II CY refer to main catalogue
- UNITRONIC® 300 STP refer to main catalogue

Accessories

- SKINTOP® ST-M refer to page 60
- SKINTOP® ST-M Small PU refer to main catalogue
- UNIVERSAL STRIP stripping tool refer to main catalogue
- STAR STRIP stripping tool refer to main catalogue

ECOLAB FDA

NEW

UNITRONIC® SENSOR HD M12

S/A cable: Hygienic Design for Food&Beverage

- Other types are available at www.lappgroup.com/assemblyfinder or on request

Benefits

- Hygienic design for optimum cleaning results
- Guaranteed density by meeting the highest protection class
- High-quality stainless steel knurl to ensure protection against corrosion
- Bright surfaces to detect contamination easily

Application range

- Food production and packaging machinery
- Refrigerated goods plants, cold storage
- Wet area with frequent contact with cleaning agents

Product features

- Suitable for drag chains
- 4-pin connector/socket M12 on free cable end

Norm references / approvals

- **ECOLAB®**
  Industry standard in the field of professional cleaning and disinfection in the food and beverage industry
- **FDA 21 CFR 177.2600**
  Special sealing element for the food and beverage industry in North America

Design

- Core cross-section: 0.34 mm²
- Core colours:
  4-pin: bn (1), wh (2), bu (3), bk (4)
- Outer sheath: TPE halogen-free, grey (similar to RAL 7035)

Suitable tools

- DATA STRIP stripping tool
  refer to main catalogue

Technical data

Classification
ETIM 5.0 Class-ID: EC001855
ETIM 5.0 Class-Description: Assembled sensor/actuator cable

Material
Contact: CuSn
Contact surface: Ni/Au
Knurl: Stainless steel (V4A)
Handle body: PP

Minimum bending radius
Fixed installation: 5 x outer diameter
Flexing: 10 x outer diameter

Protection rating
IP65/IP67/IP68/IP69

Ambient temperature (operation)
Fixed installation -40°C to +105°C
Flexing -25°C to +105°C

Coding
A-standard

Rated current in A
4 A

Article number	Article designation	Number of pins	Length in m	Design	LED	Rated voltage (V)	PU
4-pin							
Connector							
22262040	AB-C4-M12MS-2,0TPE-HD	4	2	straight	no	250	1
22262041	AB-C4-M12MS-5,0TPE-HD	4	5	straight	no	250	1
22262060	AB-C4-M12MS-7,5TPE-HD	4	7.5	straight	no	250	1
22262042	AB-C4-M12MS-10,0TPE-HD	4	10	straight	no	250	1
22262061	AB-C4-M12MS-15,0TPE-HD	4	15	straight	no	250	1
Socket							
22262043	AB-C4-2,0TPE-M12FS-HD	4	2	straight	no	250	1
22262044	AB-C4-5,0TPE-M12FS-HD	4	5	straight	no	250	1
22262062	AB-C4-7,5TPE-M12FS-HD	4	7.5	straight	no	250	1
22262045	AB-C4-10,0TPE-M12FS-HD	4	10	straight	no	250	1
22262063	AB-C4-15,0TPE-M12FS-HD	4	15	straight	no	250	1
22262046	AB-C4-2,0TPE-M12FA-HD	4	2	angled	no	250	1
22262047	AB-C4-5,0TPE-M12FA-HD	4	5	angled	no	250	1
22262064	AB-C4-7,5TPE-M12FA-HD	4	7.5	angled	no	250	1
22262048	AB-C4-10,0TPE-M12FA-HD	4	10	angled	no	250	1
22262065	AB-C4-15,0TPE-M12FA-HD	4	15	angled	no	250	1

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Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® SENSOR M12 refer to main catalogue
- EPIC® SENSOR M12 V4A refer to page 46
- EPIC® SENSOR M12/M12 refer to main catalogue

UNITRONIC® ROBUST S/A FD

Highly flexible, halogen-free sensor/actuator cable - resistant to a wide range of chemical media

- Good chemical resistance
- Excellent weather-resistance
- Flexible at cold temperatures

Benefits

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant against organic oils, emulsions, greases and waxes based on organic, animal or synthetic
- Good resistance to cold and hot water as well as water-soluble cleaning agents
- Suitable for frequent steam cleaning
- Good resistance to ammonia compounds and biogases

Application range

- Automation technology
- Machine tool building, washing equipment, slaughterhouses, composting plants, sewage works
- Food and beverage industry, especially for production and processing of milk and meat products

Product features

- Good chemical resistance to ester-based hydraulic fluids
- Ozone-, UV- and weather-resistant according to EN 50396 and HD 605 S2
- Suitable for drag chains
- Torsion-resistant
- Halogen-free

Norm references / approvals

- Certified resistance to disinfectant and cleaning solutions used in food and beverage industry
- **ECOLAB®**
  Industry standard in the field of professional cleaning and disinfection in the food and beverage industry

Design

- Extra-fine wire strand made of bare copper
- Core insulation: PE
- Core colours:
  3-pin: bn, bu, bk
  4-pin: bn, wh, bu, bk
  5-pin: bn, wh, bu, bk, gy
- Outer sheath made of special TPE
- Outer sheath colour: Black

Technical data

Classification
ETIM 5.0 Class-ID: EC001578
ETIM 5.0 Class-Description:
Flexible cable

Core identification code
acc. to EN 60947-5-2

Conductor design
Strand, extra-fine wire

Minimum bending radius
Flexing: 5 x outer diameter
Fixed installation: 3 x outer diameter

Temperature range
Flexing: -40°C to +90°C
Fixed installation: -50°C to +90°C

Article number	Dimensions (mm²)	Outer diameter [mm]	Colour	Copper index [kg/km]
0,25 mm²				
7038897	4x0.25	4.9	black	10.2
0,34 mm²				
7038895	3 x 0.34	5	black	9.8
7038894	4 x 0.34	5.4	black	13.1
7038896	5 x 0.34	5.9	black	16

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Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Other versions are available upon request
Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® SENSOR M12 refer to main catalogue
- EPIC® SENSOR M12 V4A refer to page 46
- EPIC® SENSOR M8 refer to main catalogue
- STAR STRIP stripping tool refer to main catalogue

UNITRONIC® BUS PB ROBUST

Fixed installation

Benefits

- Robust PROFIBUS cable for use under harsh environmental conditions

Application range

- For use for PROFIBUS-DP or FIP in harsh industrial environments
- Fixed installation
- Dairy and cheese technology
- Packaging machines
- Weighing and dosing systems
- Mills for grains and cereals
- Oil presses
- Coaters and roasters

Product features

- Significantly extended use and application areas, water and chemical resistance for use in industrial environments.
- High resistance to surfactants, soaps etc.
- UV-resistant
- Flame-retardant according to IEC 60332-1-2
- Based on the bit rates listed, in accordance with PNO specifications the following maximum cable lengths for a bus segment apply
  (cable type A, PROFIBUS-DP):
  93.75 kbit/s = 1200 m
  187.5 kbit/s = 1000 m
  500 kbit/s = 400 m
  1.5 Mbit/s = 200 m
  12.0 Mbit/s = 100 m

Design

- Solid and bare copper conductor
- Foam Skin - core insulation (O2YS)
- Overall shielding with copper braiding and plastic-laminated aluminium foil
- Tin-plated copper wire braiding
- With conventional cable design, but with an outer sheath made of special TPE

Technical data

Classification
ETIM 5.0 Class-ID: EC000830
ETIM 5.0 Class-Description: Data cable

Operating capacitance
(1 kHz): approx. 28.5 nF/km

Peak operating voltage
(not for power applications)
250 V

Minimum bending radius
Fixed installation: 75 mm

Test voltage
Core/Core: 1500 V eff.
Core/Shield: 1500 V

Characteristic impedance
(3 - 20 MHz): 150 ±15 ohm

Temperature range
-40°C to +80°C

Article number	Article designation	Number of pairs and conductor diameter (mm)	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
for fixed installation					
2170620	UNITRONIC® BUS PB ROBUST	1 x 2 x 0.64	8	26	55

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Copper price basis: EUR 150/100 kg; see catalogue appendix T17 for the application and definition of “Metal price basis” and “Metal index”
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred packaging (e.g. 1 x 500 m drum or 5 x 100 m rings)
SIMATIC® is a registered trademark of Siemens AG. FIP is a registered trademark of World FIP
Lapp Kabel is a member of the PROFIBUS user organisation (PNO)
Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- Sub-D Bus-Connectors refer to main catalogue

EPIC® SENSOR M12 V4A

Mountable connectors M12 for the food & beverage industry/outdoors

Benefits

- High-quality stainless steel knurl to ensure protection against corrosion
- Quick and easy on-site assembly
- For creating of individual cable lengths
- Space-saving due to compact dimensions
- Easy connection with tried-and-tested screw terminal technology

Application range

- Automation systems
- Conveyor and transport systems
- Food production and packaging machinery
- SKINTOP® version for outdoor applications

Product features

- 4-pin plug connector
- Screw connection
- PWIS-free

Technical data

Classification
ETIM 5.0 Class-ID: EC002062
ETIM 5.0 Class-Description:
Sensor/actuator connectors

Material
Contact: CuZn
Contact surface: Au (gold)
Knurl: Stainless steel (V4A)

Protection rating
IP 67

Ambient temperature (operation)
Connector/socket -40°C to +85°C

Coding
A-standard

Rated current in A
4 A

Article number	Article designation	Number of pins	Conductor cross-section in mm²	Cable diameter in mm	Rated voltage (V)	PU
Connector, straight						
22262049	AB-C4-M12MS-PG7-VA	4	0.25 - 0.75	4 - 6	250	1
22262123	AB-C4-M12MS-PG7-VA-SKINTOP	4	0.25 - 0.75	4.0 - 6.5	250	1
Socket, straight						
22262050	AB-C4-M12FS-PG7-VA	4	0.25 - 0.75	4 - 6	250	1
22262124	AB-C4-M12FS-PG7-VA-SKINTOP	4	0.25 - 0.75	4.0 - 6.5	250	1
Socket angled						
22262051	AB-C4-M12FA-PG7-VA	4	0.25 - 0.75	4 - 6	250	1

Photographs are not to scale and do not represent detailed images of the respective products.

ECOLAB

ETHERLINE® ROBUST

Flexible use

- For PROFINET applications
- Good chemical resistance

Benefits

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Resistant to contact with bio-oils, fats, waxes and their emulsions with a plant, animal or synthetic basis
- Good resistance to ammonia compounds and biogases
- Good resistance to cold and hot water as well as water-soluble cleaning agents
- Suitable for frequent steam cleaning

Application range

- For flexible applications (7-wire stranded conductor)
- Machine tool building, washing equipment, slaughterhouses, composting plants, sewage works
- Food and beverage industry, especially for production and processing equipment of milk and meat products
- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702

Product features

- Halogen-free materials
- Good chemical resistance to ester-based hydraulic fluids
- Ozone-, UV- and weather-resistant according to EN 50396
- Low smoke density according to IEC 61034-2

Design

- Stranded wire, bare, 7-wire
- Polyolefin-based core insulation
- Screening braid made of tin-plated copper wires
- Outer sheath made of special TPE
- Colour: black

Technical data

Classification
ETIM 5.0 Class-ID: EC000830
ETIM 5.0 Class-Description: Data cable

Minimum bending radius
Flexing: 10 x outer diameter
Fixed installation: 4 x outer diameter

Characteristic impedance
nom. 100 ohm according to IEC 61156-6

Temperature range
Occasional flexing: -40°C to +80°C
Fixed installation: -50°C to +80°C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
PROFINET Cat.5e					
2170451	ETHERLINE® ROBUST PN Cat.5	2x2xAWG22/7	6.5	30.4	50
PROFINET Cat.7					
2170452	ETHERLINE® ROBUST PN Cat.7	4x2xAWG23/7	8.7	48	75
Industrial Ethernet Cat.7					
2170453	ETHERLINE® ROBUST Cat.7 FLEX	4x2xAWG26/7	6,5	27	36

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Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
PROFINET® is a registered trademark of the PNO (PROFIBUS user organisation)
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable
Photographs are not to scale and do not represent detailed images of the respective products.

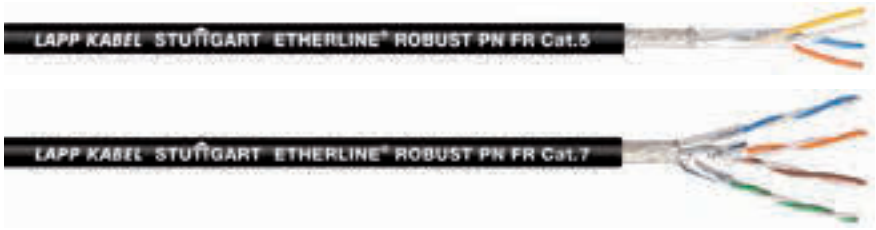
Accessories

- EPIC® DATA PN AX RJ45 refer to main catalogue
- EPIC® DATA PN 90 RJ45 refer to main catalogue
- EPIC® DATA AX RJ45 Cat.6A refer to main catalogue
- EPIC® DATA 90 RJ45 Cat.6A refer to main catalogue
- EPIC® DATA AX RJ45 Cat.6A IP68 refer to main catalogue
- EPIC® DATA M12D refer to main catalogue
- EPIC® DATA M12X refer to main catalogue
- EPIC® DATA CCR FA refer to main catalogue

ECOLAB

ETHERLINE® ROBUST FR

Flexible use



- For PROFINET applications
- Flame-retardant

Benefits

- Outstanding weather, ozone and UV resistance together with the wide temperature range enable versatile use for indoor and outdoor applications
- Good resistance to cold and hot water as well as water-soluble cleaning agents
- Suitable for frequent steam cleaning

Application range

- For flexible applications (7-wire stranded conductor)
- Machine tool building, washing equipment, slaughterhouses, composting plants, sewage works
- Food and beverage industry, especially for production and processing equipment of milk and meat products
- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702

Product features

- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference
- Flame retardance makes it suitable for indoor and outdoor installations
- 2-pair: 10/100 Mbit/s for Industrial Ethernet
- 4-pair: 100 Mbit/s up to 10 Gbit/s for Industrial Ethernet
- Many applications with Industrial Ethernet, e.g. PROFINET type B, i.e. fixed installation and flexible use.

