

THE JUBILEE MAGAZINE

PFLITSCH

50 years

Special Edition 2015 GB

UNI Dicht®



**Cables perfectly sealed –
yesterday and today**



Harald Pflitsch
Managing Director

A brand celebrates its jubilee



UNI Dicht®

UNI Dicht® reaches 50! A good enough reason to take a look at the cable gland that played a huge part in the form and development of the modern industrial cable entry.

Everything began with deep dissatisfaction with the performance of the products available at the time and a will to improve the situation. When, following the death of my father and shortly after my graduation, my uncle, Otto Pflitsch, and I began to further develop our then small family business, one thing was clear: a new product was needed here. One which would sell itself less on price and more on the great advantages it offered our customers.

Thus evolved – starting from the ordinary stuffing box – first our OPECO cable glands with a rubber seal, which was pressed onto the cable by a pressure screw. From these beginnings we developed an innovation: UNI Dicht®, the first modern cable gland with exchangeable sealing inserts.

Over the years, the idea grew into a large modular system, which is still as modern and up to date as ever. Then the requirements internationally and from industry became increasingly greater.

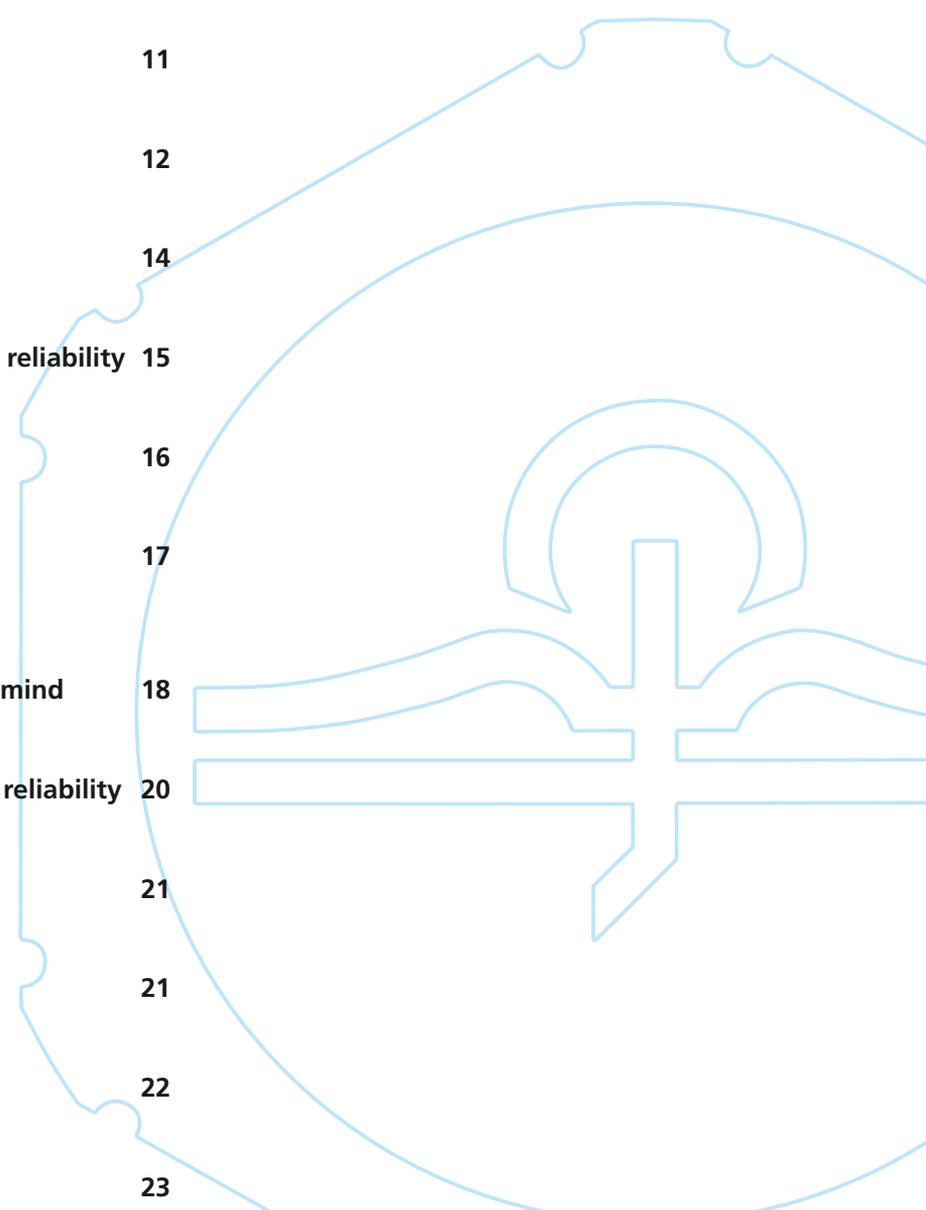
At this point, I would like to thank all customers and fellow travellers on our journey, who repeatedly opened doors in the beginning to enable us to access industries for the new product. My thanks also go to our many employees who committed heart and soul to the concept over these 50 years to make UNI Dicht® so successful.

And now I wish you a great deal of pleasure on this journey through the last 50 years that we have prepared for you in this magazine.

Harald Pflitsch

Inhalt

A brand celebrates its jubilee UNI Dicht®	2
A company logo becomes a brand with UNI Dicht® The PFLITSCH hexagon	4
50 years UNI Dicht® – cables perfectly sealed – then as now PFLITSCH invention opened the way to the modern cable gland	5
Reliable sensors for international railway engineering Customers such as Lenord + Bauer rely on PFLITSCH quality	9
UNI Dicht® and the fire brigade Seal retained especially in a fire	10
Presenting UNI Dicht® Carousel proves a trade fair eye-catcher	11
From stuffing box to modern cable entry The history of UNI Dicht®	12
UNI Dicht® in sizes M4 to M120 Simply huge – from small to large	14
UNI Flange® for preassembled cables Advantages for installation and operational reliability	15
UNI Dicht® in plastic processing M120 – the space-saving wonder	16
PFLITSCH cable gland catalogues Marketing through the years	17
The culture of innovation at PFLITSCH – an interview with Roland Lenzing UNI Dicht® – designed with the customer in mind	18
UNI Dicht® in German E-Cars Agile Stromos depends on high operational reliability	20
Logical reference Cable gland templates	21
UNI Dicht® immortalised: Two books full of specialist knowledge	21
UNI Dicht® in railway engineering: No chance for fire and smoke	22
UNI Dicht® – fit for the future: Carsten Wohlrath – an outlook	23





A company logo becomes a brand with UNI Dicht®

The PFLITSCH hexagon

Kleenex, Corn Flakes and Selotape have long since become generic terms in common use – detached from the actual product. These are cases where effective brand management and targeted marketing have led to a high degree of recognition.

