



Meetings of the IECEx System : Umhlanga, South Africa, 5 - 9 September 2016

TEST, ASSESSMENT AND CERTIFICATION OF NON-ELECTRICAL EQUIPMENT

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**IECEX ExTAG Training
5th September 2016**



International
Electrotechnical
Commission



Draft Operational Document ExMC 1031A

- Guide to certification of non-electrical equipment
 - Circulated August 2016 for discussion and voting at the ExMC Meeting
- Main focus of this presentation
- Starting point for discussions
- Minor recommendations for clarification can be made to ExMC, but members will essentially be voting on the circulated document





Draft Operational Document ExMC 1031A

- From WG15 led by Jim Munro
- Intended as a live document
 - Initial publication September 2016
 - Next edition soon to follow based on experience and feedback from ExCBs/ExTLs
 - Therefore hope ExMC will agree to publish and hold back any major comments for the next edition
- Anticipated WG15 will remain constituted to look after at least first revision cycle





Standards Covered

- ISO 80079-36 – Basic Methods and Requirements (“h”)
- ISO 80079-37 – Constructional Safety “c”
Control of Ignition Sources “b”
Liquid Immersion “k”
 - NB: ExCBs/ExTLs must apply for both -36 and -37
- IEC 60079-1 “d” -2 “p” -31 “t”
 - All as applied to non-electrical equipment
- ISO 16852 – Flame Arresters (Performance)
 - Specialist test facilities required – not considered further in this presentation





Ignition Hazard Assessment

- Manufacturer **MUST** prepare the initial ignition hazard assessment (IHA)
- Manufacturer knows more than the ExTL about their own equipment
- Manufacturer possibly has a better understanding of the relevant Industrial Standards
 - Items in the IHA may come from the Industrial standards or from other related Ex Standards
 - For example reference to EN 14986 re fans





Ignition Hazard Assessment

- The manufacturer follows significant guidance in IEC 60079-36 Annex B, including looking at the examples in Annex C
 - It would normally be unwise to confirm a price until after the initial IHA has been received, so it should be considered an essential part of the application documentation prior to technical contract review
- ExTL probes and challenges the initial IHA
- A provisional IHA is agreed and forms the main input to the project plan
 - This may prompt a second contract review





The Project Plan

- Unlike electrical equipment, assessment of non-electrical equipment may sometimes not involve actual testing at all, or it may involve testing only at the manufacturer's premises or on site after final erection
 - Not many ExTLs are geared up to do, for example, high volume hydraulic testing or can supply suitable back pressure for large fans
 - Testing at the manufacturer or on the final site follows exactly the same witnessing arrangements outlined in OD 024





The Project Plan

- More importantly than in the standardised field of electrical equipment, the project plan needs to be agreed effectively by both the ExTL and the ExCB, as well as the manufacturer. This may include, for example, an early indication of special QA issues that the ExCB auditors will require to understand.
- If the IHA partly relies on information from other standards (for example on bearing life) the ExCB (if not integral with the ExTL) might need access to these standards





The ExTR

- The draft OD says:

On successful completion of the project an ExTR will be issued including detail of the ignition hazard assessment together with other information showing compliance with the standards.

- Questions for discussion:

a) Should the entire IHA be integrated in the ExTR?

b) Should the IHA be appended to the ExTR?

c) Should reference in the ExTR to the IHA as a controlled document be sufficient?

If (c) should the ExTR contain a summary?





Assemblies

- The draft OD is compatible with ExTAG Decision Sheet DS 2015/001A and the coming draft standard on the subject
- Only connections between items on the assembly can be covered in the certificate
- Connections made on site as part of installation cannot be covered in the certificate
- If the final installation needs to be completed in order to perform tests, the certificate cannot be issued until those tests have been completed





Assemblies

- For assemblies containing both electrical and non-electrical items, it is permitted to certify one or the other or both
PROVIDED THE CERTIFICATE MAKES IT CLEAR WHAT IS COVERED
- Ideally, this clarification should be clear in the equipment title on the front page of the certificate, amplified in the descriptive text





Scope limitations of ISO 80079-36

- Hand tools and manually operated equipment without energy storage are excluded from the scope of this standard. This standard does not address the safety of static autonomous process equipment when it is not part of equipment referred to in this standard.
- NOTE 1 Static autonomous process equipment includes items such as tanks, vessels, fixed pipework and hand operated valves which do not have their own source of energy that could create a potential ignition source during operation.





Scope limitations of ISO 80079-36

- NOTE 4 It is not unusual for equipment designed and constructed in accordance with this standard for a particular EPL to be used in areas requiring an EPL with a higher level of safety by including the application of additional measures. Such measures include for example inerting, suppression, venting or containment or for example by dilution, drainage, monitoring and shut-down. Such measures are outside the scope of this standard





Containment

- Unlike electrical equipment, non-electrical may have an “intended” hazardous atmosphere inside the enclosure
- The effectiveness of the containment is not considered in 80079-36 and -37
- If plastic or elastomeric materials are used to ensure containment (but not ignition protection) they should not be subjected to conditioning
- However, there needs to be an awareness how breaching containment affects zones



