

solution

CUSTOMER MAGAZINE: SPECIAL SPS ISSUE 02 | 2022

Trade fair innovation: CABseal

The first split cable entry
in PFLITSCH quality

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Systems and solution provider
Cable entry
Cable protection
Safety
Ease of installation
Certification
All from under one roof
Standard and special solutions
Development partner
Scope of engineering

Vertical integration
Delivery performance
Made in Germany
Innovation leader
Social responsibility

Plant I



Trunking Competence Centre
Customised cable routing
Component assembly service

Quality product
Durability
Ease of installation
Delivery reliability
Development know-how
Dedicated points of contact
Sustainability
Precision
Made in Germany
Innovative force
Work-life balance

Plant II

Editorial

DEAR CUSTOMERS, BUSINESS PARTNERS AND FRIENDS,

Our current overall economic situation couldn't be any more "delicate". That said, every crisis offers opportunities for further development and innovation. It's precisely in such difficult times as these that people rise above themselves, courageously go down new paths and take on responsibility. Challenges forced on us from outside can help develop new potentials. And we're no exception: PFLITSCH continues to grow, and we are setting a new course for a successful future. This development affects the way we work together, how sustainable our actions are and the measures we take to make your everyday working life a little easier.

The aim is to share knowledge, to expand future markets such as electromobility and to further improve our delivery performance. In short, it's all about you! We say thank you for being such a big and important team player.

We'd also like to take this opportunity to invite you to discover the many key levers we've put in place such as CABseal, the split cable entry for pre-assembled cables that lives up to PFLITSCH standards and the LevelEx AC cable gland for maximum explosion protection – our innovations for the SPS trade fair.

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NEW:

Split cable entry
from PFLITSCH

Split cable entries for pre-assembled cables have long been the solution for dependable installation and guaranteed warranty coverage. Up to now, PFLITSCH has had no product for this market segment. So we asked ourselves: "We asked ourselves, how can we combine the tried and tested with our typical PFLITSCH quality to create a high-quality solution?" The answer: CABseal, which will shortly be unveiled at SPS 2022 in Nuremberg.

What the CABseal modular system consists of

The CABseal system consists of well thought-out components that are fully compatible with one another. There are four frames – suitable for all common control cabinet cut-outs – and a variety of cable grommets in two sizes for flexible positioning of these frames. All grommets fit all frames. They cover a cable diameter range from 3 mm to 33 mm, and our portfolio also includes blind grommets and blind plugs. And we haven't forgotten the environment, either: CABseal is RoHS-certified as well as halogen- and silicone-free. →

Trade fair innovation: CABseal

The problem is as old as industrial and plant engineering itself: how do you insert pre-assembled cables into control cabinets or enclosures – safely, in a time-saving manner, flexibly, protected against dust and water and with strain relief? Now there is a smart solution that lives up to PFLITSCH standards: CABseal, our split and modular cable entry, is a patented modular system with IP 66 protection.



CABseal

6 ideas that make CABseal unique

1. CABseal is modular:

Since all system components are compatible, they can be assembled very quickly without any risk of confusion. Storage is likewise much easier as a result.

2. CABseal is flexible:

We have highly dimensionally accurate split grommets for any cable diameter between 3 mm and 33 mm. Each elastomer grommet has a sealing range of up to 1.6 mm thanks to the flexible sealing lip geometry. Up to 40 cables are possible per frame if a CABseal F 24 frame is equipped with 10 quadruple grommets. Since the installation height is only 20 mm, the amount of space available at the assembly location is not generally an issue.

3. CABseal always provides maximum protection:

CABseal provides IP 66 and UL type 4X in any configuration, unlike systems with product and combination-dependent protection ratings. That saves time and effort, especially when it comes to documentation. The permissible temperature range extends from -40 °C to +100 °C with static installation. The UV resistance moreover means that CABseal can be used outdoors.

4. CABseal offers integrated strain relief:

Cables that are inserted need strain relief. This is already integrated into all CABseal grommets in the form of a small, moulded-on flap. Additional strain relief can be provided for highly stressed cables using cable ties – it couldn't be simpler.

5. CABseal is easy to use:

The modular system is always assembled in the same way and in just a few steps. No product or configuration-dependent "either or" but identically every time.