PFLITSCH realised at an early stage how important it is to have and communicate a distinctive company logo: electrical products manufactured by Ernst Pflitsch & Co. KG have carried a logo composed of the stylised, merged letters P and F from the company name since 1936, and that design element can still be found, unaltered, in the PFLITSCH logo today. In 1974, this PF was supplemented by the distinctive hexagon with its twelve characteristic grooves – borrowed from the UNI Dicht® system – and registered as a trademark.

Today the PFLITSCH logo is a long-established brand. These grooves can be found consistently in product designs for the

cable glands in the pressure screws and double nipples, as well as on all trunking systems. This brand design has become synonymous in many industries with the well-known PFLITSCH quality and the flexibility of the system. Competitors have therefore tried several times to give their cable glands a similar look and feel.

To safeguard the unique features, PFLITSCH has protected the trademark, and the word and design marks of important product series internationally. In spring 2002, the PFLITSCH hexagon with the twelve grooves along the six edges of the UNI Dicht® cable gland body was recognised as a trademark by the testing and certification body VDE Prüf- und Zertifizierungsinstitut and internationally by UL and CSA.

In other words: only products with the PFLITSCH hexagon outside have PFLITSCH know-how inside.

To ensure that the company's products would be clearly differentiated from those of the competitors in the continuously developing market, Ernst Pflitsch, who had an excellent sense of business as well as design, developed the idea of a customised marking, a company logo.

The first company logo for Ernst Pflitsch & Co. 1936



From the international symbols for direct current (straight line) and alternating current (wavy line), he created the new company logo using two intertwined letters – P and F – to form the new company logo, which has graced PFLITSCH documents since then.

Neu!



PECO Kabelverschraubungen

BP. angemeldet

Ausführung: **Messing vernickelt**

Selbständige Abdichtung.



*Bildung von
Kondenswasser unmöglich!*



Gummidichtung tritt im Drucknippel aus.



Der alte Trichter der Handelsausführung
ist verschwunden.



Kein Verkitten mehr notwendig.



Old Advertisement

50 years UNI Dicht[®] – cables perfectly sealed – then as now

PFLITSCH invention opened the way to the modern cable gland

Development



The UNI Dicht[®] system reaches the age of 50 and is still acknowledged today as the forerunner of the modern cable entry. What was the path that led from the simple stuffing box to today's cable gland system, which can be individualised for a wide range of requirements and industries?

Cables and wiring connect electrical systems with one another in a whole range of applications. Energy, data and control cables carry electricity at various voltages and currents, which may be direct, alternating or pulse. Modern glass fibre cable technology

uses light to transmit data. One problem emerged quite soon after the start of industrial electrification. How can cables passing through holes in a housing wall of a switchgear cabinet or machine body be effectively sealed?

Harald Pflitsch, who has continuously developed the UNI Dicht[®] series from its beginnings, recalls: "In those early days, engineers resorted to stuffing boxes (also known as packing glands) manufactured of metal and later Bakelite, which were screwed into the hole in the housing. The cable they surrounded had to be laboriously filled with putty in the bush to achieve the

desired seal. This was costly and always required maintenance. In addition, the putty soon became so hard that it was no longer able to provide a seal." The industrial electrician was then forced to remove the old putty and refill the stuffing box with new putty. There was always the possibility that water collecting on the surface of the putty would be able to penetrate the electrics through the smallest defect in the seal.

Rubber instead of putty

"This high maintenance cost and the technical shortcomings annoyed my uncle, Otto Pflitsch, who began to search from the mid-1950s for a technically innovative and above all economically efficient solution for the problem of cable seals." First, he replaced the extremely rigid rectangular seal with a flexible rubber ring, which became squashed between the two plain washers in the brass stuffing box as a union nut was tightened so that its internal diameter narrowed and the gap to the fed-through cable closed – a concept that is still used today in many cheap cable glands. This produced some improvement in the seal and provided strain relief over a much longer period.

This first modern cable gland, which was marketed under the name of "Opeco" (Otto Pflitsch

Ernst Co.), soon became a success. By 1956, PFLITSCH was developing further metal hose cable glands, including the "Capri Tube", and the "SVD-Schlauch-Verschraubung Dicht" hose connections.

These products provided PFLITSCH with a way to start supplying the standard components at the time for the rapidly growing number of production plants for the automotive industry.

"Later, following the introduction of the first industrial plastics, the rubber ring was supplemented by 'onion ring' seals (multi-layer seals with adjustable inner diameters), which increased strain relief but a so irreparably indented or cut into the cable sheath, at some risk to the long-term sealing performance. That was also unacceptable to us," says Harald Pflitsch. "In accordance with our motto 'Crossing frontiers...', the

new future-oriented PFLITSCH cable entry systems would have to eliminate these disadvantages and offer further plus points, such as full insulation of the cable in the entry and a superb seal."