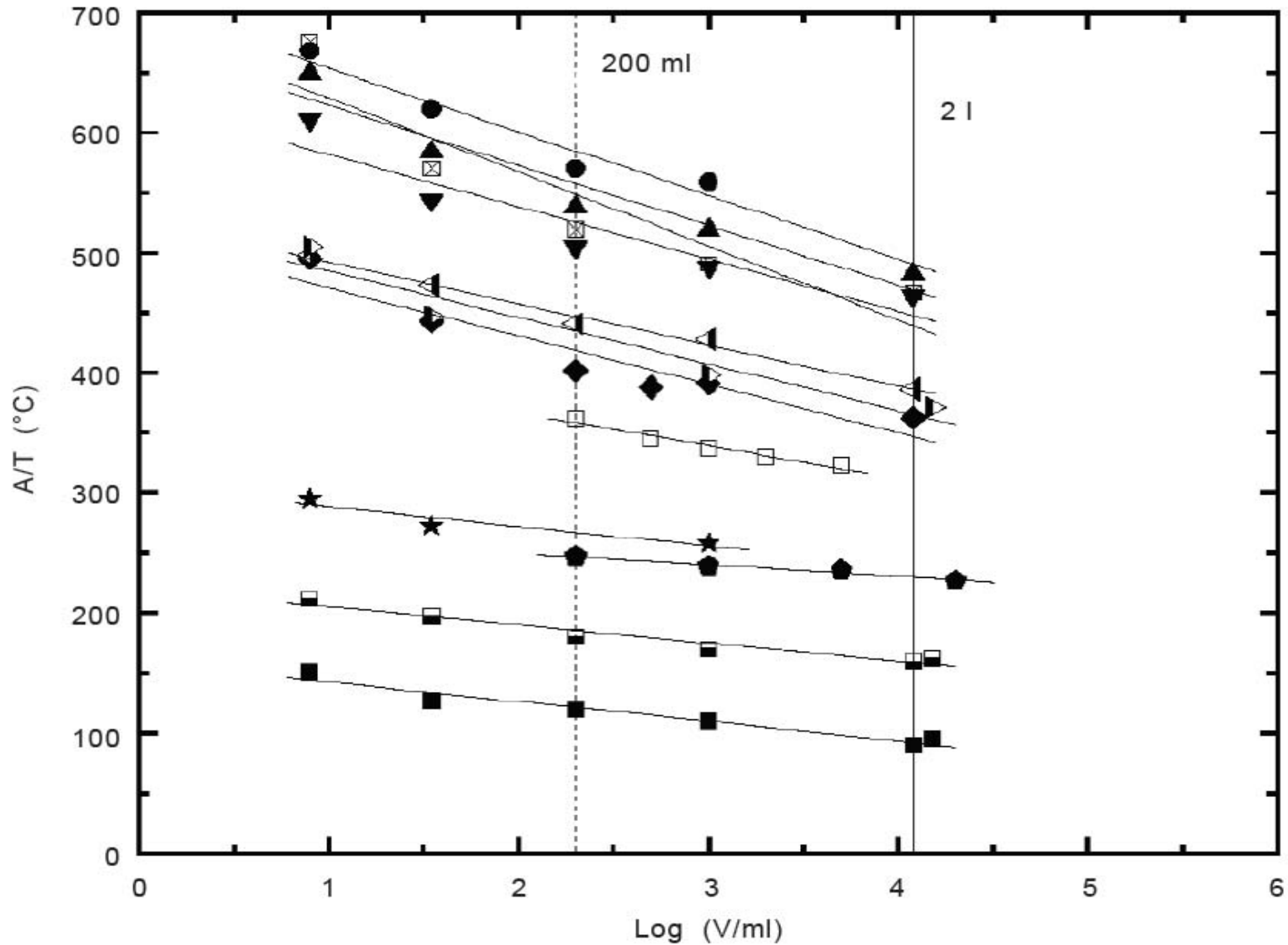


Containment

- Temperature Classification:
Unlike electrical equipment, 80079-36 requires the addition of a safety margin to measured temperatures for equipment containing (surrounding) more than 1 litre of the flammable gas or vapour
- For Ga, the measured temperature must not exceed 80% of the Temperature Class or marked temperature
- For Gb similar unless proven OK by test or using the data from Annex H Fig H1



80079-36 Annex H Fig H1





Certificate

- 80079-36 requires the manufacturer to prepare or have prepared a “certificate” as also required by 60079-0 but not by EN 13463-1, which requires only a “technical file”
- Therefore 80079-36, along with 60079-0 allow self creation of the certificate, but will the changed terminology lead to a greater demand for certification (i.e. with third party involvement)?
- Will any increased demand automatically be for IECEx?





Instructions

- Requirement for the instructions to contain:
A summary of the relevant ignition hazards identified and the protective means implemented
- How extensive should this be?
- How much of the format outlined in the standard is relevant to the user?
- If a summary is included in the ExTR, would this be an appropriate format for the instructions?





Technical Capability Document

- New edition introduced 2016
- Introduces requirements for bodies working with ISO 80079-36 and -37
- Draft used during assessment of ExTLs/ExCBs prior to formal issue





Technical Capability Document

- Competence topics for ISO 80079-36
 - What are the important aspects to be considered for non-electrical equipment
 - Ignition hazard assessment
 - Normal operation
 - Expected maintenance
 - Expected malfunctions
 - Rare malfunctions





Technical Capability Document

- Competence topics for ISO 80079-37
 - What are the important aspects to be considered for non-electrical equipment with type of protection constructional safety "c" with respect to the ignition hazard assessment
 - What are the important aspects to be considered for non-electrical equipment with type of protection control of ignition source "b" with respect to the ignition hazard assessment
 - What are the important aspects to be considered for non-electrical equipment with type of protection liquid immersion "k" with respect to the ignition hazard assessment





Other points for discussion, please.