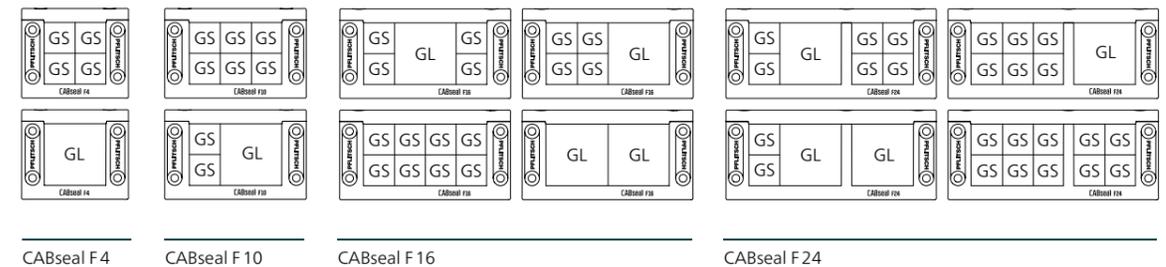
6. CABseal has no loose small parts:

CABseal frames have an integrated, moulded elastomer seal. There is no need for an additional flat gasket, which could be forgotten or squeezed during installation so that the protective effect would be impaired.

Four frames, dozens of grommets

Four CABseal frames made from robust polyamide are available for cut-outs up to 115 mm x 46 mm in size and with between 4 and 10 grommet fields, to match the most common standard cut-outs. The small GS grommets fit in one grommet field and can be supplied as single

grommets in increments from 3–4 mm to 15–16 mm, double grommets for 4–5 mm to 7–8 mm or quadruple grommets for 4–5 mm and 5–6 mm. Blind grommets and blind plugs are available as placeholders. The large GL grommets require four fields and are designed for cable diameters from 16–17 mm to 32–33 mm.



Simple assembly: an Allen key is all you need

Special tools? Not with CABseal! All you need for assembly is finesse and an Allen key. The wrench width is identical for all bolts, so that tedious bit changes are avoided. Of course, we've also given some thought to optional aids to make assembly even more ergonomic: our "third hand" holds the grommets in place while the frames are being equipped. That saves you valuable time. PFLITSCH expanding pliers are also very useful, especially with large cable diameters, because they enable split grommets to be held open with little effort.

Quality and delivery reliability? Typical PFLITSCH

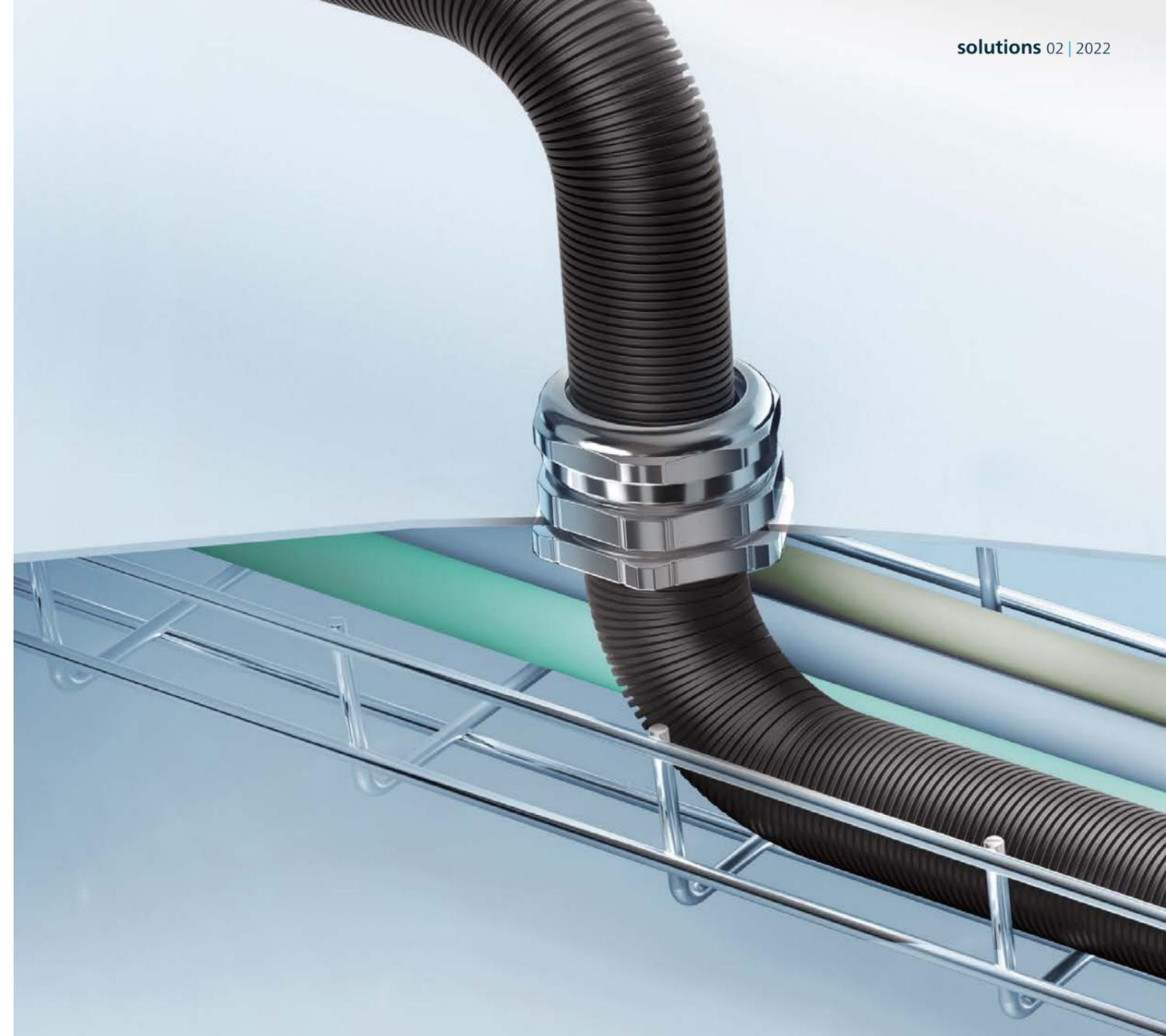
Quality engineering alone is not good enough for us at PFLITSCH. We always bear the overall package in mind, and that includes quality and delivery reliability. CABseal is manufactured at PFLITSCH in Hückeswagen and shipped from there all over the world. Excellent availability and short delivery times are guaranteed in this way, as with all PFLITSCH products.