Norm references / approvals

- UV-resistant according to ISO 4892-2 and ozone-resistant according to EN 50396
- Flame-retardant according to IEC 60332-1-2

Design

- Stranded wire, bare, 7-wire
- Polyolefin-based core insulation
- Screening braid made of tin-plated copper wires
- Outer sheath made of special TPE
- Colour: black

Technical data

Classification
ETIM 5.0 Class-ID: EC000830
ETIM 5.0 Class-Description: Data cable

Minimum bending radius
Flexing: 10 x outer diameter
Fixed installation: 4 x outer diameter

Characteristic impedance
nom. 100 ohm according to IEC 61156-6

Temperature range
Occasional flexing: -40°C to +80°C
Fixed installation: -50°C to +80°C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
PROFINET Cat.5e					
2170454	ETHERLINE® ROBUST PN FR Cat.5	2x2xAWG22/7	6.5	30.4	55
PROFINET Cat.7					
2170455	ETHERLINE® ROBUST PN FR Cat.7	4x2xAWG23/7	8.7	48	80
Industrial Ethernet Cat.7					
2170456	ETHERLINE® ROBUST FR Cat.7 FLEX	4x2xAWG26/7	6,5	27	40

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Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
PROFINET® is a registered trademark of the PNO (PROFIBUS user organisation)
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable
Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® DATA PN AX RJ45 refer to main catalogue
- EPIC® DATA PN 90 RJ45 refer to main catalogue
- EPIC® DATA AX RJ45 Cat.6A refer to main catalogue
- EPIC® DATA 90 RJ45 Cat.6A refer to main catalogue
- EPIC® DATA AX RJ45 Cat.6A IP68 refer to main catalogue
- EPIC® DATA M12D refer to main catalogue
- EPIC® DATA M12X refer to main catalogue
- EPIC® DATA CCR FA refer to main catalogue

ETHERLINE® PN Flex

Flexible use

- For Profinet applications
- CAT.5 performance
- Flexible use

Benefits

- For PROFINET applications type B
- Can be used in dry or damp rooms
- Shielded against interference signals
- Can be used for Industrial Ethernet in harsh industrial environments
- 2-pair: 10/100 Mbit/s for Industrial Ethernet

Application range

- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702
- For flexible applications (7-wire stranded conductor)
- Wiring of machines, tools, devices, appliances and control cabinets
- Suitable for EtherCAT and EtherNet/IP applications
- 2pair: 10/100 Mbit/s for Industrial Ethernet
- Food and beverage industry, especially where equipment has to be cleaned very often

Product features

- Flame-retardant according to CSA FT4 UL Vertical-Tray Flame Test
- CAT.5 performance
- FRNC version: Halogen-free and flame-retardant
- Fast Connect (FC) cable design

Norm references / approvals

- The cable is UL/CSA-certified (CMG)
- ETHERLINE® PN Cat.5 Y FLEX FC: **ECOLAB®** Industry standard for innovations and efficiency in the field of professional cleaning and disinfection

Design

- Stranded wire, bare, 7-wire
- Core insulation: PE or PP
- Star quad
- Inner sheath made of PVC or FRNC
- Overall shielding with copper braiding and plastic-laminated aluminium foil
- PVC or FRNC outer sheath material
- Colour: green (similar to RAL 6018)

Technical data

Classification
ETIM 5.0 Class-ID: EC000830
ETIM 5.0 Class-Description: Data cable

Peak operating voltage
(not for power applications)
125 V

Minimum bending radius
FRNC cable:
Flexing: 8 x outer diameter
Fixed installation: 4 x outer diameter
PVC cable:
Flexing: 7 x outer diameter
Fixed installation: 3 x outer diameter

Test voltage
Core/Core: 2000 V
Core/Shield: 2000 V

Characteristic impedance
100 W ± 15%

Temperature range
Cable with FRNC sheath
Fixed installation: -25°C to +80°C
Flexing: -25°C to +80°C
Cable with PVC sheath
Fixed installation: -40°C to +80°C
Flexing: -20°C to +60°C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
PVC outer sheath					
2170886	ETHERLINE® PN Cat.5 Y FLEX FC	2 x 2 x AWG22/7	6.5	31.3	67
FRNC outer sheath					
2170890	ETHERLINE® PN Cat.5e FRNC FLEX FC	2 x 2 x AWG22/7	6.5	31.2	65

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Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging: Ring ≤ 30 kg or ≤ 250 m, otherwise drum
PROFINET® is a registered trademark of the PNO (PROFIBUS user organisation)
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable
Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® DATA PN AX RJ45 refer to main catalogue
- EPIC® DATA PN 90 RJ45 refer to main catalogue
- EPIC® DATA RJ45F Cat.6A refer to main catalogue
- EPIC® DATA M12D refer to main catalogue
- FC STRIP stripping tool refer to main catalogue

ETHERLINE® PN Cat.6$_A$ FLEX

Flexible use

- For PROFINET applications with 4 pairs
- CAT.6$_A$ qualified for 10 Gbit/s

Benefits

- Can be used in dry or damp rooms
- Shielded against interference signals
- Can be used for Industrial Ethernet in harsh industrial environments
- 4-pair: 100 Mbit/s up to 10 Gbit/s for Industrial Ethernet

Application range

- For industrial secondary and tertiary cabling according to EN 50173-3 ISO/IEC 24702
- For flexible applications (7-wire stranded conductor)
- Plant engineering, machinery manufacturing
- Suitable for EtherCAT and EtherNet/IP applications
- Food and beverage industry, especially where equipment has to be cleaned very often

Product features

- Flexible CAT.6$_A$ cable qualified for 10 Gbit/s
- Meets the requirements according to CAT.6$_A$, ISO/IEC 11801 and EN 50173
- High-quality, double screening ensures high transmission reliability in areas with electromagnetic interference
- The oil-resistant PVC sheath enables usage in industrial environments

Norm references / approvals

- PVC cable is UL/CSA-certified (CMG)
- ETHERLINE® PN Cat.6A Y FLEX: **ECOLAB®** certified
  Industry standard for innovations and efficiency in the field of professional cleaning and disinfection
- FRNC cable is UL/CSA-certified (CM)

Design

- 7-wire stranded wire made of tin-plated copper wires
- Core insulation: Polyethylene (PE)
- S/FTP: Copper braid as overall shielding and pair screening with aluminium compound foil
- PVC or FRNC outer sheath material
- Colour: green (similar to RAL 6018)

Technical data

Classification
ETIM 5.0 Class-ID: EC000830
ETIM 5.0 Class-Description: Data cable

Peak operating voltage
(not for power applications)
125 V

Minimum bending radius
Flexing: 15 x outer diameter
Fixed installation: 8 x outer diameter

Characteristic impedance
100 ±15 ohm (> 1 MHz)

Temperature range
Cable with FRNC sheath
Fixed installation: -25°C to +80°C
Cable with PVC sheath
Fixed installation: -40°C to +80°C

Article number	Article designation	Number of pairs and AWG per conductor	Outer diameter [mm]	Copper index (kg/km)	Weight (kg/km)
PVC outer sheath					
2170930	ETHERLINE PN Cat.6$_A$ Y FLEX	4 x 2 x AWG23/7	8.8	48	92
FRNC outer sheath					
2170931	ETHERLINE PN Cat.6$_A$ FRNC FLEX	4 x 2 x AWG23/7	8.8	48	87

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
PROFINET® is a registered trademark of the PNO (PROFIBUS user organisation)
Detailed data sheets are available upon request. Please specify the type/dimensions of the required cable
Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- EPIC® DATA AX RJ45 Cat.6A refer to main catalogue
- EPIC® DATA 90 RJ45 Cat.6A refer to main catalogue
- EPIC® DATA AX RJ45 Cat.6A IP68 refer to main catalogue
- EPIC® DATA RJ45F Cat.6A refer to main catalogue
- EPIC® DATA M12X refer to main catalogue
- EPIC® DATA CCR FA refer to main catalogue
- DATA STRIP stripping tool refer to main catalogue

NEW

HITRONIC® PCF cables for PROFINET applications

- PROFINET-compliant
  - Type B or type C
- J-V(ZN)YY 2K200/230
  J-V(ZN)Y(ZN)11Y 2K200/230 flex
  J-V(ZN)Y(ZN)Y 2K200/230 flex

Benefits

- Optical signal transmission up to 500 m
- Easy to handle
- No interference by external fields
- No grounding problems
- Suitable for direct connector assembly

Application range

- PCF DUPLEX cable for optical signal transmission in industrial applications
- PROFINET / Industrial Ethernet
- At 100 Mbit/s: max. 100 m length
- PROFINET type B:
  for fixed installation
- PROFINET type C:
  for flexible applications (drag chain)

Product features

- Cable version with PVC sheath:
  for standard applications in industrial environments
- Cable version with PUR sheath:
  for high mechanical or chemical stress in industrial environments
- PNB - PROFINET type B
- PNC - PROFINET type C
- FD - highly flexible (drag chain)

Norm references / approvals

- 28055702: with c(UL)us certification (OFNG 75°C)

Design

- Colour-coded, tight buffered PCF single cable with PVC sheath
- Single cable diameter: 2.2 mm
- Aramide fibres as strain relief
- Outer sheath made of PUR or PVC (see article description)
- Outer sheath colour: green (RAL 6018)

Technical data

Classification
ETIM 5.0 Class-ID: EC000034
ETIM 5.0 Class-Description:
Fibre optic cable

Dimensions
Single cable diameter: 2.2 mm
Cable: see table

Core identification code
Black, orange (with arrow printing)

Minimum bending radius
see data sheet

Optical fibre type
Fibre core material: Glass
Fibre sheath material: Fluoropolymers

Permissible tensile force
see data sheet

Temperature range
see data sheet

Article number	Article designation	Fibre type	Number of fibres	Outer diameter [mm]	Weight (kg/km)
PCF DUPLEX - PROFINET TYPE B					
28055702	HITRONIC® PCF DUPLEX PNB PVC-PVC A	200/230 PCF	2	7.5	59
28052702	HITRONIC® PCF DUPLEX PNB PVC-PVC	200/230 PCF	2	7.2	55
PCF DUPLEX - PROFINET TYPE C					
28351702	HITRONIC® PCF DUPLEX FD PNC PVC-PUR	200/230 PCF	2	8.8	71
28352702	HITRONIC® PCF DUPLEX FD PNC PVC-PVC	200/230 PCF	2	8.8	76

Unless otherwise specified, the product values shown are nominal values. You can receive further values, such as tolerances, upon request if they available and have been released for publication.
Lapp Kabel is a member of the PROFIBUS user organisation (PNO)
The cables can also be supplied as pre-assembled fibre optic trunks.
Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- PCF Assembly Sets refer to main catalogue
- PCF Connector F-SMA and ST(BFOC) refer to main catalogue
- PCF Cutting Tools refer to main catalogue
- PCF Connector SC-RJ refer to main catalogue
- EPIC® DATA PB Sub-D FO refer to main catalogue
- STAR STRIP stripping tool refer to main catalogue

EPIC® ULTRA H-A 3 TG

Housing EPIC® ULTRA: For higher functional reliability

- For humid environment
- Corrosion-resistant
- Protection rating tested according to UL50E

EPIC® ULTRA H-A 3 TS

Housing EPIC® ULTRA: For higher functional reliability

- For humid environment
- Corrosion-resistant
- Protection rating tested according to UL50E

EPIC® ULTRA H-A 3 TBF

Housing EPIC® ULTRA: For higher functional reliability

- For humid environment
- Corrosion-resistant
- Protection rating tested according to UL50E

Benefits

- Optimum, low-resistance 360° screening
- All-purpose thanks to high corrosion resistance and high protection against environmental influences.
- Space-saving due to compact dimensions
- High mechanical and chemical resistance

Application range

- Packaging machines
- Bottling
- Food production
- Electric Motors

Technical data

Classification
ETIM 5.0 Class-ID: EC000437
ETIM 5.0 Class-Description: Housing for industrial connectors

Material
Housing: Nickel-plated zinc die-cast
Lever: Stainless steel
Seal: NBR

Protection rating
IP 65
NEMA 250, UL50E: 12, 4, 4X (latched)

Temperature range
-40°C to +100°C,
short-term up to +125°C

Product features

- Pluggable with standard housings
- Salt spray test according to IEC 68-2-52, severity level 2
- Salt spray testing according to DIN EN ISO 9227, method NSS, test duration 480 hours
- Corrosion-resistant according to DIN EN 6988
- Delivery including stainless steel screw for the inserts

Suitable inserts

- A selection of inserts is given in the main catalogue

Article number	Article description	M	Pieces / PU
EPIC® ULTRA H-A 3 TG			
10423300	ULTRA H-A 3 TG	20	10
EPIC® ULTRA H-A 3 TS			
10423201	ULTRA H-A 3 TS	20	10
EPIC® ULTRA H-A 3 TBF			
10423204	ULTRA H-A 3 TBF	20	10

Photographs are not to scale and do not represent detailed images of the respective products.

