



# RAPID Ex

Barrier Glands Made Easy



**The Fast Curing, Gas Blocking, Liquid Resin Seal**



**CMP PRODUCTS**

## Sealing cables in explosive atmospheres

Electrical power, control and instrument cables are manufactured to a host of different national and international construction standards. The matter of correctly sealing these cables as they enter hazardous area electrical equipment is an essential safety

requirement the world over. Ensuring that the installed cable entry maintains the protection method of the associated equipment is a safety critical aspect of the installation which should not be treated lightly.

### Sealing ring or barrier seal?

In some cases the sealing of cables may be achieved using a cable sealing ring applied to the extruded inner cable bedding, a method which is permitted in some hazardous area situations. However the cable to be used must be evaluated first to ensure it is suitable for the application of a cable entry with a sealing ring, otherwise a barrier seal may be necessary. Even when cables are deemed to be suitable for being sealed by a sealing ring other factors laid down in statutory installation standard requirements determine that this may not be a safe scenario. (see page 9 for further guidance)

When flameproof Type 'd' enclosures (also categorised Ex d) are encountered the cable entry selection is most critical, as this protection method relies upon the principal of 100% containment. Some Ex d equipment is manufactured utilising factory sealed cables, or barrier bushings that seal around individual

cables used to interconnect between two hazardous area enclosures. However the vast majority of Ex d equipment is connected using cables that have been installed on site using suitably certified Ex d cable entry devices, these being either a cable gland with a sealing ring, a barrier gland, or cable sealing stopper box.

For Flameproof Type 'd' (Ex'd) enclosures a barrier seal provides the very best method of sealing cables as they enter the electrical equipment. In certain circumstances, if the wiring code in operation allows it, elastomeric sealing rings may be permitted to seal between the cable and the gland body, but only where specific restrictions on the cable construction are satisfied. If in doubt, barrier seal cable glands should be used.

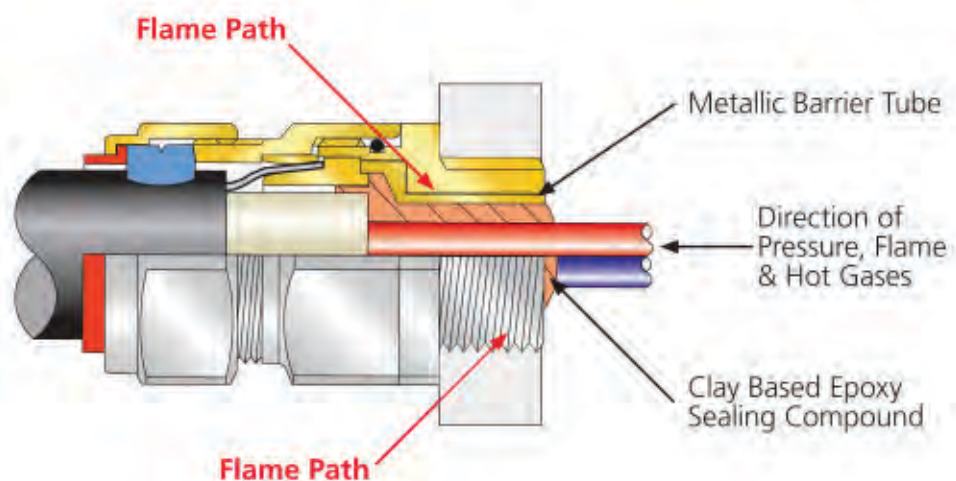
Under NEC conditions an approved barrier seal must be used.

### What is a Barrier Gland?

A barrier gland is an Explosion Protected (or explosion proof) cable gland incorporating a sealing chamber through which the individual insulated cable conductors are passed, and a barrier is formed around the conductors. This ensures that gas migration through the cable is prevented and also provides a flame barrier if an explosion occurs, thus

maintaining the explosion protection integrity of the equipment to which it is connected. It is essential that the barrier seal is created correctly and this requires a higher level of competence than would normally be required for the installation of a hazardous area cable gland incorporating a sealing ring.

### Typical Flameproof Type 'd' Compound Barrier Cable Gland mounted on SWA Cable



## What issues exist with Barrier Gland installations?

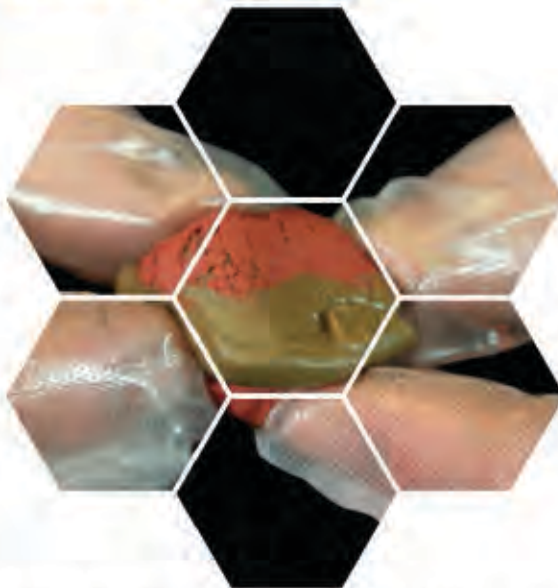
Traditional barrier type cable glands employing epoxy/clay based sealing compound have been used in hazardous areas for many years to provide effective explosion protection.