CABseal. Seals the cabinet
The "CAB" in CABseal naturally stands for cabinet, as in control cabinet. "Seal" stands for the seals, which in this case are twofold – in the frame and in the grommets.

World first at InnoTrans

PFLITSCH presents safe and dependable corrugated conduit transit for train roofs and walls.



Representatives from the worlds of transport technology and mobility came together at this year's InnoTrans fair held between 20 and 23 September 2022 in Berlin. 2,834 exhibitors from 56 countries played host to around 140,000 visitors from more than 130 countries – some very impressive figures. With 250 world premieres, the exhibitors presented more innovations than ever before – including PFLITSCH, with its innovative, new corrugated conduit transit.

This compact and durable feed-through solution is the perfect product wherever power, data and hydraulic lines need to be safely and dependably routed through a rail vehicle, e.g. through a roof

or wall. The key benefits: corrugated conduits can be fed through in one piece and sealed without additional fittings, simplifying assembly, increasing installation reliability and saving time. Other undeniable advantages in the railway environment are the great tightness of seal and vibration resistance, guaranteed IP 68 protection rating and conformity to EN 45545-2 HL3 this solution offers.

No wonder, then, that the visitors to the fair and representatives of the trade press present in Berlin were so keen to see PFLITSCH's latest solutions.

Maximum safety at sea with PFLITSCH

VG 88846-4 – the very latest German standard for naval EMC cable glands. And the first product certified in line with it is – the PFLITSCH blueglobe TRI NM/Cr.

Today's naval surface vessels and submarines are highly digitalised data centres that are subjected to the exceptional stresses of what is an extremely harsh environment. The demands made on cable entries and transits are high: they must provide protection against salt water and vibration, as well as electromagnetic compatibility, all properties of key relevance to safety on board a ship. →





blueglobe TRI NM/Cr
with metric naval thread

And in the naval segment of the marine industry, civilian standards simply don't match up to requirements; the military sets its own, more stringent ones. In Germany, these standards are known as "Verteidigungsgerätenormen" (defence equipment standards), or VG standards, for short. The VG series has now been extended to include the design standard VG 88846-4 for watercraft. Since July 2022, EMC cable glands that comply with the new test standard must be used in all new projects for the German Navy.

The first – and currently the only – product that complies with this standard comes from PFLITSCH: blueglobe TRI NM/Cr with metric marine thread.

IP 68 instead of IP 56: more than the standard requires

EMC cable glands with a double cone that met the previous standard would have to be brought up to the standard of contemporary protection ratings by fitting them with sealing rings and heat shrink tubing. If errors occurred during assembly, the degree of protection provided would decrease. What's more, shrink tubing is susceptible to ageing.

The new standard therefore demands state-of-the-art, smart cable glands that fulfil at least IP

56 – without heat shrink tubing. The first solution to be certified in line with this new norm is the PFLITSCH blueglobe TRI NM/Cr made of chrome-plated brass and equipped with a metric naval thread. By default, it offers more than the standard requires: namely an ingress protection rating of IP 68 up to 15 bar, otherwise IP 69.

Built-in, flawless EMC shielding

The time-saving, error-preventing ease of assembly offered by the blueglobe TRI product family with spring contact is a massive advantage, as bonding is guaranteed to be 100% tight and no longer needs to be checked. Thanks to the non-magnetic bronze TRI spring, the shielding is run from end to end without interruption. It provides built-in EMC protection for even better screening attenuation values and a higher current-carrying capacity – even strain relief up to class B.

EMC protection is essential particularly when it comes to state-of-the-art data communication systems. The naval cable gland from PFLITSCH has passed the tests stipulated for Cat. 8.2, the extremely demanding cable category for gigabit networks.

