

# AGRO cable glands

Customised solutions – as individual as our customers





## AGRO cable glands – the all-rounders.

Our standard range of cable glands is designed to provide ideal cable entry solutions for standard applications.

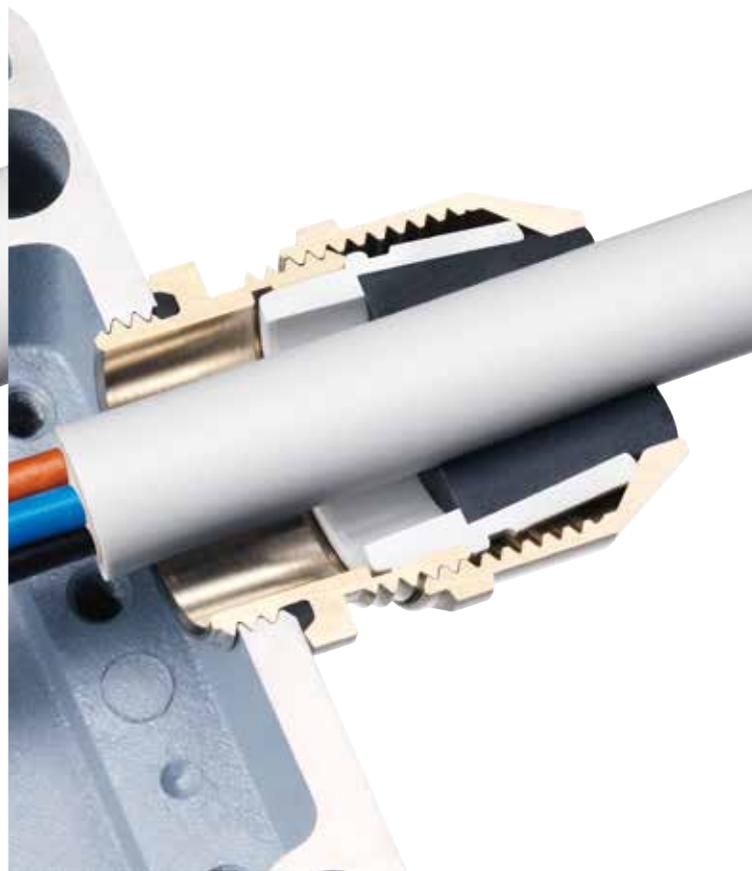
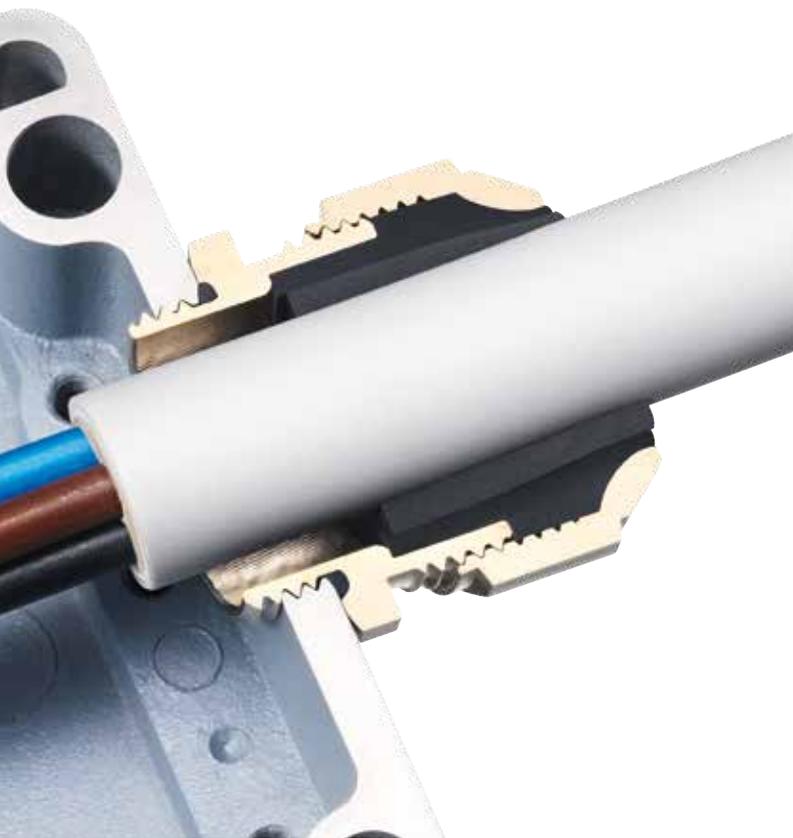
In some specific situations, the cable gland must be adapted to special requirements. It is often possible to find a suitable solution simply by assembling the Progress® kit's components in an appropriate way. All individual components of the kit are compatible and can be freely combined.