EPIC® ULTRA H-A 3 AG

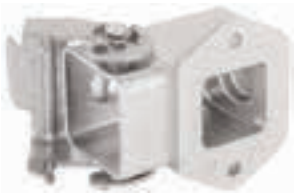
Housing EPIC® ULTRA: For higher functional reliability

- For humid environment
- Corrosion-resistant
- Protection rating tested according to UL50E

EPIC® ULTRA H-A 3 AGS

Housing EPIC® ULTRA: For higher functional reliability

- For humid environment
- Corrosion-resistant
- Protection rating tested according to UL50E



EPIC® ULTRA H-A 3 AGSV

Housing EPIC® ULTRA: For higher functional reliability

- For humid environment
- Corrosion-resistant
- Protection rating tested according to UL50E

Benefits

- Optimum, low-resistance 360° screening
- All-purpose thanks to high corrosion resistance and high protection against environmental influences.
- Space-saving due to compact dimensions
- High mechanical and chemical resistance

Application range

- Packaging machines
- Bottling
- Food production
- Electric Motors

Technical data

Classification
ETIM 5.0 Class-ID: EC000437
ETIM 5.0 Class-Description: Housing for industrial connectors

Material
Housing: Nickel-plated zinc die-cast
Lever: Stainless steel
Seal: NBR

Protection rating
IP 65
NEMA 250, UL50E: 12, 4, 4X (latched)

Temperature range
-40 °C to +100 °C, short-term up to +125 °C

Product features

- Pluggable with standard housings
- Salt spray test according to IEC 68-2-52, severity level 2
- Salt spray testing according to DIN EN ISO 9227, method NSS, test duration 480 hours
- Corrosion-resistant according to DIN EN 6988
- Delivery including stainless steel screw for the inserts

Suitable inserts

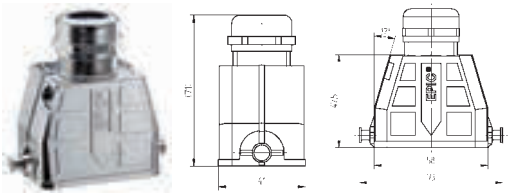
- A selection of inserts is given in the main catalogue

Article number	Article description	M	Pieces / PU
EPIC® ULTRA H-A 3 AG			
10423200	ULTRA H-A 3 AG		10
EPIC® ULTRA H-A 3 AGS			
10423202	ULTRA H-A 3 AGS		10
EPIC® ULTRA H-A 3 AGSV			
10423203	ULTRA H-A 3 AGSV	20	10

Photographs are not to scale and do not represent detailed images of the respective products.

EPIC® ULTRA H-B 6 TG LB

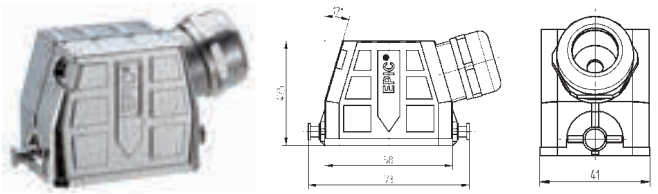
Housing EPIC® ULTRA: For higher functional reliability



- For humid environment
- Corrosion-resistant
- SKINTOP® integrated gland

EPIC® ULTRA H-B 6 TS LB

Housing EPIC® ULTRA: For higher functional reliability



- For humid environment
- Corrosion-resistant
- SKINTOP® integrated gland

Benefits

- Optimum, low-resistance 360° screening
- All-purpose thanks to high corrosion resistance and high protection against environmental influences.
- Space-saving due to compact dimensions
- Faster than any other comparable system
- High mechanical resistance

Application range

- Packaging machines
- Bottling
- Food production
- Electric Motors

Product features

- Housing with the BRUSH attachment comes with BRUSH shield contacting for cables
- Pluggable with standard housings
- Corrosion-resistant according to DIN EN 6988
- Salt spray test according to IEC 68-2-52, severity level 2
- Salt spray testing according to DIN EN ISO 9227, method NSS, test duration 480 hours

Suitable inserts

- A selection of inserts is given in the main catalogue

Technical data

Classification
ETIM 5.0 Class-ID: EC000437
ETIM 5.0 Class-Description: Housing for industrial connectors

Material
Housing: Nickel-plated zinc die-cast
Lever and bolts: Stainless steel
Seal: NBR
Cable gland
Body: Nickel-plated brass
Insert: PA
Sealing ring: Special elastomer

Protection rating
IP 65
NEMA 250, UL50E: 12, 4, 4X (latched)

Temperature range
-40°C to +100°C

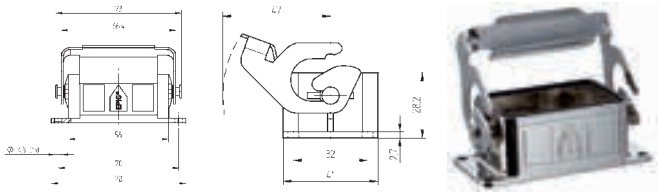
Article number	Article description	Clamping range in mm	Minimum Ø above braiding (mm)	Pieces / PU
H-B housing: Hood (straight cable entry, bolts for single lever)				
70250200	ULTRA H-B 6 TG-LB 6-13	6 - 13		1
70250201	ULTRA H-B 6 TG-LB 9-17	9 - 17		1
70250202	ULTRA H-B 6 TG-LB 9-17 BRUSH	9 - 17	6	1
H-B housing: Hood (side cable entry, bolts for single lever)				
70250203	ULTRA H-B 6 TS-LB 6-13	6 - 13		1
70250204	ULTRA H-B 6 TS-LB 9-17	9 - 17		1
70250205	ULTRA H-B 6 TS-LB 9-17 BRUSH	9 - 17	6	1

Photographs are not to scale and do not represent detailed images of the respective products.

EPIC® ULTRA H-B 6 AG LB

Housing EPIC® ULTRA: For higher functional reliability

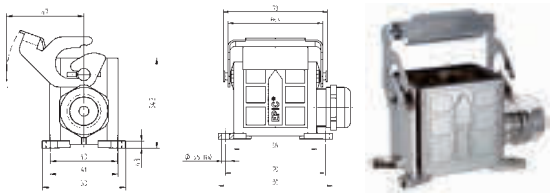
- For humid environment
- Corrosion-resistant



EPIC® ULTRA H-B 6 SGR LB

Housing EPIC® ULTRA: For higher functional reliability

- For humid environment
- Corrosion-resistant
- SKINTOP® integrated gland



Benefits

- Optimum, low-resistance 360° screening
- All-purpose thanks to high corrosion resistance and high protection against environmental influences.
- Space-saving due to compact dimensions
- Faster than any other comparable system
- High mechanical resistance

Application range

- Packaging machines
- Bottling
- Food production
- Electric Motors

Product features

- Housing with the BRUSH attachment comes with BRUSH shield contacting for cables
- Pluggable with standard housings
- Corrosion-resistant according to DIN EN 6988
- Salt spray test according to IEC 68-2-52, severity level 2
- Salt spray testing according to DIN EN ISO 9227, method NSS, test duration 480 hours

Suitable inserts

- A selection of inserts is given in the main catalogue

Technical data

Classification
ETIM 5.0 Class-ID: EC000437
ETIM 5.0 Class-Description: Housing for industrial connectors

Material
Housing: Nickel-plated zinc die-cast
Lever and bolts: Stainless steel
Seal: NBR
Cable gland
Body: Nickel-plated brass
Insert: PA
Sealing ring: Special elastomer

Protection rating
IP 65
NEMA 250, UL50E: 12, 4, 4X (latched)

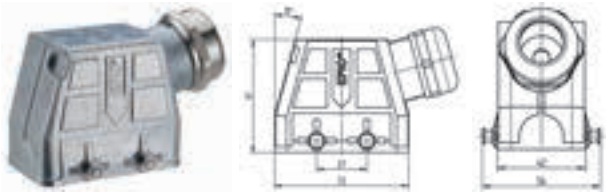
Temperature range
-40°C to +100°C

Article number	Article description	Clamping range in mm	Minimum Ø above braiding (mm)	Pieces / PU
H-B housing: Panel-mount base (single lever)				
70250206	ULTRA H-B 6 AG LB			1
H-B housing: Surface-mount base (1 cable entry, single lever)				
70250207	ULTRA H-B 6 SGR LB 6-13	6 - 13		1
70250208	ULTRA H-B 6 SGR LB 9-17	9 - 17		1
70250209	ULTRA H-B 6 SGR LB 9-17 BRUSH	9 - 17	6	1

Photographs are not to scale and do not represent detailed images of the respective products.

EPIC® ULTRA H-B 10 TS QB

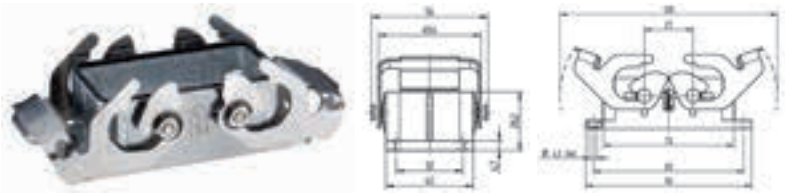
Housing EPIC® ULTRA: For higher functional reliability



- For humid environment
- Corrosion-resistant
- SKINTOP® integrated gland

EPIC® ULTRA H-B 10 AG QB

Housing EPIC® ULTRA: For higher functional reliability



- For humid environment
- Corrosion-resistant

Benefits

- Optimum, low-resistance 360° screening
- All-purpose thanks to high corrosion resistance and high protection against environmental influences.
- Space-saving due to compact dimensions
- Faster than any other comparable system
- High mechanical resistance

Application range

- Packaging machines
- Bottling
- Food production
- Electric Motors

Product features

- Housing with the BRUSH attachment comes with BRUSH shield contacting for cables
- Pluggable with standard housings
- Corrosion-resistant according to DIN EN 6988
- Salt spray test according to IEC 68-2-52, severity level 2
- Salt spray testing according to DIN EN ISO 9227, method NSS, test duration 480 hours

Suitable inserts

- A selection of inserts is given in the main catalogue

Technical data

Classification
ETIM 5.0 Class-ID: EC000437
ETIM 5.0 Class-Description: Housing for industrial connectors

Material
Housing: Nickel-plated zinc die-cast
Lever and bolts: Stainless steel
Seal: NBR
Cable gland
Body: Nickel-plated brass
Insert: PA
Sealing ring: Special elastomer

Protection rating
IP 68
NEMA 250, UL50E: 12, 4, 4X (latched)

Temperature range
-40°C to +100°C

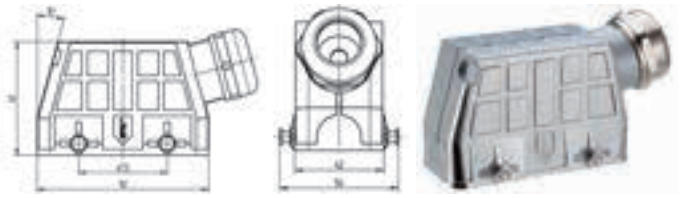
Article number	Article description	Clamping range in mm	Minimum Ø above braiding (mm)	Pieces / PU
H-B housing: Hood (side cable entry, bolts for double lever)				
70250210	ULTRA H-B 10 TS QB 7-15	7 - 15		1
70250211	ULTRA H-B 10 TS QB 11-21	11 - 21		1
70250212	ULTRA H-B 10 TS QB 11-21 BRUSH	11 - 21	8	1
H-B housing: Panel-mount base (double lever)				
70250213	ULTRA H-B 10 AG QB			1

Photographs are not to scale and do not represent detailed images of the respective products.

EPIC® ULTRA H-B 16 TS QB

Housing EPIC® ULTRA: For higher functional reliability

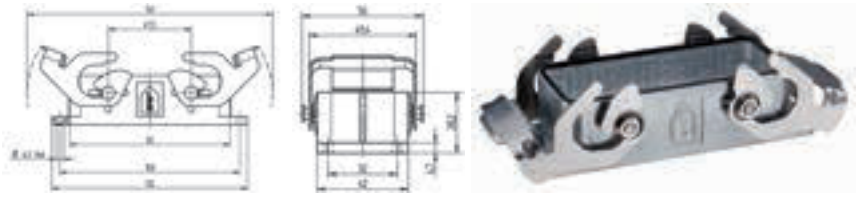
- For humid environment
- Corrosion-resistant
- SKINTOP® integrated gland



EPIC® ULTRA H-B 16 AG QB

Housing EPIC® ULTRA: For higher functional reliability

- For humid environment
- Corrosion-resistant



Benefits

- Optimum, low-resistance 360° screening
- All-purpose thanks to high corrosion resistance and high protection against environmental influences.
- Space-saving due to compact dimensions
- Faster than any other comparable system
- High mechanical resistance

Application range

- Packaging machines
- Bottling
- Food production
- Electric Motors

Product features

- Housing with the BRUSH attachment comes with BRUSH shield contacting for cables
- Pluggable with standard housings
- Corrosion-resistant according to DIN EN 6988
- Salt spray test according to IEC 68-2-52, severity level 2
- Salt spray testing according to DIN EN ISO 9227, method NSS, test duration 480 hours

Suitable inserts

- A selection of inserts is given in the main catalogue

Technical data

Classification
ETIM 5.0 Class-ID: EC000437
ETIM 5.0 Class-Description: Housing for industrial connectors

Material
Housing: Nickel-plated zinc die-cast
Lever and bolts: Stainless steel
Seal: NBR
Cable gland
Body: Nickel-plated brass
Insert: PA
Sealing ring: Special elastomer

Protection rating
IP 68
NEMA 250, UL50E: 12, 4, 4X (latched)

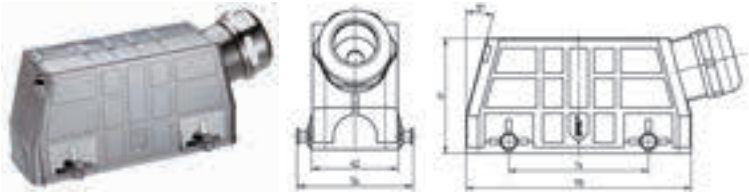
Temperature range
-40°C to +100°C

Article number	Article description	Clamping range in mm	Minimum Ø above braiding (mm)	Pieces / PU
H-B housing: Hood (side cable entry, bolts for double lever)				
70250214	ULTRA H-B 16 TS QB 7-15	7 - 15		1
70250215	ULTRA H-B 16 TS QB 11-21	11 - 21		1
70250216	ULTRA H-B 16 TS QB 11-21 BRUSH	11 - 21	8	1
H-B housing: Panel-mount base (double lever)				
70250217	ULTRA H-B 16 AG QB			1

Photographs are not to scale and do not represent detailed images of the respective products.