Made in Germany, first-class delivery capability

The RoHS-compliant naval cable glands have

been developed and are manufactured entirely at PFLITSCH's plant in Hückeswagen and are shipped from the company's own small-parts warehouse. This means shipyards and suppliers can rely on a robust and fast supply chain. To enable designers to integrate PFLITSCH products into their designs right from the planning phase, they can download the 3D CAD data from the PFLITSCH CAD component library.



LevelEx AC cable gland



Maximum explosion protection: LevelEx AC

The new LevelEx AC cable gland from PFLITSCH represents a logical extension of the company's LevelEx series and is used to feed armoured cables into enclosures. Designed for use in potentially explosive atmospheres, it is suitable for industrial onshore, offshore and marine applications. For this purpose, special attention was paid to fulfilling protection types "Ex-e" for increased safety and "Ex-d" for flameproof enclosure. In the case of increased safety, the aim is to prevent the

potentially explosive atmosphere from igniting and also entering the enclosure. The flameproof enclosure, on the other hand, prevents an explosion inside the enclosure from propagating to the outside, where it would cause further detonation in a potentially explosive atmosphere. In addition, the LevelEx AC has a deluge seal – a type of seal that has passed a water deluge test in which components are exposed to the effects of typical marine and offshore conditions.

Combining the proven with the innovative

In the case of the LevelEx AC, PFLITSCH has succeeded in combining tried-and-tested features from the LevelEx gland series with new, innovative components that have been specially designed to both safely accommodate the armouring of the cables and facilitate quick and easy assembly. For instance, PFLITSCH adopted the compact design of the cascading sealing principle used for the head thread of the LevelEx gland launched back in 2018. When it came to accommodating the cable armouring, it was decided to use double crimping, which seals both the outer cable sheath and the inner insulation. At the same time, the LevelEx AC is designed to allow SWA cables (steel wire armoured), AWA cables (aluminium wire armoured) as well as SWB cables (steel wire braided) to be used.

Using armouring for strain relief

The cable armouring provides both the ground connection and extremely good strain relief. The exceptionally high degree of mechanical strain relief provided by the LevelEx AC is the result not only of full-circumference "soft squeezing", but also of the double crimping used to clamp the armouring. As such, this great strain relief results from the requirements laid down in the standard. With regard to clamping, PFLITSCH's engineers have come up with a small innovation to provide greater clarity and further optimise a product that already offered quick and easy assembly. When assembling conventional AC cable glands, the gland always has to be assembled first and then disassembled again to check that the armouring is correctly positioned. With the double-cone principle, the system has to be pulled apart to see if the armouring is correctly seated in its final position. PFLITSCH's solution makes all the difference: two opposing windows inside the gland allow the fitter to see the positioning of the armouring.



The PFLITSCH LevelEx AC cable gland for armoured cables.

Technically and economically superior

The LevelEx AC will go to market in Q3 of 2022. In addition to its technical performance characteristics and high IP 66/IP 68 protection ratings – which are now standard at PFLITSCH – it will have all important approval certificates, such as ATEX and IECEx. Preparations for gaining EAC, CCC and Kosha approvals are currently underway. We're aiming for the AC variant to have the same set of certifications as the LevelEx. This includes UL certification for the North American markets, which the variant for use with non-armoured cables gained only a few days ago. The overall picture is rounded off by the easy assembly and excellent price-performance ratio for which the LevelEx series is known.

- The LevelEx AC fulfils protection types "Ex-d" for flameproof enclosure and "Ex-e" for increased safety.
- Protection classes IP 66 and IP 68, plus deluge test in acc. with DTS01:91
- Equipment Group II, Categories 2 G2 1D, Zone 1, Zone 2, Zone 21 and Zone 22
- Approvals: ATEX, CCC, EAC, IECEx, UL and DNV
- Double sealing (outer cable sheath and inner insulation) with silicone seal for use in potentially explosive atmospheres
- Wide range of application and temperature range
- Gland body: brass and stainless steel
- Thread: metric and NPT

UL certification granted for the LevelEx

PFLITSCH has received official confirmation of it having gained UL Listed certification for the LevelEx cable gland used to feed in cables in Ex-d and Ex-e applications.



Underwriters Laboratories is one of the world's best-known independent certification organisations for product safety. The UL seal is particularly important in the US market, because the product liability laws here are even stricter than in Europe. Unlike the UL Recognized certificate, which is issued for components parts of a product, the UL Listed certificate applies to entire products. For this purpose, the product in question is subjected to even more testing. In addition to the UL certificate as expected, the LevelEx has also gained the following important certificates: VDE, Ex, IECEx, CE, RoHS, DNV, CCC and KCs.