However, in some cases, a special cable entry solution must be developed. In this case too, the modular design of the Progress®-system enables any single component of the cable gland to be customised individually, making the process fast and cost-effective.

We can supply cable glands with any required thread type, in various materials and customise sealing inserts in terms of material and of number and shape of cable entries in order to meet all requirements.

Long-term reliability is the top priority.

Contact us, if your equipment needs cable entries. We will find a nicer, simpler or more efficient solution for you!



## Two clamping technologies – for all requirements.

### Progress® in brass, steel or synthetic material

The outstanding **compression technology** of AGRO Progress® cable glands ensures an effective sealing and excellent cable-protecting strain relief, also for dynamic loads. Sealing inserts for special applications such as railway applications according to EN 45545 or for drinking water, food industry or cleanroom applications are available as standard.

- 1 Short, long or special entry threads (metric, PG, gaspipe or NPT)
- 2 High distortion protection thanks to longitudinal grooves in the lower part
- 3 Two-piece sealing inserts for larger clamping range
- 4 Inner contours matched to the sealing insert cause the desired deformation ensuring sealing performance in compliance with protection class IP 68 up to 10 bar and IP 69

### Syntec® in brass or synthetic material

Syntec® cable glands with their innovative **lamellar technology** are particularly suitable for flexible, reliable everyday use. The pre-fixation of the synthetic compression nut facilitates easy overhead installation.

- 1 Short or long entry threads (metric, PG- or NPT)
- 2 The elastic sealing rings with good chemical resistance provide a reliable seal, are particularly durable and offer guaranteed protection to protection class IP 68
- 3 Lamellar geometry with movable jointed lamellas facilitate the insertion of cables of varying diameters and ensure outstanding strain relief and distortion protection
- 4 The large spanner flats of the synthetic compression nuts ensure a reliable and secure spanner grip when turning



# Progress®: Modular cable gland assembly kit in nickel-plated brass

The modular design of our **Progress®**-range is one of its great strengths. The components are designed with the others in mind, and can be freely combined with each other. Customer-specific requirements can be flexibly, practically and quickly met. We will combine the most suitable upper and lower parts with the right sealing insert for you, and thus deliver the most effective, most efficient solution for your needs.

## Standard upper part



## Standard sealing inserts

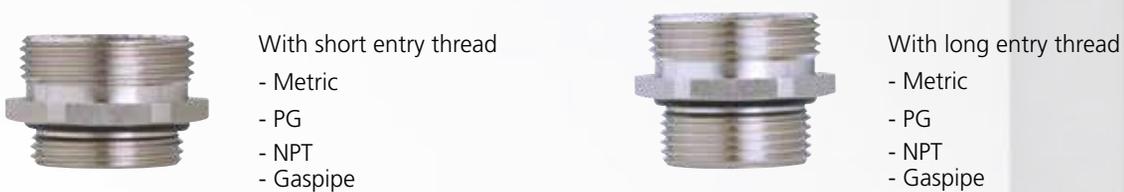


Short one- or two-piece sealing inserts in NBR, TPE, Special TPE to EN 45545, or FPM (temperature-resistant)

Long one or two-piece over-all length insulating sealing insert made of NBR or TPE special TPE acc. EN 45545

For the most common cable diameters, sealing inserts are available for the entry of several cables at once

## Standard lower Part



## Customisation

Where requirements are very specific, we custom-design each individual component of our Progress® cable glands accordingly: both metal parts and sealing inserts can be tailored to optimally meet your needs, reducing assembly time and enhancing reliability.