Following an analysis of the strengths and weaknesses of the available cable entry products, Otto and Harald Pflitsch came up with something completely new: the UNI Dicht® system. 1965 – 50 years ago – saw the start of the development of this brass cable gland, a product which is in use today in thousands of applications all over the world. New forms of PVC seals were able to ensure a perfect seal around the cable for the first time. PFLITSCH's development work was rewarded by the German Patent Office,



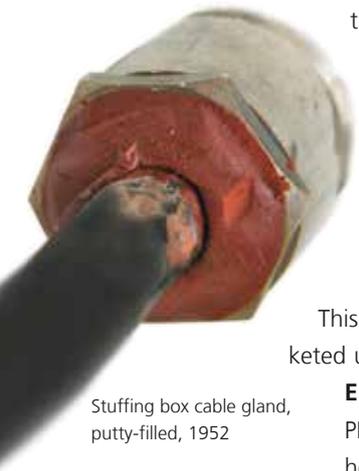
Stefan Stroh – designs UNI Dicht®

„‘That will not work’ – is not part of our vocabulary. And therefore, over the last 50 years of UNI Dicht®, we have brought many of our customers' ideas, requirements of the market and impulses of colleagues to fruition in cable gland solutions. My first project was a UNI Dicht® with extra-long external connection threads that the customer needed because of an extremely thick housing wall. Today, UNI Dicht® is available in a number of international threads such as NPT and CTG. And the long-since declared-dead Pg thread is in our product range in sizes Pg7 to Pg48.“

Munich, in 1966: the progenitor of today's cable glands was technically described and protected in patent number 1 263 134. This hexagonal component with the then popular heavy-gauge thread (Pg) was on the threshold of its journey to international success. The electrical industry was expanding rapidly at that time and just waiting for such a solution.

The UNI Dicht® system set out on its journey to success in 1965

"Cur new cable glands with their non-detachable seals, the processing of soft plastics into sealing inserts and the modular system approach were then unique and pioneering," says Harald Pflitsch. He found great interest on many visits to customers in Germany and abroad, e.g. from automobile manufacturers and machine builders. In 1966/67, the product range expanded to include new hose clamp cable glands and elbow cable glands.



Stuffing box cable gland, putty-filled, 1952



„Opeco“ cable gland, 1958



Claudia Maurer – documents UNI Dicht®

„We have patented many solutions involving UNI Dicht® or at least protected them with a registered design, including, for example, a cable gland made from wood. When the main patent for UNI Dicht® ran out in 1984, our products were already so well established on the market that the numbers of pieces manufactured has continued to rise. Our ideas have certainly been imitated by many others on the market, but our product diversity and quality have never been matched. On the contrary: we are currently a pioneer once more, this time in the field of fire protection in railway engineering with our certified UNI Dicht®.“

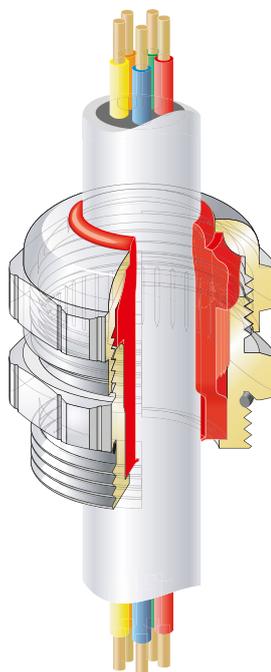
Primary functions

Under Harald Pflitsch’s leadership, the company was also able to build tools that allowed the use of plastic in its products – as a replacement for the less durable Makrolon. Injection moulding tools were developed for the special PFLITSCH PVC sealing inserts, which were the perfect match for cable glands manufactured from brass and Trogamid. In 1971, UNI Dicht® PA6-3, the first plastic cable gland, came on to the market.

The clou with UNI Dicht®: as the pressure screw tightens, the sealing insert makes gentle and even contact around and over a large area of the cable, an action which prevents the cable sheath from being cut into or severely indented and provides higher strain relief. “We achieved what we call a soft, spherical squashing action,” says Harald Pflitsch. This sealing concept provides a high ingress protection rating of IP 68. The insertion of a membrane into the sealing insert means that the cable gland still achieves the standard protection rating of IP 54, even without any tightening of the pressure screw.

The advantages of UNI Dicht® for the customer are plain to see:

- Complete insulation in the metal gland without the use of putty
- A perfect seal around the inserted cable achieved with sealing inserts
- A rubber O-ring sitting in a groove seals the cable gland against the housing wall
- Ingress protection (up to IP 68), vastly superior to the norm, and
- Excellent strain relief.

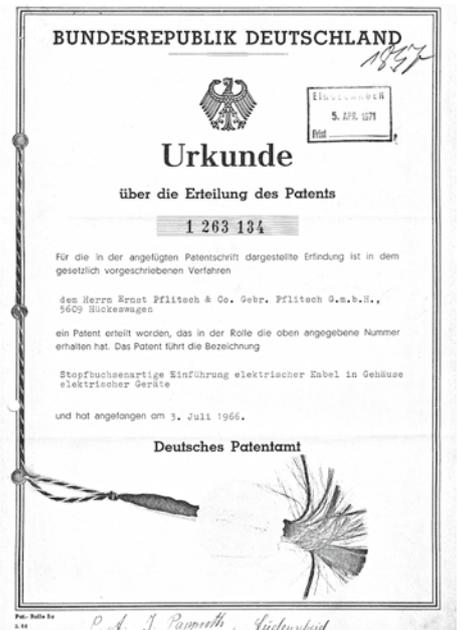


UNI Dicht® today

A further plus point: when equipment was modified at a later date, these glands could be simply dismantled and removed. If cable cross sections changed, the user could add a different sealing insert to existing cable glands, reducing or expanding the size to ensure the sealing performance was maintained. The PFLITSCH system was also soon in the position to allow glands to be used in combination with hoses to protect cables from mechanical damage.

The challenge called for new approaches

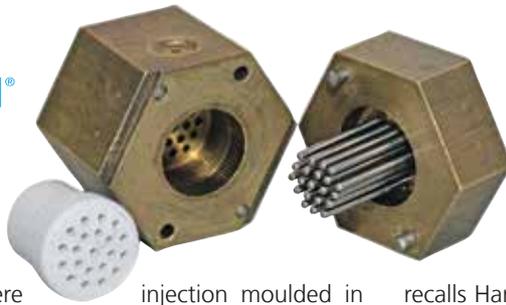
Harald Pflitsch: “From the 1980s we introduced some internal knurling on the cable gland body to prevent the sealing insert from rotating when the pressure screw is tightened, which involved appreciable manufacturing costs.” The knurled sealing insert made from soft PVC plastic then remained in position.



Patent dated 1966 for a „Stuffing box type entry for electrical cable in housings of electrical devices“.

Some manufacturing steps were at first done using hand tools. “It was only when orders for larger quantities arrived that we invested in a machine.” Customers’ special wishes are a recurring theme in the history of UNI Dicht®. “One example from the early 1980s: TetraPak was looking for a solution to connect a UL hose securely to the cable gland without clips. Therefore we decided to develop various UNI-UL hose types.”