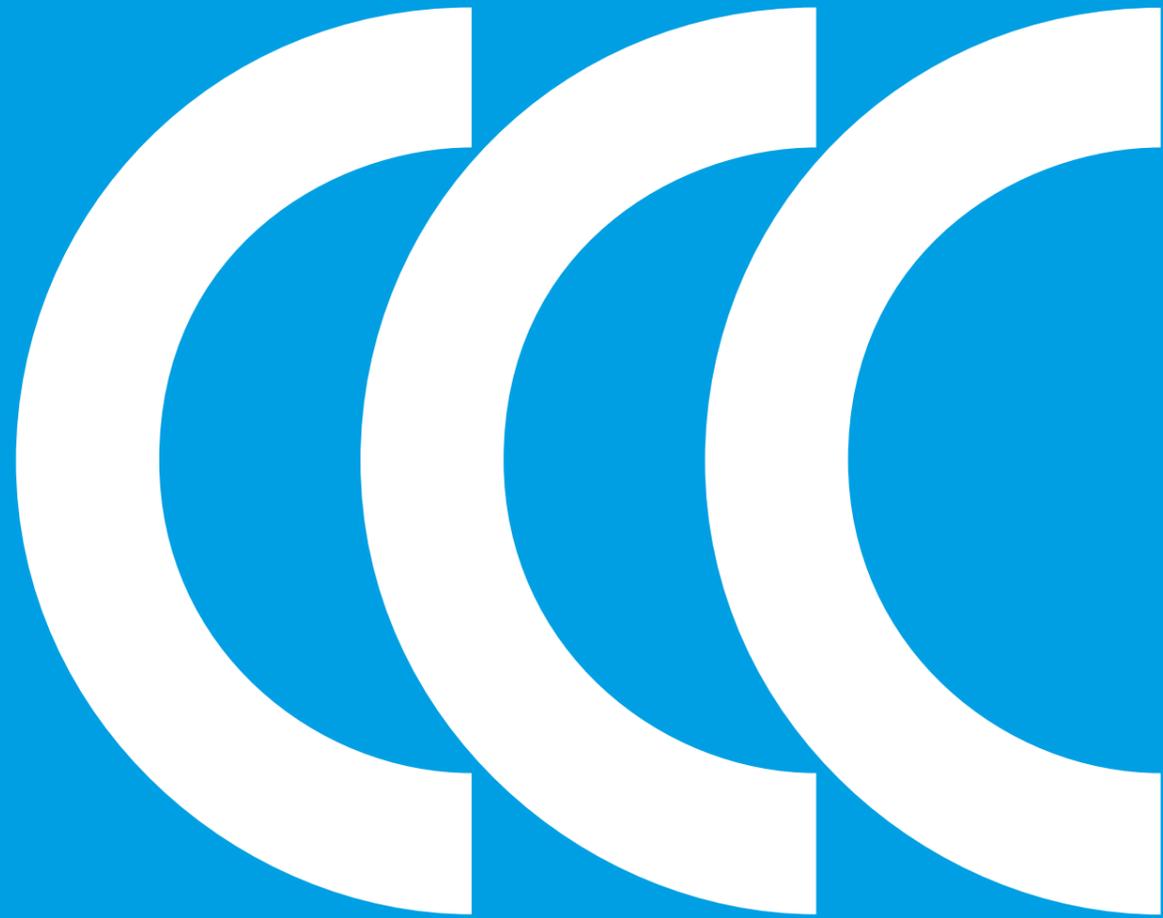
ADVERT

Does the issue of current-carrying capacity in high-voltage vehicle electrical systems give you

hot flushes?

WE HAVE SOMETHING FOR YOU.





CCC approval for ATEX/IECEX products

PFLITSCH products meet the highest safety standards – and now CCC approval, too.

We are pleased to announce that we have gained official Chinese CCC certification for all of our ATEX-/IECEX-approved products. All 13 certificates are available in English and Chinese and can be downloaded free of charge from our website.

ADVERT



The blueglobe TRI cable gland from PFLITSCH.

No matter what discomfort insecure high-voltage vehicle electrical systems cause you, the **blueglobe TRI cable gland** from **PFLITSCH** is the right remedy. Thanks to reliable and effective EMC shielding, a high current-carrying capacity, excellent vibration resistance and exemplary ease of installation, it's guaranteed to work – without risks or side effects. We give you our word on this: **PFLITSCH GUARD – SAFETY IN HV SYSTEMS.**

www.pflitsch.de/en



Keeping electromobility up and running – and charged

PFLITSCH cable glands for high-voltage vehicle electrical systems and the charging infrastructure.





The decision to focus more strongly on the growing electromobility market has proven to be the right one for PFLITSCH. For example, we have already developed cable glands specifically to meet the special requirements of the high-voltage electrical systems of commercial vehicles powered by an alternative drive system – glands that make these vehicles safer. We are now turning our attention to the charging infrastructure sector, too.

