

EEMUA document 9002

EEMUA Position statement on IEC 60079-14:2013 Explosive atmospheres - Part 14: Electrical installations design, selection and erection.

EEMUA Position

November 2015

EEMUA believes that the IEC 60079-14:2013 method of determining whether a barrier gland is needed for an Ex 'd' enclosure is deficient and potentially dangerous. EEMUA has commissioned research to establish whether the approach adopted in the standard is adequate to achieve at least the level of safety offered by adherence to IEC 60079-14:2008 – the former version of the standard. The outcome of that research has conclusively shown the superiority of the former version of the standard over the current version. IEC 60079-14:2013 therefore lacks the authority required of a standard as the new assessment procedure is not sustainable in the face of the evidence. Therefore IEC 60079-14 should be immediately amended with the reinstatement of the assessment procedure used in IEC 60079-14:2008.

Summary of issues

- Enclosure volume does not form a part of the assessment procedure for whether a barrier gland is required, whereas our investigation has confirmed that there is a clear correlation between enclosure volume and cable damage.
- Cable length is considered in the standard to be a mitigating factor. Specifically, if the cable length exceeds 3 metres then no barrier gland is mandated. However our research has identified consistent cable damage with such lengths, to the point that flame propagation through the damaged cable would be expected to occur.

Background

IEC 60079-14:2008 contained an assessment procedure and flow chart for whether a barrier gland would be needed or whether an ordinary flameproof gland would suffice for a cable entering an Ex 'd' enclosure which contains ignition capable sources in normal operation. Use of a barrier gland could

be triggered either by Group IIC gas requirements or by the enclosure volume being larger than 2 litres and which is in a Zone 1 area. These requirements were derived from extensive research by ERA (now part of the EDIF group), which was described in their detailed report 3051/85 – Flameproof Enclosures: The integrity of cable/cable gland inlet assemblies.

The reasons for departing from this established safe practice seem not to have been clearly articulated, nor does there seem to have been any clear evidence to support the change. Therefore EEMUA members felt that there was a clear need to demonstrate whether factors such as cable construction might have improved to such an extent that the ERA report conclusions were no longer valid. However, on the contrary, the results of the EEMUA tests have corroborated the ERA results, and specifically have shown that:

- Cable damage is strongly dependant on enclosure volume. Consequently larger enclosures introduce a greater risk of flame propagation unless a barrier gland is used.
- Cable damage is not reduced with longer lengths of cable. Consequently cable length has no significant influence on the risk of flame propagation.