### Customised upper parts



Upper parts can be customised with respect to both shape and thread.

In close cooperation with the customer, a component is developed which best meets individual requirements and optimises user benefit.

### Customised sealing inserts



Sealing inserts can be customised with respect to shape and number of cable entries, and to material. We work with the following materials:

- NBR
- TPE
- TPE-V
- FPM
- Silicone rubber
- HNBR
- EPDM
- Special TPE acc. to EN 45545

### Customised lower parts



Lower parts can be customised with respect to shape and entry thread. All sizes and customer-specific lengths are available with the following types of threads:

- Metric
- NPT
- PG
- Gaspipe



# AGRO tailored solutions in use

## Application examples

We really get in our stride when developing solutions to specific challenges, together with our customers.

A cable entry for an industrial production facility (see picture), an economical and weather-resistant connection between two units or especially watertight cable entries for a submarine – challenges

like these are the highlight of our workday and enable us to help optimise our customers' work processes.



## Application in the Gotthard Base Tunnel, the world's longest railway tunnel

### The situation:

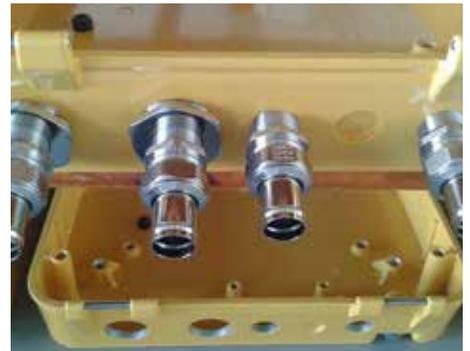
Safety arrangements in the Gotthard tunnel are extensive and provide for permanent monitoring of trains as they pass through. At relatively short intervals, so-called axle counters check the completeness of the train. The equipment is exposed to rough tunnel conditions, including stone impacts.

### The requirement:

The power cables should be protected from stone ballast by an impact-resistant conduit. The connection between cable gland and conduit should be as simple as possible.

### The AGRO solution:

The solution is based on a standard Progress® cable gland. It is supplemented by a customised conduit connection sleeve for a simple and tension-resistant fitting for the protective conduit. When not in use, a cap seals the cable entry to IP 68 requirements.





## Pressure compensation element for avalanche and wildlife-crossing systems

### The situation (1):

In mountainous areas, roads, ski slopes and residential areas are protected from avalanches by exploding up large quantities of snow in areas where they cannot cause any damage.

Explosion devices are often permanently installed and exposed to the weather conditions. Changing temperatures cause condensation water, which can corrode monitoring and control electronics leading to malfunctions.

### The situation (2):

A wildlife-crossing warning system monitors the movements of wild animals and warns motorists when they approach the road. Differences in temperature between day and night / summer and winter have caused condensation in such equipment in the past preventing it from working properly.

### The requirement:

The formation of condensation water must be prevented.

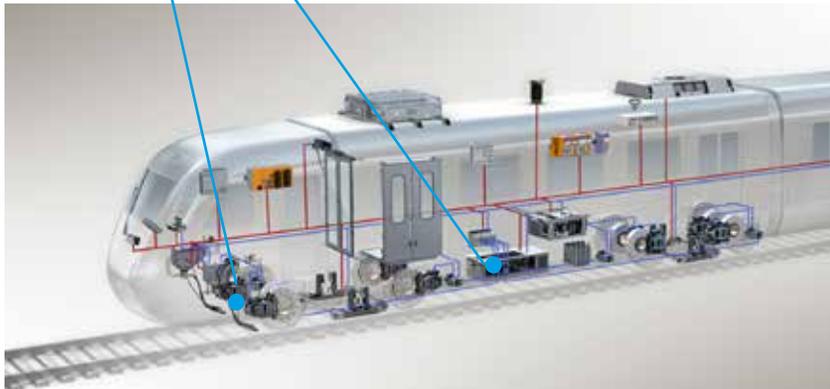
### The AGRO solution:

With AGRO pressure compensation elements with membrane, differences between atmospheric pressure and the pressure inside the housing are balanced so quickly that the formation of condensation water is prevented. Short-circuits resulting from corrosion or unwanted contact of conducting parts can thus be avoided.