When the Dutch reseller Hemmink came to us with a requirement for marine EMC applications in the mid-1980s, PFLITSCH developed its first EMC cable gland in the form of the anti-interference UNI Entstör, which soon resulted in a new, independent product range with the improved UNI EMC Dicht® and at the beginning of the 1990s the UNI IRIS®. The development of new products was supported by the establishment of our in-house test laboratory which today holds some 35 approvals from the PTB (German Federal Physical-Technical Institute), the VDE (German Association for Electrical, Electronic & Information Technologies) and the UL (Underwriter’s Laboratories).



Prototype of a single cavity injection moulding tool
UNI Multiple sealing insert

The sealing inserts were injection moulded in different colours to make the installation and cable diameter assignment more foolproof. This UNI colour-code still applies today. According to the code, e.g. sealing inserts for 4 mm to 6.5 mm cable are yellow, for 7 mm to 10.5 mm they are green and for 20 mm to 25 mm they are orange. "Today, we use high-grade



Rosario LiPira – manages UNI Dicht®

„As a development partner for our customers, we have designed and manufactured a host of special UNI Dicht® variants, e.g. an orange cable gland to match orange cables. Or versions

in aluminium to achieve weight savings. In the field of EMC, we have set new standards with UNI IRIS® when it comes to high screening attenuation and installer friendliness. Many customer solutions are now part of our standard ranges because they are of interest to the wider circle of users, for example UNI Multiple with its different holes or UNI Dicht Strain relief, which provides much greater strain relief thanks to special plastic clamping jaws.“

recalls Harald Pflitsch. Whether it was for special cable shapes and cross sections, electromagnetic compatibility, country-specific threads or the need to provide entries for preassembled cables – the modular system continuously expanded. "We now have EMC and Ex-protection variants, flat, special and pre-assembled cables can be fed through split sealing inserts or several cables through a multiple-cable gland without any difficulties, just as can be done through elbow and flanged glands with corrugated tubes and protective sleeves for full mechanical cable protection."

UNI Dicht® is produced in sizes M4 to M120 in addition to the equivalent Pg sizes and international special threads such as NPT, CTG and imperial. The gland bodies are available in the metals brass, zinc, stainless steel and aluminium and plastics PVDF and PA 6-3. The metal types have an O-ring sitting in a groove to create a reliable seal between the cable gland and the housing. In addition, several international certifications such as EN, CSA, UL and PCT as well as works approvals from renowned manufacturers ensure maximum certainty for the customers.

TPE for the sealing inserts," says Harald Pflitsch. This thermoplastic elastomer is very resistant to many modern chemicals and provides improved strain relief, because the halogen-free TPE slightly increases in volume in contact with cutting fluids, for example. UNI Dicht® achieves the high ingress protection rating of IP 68 (up to 10 bar) in standard production versions.



"No end of ideas"

Asked about the recipe of success behind the 50 years of UNI Dicht® success, Harald Pflitsch named five aspects: "We have stuck to our task, always placed great importance on the durability of our products and on customer loyalty. In addition, we have been able to satisfy a wide range of requirements within the system and develop customer-specific solutions, most of which have been added to the standard range."

The latest example of contemporary modifications is the new fire protection standard for railways: here PFLITSCH more than fulfilled the high requirements by using an improved TPE material for the sealing inserts. As a result, UNI Dicht® can be used without restriction on trains – whether on open lengths of track, in tunnels or in stations.

Manfred Solibida – sells UNI Dicht®

„The product advantages offered by UNI Dicht® soon became spoken of all around the world, even as far as Africa. One day a Congolese man arrived at the factory by taxi and asked for a demonstration of UNI Dicht® in plastic. He selected a few hundred components from our store, which he took away with him in a suitcase after paying cash for them in dollars. From then on he came every few years. What our customers enthuse about with UNI Dicht® is not only the way the various cable gland bodies and sealing inserts can be combined with one another, but also the special solutions the system provides for EMC, strain relief and kink protection. We have even received complaints that turned out to relate to copy-cat products. However, no-one can copy our large modular system with over 6,000 components from M4 to M120 all that quickly.“

Problems solved with system modules

"Over the years, we have developed a number of solutions to problems we encounter and that are frequently initiated through new technical challenges faced by our customers,"

The end of the UNI Dicht® system is clearly nowhere in sight, provided customers keep coming up with new requirements for cable glands, which cannot be satisfied with simple standard solutions. In its jubilee year for instance, PFLITSCH launched the new slimline and lightweight UNI Dicht® 2M for applications that require large quantities. Harald Pflitsch is convinced that "there is no end of ideas".

Reliable sensors for international railway engineering.

Customers such as Lenord + Bauer rely on quality

Case study

OBERHAUSEN – Railway engineering applications demand a great deal from systems, because wind and weather, dust and stone impact, vibrations and braking forces are always acting on the components. In addition, locomotives and wagons must function reliably over very long periods of time – in any part of the world. Therefore Lenord + Bauer sensors are fitted with UNI Dicht® cable glands.



Under harsh conditions of use from -40 °C to +120 °C, the UNI Dicht® cable gland provides the high ingress protection rating of IP 68 for this compact rotation sensor.

Lenord + Bauer is a global player in the field of highly sensitive sensors that rely on magnetism to work. These sensors from Oberhausen are used in ICE trains as well as on many railways all over the world.

Life-long seal with IP 68 performance

For cable glands, the company opts for the PFLITSCH UNI Dicht® system: The standard versions of these cable glands achieve the high ingress protection rating of IP 68 and higher than normal strain relief. This is due to their TPE-V sealing insert, which presses on to a large area of the complete cable circumference. The TPE-V material for the sealing inserts is also usable over a wider temperature range of -40 °C to +135 °C, which is what railway customers require. PFLITSCH cable glands have consistently withstood even the wide variety of vibration and temperature shock tests carried out in accordance with industry standards by Lenord + Bauer.



Up to 8000 revolutions per minute are measured accurately by this hollow-shaft encoder. The cable gland must carry the cable securely through the enclosure wall despite extremely strong vibrations.



