

**WORKING IN
HAZARDOUS AREAS ?**

**ARE YOUR CABLES
FILLED AND
NON HYGROSCOPIC ?**

NOT SURE ?

**CCG HAS A RELIABLE,
QUICK AND
SAFE SOLUTION !**



ARE YOU INVOLVED WITH ELECTRICAL INSTALLATIONS FOR HAZARDOUS AREAS?

If so, you should be aware with problems of terminating cables into hazardous areas equipment and the various codes of practice and standards applicable.

PROBLEMS WITH CABLE CONSTRUCTION:

In order to comply with the installation codes of practice, cable glands using elastomeric sealing rings should only be used on cables that are substantially round and compact with an extruded bedding and have non hygroscopic fillers such as Figure 1. However this cable construction is not always possible especially when it comes to multicore cables. Figure 2 and 3 show cable that should not be used with glands with elastomeric sealing rings.



Figure 1



Figure 2



Figure 3

CODES OF PRACTICE:

The following Standards give guidance and prescribe the selection of electrical equipment in hazardous areas:

AS/NZS and IEC 60079-14 : Explosive atmospheres; Electrical Installation, Design, Selection and Erection

A knowledge of these Standards is imperative when selecting cables and cable glands for use in hazardous areas and merely referring to the product certification is not enough.

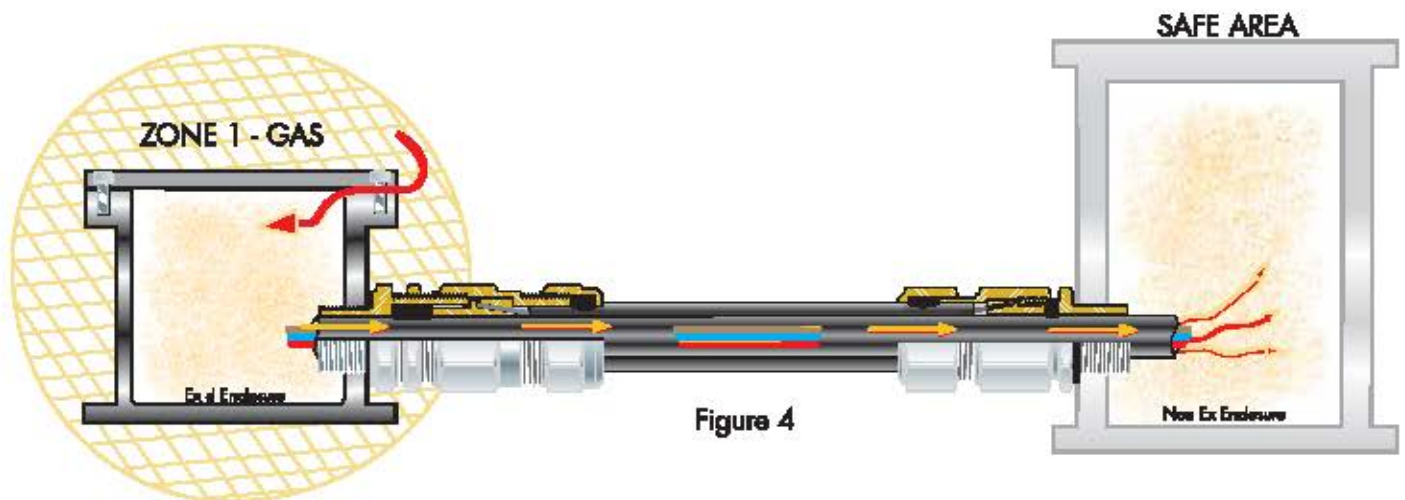
WHEN TO USE A BARRIER GLAND

EC 60079-14 and AS/NZS 60079-14, Section 9.3 States:

"NOTE: Where enclosures are likely to be subjected to large variations in ambient and/or service temperature conditions, a 'pumping' action can transfer the fluids from the hazardous atmosphere through cables which are not substantially compact. Similarly cables with non filled interstices or with hygroscopic fillers (eg. fibre fillers), may transmit flammable fluids through the interstitial spaces of the cable under capillary or hygroscopic action with sufficient partial pressure to exit the cable termination at the extremities of the cable.