## Dynamic application in the new Stadler Giruno low-floor high-speed multiple unit train



● Location of the special part in the train

### The situation:

Cables in the area of the wheel brakes could be damaged by stone impacts and are thus protected by special conduits. The cables lead into an enclosure that houses the entire control system.

### The requirement:

Two cables, protected by conduits, required to be inserted, fully sealed, into an existing internal thread in the enclosure. Condensation forming inside the conduit had to be prevented from entering the enclosure. The available space was limited.

### The AGRO solution:

A special brass part, which is screwed into the enclosure's internal thread has itself two entries with internal threads into which cable glands with F-type sealing inserts can be screwed.

Special sleeves for fixing the conduits in place are directly integrated in the compression nut.



## Carriage transitions in Norwegian in FLIRT trains

### The situation:

Power and data cables must be fed from the pantograph on the train's roof into its technical room. The cables are to be EMC protected. The sealing of the cable entries must be absolutely ensured.

### The requirements:

The EMC grip of the power cables required to be carried out by means of a metal protection conduit. The penetration of condensation water into the technical room must be prevented.

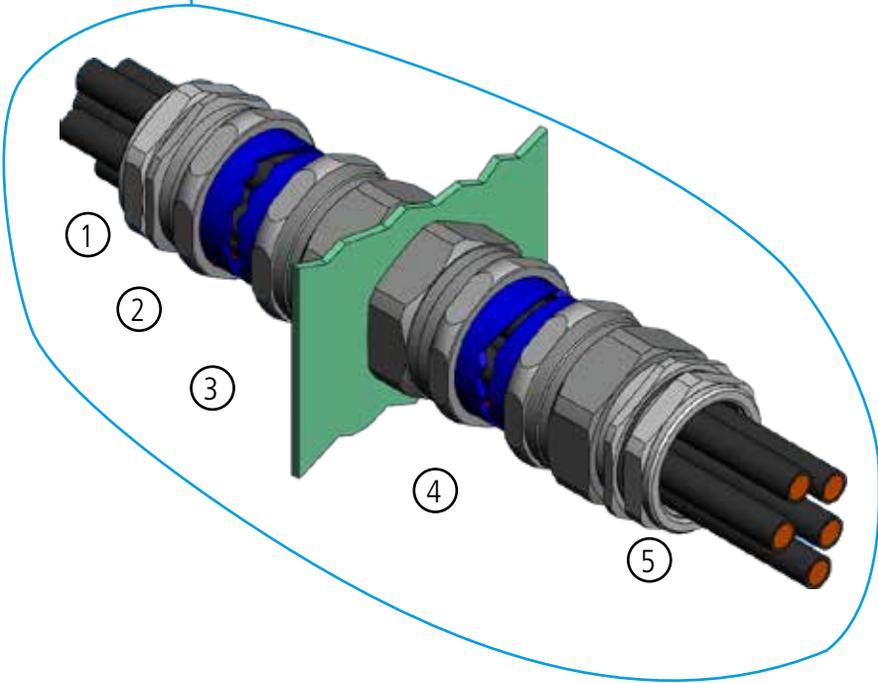
### The AGRO solution:

The real stroke of genius of this special solution is its individualised combination conduit gland, whose thread can be screwed into an individualised conduit gland with internal thread. The thread of the combination conduit gland passes through the wall of the roof entry and creates a sealed cable entry when screwed into the conduit gland.

The cables are sealed with a M75 multiple cable gland, both outside the entry point and at the entrance to the interior – doubling up on the protection provided.