EPIC® ULTRA H-B 24 TS QB

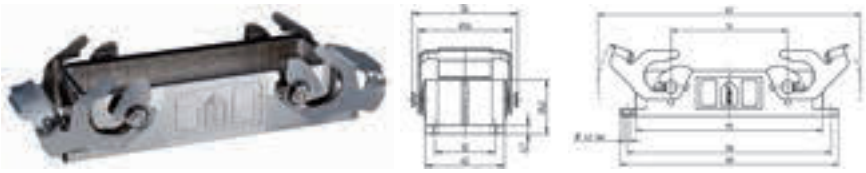
Housing EPIC® ULTRA: For higher functional reliability



- For humid environment
- Corrosion-resistant
- SKINTOP® integrated gland

EPIC® ULTRA H-B 24 AG QB

Housing EPIC® ULTRA: For higher functional reliability



- For humid environment
- Corrosion-resistant

Benefits

- Optimum, low-resistance 360° screening
- All-purpose thanks to high corrosion resistance and high protection against environmental influences.
- Space-saving due to compact dimensions
- Faster than any other comparable system
- High mechanical resistance

Application range

- Packaging machines
- Bottling
- Food production
- Electric Motors

Product features

- Housing with the BRUSH attachment comes with BRUSH shield contacting for cables
- Pluggable with standard housings
- Corrosion-resistant according to DIN EN 6988
- Salt spray test according to IEC 68-2-52, severity level 2
- Salt spray testing according to DIN EN ISO 9227, method NSS, test duration 480 hours

Suitable inserts

- A selection of inserts is given in the main catalogue

Technical data

Classification
ETIM 5.0 Class-ID: EC000437
ETIM 5.0 Class-Description: Housing for industrial connectors

Material
Housing: Nickel-plated zinc die-cast
Lever and bolts: Stainless steel
Seal: NBR
Cable gland
Body: Nickel-plated brass
Insert: PA
Sealing ring: Special elastomer

Protection rating
IP 65
NEMA 250, UL50E: 12 (latched)

Temperature range
-40°C to +100°C

Article number	Article description	Clamping range in mm	Minimum Ø above braiding (mm)	Pieces / PU
H-B housing: Hood (side cable entry, bolts for double lever)				
70250219	ULTRA H-B 24 TS QB 7-15	7 - 15		1
70250220	ULTRA H-B 24 TS QB 11-21	11 - 21		1
70250221	ULTRA H-B 24 TS QB 11-21 BRUSH	11 - 21	8	1
H-B housing: Panel-mount base (double lever)				
70250222	ULTRA H-B 24 AG QB			1

Photographs are not to scale and do not represent detailed images of the respective products.

EPIC® ULTRA protective cover for housing H-B

Product features

- Protective cover for EPIC® ULTRA housing
- Without securing cord
- Protective cover made of material suitable for the food industry
- Protective cover for hood with stainless steel levers and bolts

Technical data

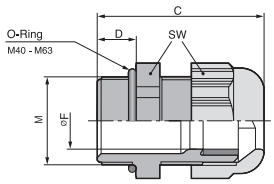
Classification
ETIM 5.0 Class-ID: EC002314
ETIM 5.0 Class-Description: Protective cap for industrial connectors

Article number	Version	Bolts	Lever	Pieces / PU
ULTRA protective cover for panel- and surface-mount bases				
70250250	for housing ULTRA H-B 6	2		1
70250251	for housing ULTRA H-B 10	4		1
70250252	for housing ULTRA H-B 16	4		1
70250253	for housing ULTRA H-B 24	4		1
ULTRA protective cover for hood				
70250254	for housing ULTRA H-B 6		Single lever	1
70250255	for housing ULTRA H-B 10		Double Lever	1
70250256	for housing ULTRA H-B 16		Double Lever	1
70250257	for housing ULTRA H-B 24		Double Lever	1

Photographs are not to scale and do not represent detailed images of the respective products.

SKINTOP® ST-M / SKINTOP® STR-M





- Now with IP69 approval! Proven to withstand demanding cleaning procedures for machinery and systems with high-pressure cleaners and hot water!

Benefits

SKINTOP® ST-M

- High oil resistance for maximum functional reliability
- Permanent vibration protection
- Wide, variable clamping ranges
- Optimum strain relief
- Various accessories (e.g. multiple sealing inserts)

Application range

SKINTOP® ST-M

- Used in areas where a lot of cables and wires need to be inserted into housing with minimum space requirements
- Machine and equipment manufacturing
- Automation technology

SKINTOP® STR-M

- With reducing seal insert, to seal cables with smaller outer diameters.

Norm references / approvals

- UL file no. E79903
- GGVS: TÜ.EGG.020-95

Design

- Metric connection thread according to DIN EN 60423
- Basis for technical information DIN IEC 62444

Note

- Refer to SKINTOP® metric accessories for suitable accessories
- Counter nut to be used: SKINTOP® GMP-GL-M
- SKINTOP® ST(R) M ISO versions have an extra-long connection thread
- SKINTOP® ST(R) M ISO versions with extra-long connection thread, see table, have no DNV approval

Suitable cables

SKINTOP® STR-M

- The following cables are recommended for IP 69 applications:
  ÖLFLEX® ROBUST 200
  H07RN8-F
  H07RN-F

Suitable tools

SKINTOP® ST-M

- SKINTOP® LOCATOR
  refer to main catalogue
- SKINMATIC® QUICK Set 1
  refer to main catalogue
- SKINMATIC® RZ refer to main catalogue
- SKINMATIC® MH Set refer to main catalogue

Technical data

Classification
ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description:
Cable gland

Caution
SKINTOP® ST-M
Refer to T21 for the installation dimensions and tightening torques
Size M 40 x 1.5 up to M 63 x 1.5 with O-ring
SKINTOP® STR-M
Refer to T21 for the installation dimensions and tightening torques

Colour delivered
RAL 7001 silver grey
RAL 7035 light grey
RAL 9005 black/UV-resistant

Material
Body: Polyamide
Seal: CR

Tests
GGVS: TÜ.EGG.020-95

Protection rating
IP 68 - 5 bar
IP 69

Temperature range
static: -40°C to +100°C
dynamic: -20°C to +100°C

Article number	Article designation / size	Clamping range ØF (mm)	SW mm	Total length C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® ST-M silver-grey						
53111000	M 12 x 1,5	3,5-7	15	30.0	8	100
53111010	M 16 x 1,5	4,5-10	19	34.0	8	100
53111020	M 20 x 1,5	7-13	25	37.0	9	100
53111030	M 25 x 1,5	10-17	30	40.0	10	50
53111040	M 32 x 1,5	11-21	36	47.0	10	25
53111050	M 40 x 1,5	19-28	46	52.0	10	10
53111060	M 50 x 1,5	27-35	55	62.0	12	5
53111070	M 63 x 1,5	34-45	66	71.0	12	5
SKINTOP® ST-M black						
53111200	M 12 x 1,5	3,5-7	15	30.0	8	100
53111210	M 16 x 1,5	4,5-10	19	34.0	8	100
53111220	M 20 x 1,5	7-13	25	37.0	9	100
53111230	M 25 x 1,5	10-17	30	40.0	10	50
53111240	M 32 x 1,5	11-21	36	47.0	10	25
53111250	M 40 x 1,5	19-28	46	52.0	10	10
53111260	M 50 x 1,5	27-35	55	62.0	12	5
53111270	M 63 x 1,5	34-45	66	71.0	12	5
SKINTOP® ST-M light grey						
53111400	M 12 x 1,5	3,5-7	15	30.0	8	100
53111410	M 16 x 1,5	4,5-10	19	34.0	8	100
53111420	M 20 x 1,5	7-13	25	37.0	9	100
53111430	M 25 x 1,5	10-17	30	40.0	10	50
53111440	M 32 x 1,5	11-21	36	47.0	10	25
53111450	M 40 x 1,5	19-28	46	52.0	10	10
53111460	M 50 x 1,5	27-35	55	62.0	12	5
53111470	M 63 x 1,5	34-45	66	71.0	12	5

Article number	Article designation / size	Clamping range ØF (mm)	SW mm	Total length C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® ST M ISO silver-grey (with long metric connection thread)						
53017010	M 16 x 1,5 ISO	3,5-8	19	40.0	12	100
53017030	M 20 x 1,5 ISO	5-12	24	45.0	13	100
53017040	M 25 x 1,5 ISO	9-14	27	47.0	13	50
SKINTOP® ST M ISO black (with long metric connection thread)						
53010000	M 12 x 1,5 ISO	3,5-7	15	36.7	15	100
53017210	M 16 x 1,5 ISO	3,5-8	19	40.0	12	100
53017230	M 20 x 1,5 ISO	5-12	24	45.0	13	100
53017240	M 25 x 1,5 ISO	9-14	27	47.0	13	50
SKINTOP® STR-M silver grey						
53111100	M 12 x 1,5	1-5	15	30.0	8	100
53111110	M 16 x 1,5	2-7	19	34.0	8	100
53111120	M 20 x 1,5	5-10	25	37.0	9	100
53111130	M 25 x 1,5	6-13	30	40.0	10	50
53111140	M 32 x 1,5	7-15	36	47.0	10	25
53111150	M 40 x 1,5	15-23	46	52.0	10	10
53111160	M 50 x 1,5	22-29	55	62.0	12	5
53111170	M 63 x 1,5	28-39	66	71.0	12	5
SKINTOP® STR-M black						
53111300	M 12 x 1,5	1-5	15	30.0	8	100
53111310	M 16 x 1,5	2-7	19	34.0	8	100
53111320	M 20 x 1,5	5-10	25	37.0	9	100
53111330	M 25 x 1,5	6-13	30	40.0	10	50
53111340	M 32 x 1,5	7-15	36	47.0	10	25
53111350	M 40 x 1,5	15-23	46	52.0	10	10
53111360	M 50 x 1,5	22-29	55	62.0	12	5
53111370	M 63 x 1,5	28-39	66	71.0	12	5
SKINTOP® STR-M light grey						
53111500	M 12 x 1,5	1-5	15	30.0	8	100
53111510	M 16 x 1,5	2-7	19	34.0	8	100
53111520	M 20 x 1,5	5-10	25	37.0	9	100
53111530	M 25 x 1,5	6-13	30	40.0	10	50
53111540	M 32 x 1,5	7-15	36	47.0	10	25
53111550	M 40 x 1,5	15-23	46	52.0	10	10
53111560	M 50 x 1,5	22-29	55	62.0	12	5
53111570	M 63 x 1,5	28-39	66	71.0	12	5
SKINTOP® STR M ISO silver-grey (with long metric connection thread)						
53017110	M 16 x 1,5 ISO	2-6	19	40.0	12	100
53017130	M 20 x 1,5 ISO	4-9	24	45.0	13	100
53017140	M 25 x 1,5 ISO	6-12	27	47.0	13	50
SKINTOP® STR M ISO black (with long metric connection thread)						
53017310	M 16 x 1,5 ISO	2-6	19	40.0	12	100
53017330	M 20 x 1,5 ISO	4-9	24	45.0	13	100
53017340	M 25 x 1,5 ISO	6-12	27	47.0	13	50

Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

SKINTOP® ST-M

- SKINTOP® DIX-M refer to main catalogue
- SKINTOP® GMP-GL-M refer to main catalogue
- SKINTOP® DIX-M AUTOMATION refer to main catalogue
- SKINTOP® SDV-M ATEX refer to main catalogue
- SKINTOP® SD-M refer to main catalogue
- SKINTOP® DV-M refer to main catalogue

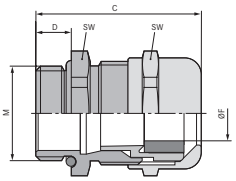
SKINTOP® STR-M

- SKINTOP® GMP-GL-M refer to main catalogue
- SKINTOP® SDVR-M ATEX refer to main catalogue
- SKINTOP® SD-M refer to main catalogue

SKINTOP® MS-M / SKINTOP® MSR-M

SKINTOP® MS-M

SKINTOP® MSR-M



- SKINTOP® MS-M sizes 75 x 1.5 bis 110 x 2 with innovative double lamella basket. This simplifies the installation of cables with a large cross-section.
- Now with IP69 approval! Proven to withstand demanding cleaning procedures for machinery and systems with high-pressure cleaners and hot water!

Benefits

SKINTOP® MS-M

- High functional reliability
- Optimum strain relief
- Wide, variable clamping ranges
- For cable diameters up to 98 mm

Application range

SKINTOP® MS-M

- In areas where mechanical and chemical stability are critical.
- Measurement, control and regulation technology
- Machine and equipment manufacturing
- Plant construction

SKINTOP® MSR-M

- With reducing seal insert, to seal cables with smaller outer diameters.

Norm references / approvals

- UL file no. E79903

Design

- Metric connection thread according to DIN EN 60423
- Basis for technical information DIN IEC 62444

Note

- Counter nut to be used: SKINDICHT® SM-M
- Refer to SKINTOP® metric accessories for suitable accessories

Technical data

Classification
ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description: Cable gland

Caution
Refer to T21 for the installation dimensions and tightening torques

Certifications
IP 69 approval from size M75 x 1.5 pending.
UL, CSA, DNV, VDE approval for sizes M90x2 and M110x2 pending.