By focusing on the electromobility sector, we have once again demonstrated our forward-looking customer and market focus – as we did previously with the food, pharmaceutical and rail industries. This growing future market is of interest to us in two respects. On the one hand, we have succeeded in creating sophisticated cable glands and cable entries for the HV electrical systems of commercial vehicles with alternative drive systems that precisely reflect the needs of the industry and our customers: thanks to effective screening attenuation and a high current-carrying capacity, these products ensure maximum safety. On the other hand, the charging infrastructure opens up a new area of application for our cable glands – especially as this area is currently the subject of massive expansion in the wake of the rapid growth in electromobility.

To illustrate the potential, here are a few figures: across Europe, there are plans to install some 15 million chargers – an investment volume amounting to USD17 billion. In the USA, it's 13 million chargers and a total investment of USD11 billion, and in China, 14 million chargers costing USD19 billion.

Focus on charging stations

In contrast to the applications of our cable glands in the HV electrical systems of commercial vehicles, their use in infrastructure is focused on public and private charging stations that can be used to charge cars and trucks. A basic distinction is made between two standard charging modes and the corresponding charging infrastructure. Charging at public charging stations or home EV chargers ("wallboxes") is primarily in AC charging

mode; the charging cable is permanently connected to the charger. Rapid charging, on the other hand, is conducted in DC charging mode; here too, the charging cable is permanently connected to the charger. In both cases, the cable entry where the charging cable enters the housing can be subjected to a great deal of stress and strain when it is being hooked up to vehicles. This can lead to the connection between the charging cable and the mains supply cable inside the housing becoming damaged or separating. This makes PFLITSCH's blueglobe gland – with its extraordinarily strong strain relief – the number one choice for this application.

Since the cables of the charging station or wallbox for AC charging are relatively thin, a normal blueglobe made of polyamide is quite sufficient. The wallbox made by German manufacturer PRACHT is a good application example.

In contrast, however, effective EMC shielding may be required inside charging stations designed for rapid charging due to the high current levels involved. This, then, is the domain of the blueglobe TRI: its unique TRI spring ensures reliable 360° contact with the cable shield and the minimal amount of assembly work saves both time and costs. In addition to these "standard" applications, our special expertise is repeatedly in demand when it comes to solutions to highly specific requirements for cable entries in charging stations, as the following example shows. →



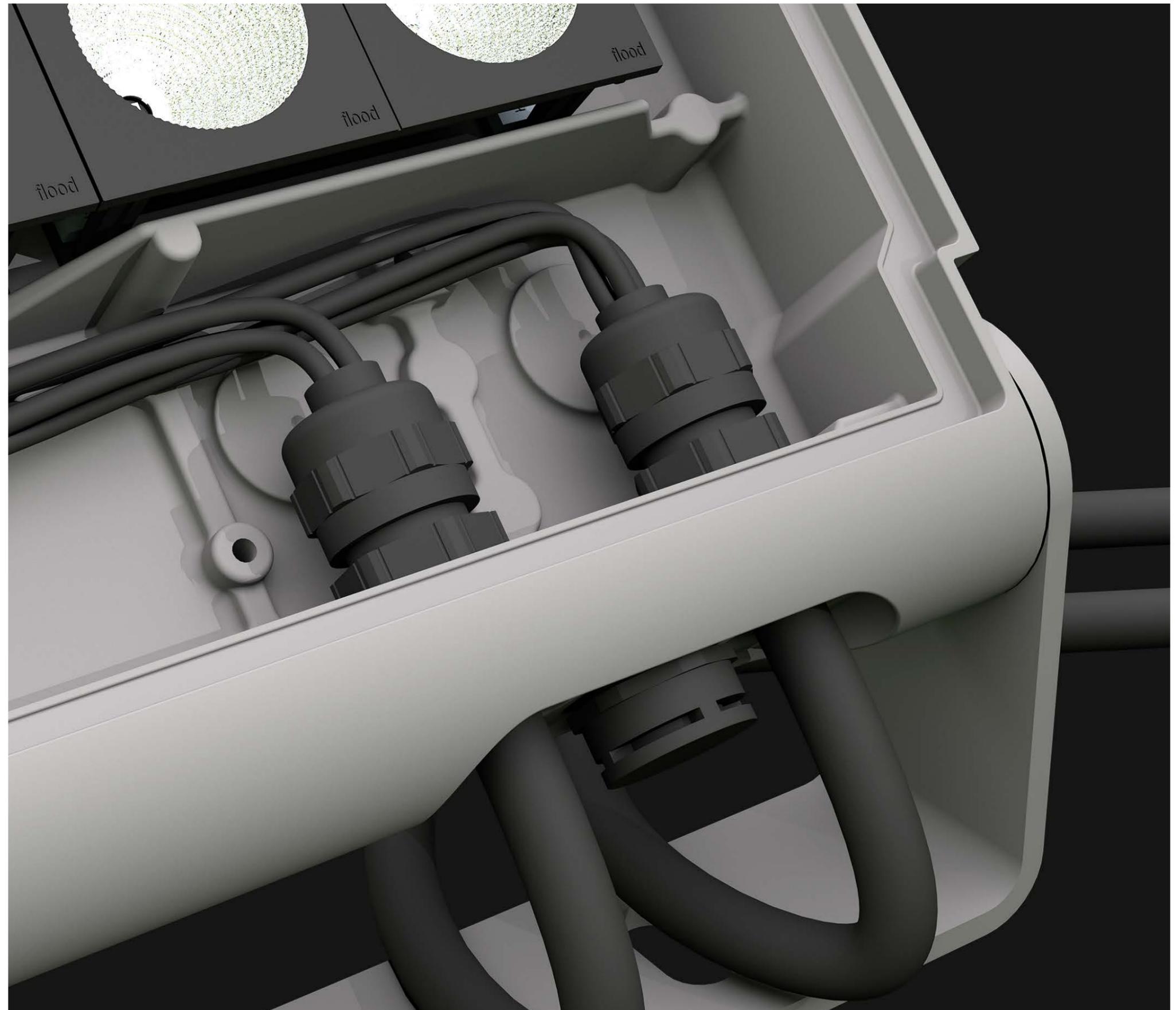
Charging station and wallbox for AC charging, charging station for rapid DC charging.