The cables are also shielded from electromagnetic interference by the metal protection conduits inside and outside.





- 1 Conduit gland to secure the metal cable-protection conduit.  
Six power cables are run within the protective conduit. The metal conduit functions as an external EMC shield through its connection with the metal enclosure
- 2 Combination conduit gland with Progress® multi-sealing insert for sealed cable entry into the transformer room (protection from external moisture)
- 3 Conduit gland to receive the metal conduit (extension of EMC protection)
- 4 Combination conduit gland (identical to #2) for cable entry into the transformer room (protection from internal moisture)
- 5 Locknut to secure the combination conduit gland

● Position of the special part



## Rodent protection for outdoor applications

### The situation:

In outdoor installations, cables and cable entries are often freely accessible - a feast for rodents, martens and birds. They love rubber!

### The requirement:

Cables required to be routed through a rodent-proof protective conduit and entered, via sealed entry point, into an enclosure.

### The AGRO solution:

The respective advantages of a conduit gland and a cable gland were combined in a single special part. The conduit gland accommodates a liquid-tight conduit with a steel coil and protects the cables from rodents. For the cable entry, an EMC cable gland was selected, which both ensures reliable gripping of the cable's braiding and protects against interference signals.





## Special solution for „very heavy duty” application

### The situation:

Construction equipment for concrete must be able to withstand a great deal. They should not be damaged by water or stone impacts. Cable entry points are particularly vulnerable.

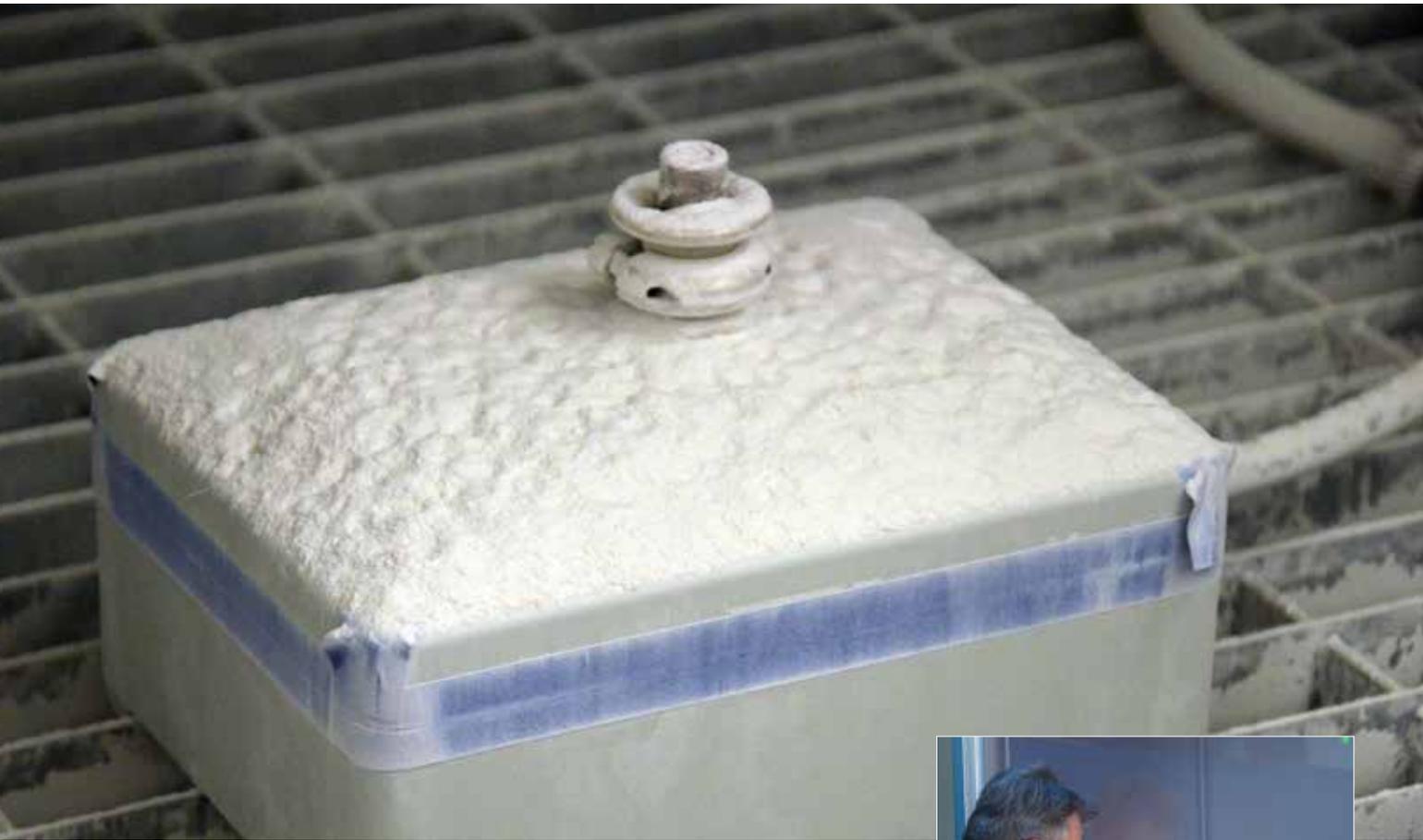
### The requirement:

Cables required to be protected against kinking while also being prevented from pulling out of the enclosure. An EMC grip was required at the entry point.

### The AGRO solution:

The solution is based on the standard EMC cable gland with antikink protection from a spiral stainless-steel spring. It safely absorbs even high dynamic bending loads at the cable entry point, and protects the cable against crushing and buckling. With the additionally integrated clamping jaws, a very high degree of strain relief is achieved, which prevents the cable from being pulled out and ensures that the EMC braiding contact remains secure despite the dynamic loading.





## The right choice for any special needs

### The AGRO testing laboratory

Our in-house testing laboratory is certified according to SMT standards and ensures the quality of our products. It can carry out tests, the results of which are recognised by official certification bodies such as electrosuisse, VDE or UL as the basis for an official certification.

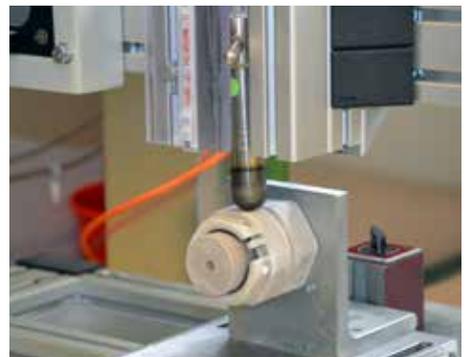
### We can also conduct testing for you

If a special part is required to comply with official standards or requirements, our testing laboratory can check its compliance - with your specific product and the cables that are to be used in practice. This ensures the greatest possible assurance of functional reliability under specific conditions. Our testing laboratory is well equipped with up-to-date instruments and can carry out the following tests:

- Water pressure resistance
- Tensile strength
- Glow wire resistance
- Lateral pressure resistance
- Thermal ageing
- Flexural strength
- Dust test
- Climatic test
- Oil spray test
- Impact resistance
- etc.