The hose pressure screw enables a protective hose to be connected directly to the cable gland to provide the sensor cables with better protection against mechanical damage.



The proven UNI Dicht® system impresses with its resistance to vibrations and strain relief values that exceed the standards.

Multiple-cable sealing inserts ensure a space-saving cable entry for the compact sensors. If the cable cross sections are changed later, the existing cable glands can be modified using reducers and expansion pieces. Right-angled cable outlets are dealt with using special elbow cable glands. To avoid mechanical damage to sensor cables, they can be fed through protective hoses, which are securely and reliably connected to hose cable glands.



Case study

Fire-fighting and rescue vehicles must work properly at all times. (Photo: Metz)

UNI Dicht® and the fire brigade Seal retained especially in a fire

KARLSRUHE – Every minute counts when there is a fire or an emergency. To ensure this is the case on every call-out, the fire brigade’s fire-fighting and rescue equipment must function reliably under all conditions. Vehicle equipment fitter Metz installs PFLITSCH cable glands.

Resistance to chemicals is important too.

The cable gland bodies of high-grade PA 6-3, an amorphous special polyamide, are resistant to a series of common chemicals, mineral oils and salt solutions. UV-resistance and good fire safety properties are further positive characteristics. For use on a turntable ladder, where the requirements are higher still, Metz relies on cable glands manufactured from high-performance PVDF, which in terms of chemical- and weather-resistance is barely inferior to stainless steel. In addition, in fires it behaves in the best possible way by being self-extinguishing in accordance with UL 94 V-0.

Likewise Metz uses special UNI elbow cable glands as a compact means of taking cable through a right angle, for example, to connect to warning lights. Reduced cable gland bodies are used where thin cables have to be safely and securely fed through existing larger holes.



Three variants on a distribution box on the Lafette: Metz installs standard, multiple or elbow cable glands from the UNI Dicht® modular system, depending on the situation. (Photo: PFLITSCH/Lutz)

There can hardly be a fire brigade in Germany that does not have a Metz turntable ladder in its fleet. This is no surprise because the firm has been one of the pioneers in the manufacture of fire-fighting and rescue equipment since its foundation in 1842. A further successful string to the company’s bow is the hydraulic elevating rescue platform sector.

The Metz specification places great emphasis on quality, reliability and durability, because it would very quickly damage the reputation of the fire service if the equipment were to fail on a call-out. Therefore Metz installs only proven, durable products such as those from the UNI Dicht® range. Thanks to the high ingress protection rating, these cable glands remain tight against wind, weather and water. High strain relief and vibration resistance are essential for coping with the mechanical loads on the vehicles. The torsional loads are enormous on turntable ladders. The cables must not be torn out of the cable glands.



Under harsh conditions of use on the turntable ladder, UNI Dicht® cable glands – seen here in the multiple version with a PVDF cable gland body – provide high ingress protection and operational reliability. (Photo: PFLITSCH/Lutz)

Presenting UNI Dicht®

Carousel proves a trade fair eye-catcher

How can a modular system with a few thousand separate parts and the versatility of the UNI Dicht® range be explained in a light-hearted and stimulating way? In the PFLITSCH carousel, of course, which has several compartments – filled with various cable gland bodies and sealing inserts – which can be rotated and arranged in different ways. This invites the onlooker to solve the “puzzle”. So you can often see people at trade fairs try to put PFLITSCH cable glands together.

The PFLITSCH carousel looks like a large cable gland – a real eye-catcher at every major trade fair.



Harald Pflitsch at trade fair, 1973



An idea has proven its worth: the popular UNI carousel.



From stuffing box
to modern cable entry

The history of UNI Dicht®

Born out of dissatisfaction, the idea then revolutionised industrial cable entries and is still unbeaten in performance and diversity today.



1965



UNI Dicht® Ms – original version
with captive PVC seal

1972



Angled cable gland

1976



UNI Dicht® as a system cable gland, with
twelve grooves for the first time



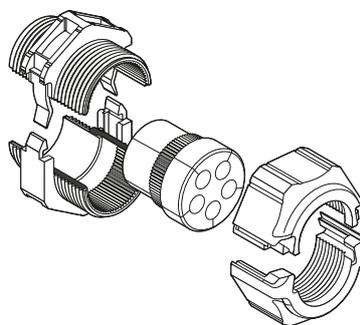
1986

2013

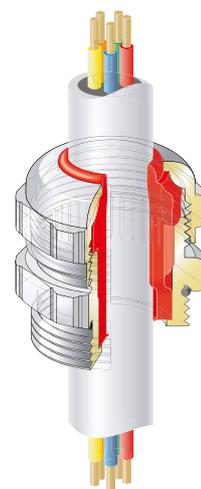
2015



EMC cable gland



UNI Split Gland®
the first splittable cable gland



UNI Dicht® – today

UNI Dicht® in sizes M4 to M120

Simply huge – from small to large

The UNI Dicht® modular system lives up to its name in its jubilee year. Because of its in-house, state-of-the-art turning shop, PFLITSCH can come up with unique solutions in the field of metal cable glands: at the moment UNI Dicht® is available in the mini-variants M4, M6 and M8 and in the maxi-variants M72 to M120.

The minis M4 to M8 are designed for thin and delicate cables and optical-fibre cables with diameters from 0.9 mm to 4.5 mm. A TPE-V or LSR silicone sealing insert sits in their nickel-plated brass bodies. Like their “bigger brothers”, the minis also achieve the high ingress protection rating of IP 68 (up to 10 bar).

At the other end of the size scale are the versions up to M120. They are designed, for example, for feeding up to 110 mm thick energy cables into power plants. A further field of application is for sealing several cables in a large cable gland where there is not enough space for several single cable glands. Thanks to a flexible manufacturing method, PFLITSCH can supply multiple-cable inserts to the customer’s specific requirements.

For both the mini and maxi cable glands, the following applies: with the cables inserted into the sealing insert, the insert is deformed by tightening the pressure screw in such a way that the sealing insert makes contact over a large area of the cable. This method achieves the high ingress protection rating of IP 68 and strain relief well in excess of the value specified in EN 50262.