The manufacturer of a rapid charging station uses an integrated cooling line to cool the charging cable. The challenge facing us: how do you ensure optimum strain relief without squeezing the cooling line and impairing the cooling effect? Our solution: the blueglobe with two HTS sealing inserts.

When intrinsic values matter

A special challenge arose in connection with the design of a wallbox. Private users generally favour the wallbox because it takes up little space and a certain degree of elegance to its design is particularly important to them. To take account of this aspect, we offer our customer, the wallbox manufacturer, the option of installing the blueglobe inside the box. This preserves the elegance of the box's design – and at the same time guarantees strain relief for the charging cable.

Internal mounting of the blueglobe in a wallbox to preserve the elegance of the box's design.



Focus on delivery performance

How PFLITSCH supports the supply chain.

Without cable glands, an electric bus or train isn't capable of travelling a single inch or a multi-million dollar production line can't be put into operation.

So the demands made on PFLITSCH's ability to deliver across the full range of the 34,000 or so individual articles that make up its product portfolio are enormous. That is why PFLITSCH ensures at all levels that its products enjoy firstly excellent availability and secondly fast delivery performance. Automation and digitalisation – in a fully integrated system ranging from production to the automated small-parts warehouse – help us to achieve this. →



Production performance comes before delivery performance

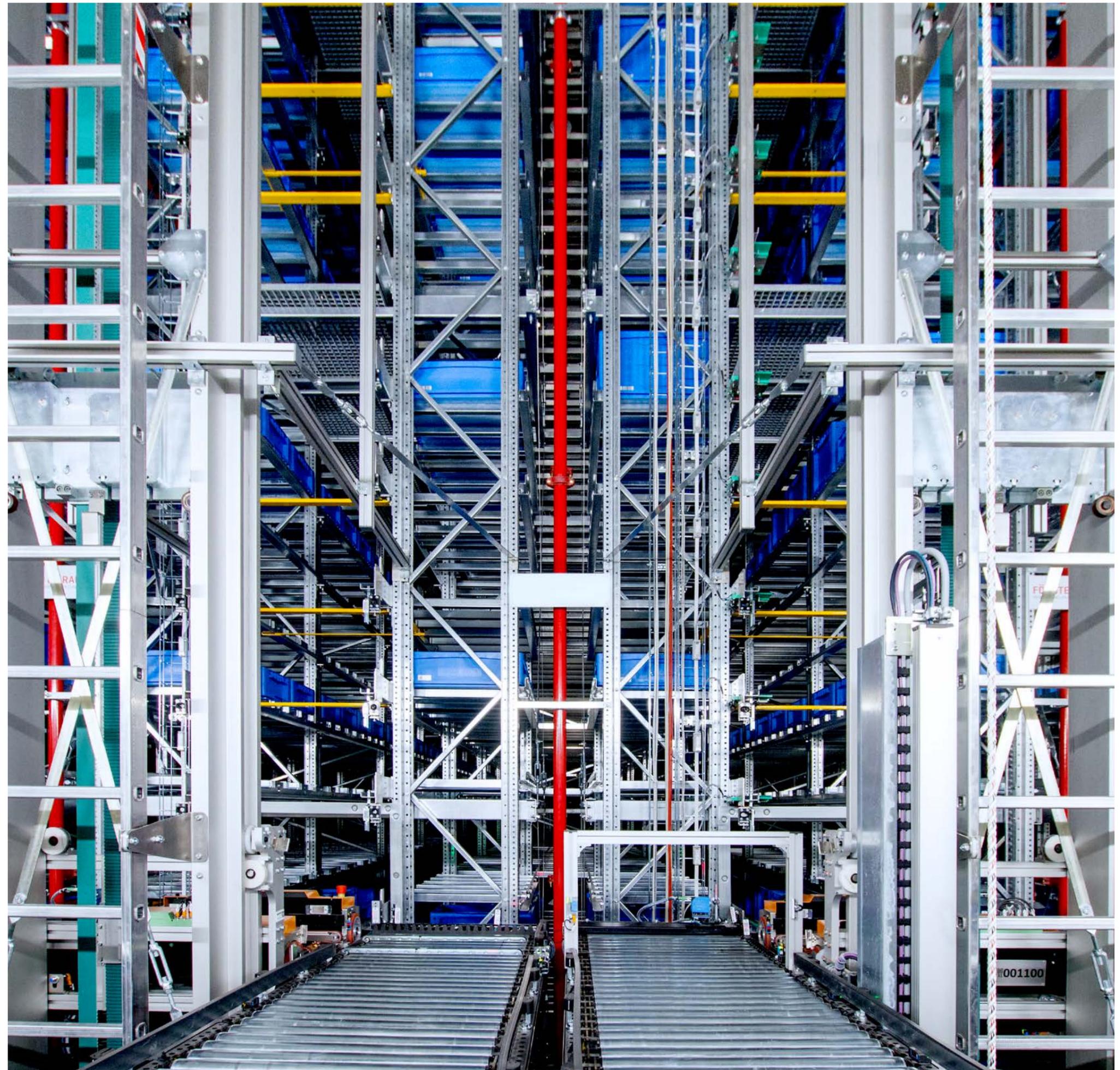
All products from PFLITSCH are “Made in Germany”. The cable glands and cable trunking are manufactured by some 300 employees in two plants. There is a very high degree of vertical integration. Upstream suppliers are for the most part from the local region to keep distances short. Thanks to long-standing partnerships based on trust and backed by delivery guarantees, production is always assured.

