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## **Do you REALLY know barrier glands?**

An in-depth look at the seal options for barrier glands

The types of barrier glands on the market today are wide ranging and choosing the correct products for your application can be a complex process.

It is essential that the correct seal method is used. We take an in-depth look at each seal option for barrier glands to help you navigate the selection process.

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International

## What is a cable gland?

A cable gland is designed to secure a cable to a piece of equipment or enclosure. It provides strain relief and can include a provision for making a connection to the armour, braid, lead or aluminium sheath of the cable. It may also be used to maintain an IP rating, this would be dependent on the equipment the cable gland is mounted to.

For unarmoured and braided cables, this strain relief is provided by the seal only. For armoured cables the armour and clamp can also provide pull-out resistance. In hazardous areas, cable glands are also used to maintain the protection concept of the equipment or enclosure into which they are being terminated - in most instances Exe or Exd.

## What is a barrier gland?

A barrier gland is a cable gland that provides a seal around the individual cores of a cable to maintain the flameproof integrity of Exd equipment. These glands meet the requirements of IEC 60079-1 and employ a compound seal or other sealing method around each core. This prevents gas migration which can mitigate any possible explosion in the outside atmosphere.

## A history of expertise and innovation

With over 65 years of experience manufacturing cable termination products for harsh environments, Hawke International built a reputation around safety and reliability. All our cable glands meet or exceed test requirements for use in potentially hazardous areas, providing safety with cost-effectiveness. Plus, our global sales network and distribution partners offer superior technical support. Installers and owners count on Hawke products for peace of mind.

## The risks

Poorly installed cable glands or glands that are incorrect for a given application can become the weakest link in the chain. It should preserve the integrity of the overall installation. Whilst the

cost of cable glands is insignificant compared to that of other hazardous area equipment, the cost of failure can be catastrophic.

## The Hawke International range of barrier glands

Our comprehensive range of barrier glands deliver benefits and features not offered by other manufacturers.

Complete explosion protection and inspectability are prioritised in our product development. The search for inspectability pushed us to develop a unique transparent silicone compound pot in which the compound is visible both as it is being installed and once installation is complete.

We now manufacture an innovative, redesigned multi-diaphragm seal that offers all features of a traditional barrier gland and eliminates the need for additional compound.

A traditional metallic compound pot uses a flame path to dissipate the energy of an ignition. The flame path is a tightly controlled clearance between the pot and the gland housing.

If the clearance is too large, there is a risk of ignition. If the clearance is too small, the pot won't fit into the gland. Any scratches or damage render the gland useless. Our silicone compound pot works by compression, meaning that the flame path gap is always zero.

## Barrier gland installation options

Really get to know barrier glands as we explore the nuances of two-part putty compound, express epoxy resin, and instant barrier seals.

In hazardous area environments, barrier gland installation plays a pivotal role to ensure safety and protection. The availability of different options, including putty compound, Express resin, and instant barrier seals, necessitates a thorough understanding of their features and considerations.

This comprehensive analysis of barrier gland installation options will clarify their advantages and disadvantages. It facilitates your informed decision-making when choosing which is best for your application.

## Two Part Putty Compound

Putty compound has long been a popular choice for barrier gland installation due to its unique characteristics. One of its key advantages is its suitability for horizontal installations, providing flexibility for installation anywhere in the field.

Faster-setting putty compounds are now available, such as our QSP (Quick Set Putty). This formulation saves valuable installation time when compared to compounds of the past, which took over 24 hours to cure.

When installing putty compound with Hawke cable glands, users can see that each core is properly contained within the putty as they build the barrier seal, enhancing precision and quality.

The cable gland design allows for inspection capability and ensures the compound is free from any irregularities during installation or damage sustained during service.

Putty compound does have drawbacks which should be considered. Two-part putty installation involves a hand-mixing process which introduces a risk of improper mixing. Inconsistent mixing can compromise the putty's performance, leading to potential vulnerabilities such as the barrier seal not curing as intended.

Additionally, installing putty can be a time-consuming task, particularly when dealing with cables which contain a large quantity of conductors. This time investment can impact project timelines and productivity.

Putty compound may also have hidden voids within the compound that are not visible due to the opacity of the compound. These voids can undermine the integrity of the barrier seal, creating weaknesses and potentially introducing risk of gas migration down the cable.

Proper preparation of the compound and positioning of cable conductors is crucial to achieving the necessary movement required to fill the compound chamber effectively. Failing to prepare adequately may result in failure.

Putty compound has a fixed shelf life, and expired compounds must be disposed of and replaced to ensure reliability and effectiveness.