Material
Body: Nickel-plated brass
Insert: Polyamide
Sealing ring: CR
O-ring: NBR

Protection rating
IP 68 - 10 bar
IP 69 (M12 - M63)

Temperature range
dynamic -25°C up to +100°C
static: -40°C to +100°C

Article number	Article designation / size	Clamping range ØF (mm)	SW mm	Total length C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® MS-M						
53112000	M 12 x 1,5	3-7	16	26.5	6.5	100
53112010	M 16 x 1,5	4,5-10	20	32.0	7	100
53112020	M 20 x 1,5	7-13	24	35.5	8	50
53112030	M 25 x 1,5	9-17	29	37.5	8	25
53112040	M 32 x 1,5	11-21	36	42.2	9	25
53112050	M 40 x 1,5	19-28	45	49.5	9	10
53112060	M 50 x 1,5	27-35	54	52.0	10	5
53112070	M 63 x 1,5	34-45	67	61.3	15	5
53112080	M 63 x 1,5 plus	44-55	75	65.5	15	5
53112510	M 75 x 1,5	58-68	95	105.0	15	1
53112512	M 90 x 2	66-78	115	136.0	20	1
53112514	M 110 x 2	86-98	135	154.0	25	1
SKINTOP® MSR-M						
53112100	M 12 x 1,5	1-5	16	26.5	6.5	100
53112110	M 16 x 1,5	2-7	20	32.0	7	100
53112120	M 20 x 1,5	5-10	24	35.5	8	50
53112130	M 25 x 1,5	6-13	29	37.5	8	25
53112140	M 32 x 1,5	7-15	36	42.2	9	25
53112150	40 x 1,5	15-23	45	49.5	9	10
53112160	50 x 1,5	22-29	54	52.0	10	5
53112170	M 63 x 1,5	28-39	67	61.3	15	5
53112511	M 75 x 1,5	53-63	95	105.0	15	1
53112515	M 110 x 2	76-88	135	154.0	25	1

Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

SKINTOP® MS-M

- SKINDICHT® SM-M refer to main catalogue
- SKINTOP® DIX-M refer to main catalogue
- SKINMATIC® MH Set refer to main catalogue
- SKINTOP® DIX-M AUTOMATION refer to main catalogue
- SKINTOP® SDV-M ATEX refer to main catalogue
- SKINTOP® SD-M refer to main catalogue
- SKINTOP® DV-M refer to main catalogue

SKINTOP® MSR-M

- SKINDICHT® SM-M refer to main catalogue
- SKINTOP® SDVR-M ATEX refer to main catalogue
- SKINTOP® SD-M refer to main catalogue

SKINTOP® MULTI

- Compact multi-insertion system with innovative gel technology

Benefits

- Large clamping range of 4 mm and AS-I BUS entry system by elastic gel technology with innovative membrane technology
- Easy assembly with high packing density
- Optimum strain relief at the entire cable bundle
- Error reduction through clear assignment of the cables to be installed by clear marking of the implementing points
- Unoccupied points remain securely sealed

Application range

- Used in areas where a lot of cables and wires need to be inserted into housing with minimum space requirements
- For cables that have not been assembled and media conduits
- Control system, control cabinet and apparatus construction
- Automation technology

Product features

- Integrated seal for the cable & housing (captive)
- Halogen-free
- UV-, ozone and oil-resistant
- The adhesive effect of the gel enables very easy positioning at the housing during assembling

Norm references / approvals

- UL 508A for SKINTOP® MULTI versions 1 + 2
- UL pending for SKINTOP® MULTI versions 3 + 4

Design

- For connector mounting cut-outs 24-pin (36 x 112 mm)

Included in delivery

- SKINTOP® MULTI including mounting material

Technical data

Classification
ETIM 5.0 Class-ID: EC000240
ETIM 5.0 Class-Description: Cable entry

Certifications
UL File No. E349737
Fire behaviour according to UL94 V-2

Note
Individual hole configuration on request

Material
Frame: Polycarbonate
Seal: Gel

Protection rating
IP 68

Temperature range
-30 °C to +100 °C

Article number	Article designation / size	Max. number of executions	Number of cables x clamping range	Pieces / PU
SKINTOP® MULTI				
52220065	SKINTOP® MULTI Version 1	22	6 x 8-12 mm, 16 x 3-7 mm	1
52220073	SKINTOP® MULTI Version 2	21	5 x 2-6 mm, 8 x 4-8 mm, 3 x 5-9 mm, 2 x 8-12 mm, 1 x 12-16 mm, 2 x AS-I BUS oder 2 x 2-4 mm	1
52220080	SKINTOP® MULTI Version 3	30	30 x 2-6 mm	1
52220085	SKINTOP® MULTI Version 4	11	8 x 8-12 mm, 2 x 12-16 mm, 1 x 16-20 mm	1

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- SKINTOP® CUBE MULTI refer to main catalogue

Accessories

- SKINTOP® DIX-DV refer to main catalogue
- Kraftform Kompakt® 10

NEW

SKINTOP® BRUSH ADD-ON



- Innovative EMC add-on for SKINTOP® ST(R)-M plastic cable glands.
- The world's first patented active EMC counter nut!

Benefits

- Optimum, low-resistance 360° screen contact
- Cutting edges cut through the insulating layer of the housing or switch cabinet when tightening, thus guaranteeing optimum contact
- Easy disassembly
- Visible, large-scale shield contacting
- Uncomplicated and safe

Application range

- For EMC-compliant earthing of the copper braided shield, or for cables with copper corrugated sheath
- For EMC-contact at through-holes
- Control cabinet construction
- Automation systems
- Conveyor and transport systems

Design

- Metric connection thread according to DIN EN 60423
- Basis for technical information DIN IEC 62444

Technical data

Classification
ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description:
Cable gland

Caution
Refer to T21 for the installation dimensions and tightening torques
The SKINTOP® ST-M torques apply

Certifications
UL pending

Material
Body: nickel-plated brass
EMC brush: Brass

Temperature range
dynamic: -20 °C to +100 °C
Depending on the combination of the cable gland used

Article number	Article designation / size	Minimum Ø above braiding (mm)	SW mm	Thread length, D (mm)	Pieces / PU
SKINTOP® BRUSH ADD-ON					
54110839	M 12 x 1,5	4	24	10	25
54110840	M 16 x 1,5	5	24	10	25
54110841	M 20 x 1,5	5	24	10	10
54110842	M 25 x 1,5	5	30	10	10
54110843	M 32 x 1,5	8	39	12	10
54110844	M 40 x 1,5	10	47	12	5
54110845	M 50 x 1,5	14	56	12	5
54110846	M 63 x 1,5	14	63	12	5

Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- SKINTOP® BS-M refer to main catalogue
- SKINTOP® ST-M refer to page 60
- SKINTOP® STR-M refer to page 60
- SKINTOP® ST-M Small PU refer to main catalogue
- SKINTOP® COLD NPT refer to page 73
- SKINTOP® ST-HF-M refer to main catalogue
- SKINTOP® COLD refer to page 72
- SKINTOP® COLD-R refer to page 72

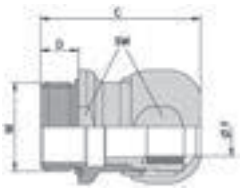
CE ECOLAB

NEW

SKINTOP® INOX / SKINTOP® INOX-R

- Stainless steel version with compact design
- For use in the splash zone in food production



Benefits

- Corrosion-resistant
- Sea water-resistant
- Smooth surfaces - no edges
- Compact design
- Wide, variable clamping ranges

Application range

- Food industry (product-free zone, splash zone)
- Bottling plants and breweries
- Weighing and dosing systems
- Fish/shrimp farms

Norm references / approvals

- **ECOLAB®**
  Industry standard in the field of professional cleaning and disinfection in the food and beverage industry
- **DIN EN 1672-2**
  Food machines General principles for design
- **DIN EN ISO 14159**
  Security of machinery hygienic requirements for the design of machinery

Design

- Metric connection thread according to DIN EN 60423
- Basis for technical information DIN IEC 62444

Technical data

Classification
ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description: Cable gland

Material
Body: Stainless steel V4A (1.4044 / 316L)
Insert: Polyamide
Sealing ring: Silicone
O-ring: Silicone

Protection rating
IP 68 - 10 bar (M12 - M20)
IP 68 - 5 bar (M25 - M32)
IP 69

Temperature range
-40 °C to +100 °C

Article number	Article designation / size	Clamping range ØF (mm)	Thread length, D (mm)	SW mm	Total length C (mm)	Pieces / PU
SKINTOP® INOX						
53806739	M 12 x 1,5	4-7	6.5	16	29.3	5
53806740	M 16 x 1,5	6-10	7	20	32.4	5
53806741	M 20 x 1,5	7-13	8	24	35.8	5
53806742	M 25 x 1,5	9-17	8	29	37.8	5
53806743	M 32 x 1,5	11-21	9	36	43.3	5
53806744	M 40 x 1,5	19-28	9	45	51.2	5
53806745	M 50 x 1,5	27-35	10	54	56.2	5
SKINTOP® INOX-R						
53806749	M 12 x 1,5	3-5	6.5	16	29.3	5
53806750	M 16 x 1,5	5-7	7	20	32.4	5
53806751	M 20 x 1,5	5-10	8	24	35.8	5
53806752	M 25 x 1,5	7-13	8	29	37.8	5
53806753	M 32 x 1,5	7-15	9	36	43.3	5
53806754	M 40 x 1,5	15-23	9	45	51.2	5
53806755	M 50 x 1,5	22-29	10	54	56.2	5

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- SKINDICHT® CN-M refer to page 71
- SKINTOP® HYGIENIC refer to main catalogue

Accessories

- Suitable counter nut SKINDICHT® SM CrNi M

NEW

SKINTOP® INOX SC / SKINTOP® INOX-R SC

- Stainless steel version with compact design
- Optimum EMC protection

Benefits

- Smooth surfaces - no edges
- Compact design
- Wide, variable clamping ranges
- Low-resistance screen contact, optimum EMC protection
- Highly conductive, flexible EMC contact spring for easy installation of various screen diameters

Application range

- For EMC-compliant earthing of the copper braided shield, or for cables with copper corrugated sheath
- Food industry (product-free zone, splash zone)
- Bottling plants and breweries
- Fish/shrimp farms

Norm references / approvals

- **DIN EN ISO 14159**
  Security of machinery hygienic requirements for the design of machinery
- **DIN EN 1672-2**
  Food machines General principles for design
- **ECOLAB®**
  Industry standard in the field of professional cleaning and disinfection in the food and beverage industry

Design

- Metric connection thread according to DIN EN 60423
- Basis for technical information DIN IEC 62444

Note

- The grounding compensation counter nut SKINDICHT® SM should be used to ensure optimum contact with painted, anodised or powder-coated housings
- For suitable additional parts, refer to SKINTOP® metric accessories
- Size M 40 x 1.5 and M 50 x 1.5 available on request

Technical data

Classification
ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description:
Cable gland

Caution
Refer to the package insert for the installation dimensions and tightening torques

Material
Body: Stainless steel V4A (1.4044 / 316L)
Insert: Polyamide
Sealing ring: Silicone
O-ring: Silicone

Protection rating
IP 68 - 10 bar (M12 - M20)
IP 68 - 5 bar (M25 - M32)
IP 69

Temperature range
-40°C to +100°C

Article number	Article designation / size	Clamping range ØF (mm)	Thread length, D (mm)	SW mm	Total length C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® INOX SC							
53806720	M 12 x 1,5	4-7	6.5	16	29.3	6.5	5
53806722	M 16 x 1,5	6-10	7	20	32.4	7	5
53806724	M 20 x 1,5	7-12,5	8	24	35.5	8	5
53806726	M 25 x 1,5	9-17	8	29	30.8	8	5
53806728	M 32 x 1,5	11-21	9	36	44.6	9	5

Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- SKINDICHT® CN-M refer to page 71
- SKINTOP® HYGIENIC

Accessories

- Suitable counter nut SKINDICHT® SM CrNi M

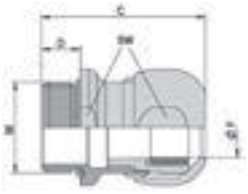
CE ECOLAB

NEW

SKINTOP® INOX NPT

- Stainless steel version with compact design
- For use in the splash zone in food production



Benefits

- Corrosion-resistant
- Sea water-resistant
- Smooth surfaces - no edges
- Compact design
- Wide, variable clamping ranges

Application range

- Food industry (product-free zone, splash zone)
- Bottling plants and breweries
- Fish/shrimp farms

Norm references / approvals

- **ECOLAB®**
  Industry standard in the field of professional cleaning and disinfection in the food and beverage industry
- **DIN EN 1672-2**
  Food machines General principles for design
- **DIN EN ISO 14159**
  Security of machinery hygienic requirements for the design of machinery

Design

- NPT connection thread according to ASME B1.20.1 - 2013
- Conical NPT thread

Note

- Refer to SKINTOP® metric accessories for suitable accessories. Note that SKINDICHT® SM-M counter nut is not suitable
- 1/2" = M20, 3/4" = M25
- 1" = M32, 1 1/4" = M40
- 1 1/2" = M50, 2" = M63

Technical data

Classification
ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description: Cable gland

Material
Body: Stainless steel V4A (1.4044 / 316L)
Insert: Polyamide
Sealing ring: Silicone
O-ring: Silicone

Protection rating
IP 68 - 10 bar (M12 - M20)
IP 68 - 5 bar (M25 - M32)
IP 69

Temperature range
-40°C to +100°C

Article number	Article designation / size	Clamping range ØF (mm)	Thread length, D (mm)	SW mm	Total length C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® INOX NPT							
53806780	1/2"	7-13	15	24	42.5	15	5
53806781	3/4"	9-17	15	29	46.2	15	5
53806782	1"	11-21	15	36	50.6	15	5
53806783	1 1/4"	19-28	17	45	59.2	17	5
53806784	1 1/2"	27-35	17	54	63.2	17	5

Photographs are not to scale and do not represent detailed images of the respective products.

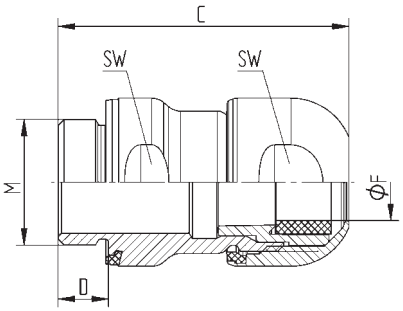
Similar products

- SKINDICHT® CN-M refer to page 71
- SKINTOP® HYGIENIC

Accessories

- Suitable counter nut SKINDICHT® SM CrNi M

SKINTOP® HYGIENIC / SKINTOP® HYGIENIC-R



- Ideal for hygienic critical areas - resistant, edge-free, robust and reliable
- No gaps, cavities or outer lying thread - so no risk of contamination of food machines, facilities or components.