Inventory comes before delivery performance

The fastest logistics in the world are worthless if there are no goods to shift. That’s why PFLITSCH takes care to keep inventories at a good level, even if that means tying up a lot of capital. Many customers operate with a just-in-time or Kanban system or order on a project basis and therefore have little to no stock. If PFLITSCH, as their supplier, weren’t able to deliver, production would cease. The coronavirus pandemic has also shown that good stocks of goods and pre-products help when sections of the workforce are ill or in quarantine.

Order performance comes before delivery performance

The best ordering process is one that is fully automated. PFLITSCH is working intensively on perfecting this. The foundations of such a process are an ERP, a PIM and a warehouse management system. First of all, digital product data, together with digital data exchange, make it simple to search for the right products – or even to plan using 3D CAD data. The next step is for the customer to place their order request via digital parts lists or the shopping cart function on our website. Once the offer has been approved, the order is stored in the systems and processed accordingly. At all points, automation prevents errors and speeds up processes. →





In-house logistics performance comes before delivery performance

Cable glands account for a large part of PFLITSCH's product range. They come in numerous models and variants. Orders for larger projects are complex and consist of dozens of different items. The bottleneck here is the need for fast picking: With a classic high-bay warehouse, storing and retrieving such small parts would take far too long and, with around 34,000 different article numbers, a manual warehouse would require an extremely large amount of space – and mean the warehouse staff would have to walk countless miles every day! The solution is an automated small-parts warehouse. PFLITSCH has had such a warehouse in full operation since 2018. The workers in the shipping department retrieve the goods at four picking stations, pick them and scan the article barcodes, with this last step documenting the handling of the orders in the warehouse-management and ERP systems.

The small-parts warehouse provides 25,000 storage spaces on 700 square metres of net floor space and was built by Förster & Krause from Remscheid, which is just down the road. Five rack aisles and 28 levels are sufficient for this purpose. Instead of high-bay stackers, battery-powered microshuttles are used. These 40-kilogramme, mini platform trucks whizz through the aisles fully automatically at around 8 km/h, managing 500 storage and retrieval operations per hour. On their platform, they transport strong, quiet-roll, double-base Euro stacking containers from BITO, which are equipped with barcodes.

Of course, such a system also requires the use of cable glands and trunking during its construction and these obviously come from PFLITSCH: Wire-tray, PIK- and Industrial-Trunking have been installed. →

Transport links come before delivery performance

From Hückeswagen to anywhere in the world – and fast! It takes just 15 minutes to reach the motorway from Hückeswagen, and it's only 35 kilometres as the crow flies to Cologne-Bonn Airport – one of the largest hubs for air freight in Europe. Thanks to this excellent transport link and our certification as a "known consignor" by the German Federal Aviation Office, which ensures fast processing at the airport, we can guarantee that customers receive their goods speedily.



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