UNI Flange® for preassembled cables

Advantages for installation and operational reliability

KREFELD – Baumer hhs has been equipping its current Xmelt series of hot melt units with components from the new UNI Flange® series since 2011. The determining factors in the decision to opt for this innovative cable entry system are its simplicity of installation, increased operational reliability and compatibility with cut-outs for large industrial plug connectors.

Whether it is nappies, cigarette packets, the latest types of plastic packaging or layers applied to wood-based boards – Baumer hhs, Krefeld, usually has a gluing system to stick them together. In 2011, the company launched its Xmelt hot melt units, which involved some changes to the electrical cabling: rather complex plug-in units with various arrangements of plugs and sockets were originally used to connect the modules together. Baumer wanted to replace this arrangement with preassembled cables.

Looking around the market, Baumer hit upon the new PFLITSCH UNI Flange®. Then followed extensive installation and operational tests. Baumer required an ingress protection rating of IP 54, which the PFLITSCH system more than satisfied with IP 66. The design engineers were also impressed by the high strain relief (class A, EN 50262) achieved without the use of any additional elements. These high values are possible because the PFLITSCH solution is based on the UNI Dicht® cable gland system. The concept ensures a long service life and high operational reliability. Furthermore, UNI Flange® can be used within a temperature range of -20 °C to +80 °C.

Splittability makes installation easier

The simplicity of this flange system makes installation and removal very easy: the two-part, fully separable split frame manufactured from high-quality PA plastic can be inserted into standard 112 mm x 36 mm sheet metal cut-outs for 24-pin heavy-duty plug-in connectors and then simply screwed in place. Screwing from the inside achieves full contact protection to class 2 (DIN EN 61140, VDE 0140-1). The approach also makes the later task of component replacement or the dismantling of whole systems much less complicated.

Three cable gland bodies are integrated into the split frame, each of which can accommodate one of over 100 different slit, splittable or standard sealing inserts from the UNI Dicht® range. A continuous seal in the split frame seals the UNI Flange® to the housing and prevents the entry of water jets from any direction and dust.

Case study



UNI Flange® fits into cut-outs for industrial plug-in connectors and is completely splittable: this makes installation easier and allows the use of preassembled cables. (Photo: PFLITSCH)



The practical PFLITSCH tool makes a simple job of securely tightening the pressure screws.



The special pliers allow the cable to be easily fed into the slit sealing inserts.

UNI Dicht® in plastic processing

M120 – the space-saving wonder

TROISDORF – Space problems can even arise in large plants and machines. Instead of inserting one cable gland for each cable to be fed in, multi-glands save a considerable amount of space. REICOFIL commissioned PFLITSCH to produce an M120 cable gland with a multiple sealing insert.

Case study

Reifenhäuser REICOFIL is a world market leader in spunbond, meltblown and composite non-woven production systems. The non-woven materials are further processed into many products, including nappies, female hygiene products, medical protective clothing or filters. To make the plant manufacture as efficient as possible, REICOFIL redesigned the whole of the mechanical and electrical systems based on a modular concept some time ago.



The M120 cable gland from PFLITSCH with its multiple sealing insert allows five power cables to enter the switchgear cabinet in a space-saving and safe manner. (Photo: PFLITSCH)

Before that happened, long energy and signal cables were required, e.g. from the switchgear cabinet to the extruder. The large quantities of cable involved and the thermal requirements demanded a great deal of space and were costly to install. The decentralised concept allowed REICOFIL to reduce the number of cables from 35 to only five. And instead of inserting one cable per cable gland, REICOFIL reduced the space required and installation work by using a single M120 UNI Multiple cable entry.

Cable arrangement cancels out magnetic fields

Because REICOFIL also changed the material of the switchgear cabinets from aluminium to steel, the only way the decentralised concept could be realised was with the M120 cable gland. Cable entries with single conductors give rise to magnetic fields, which lead to the build up of additional heat in steel housings. The large cable gland allows all five cables to pass through a single hole in the wall of the extruder housing. Moreover, the arrangement of the cables with respect to one another cancels out the magnetic fields overall and prevents the development of additional heat.



The arrangement of the single-conductor cables in the M120 cable gland cancels out the resulting magnetic fields and minimises the development of heat. (Photo: Wagner)

PFLITSCH cable gland catalogues Marketing through the years



2013

508 pages



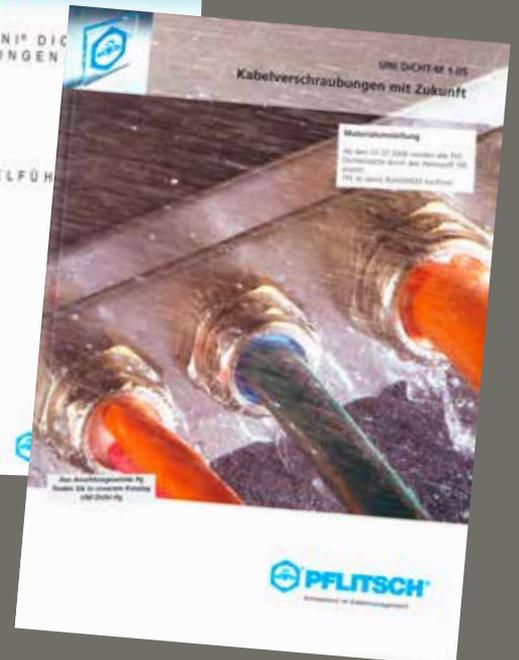
1977 – 36 pages



1982 – 108 pages



1995 – 64 pages



2005 – 112 pages



Accounts book from early in the company's history

The culture of innovation at PFLITSCH – an interview with Roland Lenzing UNI Dicht® – designed with the customer in mind

Interview



Staff working hours notice: eleven hours were the rule in those days

Companies retain their competitiveness with first-rate products that not only satisfy their customers but also impress and enthrall them. Roland Lenzing, Company Strategy Manager, Company Signatory and Partner at PFLITSCH, explains how the manufacturer of cable glands and trunking “Made in Germany”, now in its 4th ownership generation, will succeed in the future.

A company without innovations has no chance of long-term success on the market. Therefore, it is a fair question to ask about PFLITSCH's culture of innovation. Mr Lenzing, how does the culture of innovation manifest itself at PFLITSCH?