Benefits

- Hygienic design for optimum cleaning results
- Smooth surfaces and no edges prevent the accumulation of fluids and the formation of micro-organisms

Application range

- Food machinery, equipment and components
- For use in product zone
- Dairy and cheese technology
- Mills for grains and cereals

Norm references / approvals

- **EHEDG (TYPE EL Class I AUX)**
  Hygienic design for machinery, apparatus and components
- **ECOLAB®**
  Industry standard in the field of professional cleaning and disinfection in the food and beverage industry
- **FDA 21 CFR 177.2600**
  Special sealing element for the food and beverage industry in North America
- **DIN EN 1672-2**
  Food machines General principles for design
- **DIN EN ISO 14159**
  Security of machinery hygienic requirements for the design of machinery

Design

- Material and shape mean it is easy and safe to clean
- The blue colouring makes the sealing material clearly distinguishable from foodstuffs
- A complete assembly is easily mounted from the outside
- Metric connection thread according to DIN EN 60423
- Basis for technical information DIN IEC 62444

Note

- UL pending
- Installation wrench for very high packing density on request
- ATEX version on request

Technical data

Classification
ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description:
Cable gland

Material
Body: Stainless steel V4A (1.4404 / 316L)
Insert: Polyamide
Sealing material: Special elastomer

Protection rating
IP 68 - 10 bar
IP 69

Temperature range
-20°C to +100°C

Article number	Article designation / size	Clamping range ØF (mm)	Thread length, D (mm)	SW mm	Total length C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® HYGIENIC							
53105100	M 12 x 1,5	4-6	6.5	16	38,4	6.5	5
53105110	M 16 x 1,5	6,5-9	7	20	43.4	7	5
53105120	M 20 x 1,5	9-12	8	24	46.4	8	5
53105130	M 25 x 1,5	11,5-15,5	8	29	48.9	8	5
SKINTOP® HYGIENIC-R							
53105200	M 12 x 1,5	3-4,5	6.5	16	38,4	6.5	5
53105210	M 16 x 1,5	4,5-7	7	20	43.4	7	5
53105220	M 20 x 1,5	7-10	8	24	46.4	8	5
53105230	M 25 x 1,5	9-12,5	8	29	48.9	8	5

Other sizes are available upon request
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

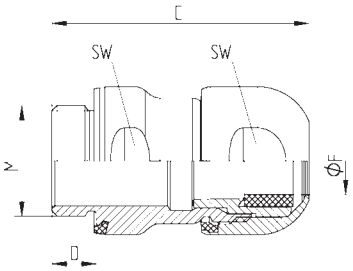
- SKINTOP® INOX / SKINTOP® INOX-R refer to page 65
- SKINTOP® INOX SC / SKINTOP® INOX-R SC refer to page 66
- SKINTOP® INOX NPT refer to page 67

Accessories

- Suitable counter nut SKINDICHT® SM CrNi M

SKINTOP® HYGIENIC SC

- Ideal for hygienic critical areas - resistant, edge-free, robust and reliable
- No gaps, cavities or outer lying thread - so no risk of contamination of food machines, facilities or components.



Benefits

- Low-resistance screen contact, optimum EMC protection
- Highly conductive, flexible EMC contact spring for easy installation of various screen diameters
- Hygienic design for optimum cleaning results
- Smooth surfaces and no edges prevent the accumulation of fluids and the formation of micro-organisms

Application range

- For EMC-compliant earthing of the copper braided shield, or for cables with copper corrugated sheath
- Food machinery, systems and components
- For use in the product zone

Norm references / approvals

- **EHEDG (TYPE EL Class I AUX)**
  Hygienic design for machinery, apparatus and components
- **ECOLAB®**
  Industry standard in the field of professional cleaning and disinfection in the food and beverage industry
- **FDA 21 CFR 177.2600**
  Special sealing element for the food and beverage industry in North America
- **DIN EN 1672-2**
  Food machines General principles for design
- **DIN EN ISO 14159**
  Security of machinery hygienic requirements for the design of machinery

Design

- Material and shape mean it is easy and safe to clean
- The blue colouring makes the sealing material clearly distinguishable from foodstuffs
- A complete assembly is easily mounted from the outside
- Metric connection thread according to DIN EN 60423
- Basis for technical information DIN IEC 62444

Note

- UL pending
- Installation wrench for very high packing density on request

Technical data

Classification
ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description: Cable gland

Material
Body: Stainless steel V4A (1.4404 / 316L)
Insert: Polyamide
Sealing material: Special elastomer

Protection rating
IP 68 - 10 bar
IP 69

Temperature range
-20°C to +100°C

Article number	Article designation / size	Clamping range ØF (mm)	SW mm	Total length C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® HYGIENIC SC						
53105300	M 12 x 1,5	4-6	16	39.9	6.5	5
53105301	M 16 x 1,5	6,5-9	20	43.4	7	5
53105302	M 20 x 1,5	9-12	24	46.4	8	5
53105303	M 25 x 1,5	11,5-15,5	29	48.9	8	5

Other sizes are available upon request
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products

- SKINTOP® INOX / SKINTOP® INOX-R refer to page 65
- SKINTOP® INOX SC / SKINTOP® INOX-R SC refer to page 66

Accessories

- Suitable counter nut SKINDICHT® SM CrNi M

When good isn't good enough

The most demanding ambient conditions, the highest hygiene standards, permanent resistance – there are very special requirements for a cable gland in the food industry like the SKINTOP® HYGIENIC. They are particularly stringent.

It is specially designed for food and beverage production and it can optionally also be used in the pharmaceutical industry – two areas in which hygiene is at the top of the agenda and good is nowhere near good enough. But how do you make a cable gland for electrical and electronic connections suitable for the highly hygiene-sensitive food industry?

The answer: it all starts with selecting the right material. In the case of the SKINTOP® HYGIENIC, class V4A stainless steel is used for the stainless steel body because it guarantees permanent corrosion protection and is able to withstand harsh conditions even in the long term. This, along with the use of sealing materials suitable for foodstuffs, makes the cable gland suitable for direct contact with food in production.

The accompanying sealing material is one of the Lapp Group's new developments: a special elastomer certified by ECOLAB®.

How design guarantees hygiene

but it was not only the material that was central in the development process, the design was too. With the SKINTOP® HYGIENIC, the aim was to design a product without any corners or edges. This is because a cable gland in this sensitive area has to minimise the amount of 'attacking surface' where impurities can accumulate. Therefore all seals are moulded to seal the gaps between components perfectly without creating any cavities.

All threads are also fully covered. Additionally there is no hexagon on the cable gland – instead, each one has two flat surfaces to which screws can be fixed. Corners, edges, cavities and grooves in which microbes might settle are prevented in this way. Additionally, both flats were rounded and the surface roughness was minimised because microorganisms can settle on rough surfaces and biofilms can form. "Hygienic Design" is the term for it – and it is possible thanks to a complex production process involving CNC milling machines in which great importance is placed on achieving precision, low tolerances and good surface quality.

Load tests passed with flying colours

The SKINTOP® HYGIENIC has earned its name then – as well as three special certificates: the cable gland has FDA approval, as well as others. That means that the materials used are permitted by the U.S. Food and Drug Association, being classed as harmless.

Additionally it has the so-called ECOLAB® certification which attests to the resistance of SKINTOP® HYGIENIC to cleaning agents. As well as this chemical test, it also passed a mechanical load test for sealing ability and strain relief and was also tested for material ageing.

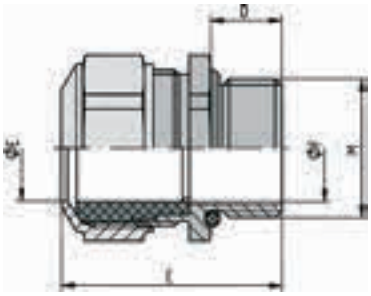
The SKINTOP® HYGIENIC was ultimately also successful in what might be the toughest test of all: the so-called EHEDG certification by the Weihenstephan Institute in Freising, Germany. In the autumn of 2014, it became the first ever product to be subjected to the new, more stringent testing procedures. Previously the certificate was awarded solely based on theoretical testing where CAD drawings were examined and material lists were monitored – the new, more demanding testing simulates extreme conditions in practice.

The test specimen is immersed in a closed piping system under pressure using a test medium. A nutrient solution loaded with bacteria is introduced and, as experts say, incubated. At the end, the components are cleaned and tested for contamination. To pass the testing, they must demonstrate that they are free of residue and that no liquid has permeated. Additionally, after the cleaning process there must be no evidence of germ or bacteria formation.

The Lapp cable gland also passed this resilience test with flying colours and can quite rightly be called hygienic – and it can live up to its name while being used anywhere in the food and pharmaceutical industries.

CE ECOLAB

SKINDICHT® CN-M


Benefits

- For high temperatures
- Resistant to oils, solvents, acids and chemicals
- Seawater-resistant
- For high mechanical stress
- High corrosion resistance

Application range

- Chromium nickel steel cable gland with VITON® seal, specially designed for use under tough conditions
- Oil presses
- Coaters and roasters
- Heaters and stoves

Design

- Metric connection thread according to DIN EN 60423
- Basis for technical information DIN IEC 62444

Note

- Suitable counter nut SKINDICHT® SM CrNi M

Technical data

Classification
ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description: Cable gland

Caution
Installation dimensions see appendix T21

Material
Body: chrome-nickel steel in accordance with DIN, material no. 1.4305
Inner seal: FPM
O-ring: FPM

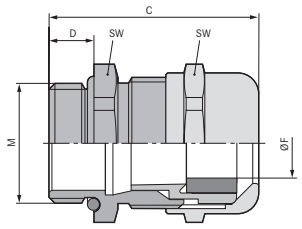
Protection rating
IP 68 - 5 bar
IP 69

Temperature range
-40°C to +200°C

Article number	Article designation / size	Clamping range ØF (mm)	SW mm	Total length C (mm)	Thread length, D (mm)	Pieces / PU
SKINDICHT® CN-M						
52032580	M 12 x 1,5/1	3,5 - 5	17	27.0	10	5
52032590	M 12 x 1,5/2	5 - 6,5	17	27.0	10	5
52032600	M 12 x 1,5/3	6,5 - 8	17	27.0	10	5
52032610	M 16 x 1,5	8 - 10,5	18	30.0	10	5
52032620	M 20 x 1,5	11 - 15	24	31.0	10	5
52032630	M 25 x 1,5	16 - 20,5	30	36.0	11	5
52032640	M 32 x 1,5	21 - 25,5	36	41.0	13	5
52032650	M 40 x 1,5	28,5 - 33	46	44.0	13	1
52032660	M 50 x 1,5	37 - 42	55	48.0	14	1
52032670	M 63 x 1,5	46 - 52	70	51.0	14	1
SKINDICHT® SM CrNi M counter nut						
52032585	M 12 x 1,5	-	17	3.0	3	10
52032615	M 16 x 1,5	-	19	3.0	3	10
52032625	M 20 x 1,5	-	24	3.5	3.5	10
52032635	M 25 x 1,5	-	30	3.5	3.5	10
52032645	M 32 x 1,5	-	36	4.5	4.5	10
52032655	M 40 x 1,5	-	46	4.5	4.5	10
52032665	M 50 x 1,5	-	55	5.5	5.5	10
52032675	M 63 x 1,5	-	70	6.0	6	10

Photographs are not to scale and do not represent detailed images of the respective products.

SKINTOP® COLD / SKINTOP® COLD-R



- For extreme sub-zero temperatures

Benefits

SKINTOP® COLD / SKINTOP® COLD-R

- High resistance to cold
- Cold impact resistance
- High mechanical stability
- Optimum strain relief
- Wide, variable clamping ranges

Application range

SKINTOP® COLD

- In areas where mechanical stability and high cold-resistance are critical
- Air-conditioning technology
- Freezing plants, cold storage

SKINTOP® COLD-R

- With reducing seal insert, to seal cables with smaller outer diameters.

Design

- Metric connection thread according to DIN EN 60423
- Basis for technical information DIN IEC 62444

Note

- Counter nut to be used: SKINDICHT® SM-M
- Refer to SKINTOP® metric accessories for suitable accessories

Technical data

Classification
ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description: Cable gland

Caution
Refer to T21 for the installation dimensions and tightening torques

Material
Body: Nickel-plated brass
Insert: Special polyamide
Sealing ring: Silicone
O-ring: Silicone

Protection rating
SKINTOP® COLD
IP 68 - 10 bar (M12 - M20)
IP 68 - 5 bar (M25 - M63)
SKINTOP® COLD-R
IP 68 - 5 bar (M25 - M63)

Temperature range
-70°C to +100°C

Article number	Article designation / size	Clamping range ØF (mm)	SW mm	Total length C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® COLD						
53113500	M 12 x 1,5	3-7	16	26.5	6.5	100
53113510	M 16 x 1,5	4,5-10	20	32.0	7	100
53113520	M 20 x 1,5	7-13	24	35.5	8	50
53113530	M 25 x 1,5	9-17	29	37.5	8	25
53113540	M 32 x 1,5	11-21	36	42.2	9	25
53113550	M 40 x 1,5	19-28	45	49.5	9	10
53113560	M 50 x 1,5	27-35	54	52.0	10	5
53113570	M 63 x 1,5	34-45	67	61.3	15	5
SKINTOP® COLD-R						
53113600	M 12 x 1,5	1-5	16	26.5	6.5	100
53113610	M 16 x 1,5	2-7	20	32.0	7	100
53113620	M 20 x 1,5	5-10	24	35.5	8	50
53113630	M 25 x 1,5	6-13	29	37.5	8	25
53113640	M 32 x 1,5	7-15	36	42.2	9	25
53113650	M 40 x 1,5	15-23	45	49.5	9	10
53113660	M 50 x 1,5	22-29	54	52.0	10	5
53113670	M 63 x 1,5	28-39	67	61.3	15	5

Photographs are not to scale and do not represent detailed images of the respective products.

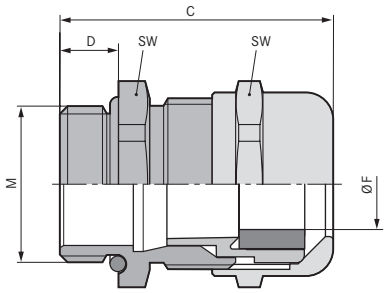
Accessories

SKINTOP® COLD

- SKINDICHT® SM-M refer to main catalogue

SKINTOP® COLD NPT

- For extreme sub-zero temperatures



Benefits

- High resistance to cold
- Cold impact resistance
- High mechanical stability
- Optimum strain relief
- Wide, variable clamping ranges

Application range

- In areas where mechanical stability and high cold resistance are critical.
- Air-conditioning technology
- Refrigerated goods plants, cold storage

Design

- Metric connection thread according to DIN EN 60423
- Basis for technical information DIN IEC 62444

Note

- UL pending
- Counter nut to be used: SKINDICHT® SM-M
- Refer to SKINTOP® metric accessories for suitable accessories

Technical data

Classification
ETIM 5.0 Class-ID: EC000441
ETIM 5.0 Class-Description: Cable gland

Material
Body: Nickel-plated brass
Insert: Special polyamide
Sealing ring: Silicone
O-ring: Silicone

Protection rating
IP 68 - 10 bar (M12 - M20)
IP 68 - 5 bar (M25 - M63)

Temperature range
-70°C to +100°C

Article number	Article designation / size	Clamping range ØF (mm)	SW mm	Total length C (mm)	Thread length, D (mm)	Pieces / PU
SKINTOP® COLD NPT						
53113700	1/4”	3,5 - 7	16	36.0	15	100
53113701	3/8”	4,5 - 10	20	39.7	15	100
53113702	1/2”	7 - 13	24	42.5	15	50
53113703	3/4”	9 - 17	29	44.5	15	25
53113704	1”	11 - 21	36	49.0	15	25
53113705	1 1/4”	19 - 28	45	57.5	15	10
53113706	1 1/2”	27 - 35	54	61.5	17	5
53113707	2”	34 - 45	67	63.5	17	5
SKINTOP® COLD-R NPT						
53113710	1/4”	1 - 5	16	36.0	15	100
53113711	3/8”	2 - 7	20	39.7	15	100
53113712	1/2”	5 - 10	24	42.5	15	50
53113713	3/4”	6 - 13	29	44.5	15	25
53113714	1”	7 - 15	36	49.0	15	25
53113715	1 1/4”	15 - 23	45	57.5	15	10
53113716	1 1/2”	22 - 29	54	61.5	17	5
53113717	2”	28 - 39	67	63.5	17	5

Photographs are not to scale and do not represent detailed images of the respective products.