## Express Resin

Hawke Express Resin provides an alternative solution for barrier gland installation, offering its own set of advantages and considerations. A key benefit is how the Express resin compound assures correct mixing.

The resin conveniently mixes inside the nozzle, ensuring the right blend of components for consistent performance. The liquid properties of Express resin allow it to flow around conductors, forming a solid barrier without any voids. This seamless flow ensures a reliable and robust seal.

Express resin installations can be inspected when using our glands, allowing for visual confirmation of the compound's integrity. This inspection capability ensures that the compound chamber is properly filled and provides piece of mind that the cable gland is installed to meet the required protection concepts.

In cases where air pockets become visible during pouring, prompt action can address these pockets and ensure a more consistent barrier formation. Pouring a liquid resin is generally faster compared to using putty, resulting in shorter installation times.

Express resin does have limitations that require careful consideration. Unlike putty compound, express resin must be poured vertically. This may introduce additional planning and adjustments in certain installation scenarios. Inexperienced users may find the pouring process messy, as it demands careful handling and preparation to avoid spills and wastage.

The working time for express resin is relatively shorter compared to putty, necessitating efficient and swift execution during the installation process. Once the compound sets, rectifying any errors becomes challenging, often requiring a complete restart with a new installation (unlike two part putty which can be repaired).

As with putty, express resin has a shelf life, and expired compounds must be disposed of and replaced to maintain performance.

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In addition, express resin may have specific considerations for shipping due to compliance with Dangerous Goods regulations. These regulations govern the safe transportation of potentially hazardous materials, adding an additional layer of complexity when using epoxy resin for barrier gland installation.

### Instant Seals

Hawke International's new multi-diaphragm seals offer distinct advantages for barrier gland installation, making them a noteworthy option to consider. One of their most significant advantages is the installation flexibility they provide. Instant barrier seals can be installed in any orientation, offering versatility in accommodating different installation setups.

These seals are designed for almost any environment, making them suitable for diverse harsh conditions. This adaptability ensures consistent performance, regardless of the environmental challenges.

In terms of inspection capabilities, Instant barrier seals offer an enhanced level of scrutiny compared to compound-based solutions like putty compound or Express resin. This increased inspection capability allows for regular maintenance, ensuring the longevity and reliability of the barrier seal.

A faster overall installation process streamlines project timelines and minimises equipment downtime. Once the installation is complete, equipment can be switched on immediately. There is no waiting time for curing. This immediate barrier solution enables swift resumption of operations, reducing potential disruptions and losses.

Cost-effectiveness is another noteworthy advantage of instant barrier seals. They often present a more affordable option for traditional barrier gland installation, offering a viable solution for budget-conscious projects.

As a comprehensive Exd and Exe solution, instant barrier seals cater to a variety of application requirements with a single gland type, streamlining procurement and reducing complexity in installations.

The Hawke instant barrier seal is easy to replace. In the event of seal damage, it can be easily swapped out without the need for extensive reinstallation processes. This convenience minimises equipment downtime and ensures the continuity of operations.

Seals have an infinite shelf life, eliminating concerns about expiration and ensuring long-term availability.

Instant barrier seals offer further advantages in terms of safety and handling. Unlike putty compound or epoxy resin, they are not bound by regulations for shipping. This can simplify logistics and compliance requirements.

The risk of voids, which can compromise the effectiveness of the barrier seal, is significantly minimised with instant seals. They provide a superior service temperature, ensuring reliable performance even in demanding operating conditions.

It is important to acknowledge the limitations of instant barrier seals. Installation doesn't involve handling any raw chemicals, so potential handling risks are reduced. Careful consideration is required when selecting a seal like this for projects involving large or irregularly sized cores.

As with any type of gland, incorrect installation can potentially lead to seal damage. This compromises the overall effectiveness of the barrier gland installation. Proper training and expertise are crucial to ensure optimal performance and safety.



### In Conclusion

Barrier gland installation is a critical consideration for installing cables in hazardous areas. Putty compound, Express resin, and the multi-diaphragm seals offer distinct advantages and considerations, each catering to specific installation requirements.

Putty compound provides flexibility in horizontal installations but demands careful mixing, has longer cure times, and may have hidden gaps within the compound.

Express resin offers the assurance of correct mixing, faster installation and curing times, but requires vertical pouring, has a shorter working time, and involves considerations for shipping and shelf life.

Multi-diaphragm seals provide installation flexibility, increased inspection capabilities, immediate barrier solutions, cost-effectiveness, and ease of replacement, but have limitations on core size and quantity.

Understanding the nuances and uniqueness of each option is crucial in making informed decisions for optimal safety and protection in hazardous area environments. Consulting with experts or qualified professionals for barrier gland installation is highly recommended to ensure successful and reliable installations.



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