Particular caution is drawn to the use of electro-pneumatic transducers and the like which employ natural gas as their pneumatic medium. When such cables link between a hazardous and non-hazardous area this may result in a flammable atmosphere being transported to the inside of, for example, control room equipment. The situation is likely to be most acute with equipment installed in a Zone 0 or Zone 1 location (where the presence of a hazardous atmosphere has a greater likelihood and duration). If these conditions are likely to apply, a cable sealing device (which seals between the inner sheath and the individual conductors) should be used".

Therefore it has been established that if unfilled cable is used explosive gases or liquids can migrate down the interstices of a cable from a hazardous area into a safe area as shown in Figure 4.

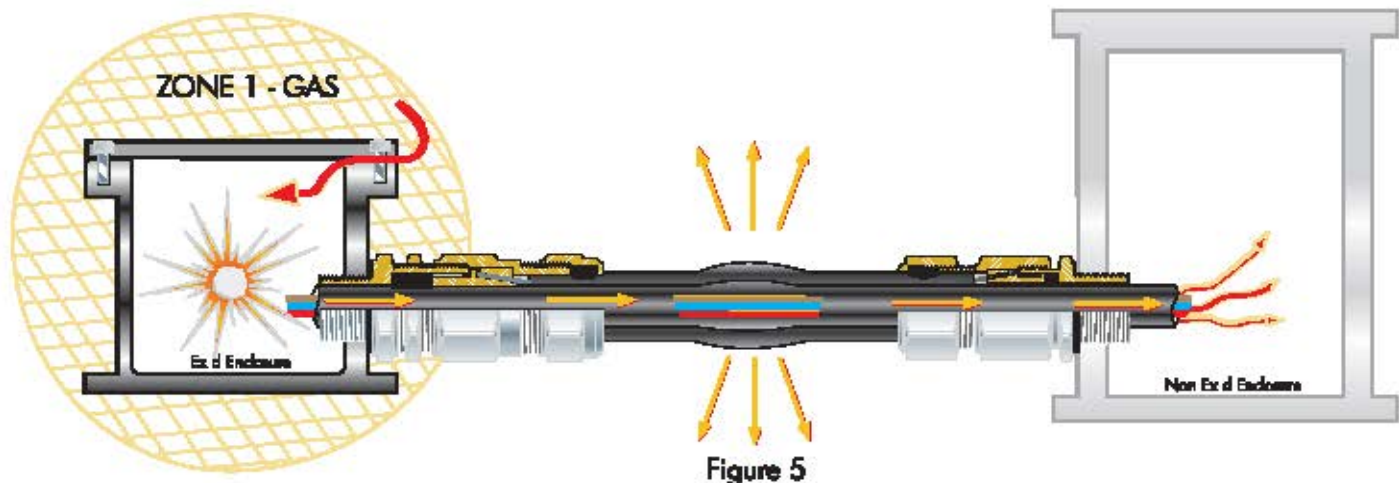


The use of Barrier Glands for Ex d equipment is prescribed by the Installation standards as follows:

AS/NZS 60079-14 Section 10.4.2
IEC 60079-14 Section 10.4.2

Flameproof Ex d cable glands are designed primarily to retain the explosive pressure within an Ex d enclosure and prevent the passage of hot gasses through the cable entry to the surrounding atmosphere. The design of such cable glands relies on elastomeric seals sealing around the bedding of the cable to perform this function.

It has been established that if cables are not effectively filled, substantially round and are hygroscopic, hot gasses and pressure produced by an explosion within an Ex d enclosure can bypass the protective elastomeric seals of a conventional Ex d Gland. These hot gasses can be forced down the interstices of the cable resulting in the potential damage to the cable and or non Ex d equipment. Figure 5 illustrates this.



Barrier Glands are not only required for Ex d

Ex nR Restricted-Breathing Equipment when used with unfilled hygroscopic cable may also require the use of Barrier Glands. IEC 60079-14 Section -14.3.2.2 states; "The sealing of restricted-breathing enclosures shall be such as to maintain the restricted breathing properties of the enclosure".

"NOTE 1: Where the cable used is not part of the certificate and/or instruction manual and is not effectively filled, it may be necessary to use a cable gland or other method (e.g. epoxy joint, shrinking tube) which seals around the individual conductors of the cable to prevent leakage from the enclosure".

Ex p Pressurized Equipment may also necessitate the use of Barrier Glands.