NEW

SILVYN® FG

- Specifically for the food and beverage industry

Benefits

- FDA-approved outer sheath
- Smooth, white surface makes it easy to clean
- Protects against liquids
- Highly tensile
- Very hard-wearing

Application range

- Food and beverage industry, especially for production and processing of milk and meat products
- Food packaging machinery
- Pharmaceutical industry
- Mechanical engineering
- Plant construction

Product features

- Flexible
- Pressure-resistant
- Impact-resistant
- Highly tensile

Norm references / approvals

- Certified according to FDA CFR 21 and NSF 51 (standard for the USA)

Design

- Helically wound heavy metal protective conduit with interlocked profile
- Special, FDA-approved plastic sheathing

Suitable tools

- SILVYN® vice refer to main catalogue

Technical data

Classification
ETIM 5.0 Class-ID: EC001179
ETIM 5.0 Class-Description:
Metal protective conduit

Colour delivered
White

Material
Electrogalvanised, helically wound strip steel inner conduit with special plastic sheath

Temperature range
-20°C to +60°C
short-term: +80 °C

Article number	Nominal size	ID x OD mm	Bending radius (mm)	PU ring (m)
SILVYN FG				
55503279	3/8”	12.6 x 17.8	60	30
55503280	1/2”	16.0 x 21.1	75	30
55503281	3/4”	21.0 x 26.4	90	30
55503282	1”	26.5 x 33.1	120	30
55503283	1 1/4”	35.1 x 41.8	135	15
55503284	1 1/2”	40.3 x 47.8	165	15
55503285	2”	51.6 x 59.9	210	15

* Trade product, not Lapp product
Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- Detectable Cable ties refer to page 82
- SILVYN® HYGIENIC refer to page 76
- SILVYN® LTP-E refer to main catalogue

ECOLAB

NEW

SILVYN® FG NM

- All-plastic conduit
- Specifically for the food and beverage industry

Benefits
- FDA-approved outer sheath
- Smooth, blue surface makes it easy to clean
- Protects against liquids

Application range
- Food and beverage industry, especially for production and processing equipment of milk and meat products
- Packaging machines
- Dairy and cheese technology
- Mechanical engineering
- Plant engineering

Product features
- Flexible
- Dimensionally stable
- Flame-retardant

Norm references / approvals
- Certified according to FDA CFR 21 and NSF 51 (standard for the USA)
- **ECOLAB®**
  Industry standard in the field of professional cleaning and disinfection in the food and beverage industry

Design
- Hard PVC inner spiral
- Special, FDA-approved plastic sheathing

Technical data

Classification
ETIM 5.0 Class-ID: EC001177
ETIM 5.0 Class-Description:
Plastic protective conduit

Certifications
FDA CFR 21
NSF 51

Colour delivered
Blue

Material
Special soft PVC sheath with hard PVC spiral

Temperature range
-20°C to +60°C
short-term: +80 °C

Article number	Nominal size	ID x OD mm	Bending radius (mm)	PU ring (m)
SILVYN® FG NM blue				
55503370	3/8”	12.6 x 17.8	70	30
55503371	1/2”	16.0 x 21.1	100	30
55503372	3/4”	21.0 x 26.4	130	30
55503373	1”	26.5 x 33.1	180	30
55503374	1 1/4”	35.1 x 41.8	225	15
55503375	1 1/2”	40.3 x 47.8	255	15
55503376	2”	51.6 x 59.9	310	15

* Trade product, not Lapp product
Photographs are not to scale and do not represent detailed images of the respective products.

Similar products
- SILVYN® FG refer to page 74

Accessories
- SILVYN® HYGIENIC refer to page 76

NEW

SILVYN® HYGIENIC

- Ideal for hygienic critical areas - resistant, edge-free, robust and reliable
- No gaps, cavities or outer lying thread - so no risk of contamination of food machines, facilities or components.

Benefits

- Hygienic design for optimum cleaning results
- Smooth surfaces and no edges prevent the accumulation of fluids and the formation of micro-organisms

Application range

- Food machinery, equipment and components
- For use in product zone
- Packaging machines
- Dairy and cheese technology

Product features

- High chemical and thermal resistance with very aggressive media such as detergents and disinfectants, acids and alkalis during cleaning processes etc.

Norm references / approvals

- **DIN EN 1672-2**
  Food machines General principles for design
- **DIN EN ISO 14159**
  Security of machinery hygienic requirements for the design of machinery

Design

- Material and shape mean it is easy and safe to clean
- The blue colouring makes the sealing material clearly distinguishable from foodstuffs
- Rounded flats for mounting with standard tools

Note

- Please note: for size M63x1.5 there is a different construction and design under the designation **SILVYN® AMG FG**

Suitable conduits

- SILVYN® FG NM Page 75

Technical data

Classification
ETIM 5.0 Class-ID: EC001180
ETIM 5.0 Class-Description:
Metal protective conduit gland

Norm references / approvals
IEC EN 61386-23

Material
Body: AISI 316 stainless steel
Screw-in sleeve: Nickel-plated brass
Insert: Polyamide 6
Sealing material: Special elastomer

Protection rating
IP66
IP67
IP68 (2 bar)
IP69

Temperature range
-50°C to +135°C

Article number	Metric size	Clear width (mm)	Suitable for SILVYN® FG NM	Pieces / PU
SILVYN® HYGIENIC				
55510700	16 x 1.5	10.7	3/8”	1
55510701	20 x 1.5	14.5	1/2”	1
55510702	25 x 1.5	18.7	3/4”	1
55510703	32 x 1.5	24.6	1”	1
55510704	40 x 1.5	32.7	1 1/4”	1
55510705	50 x 1.5	37.7	1 1/2”	1

Photographs are not to scale and do not represent detailed images of the respective products.

FLEXIMARK® cable label PUR

- PUR 60-10 contained in FLEXIMARK® sample bag (article no. M3251010)

Benefits

- Good chemical resistance (eg against detergents)
- Resistant to oils and lubricants
- Resistant to hydrolysis and micro-organisms
- Highly flexible material
- Halogen-free and flame-retardant cable marking

Application range

- For cable and conduit marking
- For food & beverage applications in the product-free zone
- Packaging machines
- Deighing and dosing systems
- Can be mounted directly on the cable together with plastic cable ties

Norm references / approvals

- Extremely flame-retardant according to UL 94 V0
- MIL 81531 and MIL-STD-202G

Note

- Can be printed with the FLEXIMARK® Software and the FLEXIMARK® thermal transfer printer SQUIX or EOS4
- Recommended ribbon: FLEXIMARK® FTI-Y 60-360 BK (article no. 83260201)
- Customised printing is available on request

Design

- Delivered as a roll

Technical data

Classification
ETIM 5.0 Class-ID: EC001288
ETIM 5.0 Class-Description: Labelling material

Colour delivered
Standard colour: Yellow/White
Also available in red, orange, blue, green and black

Material
Halogen-free polyurethane

Temperature range
-25°C to +80°C

Article number	Article designation	Colour	Width x length (mm)	Number of markers per PU	PU
FLEXIMARK® cable label PUR					
83260191	FLEXIMARK® Cablelabel PUR 60-10 YE	yellow	10.0 x 60.0	1000	1
83260192	FLEXIMARK® Cablelabel PUR 75-15 YE	yellow	15.0 x 75.0	1000	1
83260193	FLEXIMARK® Cablelabel PUR 75-25 YE	yellow	25.0 x 75.0	500	1
83260194	FLEXIMARK® Cablelabel PUR 60-10 WH	white	10.0 x 60.0	1000	1
83260195	FLEXIMARK® Cablelabel PUR 75-15 WH	white	15.0 x 75.0	1000	1
83260196	FLEXIMARK® Cablelabel PUR 75-25 WH	white	25.0 x 75.0	500	1

Photographs are not to scale and do not represent detailed images of the respective products.
FLEXIMARK® products are sold in packaging units i.e. you order 1 PU each with different packaging content. For example, LCK 32 contains 640 labels on 64 sheets if you want 64 sheets/640 labels, you would have to order 1 PU and not 64 or 640 pieces.

Accessories

- Basic Tie cable tie refer to main catalogue
- FLEXIMARK® Software 10.0 refer to main catalogue
- FLEXIMARK® Thermoprint A4+M and EOS4* refer to main catalogue

FLEXIMARK® wrapping labels LCK


- LCK 32 YE included in FLEXIMARK® sample bag (article no. M3251010)

Benefits

- A transparent film is wrapped around the cable and pasted over the printed field so that the printing is protected against abrasion, pollution and solvents
- Resistant to chemicals, moistureand oil (basic detergents, salt water, ethanol,....)
- Easy to clean, since no dirt can settle due to the smooth surface and the optimization of dead spaces

Application range

- Marking of cables, conduits and tubes in hygienic critical areas

Note

- Can be printed with the FLEXIMARK® Software and a commercial laser printer
- Insert sheet into the manual feed compartment
- Optimum printing results from laser printers are achieved with straight sheet feed with no deflection over rollers and low heat build-up

Included in delivery

- 10 or 100 perforated DINA 4 label sheets (dependent on the chosen packaging size)

Technical data

Classification
ETIM 5.0 Class-ID: EC001288
ETIM 5.0 Class-Description: Labelling material

Adhesive
Acrylic-based permanent adhesive

Colour delivered
White or yellow

Material
Halogen-free polyester
Thickness: 0.025 mm

Temperature range
-40 °C to +125 °C
Minimum working temperature: +10 °C

Article number	Article designation	Colour	Width x length (mm)	Labelling surface (mm)	For outer Ø (mm)	Number of markers per PU	Labels per side	PU
FLEXIMARK® wrapping labels LCK								
83256143	FLEXIMARK® Label LCK 32 WH	white	25.0 x 33.5	25 x 12	4 - 7	640	64	1
83256142	FLEXIMARK® Label LCK 32 YE	yellow	25.0 x 33.5	25 x 12	4 - 7	640	64	1
83256145	FLEXIMARK® Label LCK 35 WH	white	25.0 x 55.0	25 x 19	6 - 12	400	40	1
83256144	FLEXIMARK® Label LCK 35 YE	yellow	25.0 x 55.0	25 x 19	6 - 12	400	40	1
83256147	FLEXIMARK® Label LCK 40 WH	white	25.0 x 94.0	25 x 25	8 - 21	240	24	1
83256146	FLEXIMARK® Label LCK 40 YE	yellow	25.0 x 94.0	25 x 25	8 - 21	240	24	1
83256149	FLEXIMARK® Label LCK 45 WH	white	25.0 x 142.5	25 x 25	8 - 36	160	16	1
83256148	FLEXIMARK® Label LCK 45 YE	yellow	25.5 x 142.5	25 x 25	8 - 36	160	16	1
83256160	FLEXIMARK® Label LCK 48 WH	white	34.0 x 93.0	34 x 25	8 - 21	180	18	1
83256161	FLEXIMARK® Label LCK 48 YE	yellow	34.0 x 93.0	34 x 25	8 - 21	180	18	1
83256151	FLEXIMARK® Label LCK 60 WH	white	50.0 x 56.0	50 x 19	6 - 12	200	20	1
83256150	FLEXIMARK® Label LCK 60 YE	yellow	50.0 x 56.0	50 x 19	6 - 12	200	20	1
83256153	FLEXIMARK® Label LCK 65 WH	white	50.0 x 94.0	50 x 25	8 - 21	120	12	1
83256152	FLEXIMARK® Label LCK 65 YE	yellow	50.0 x 94.0	50 x 25	8 - 21	120	12	1
83256155	FLEXIMARK® Label LCK 70 WH	white	50.0 x 142.5	50 x 25	8 - 36	80	8	1
83256154	FLEXIMARK® Label LCK 70 YE	yellow	50.0 x 142.5	50 x 25	8 - 36	80	8	1
83256542	FLEXIMARK® Label LCK 32 YE-100	yellow	25.0 x 33.5	25 x 12	4 - 7	6400	64	1
83256545	FLEXIMARK® Label LCK 35 WH-100	white	25.0 x 55.0	25 x 19	6 - 12	4000	40	1
83256544	FLEXIMARK® Label LCK 35 YE-100	yellow	25.0 x 55.0	25 x 19	6 - 12	4000	40	1
83256546	FLEXIMARK® Label LCK 40 YE-100	yellow	25.0 x 94.0	25 x 25	8 - 21	2400	24	1
83256549	FLEXIMARK® Label LCK 45 WH-100	white	25.0 x 142.5	25 x 25	8 - 36	1600	16	1
83256548	FLEXIMARK® Label LCK 45 YE-100	yellow	25.0 x 142.5	25 x 25	8 - 36	1600	16	1
83256551	FLEXIMARK® Label LCK 60 WH-100	white	50.0 x 56.0	50 x 19	6 - 12	2000	20	1
83256550	FLEXIMARK® Label LCK 60 YE-100	yellow	50.0 x 56.0	50 x 19	6 - 12	2000	20	1
83256553	FLEXIMARK® Label LCK 65 WH-100	white	50.0 x 94.0	50 x 25	8 - 21	1200	12	1
83256555	FLEXIMARK® Label LCK 70 WH-100	white	50.0 x 142.5	50 x 25	8 - 36	800	8	1

Photographs are not to scale and do not represent detailed images of the respective products.
FLEXIMARK® products are sold in packaging units i.e. you order 1 PU each with different packaging content. For example, LCK 32 contains 640 labels on 64 sheets if you want 64 sheets/640 labels, you would have to order 1 PU and not 64 or 640 pieces.