The barrier material is a two part formula that needs to be mixed thoroughly on site at each cable end before application. This is not only time consuming but requires extreme diligence. However a certain degree of risk is associated with this traditional installation process and this risk increases with the number of conductors in multi-core cables.

The standard technique involves the "packing" of the sealing compound between and around the individual cable conductors which is required to form a complete seal, and then leaving the assembled cable gland to cure, without disturbance, for several hours before connecting the cable to the equipment.

Failure to correctly perform the mix and / or application of the compound, or premature disturbance of the conductors may lead to critical failure of the barrier seal, or extensive rework being required, assuming that such an error can be detected.

One of the major challenges with the packing of compound is avoiding channels, voids or air gaps. 'Channels' in the barrier (caused by movement of the cores) are easy to identify but voids within the barrier are almost impossible to detect especially when multi conductor instrument and control cables are installed,



Examining the surface of the cured compound externally is no guarantee of the overall integrity of the barrier seal.

Regardless of which brand of barrier gland is selected, the difficulty of ensuring the integrity of the barrier seal is one of the key reasons why many clients remain sceptical over the reliability of the epoxy/clay based material.

## Is there a more reliable solution?

Considering the high volume of multi conductor control cables and multi-pair instrument cables installed in hazardous areas there needs to be a better solution that delivers more reliability to the installation, and gives the user more confidence in the method of application.

If risks can be reduced significantly by using a solution that is easier to work with and more likely to be right at the first time of asking, then this option should be pursued vigorously in the interests of enhanced safety.

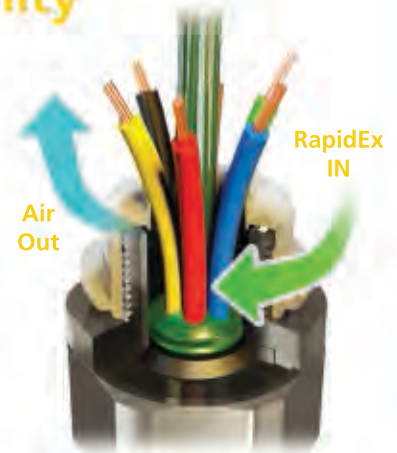
### Examples of typical multi-core cables



## A revolutionary sealing solution for barrier glands that delivers increased reliability



is a Liquid Pour, Fast Curing, Liquid Resin Seal that installs in seconds and cures in minutes. Its unique formula begins with a low viscosity liquid that flows into the cable interstices completely surrounding the cable conductors, driving out the air in the process. The viscosity then increases and completely cures in minutes, dependant on ambient temperature (see comparison graphs on page 5).



### RapidEx benefits



is a revolutionary sealing system that gets right to the heart of the cable interstices and can be reliably installed in no time at all.

- Simple cable preparation,
- Easy liquid pour RapidEx resin application,
- Cleaner, faster mixing process,
- High consistency of liquid pour fill,
- Fully compatible with IEC & CEC / NEC wiring code rules,
- Thermal endurance / age tested to the latest version of IEC 60079-0,
- Explosion pressure tested to IEC 60079-1:2007, CSA-C 22.2 and UL 2225,
- No need for repeated cable gland disassembly before connection to equipment,
- Faster RapidEx curing time, allowing earlier energizing of equipment,
- Enhanced accuracy, improved reliability.



### Effective seal

**During application the liquid resin flows between and around the cable conductors ensuring a complete and total seal with zero gaps.**

In the process of curing the RapidEx resin adheres to both the cable conductors and the inside of the barrier tube creating a bond that is set for the life of the cable gland product.

The RapidEx seal will never crack or shrink with changes in temperature.



**Perfect Seal Every Time**

# Fewer steps in the installation process

## Traditional epoxy/clay based compound

- 1 Prepare cable
- 2 Clamp armour
- 3 Mix compound
- 4 Pack cable crutch
- 5 Fill interstitial spaces
- 6 Pack around cores externally
- 7 Clean off excess compound
- 8 Pack front of gland



4



## Liquid pour resin

- 1 Prepare cable
- 2 Clamp armour
- 3 Mix liquid resin
- 4 Pour resin



The above comparison shows time taken when clay based epoxy compound and RapidEx liquid pour resin are applied to M20 (1/2") cable gland mounted on a typical 4-core armoured cable.

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.