PFLITSCH has been successful on the market for 96 years because our customers have always seen us and still see us as problem solvers. Being development partners, we create and take up ideas, and transform them into technically and commercially optimised products that enable our customers to progress and increase their competitiveness.



Roland Lenzing

Could you give some examples from practice of how PFLITSCH has come up with innovations?

We have always looked at things in detail and asked ourselves how we could improve them. Until the 1950s, for example, cable glands consisted of a stuffing box additionally sealed with putty, which soon became brittle and lost its seal.

At that time, PFLITSCH replaced the putty with a rubber ring that squashed against the cable as the pressure screw was tightened. From this, Otto and Harald Pflitsch created the patented UNI Dicht® system with its many different sealing inserts in 1965 – a revolutionary idea, which maintains a reliable IP 68 seal over the long term, provides complete insulation in standard production versions and high strain relief. Furthermore, we made an early start with our work on EMC safety and therefore can manufacture better solutions in this field than are available on the market.

There are plenty of other EMC cable glands available. What makes PFLITSCH's products in this field so different?

In ordinary solutions, the screening braid is stripped of its insulation and pushed into the cable gland on a cone. However, in practice this arrangement suffers from some serious disadvantages: the spread-out screening braid causes several dB loss of attenuation and its assembly is costly. In view of this, we fitted the UNI Dicht® cable gland with an IRIS annular spring that



narrows during screwing to securely surround and make contact with the cable screening. The installer needs to remove the cable sheath only from the contact area and push the cable through the cable gland before tightening. The screening braid remains undamaged. This avoids any undesirable coupling of useful and noise signals and achieves high attenuation values. This solution also offers advantages because it is easy to install.

Our digital world is highly diverse. How does PFLITSCH react to all the different developments?

After market observations, discussions with customers and internally with colleagues, we came up with the idea of combining the strengths of our two EMC concepts UNI Dicht® and blueglobe® using our systematised design approach to create user-specific solutions. There were users who, due to shortage of space, installed a larger EMC cable gland and had several cables running through it. Obviously their HF attenuation was suboptimal because the screening braids made point contact only. We have combined the best of both worlds, UNI Dicht® and blueglobe®, into one EMC Multiple cable gland.



Customer-specific multiple sealing insert

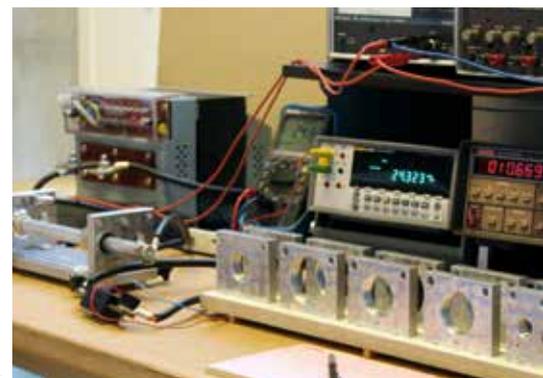
What does this solution look like in detail?

We use the familiar multiple sealing inserts from the UNI Dicht® range, which we manufacture to suit the customer's wishes, even for cables of different diameters. A metal washer manufactured to precisely suit the cable diameter used by the customer sits

behind the sealing insert. The screening of every cable is in good contact with this washer through its own TRI spring. A surrounding IRIS spring ring ensures reliable contact is made by the washer in the cable gland. Because we make UNI Dicht® in sizes up to M120, several EMC cables with screening braid diameters from 3 mm to 65 mm can be accommodated.

You have your own in-house laboratory. Are EMC tests performed there?

Of course. Our EMC experts came to realise over time that none of the established and mostly expensive testing procedures for evaluating the screening properties of cable glands are really suitable for providing clear and reproducible measurements of the screening properties of these components. In light of this knowledge, we further developed the internationally standardised measuring procedure for coaxial plugs, referred to as the triaxial procedure. KoKeT® can measure screening attenuation and transfer resistance from DC up to beyond 1.5 GHz. Comparative measurements show that this procedure measures up to about 20 dB more accurately in the important frequency range of 25 MHz to 130 MHz than conventional procedures. In addition, the effectiveness of the cable gland alone is measured and not that of the test specimen and the characteristics of the cable. We feel a little proud that our KoKeT® measuring principle has been listed in the current IEC 62153-4-10 as a recognised method.



Checking current carrying capacity

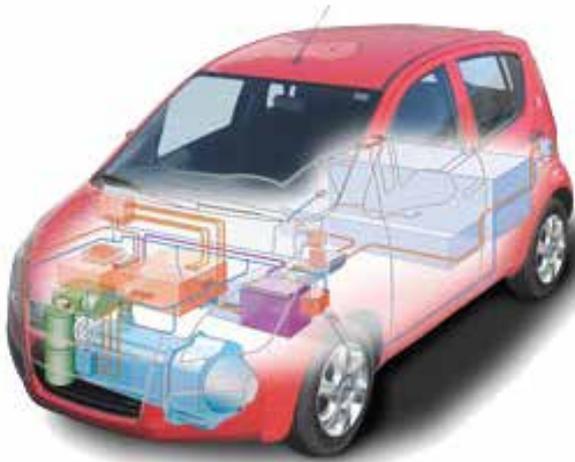
Mr Lenzing, thank you for the interview.

UNI Dicht® in German E-Cars

Agile Stromos depends on high operational reliability

GREBENSTEIN – Electromobility is no longer a dream of the future. An increasing number of vehicles are coming onto the market, including models from German E-Cars which are based on compact cars. Such E-cars place special requirements on cable glands for instance.

Case study



In the Stromos, which is based on the Opel Agila, German E-Cars offers a practical production vehicle already manufactured in great numbers. (Photo: German E-Cars)

German E-Cars GmbH was quick to recognise the signs of the times: the company launched the first German series-production electric car in 2009. The present Stromos is based on the Opel Agila. Under the bonnet sits the FRÄGER E-powertrain, which propels the compact car to a top speed of 130 km/h, over a range of about 120 km.

All vehicle components must be able to cope with long-term exposure to vibrations, changing weather conditions and temperatures. German E-Cars relies on PFLITSCH cable glands for the cable entries for the control cables between the batteries and the on-board system. Their sealing method also ensures long life-cycles because the inserted cable is not irreparably cut into or indented, as can frequently happen in practice with ordinary cable glands.