Similar products

- FLEXIMARK® Wrapping labels TCK refer to main catalogue

Accessories

- Basic Tie cable tie refer to main catalogue
- FLEXIMARK® Software 10.0 refer to main catalogue

FLEXIMARK® stainless steel FCC marking

Customised stainless steel cable and component marking

- Contained in FLEXIMARK® sample bag (article no. M32511)

Benefits

- Acid-resistant
- Excellent chemical resistance (eg against detergents)
- High-temperature resistant
- Extremely durable

Application range

- Cable and component marking system for the splash zone
- Dairy and cheese technology
- Oil presses
- Coaters and roasters

Norm references / approvals

- Achilles JQS certified

Note

- Markers are already delivered with the desired text (printing service is included in the price)
- Ordering process: Customer-specific data will be emailed as an Excel file to the responsible Lapp employee when the order is made Column A: Row 1 content- Column B: Row 2 content- Column B or C: Number of markers with corresponding text
- Length of the markers depends on the number of characters
- All characters are printed in capital letters
- The column “number of characters” refers to the quantity in one line, i.e. for the two-line version a maximum of 30 characters is possible (max. 15 characters per line)

Included in delivery

- 1 PU contains 1 marker, there is no minimum quantity
- Markers are sorted prior to delivery
- Cable ties included in 83251406, 83251456, 83251426, 83251468: Steel cable ties LS 4.6-200 (article no. 61812950)

Suitable toolsSuitable tools

- STEEL GUN HT-338 cable tie pliers refer to page 81

Technical data

Classification
ETIM 5.0 Class-ID: EC001288
ETIM 5.0 Class-Description: Labelling material

Dimensions
Character height: 4.2 mm
Gap between 2 characters: approx. 1 mm
Borehole diameter: 3.2 mm
Cable tie width: max. 7.9 mm

Note
Blanko version article no. 83251575 and 83251576

Info
Available characters:
A-Ü 0-9 ~ + - / . : , = Earth sign

Material
Acid-resistant stainless steel
EN 1.4404 (SS2348, AISI 316L)

Temperature range
-80°C to +500°C

Article number	Article designation	Height (mm)	Design	Number of characters	Number of markers per PU
One line embossing / with cable tie brackets					
83251406	FLEXIMARK® stainless steel SMC FCC LS200 0-15	9.9	with cable tie	0-15	1
83251456	FLEXIMARK® stainless steel SMC FCC LS 16-25	9.9	with cable tie	16-25	1
83251402	FLEXIMARK® stainless steel SMC FCC 0-15	9.9	without cable tie	0-15	1
83251454	FLEXIMARK® stainless steel SMC FCC 16-25	9.9	without cable tie	16-25	1
One line embossing / with srew hole					
83251450	FLEXIMARK® stainless steel SM FCC 0-15	9.9	with screw hole	0-15	1
83251478	FLEXIMARK® stainless steel SM FCC 16-25	9.9	with screw hole	16-25	1
Two-line embossing / with cable tie brackets					
83251426	FLEXIMARK® stainless steel SMC2R FCC LS 0-15	13.9	with cable tie	0-15	1
83251468	FLEXIMARK® stainless steel SMC2R FCC LS 16-25	13.9	with cable tie	16-25	1
83251422	FLEXIMARK® stainless steel SMC2R FCC 0-15	13.9	without cable tie	0-15	1
83251466	FLEXIMARK® stainless steel SMC2R FCC 16-25	13.9	without cable tie	16-25	1
Two-line embossing / with srew hole					
83251451	FLEXIMARK® stainless steel SM2R FCC 0-15	13.9	with screw hole	0-15	1
83251479	FLEXIMARK® stainless steel SM2R FCC 16-25	13.9	with screw hole	16-25	1

Photographs are not to scale and do not represent detailed images of the respective products.
Blank markers can be found on the product page “SP Metalprint” (article no. 83251575 and 83251576).

Similar products

- FLEXIMARK® Stainless steel kit refer to main catalogue
- SP Metal print refer to main catalogue

Accessories

- STEEL GUN HT-338 cable tie pliers refer to page 81
- LS steel cable ties refer to page 80

LS steel cable ties

- LS 4.6-100 included in FLEXIMARK® sample bag (article no. M3251010)

Benefits

- Acid-resistant
- Excellent chemical resistance (eg against detergents)
- High-temperature resistant
- Secure ball lock, self-locking
- Minimum space required due to the flat binder heads

Application range

- For fixing FLEXIMARK® stainless steel marking
- Cable and component marking system for the splash zone
- Dairy and cheese technology
- Oil presses
- Coaters and roasters

Norm references / approvals

- DNV 2397
- UL file number: E193947
- Meets the requirements of IEC 62275:2006
- Achilles JQS certified

Suitable tools

- STEEL GUN HT-338 cable tie pliers refer to page 81

Technical data

Classification
ETIM 5.0 Class-ID: EC000046
ETIM 5.0 Class-Description: Cable ties

On request
Other sizes are available upon request

Material
Acid-resistant stainless steel
EN 1.4404 (SS2348, AISI 316L)
Material thickness: 0.26 mm

Temperature range
-80°C to +500°C

Article number	Article description	Length x width (mm)	Bundling Ø (mm)	Minimum tensile strength (N/mm²)	Pieces / PU
Without polyester coating					
61812947	LS 4.6 - 100	100.0 x 4.6	21.0	45.3	100
61812948	LS 4.6 - 125	125.0 x 4.6	32.0	45.3	100
61812949	LS 4.6 - 150	150.0 x 4.6	40.0	45.3	100
61812950	LS 4.6 - 200	200.0 x 4.6	51.0	45.3	100
61812960	LS 4.6 - 360	360.0 x 4.6	102.0	45.3	100
61812970	LS 4.6 - 520	520.0 x 4.6	152.0	45.3	100
61812980	LS 4.6 - 680	680.0 x 4.6	203.0	45.3	100
61812990	LS 4.6 - 840	840.0 x 4.6	254.0	45.3	100
61813000	LS 7.9 - 200	200.0 x 7.9	51.0	113.3	100
61813010	LS 7.9 - 360	360.0 x 7.9	102.0	113.3	100
61813020	LS 7.9 - 520	520.0 x 7.9	152.0	113.3	100
61813030	LS 7.9 - 680	680.0 x 7.9	203.0	113.3	100
61813040	LS 7.9 - 840	840.0 x 7.9	254.0	113.3	100
61813050	LS 7.9 - 1010	1,016.0 x 7.9	305.0	113.3	100
With polyester coating					
61813085	LSC 4,6-100	100.0 x 4.6	21.0	45.3	100
61813086	LSC 4,6-125	125.0 x 4.6	32.0	45.3	100
61813088	LSC 4,6-200	200.0 x 4.6	51.0	45.3	100
61813089	LSC 4,6-360	360.0 x 4.6	102.0	45.3	100
61813093	LSC 7,9-200	200.0 x 7.9	51.0	113.3	100
61813094	LSC 7,9-360	360.0 x 7.9	102.0	113.3	100
61813096	LSC 7,9-520	520.0 x 4.6	152.0	113.3	100

Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- FLEXIMARK® Stainless steel marking FCC refer to page 79
- FLEXIMARK® Stainless steel kit refer to main catalogue
- STEEL GUN HT-338 cable tie pliers refer to page 81

STEEL GUN HT-338 cable tie pliers

Benefits

- Handy processing tool for stainless steel cable ties up to 0.3 mm thick
- Cable tie is automatically cut at its end once the required tension is achieved
- Sharp edges are avoided
- Stripping force can be adjusted in increments

Application range

- For stainless steel cable ties

Note

- Guaranteed up to 2,000 applications
- Use the adjusting screw to achieve an optimum cut - the correct tightness depends on the type of cable used
- Other spare parts are available on request

Technical data

Classification
ETIM 5.0 Class-ID: EC000453
ETIM 5.0 Class-Description: Processing tool for cable ties

Article number	Article description	For cable ties	Max. cable tie width (mm)	D x V mm	Weight (kg)	Pieces / PU
FLEXIMARK® STEEL-GUN HT 338 cable tie pliers						
83250022	FLEXIMARK® HT-338	Stainless steel	7.9	178 x 140	0.56	1
83250023	FLEXIMARK® spare part HT-338				0.018	1

Photographs are not to scale and do not represent detailed images of the respective products.

Accessories

- LS steel cable ties refer to page 80
- FLEXIMARK® Stainless steel marking FCC refer to page 79
- FLEXIMARK® Stainless steel kit refer to main catalogue

NEW

ECOLAB

Detectable cable ties

- Retrievable cable ties with a special polymer compound that activates metal detectors, X-ray equipment and visual detection systems

Benefits

- Minimise the risk of product contamination
- The colour blue facilitates visual detection
- Polypropylene version especially resistant against chemical detergents
- Helps your company implement the HACCP EU Directive

Application range

- Are recommended for applications using detection systems to detect foreign objects where cable tie installation residuals are not allowed in the finished product
- Food and beverage industry, especially for production and processing of milk and meat products
- Pharmaceutical production
- Buoyant Polypropylen version for liquid-processing aaplications

Norm references / approvals

- Flammability class: UL 94 V-2 / TY-RAP® polyamide 6.6
- Flammability class: UL 94 HB / TY-RAP® polypropylene and cable tie without steel nose
- Only the cable ties with steel nose are ECOLAB certified

Note

- Storage requirements: Nylon (polyamide) is, by its nature, susceptible to external influences. Cable ties are mechanically moistened in order to ensure optimal use. As such, they should be stored in a cool, dry location and should not be exposed to direct sunlight. Cable ties are packed in plastic bags to retain moisture. These should remain closed until use.

Suitable tools

- TY-GUN ERG 50 / TY-GUN ERG 120 cable tie pliers refer to main catalogue

Technical data

Classification
ETIM 5.0 Class-ID: EC000046
ETIM 5.0 Class-Description: Cable ties

Colour delivered
Blue

Material
Polyamide 6.6 or polypropylene
halogen-free and silicone-free

On request
Detectable cable tie mounts

Temperature range
Cable ties without steel nose:
-40°C to +65°C
Cable ties with steel nose:
-40°C to +85°C

Article number	Article description	UL certification	Length x width (mm)	Bundling Ø (mm)	Tensile strength (N)	Pieces / PU
Without steel nose / PA 6.6						
61723360	Cable tie Detect 100 x 2.5 BU	no	100.0 x 2.5	2.0 - 24.0	100	100
61723361	Cable tie Detect 200 x 4.5 BU	no	200.0 x 4.5	3.0 - 51.0	250	100
61723362	Cable tie Detect 380 x 4.5 BU	no	380.0 x 4.5	5.0 - 110.0	250	100
61723363	Cable tie Detect 360 x 7.5 BU	no	360.0 x 7.5	5.0 - 101.0	600	100
With steel nose (brand TY-RAP®) / PA 6.6						
61723351	Cable tie TY-RAP TY523M-NDT	no	92.0 x 2.4	2.0 - 6.0	80	100
61723359	Cable tie TY-RAP TY524M-NDT	no	140.0 x 3.6	2.0 - 29.0	180.0	100
61723352	Cable tie TY-RAP TY525M-NDT	no	186.0 x 4.8	3.5 - 45.0	220	100
61723353	Cable tie TY-RAP TY528M-NDT	no	360.0 x 4.8	3.5 - 102.0	220	100
61723354	Cable tie TY-RAP TY527M-NDT	no	340.0 x 7.0	6.0 - 90.0	540	50
With steel nose (brand TY-RAP®) / polypropylene						
61723355	Cable tie TY-RAP TY523M-PDT	no	92.0 x 2.4	2.0 - 16.0	50	100
61723356	Cable tie TY-RAP TY525M-PDT	no	186.0 x 4.8	3.5 - 45.0	130	100
61723357	Cable tie TY-RAP TY528M-PDT	no	360.0 x 4.8	3.5 - 102.0	130	100
61723358	Cable tie TY-RAP TY527M-PDT	no	340.0 x 7.0	6.0 - 90.0	270	50

TY-RAP® is a registered trademark of ABB.
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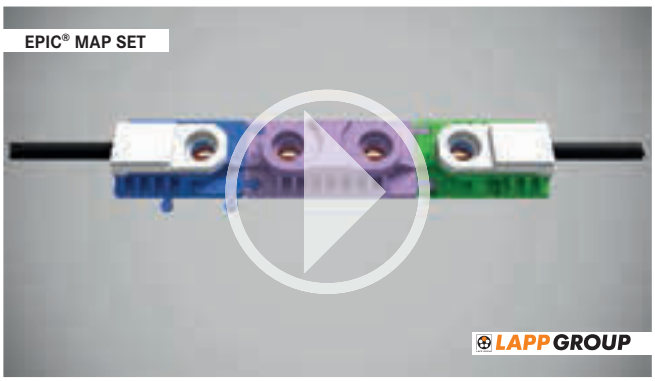

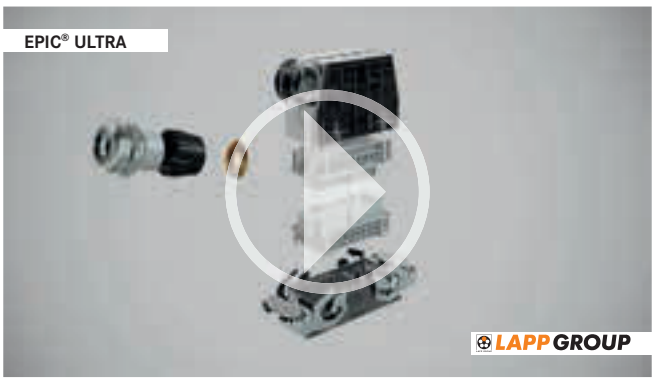

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