IEC 60079-14 Section -13.1.7 states; "Where necessary, to prevent the ingress of combustible gas or vapour by diffusion, or to prevent leakage of protective gas, wiring systems shall be sealed.. NOTE 2 Compact cables, barrier glands and/or conduit seals should be considered as sealing methods".

CCG Solution...

The traditional two part putty compound barrier glands, whilst effective in operation, are difficult and time consuming to install.

The lengthy process of mixing and applying the putty around all interstices of the cable leaves a wide margin for error.

With the increasing use of the multi core cables, the traditional putty based compound barrier glands become less and less of a viable option. Recently a liquid pour resin based system has been re-introduced back into the market to address these problems.

A liquid pour resin is extremely effective in filling all the voids and gaps in a cable as the resin flows into all interstitial spaces. However, the two part sachet / bag mixing system does not solve the problem of accurately mixing and applying the resin to the Barrier Gland and Cable. Other factors such as a relatively short shelf life, temperatures and carcinogenic toxins are also factors to consider with liquid pour resins.

CCG's QuickStop-ExTM Instant mixing, injecting resin system has all but eliminated the hassles surrounding the preparing, mixing and applying of compounds/resins in Barrier Glands. The QuickStop-ExTM Injection ResinTM system is instantly and 100% accurately mixed whilst being simultaneously injected into the barrier gland in one single action thus reducing the installation time and giving an increased confidence in the installation compared to the sachet mix liquid pour resin system.

CCG's QuickStop-ExTM Barrier Gland is a resin filled gland in which all the interstices of a cable are completely filled and sealed with a quick setting injection resin which flows into all the cable voids and interstices, completely filling the cable. This forms a 100% barrier to any migration of gases, fluids or dusts down the inside of an unfilled hygroscopic cable. The CCG QuickStop-ExTM barrier gland is safe for all types of cable construction, fully complying with the latest IEC Ex and AS/NZS Standards and Codes of Practice.

The CCG's QuickStop-ExTM Injection ResinTM system has passed the stringent weathering, heat cycling and 30-bar pressure tests according to the latest IEC Standards which are: IEC 60079-0 Ed 6, IEC 60079-1 Ed 6, IEC 60079-31 Ed 1, IEC 60079-7 Ed 4 and IEC 60079-15 Ed 3.

CCG's QuickStop-ExTM Barrier Glands are certified as follows: Ex db IIC, Ex eb IIC, Ex t IIIC, Ex nR.
Certificate Number: IECEx ITA 12.0014X



*Accurate, instant mixing
and application
in one single action!*



Multiple Patents Applied

Comparison Criteria	Traditional 2-Part Epoxy Putty Compound	Liquid Pour Resin in 2-Part Sachets	Quick Stop-Ex Injection Resin
Time to Mix	3-10 minutes ✗	1-2 minutes ✗	Instant ✓
Time to Apply	5-15 minutes ✗	1-2 minutes ✗	<1 minute ✓
Time to Set 20°C	2-4 hours ✗	30 minutes ✗	15 minutes ✓
Time to Set 40°C	1-2 hours ✗	15 minutes ✗	8 minutes ✓
Mixing Method	Knocking and mixing with both hands until "even" colour. Subjective. ✗	Squeezing and mixing in a sachet with both hands until "even" colour. Subjective. ✗	Instant mixing through the vortex nozzle, requiring only 1 hand. Objective. ✓
Application Method	Manual firming and packing of putty compound. Requiring both hands. ✗	Rolling and squeezing of sachet. Requiring both hands. ✗	Direct Injection. Requiring only one hand. ✓
Risk of not filling all interstices?	Yes ✗	No ✓	No ✓
Risk of not Mixing Correctly ?	Yes, 30% ✗	Yes, 10% ✗	No, 0% ✓
Chance of Resin or Compound Curing before Application ?	Yes ✗	Yes ✗	No ✓
Shelf Life at 30°C	1 Year ✓	3 Months (12 hours if removed from foil) ✗	+1½ Years ✓
Sensitive to Moisture ?	No ✓	Yes ✗	No ✓
Contains Carcinogenic Toxins ?	No ✓	Yes ✗	No ✓
Installation Service Temperature of 95°C ?	Yes ✓	No ✗	Yes ✓