Reliable EMC solutions thanks to UNI IRIS® springs

To ensure that electromagnetic radiation cannot interfere with the vehicle's electronic systems, German E-Cars uses high-quality EMC cable glands from the UNI Dicht® range. Inside the brass cable gland, an IRIS spring maintains a reliable 360° contact with the cable's screening braid. As the pressure screw is tightened the spring washer tapers between two cones and is reliably pressed against the stripped cable screen.



German E-Cars integrates the powerful lithium-ion batteries in stainless steel housings fitted with cable glands. PFLITSCH cable glands provide vibration- and weather-resistant cable entries for the control cables. (Photo: German E-Cars)



Logical reference

Cable gland templates

In order to be able to reliably reference the cable glands' growing range of connecting threads, PFLITSCH created a practical metal thread template (left) in the 1960s which covered the sizes available at the time.

Harald Pflitsch took up this idea in the year 2000 during the market launch of the metric thread. He had a plastic UNI Dicht® template developed which, in addition to depicting the through bores for M10 to M63 cable glands, also featured printed tables for the minimum installation spacing of metal and plastic cable glands. A really practical idea for differentiating between PG and metric threads.

UNI Dicht® immortalised: Two books full of specialist knowledge

Over recent years PFLITSCH has published two books. These provide valuable information about the basics, potential applications, standards and guidelines for the use of cable glands.



Modern cable routing (2005), 70 pages



Modern cable entries (2012), 160 pages



Case study

This blue-and-white X60 local train has been running in Sweden for years. The six cars have space for a total of up to 500 passengers. (Photo: Alstom)

UNI Dicht® in railway engineering No chance for fire and smoke

SALZGITTER – Work has been in full swing at Alstom on the new Nordic X60 “Batch B” train since 2014 . The schedule shows the train entering service around Stockholm soon. Changes in technology and directives mean engineers have to come up with new solutions in many places – in the field of fire protection, for example. The train manufacturer decided to rely on certified PFLITSCH cable glands for his cable penetrations.

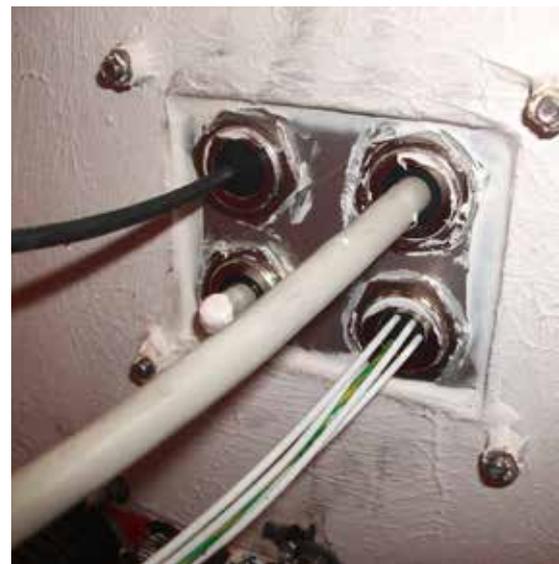
PFLITSCH cable glands retain their seal for 50 % longer

Alstom simulated the installation situation in the wall between the passenger compartment and the driver’s cab in tests: the four PFLITSCH cable glands installed there were exposed to a flame thrower in the test – and withstood this treatment for at least 22 minutes. This is 50 % longer than specified in the standard.



Following a number of train accidents caused by fires, the new fire protection standard EN 45545-2 came into force in the middle of 2013 for “better fire protection on railway vehicles”. For train manufacturers this means: they must ensure that fire and smoke cannot spread quickly in the train. The EU standard specifies that cable penetrations must retain their seal for a minimum period of 15 minutes. PFLITSCH was the first

PFLITSCH modified the TPE material used in the sealing inserts – now recognisable from their black colour. In combination with the high-quality nickel-plated brass cable gland bodies, UNI Dicht® cable glands meet the highest requirements, hazard level HL3, of the new EU standard for unrestricted use in trains – whether on open lengths of track, in tunnels or in stations.



Test set-up in accordance with the new fire protection standard EN 45545-2 at TU Braunschweig: The four PFLITSCH cable glands kept their seal for over 22 minutes, which is 50 % longer than required, even when directly exposed to a flame thrower. (Photo: Alstom)

PFLITSCH was the first manufacturer to have its cable glands, in particular the UNI Dicht® series – including the multiple version (r) – certified in accordance with the new fire protection standard EN 45545-2. (Photo: PFLITSCH/Lutz)

manufacturer to fulfil these high requirements and has had its UNI Dicht® cable glands certified in accordance with EN 45545-2.



UNI Dicht® – fit for the future

Carsten Wohlrath – an outlook

„Even after 50 years, the UNI Dicht® product is more up to date than ever. The

increasing requirements of industry demand high-quality, application-specific solutions. Our response is therefore to offer the market new materials and dimensions, for example the UNI Split Gland® which, thanks to its split design, allows preassembled cables to be fed through.



UNI Dicht® M4

And all this comes with a high ingress protection rating, excellent strain relief and great cable diversity, as our UNI Dicht® customers are aware. In addition, the splittable UNI Flange® range is also undergoing further development. Here, new cable gland variants allow larger plug connectors to be fed through. The well thought out installation concept for our flange system leads to quicker installation and removal, with a consequent reduction in maintenance times.

With the new UNI Dicht® 2M metric cable gland, which comes in sizes M16 to M50 for cable diameters of 5 mm to 38 mm, we are catering for customers who require large numbers of cable glands but do not wish to forego the usual PFLITSCH benefits. Their low overall height, small spanner sizes and wide sealing range allow a high density of cable glands to be installed wherever a large number of cable entries are required.

And because UNI Dicht® has already long established a foothold in markets beyond Europe, for example the USA and in the booming Asian economies, we also foresee further growth in high-quality, challenging applications in these countries. Our many international certifications, which include everything from EN, GL, CSA and UL through to ATEX and Gost, provide our users with the assurance they need for their international business.

UNI Dicht® will therefore continue to be the preferred cable gland when it comes to reliability, durability and diversity of applications for decades to come.”



UNI Split Gland®



Competence in cable management

Editorial information

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