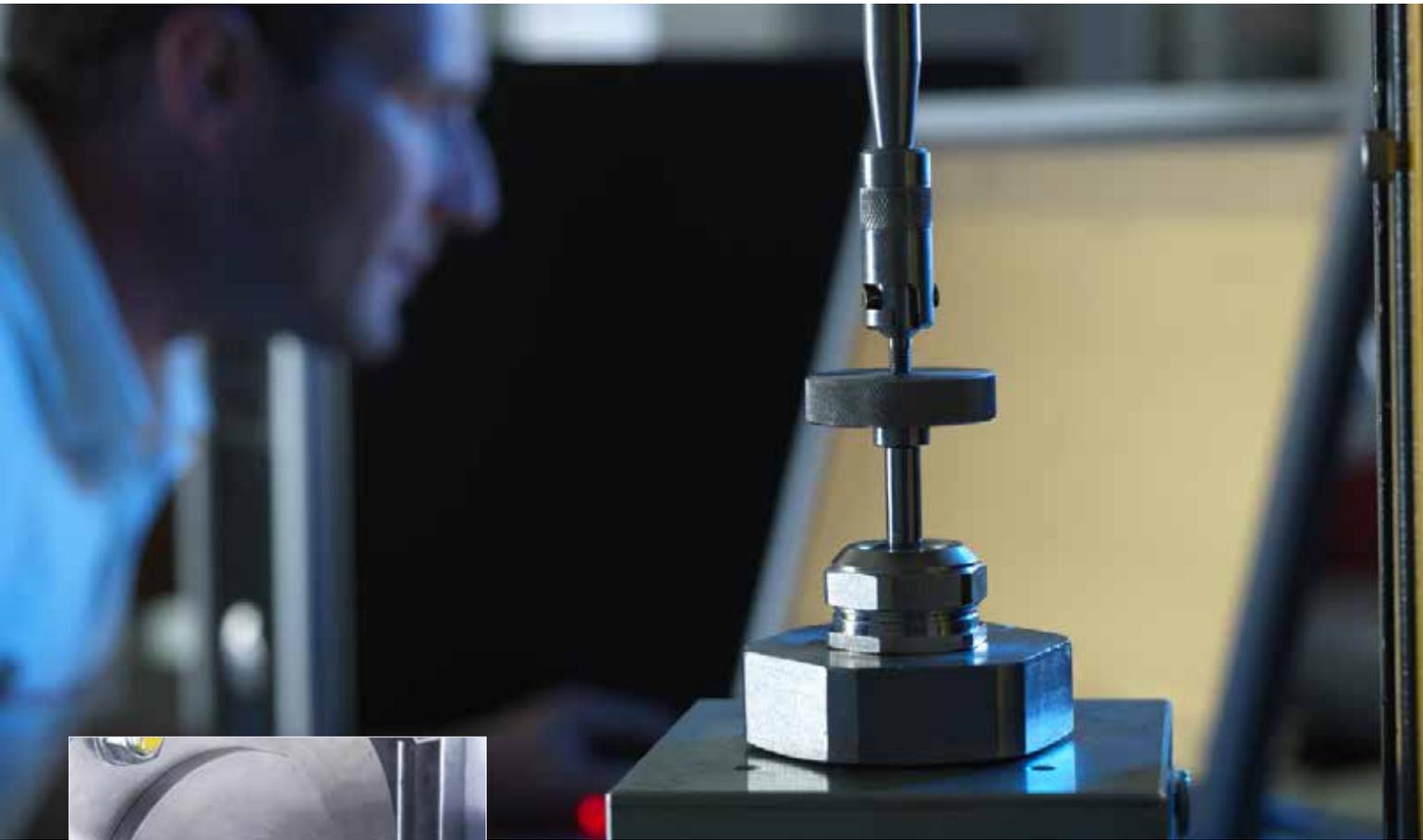
Glow wire resistance



Impact resistance



Oil spray test



Sealing test



Flexural strength test



Tensile resistance

## An example

### The situation:

A special solution needed to be worked out for the inter carriage transitions of a particular type of trains, in which great emphasis was placed on vibration resistance and especially protective cable clamping. The sealing insert of the cable gland required to be designed in accordance with of EN 45545.

### Test arrangement:

A cable gland with an F-type sealing insert was first subjected to a sealing test, using the original cable. Then a 500-cycle flexing test was carried out using the proposed jumper cable. After this loading, a further sealing test was carried out to determine whether - and if so, by how much - the sealing performance had decreased. Finally, the maximum pull-out force was determined using the already loaded cable gland.

After the cable gland / cable combination had successfully passed the tests, the customer could have confidence that the special part as developed will provide good, reliable long-term performance.

# Systems and solutions for professional cable routing.



Cable glands



Protective cable conduits



Electrical installations



BST sealing systems



Explosion protection



Fire protection



Sound insulation



EMC



Android App English



iOS App English

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