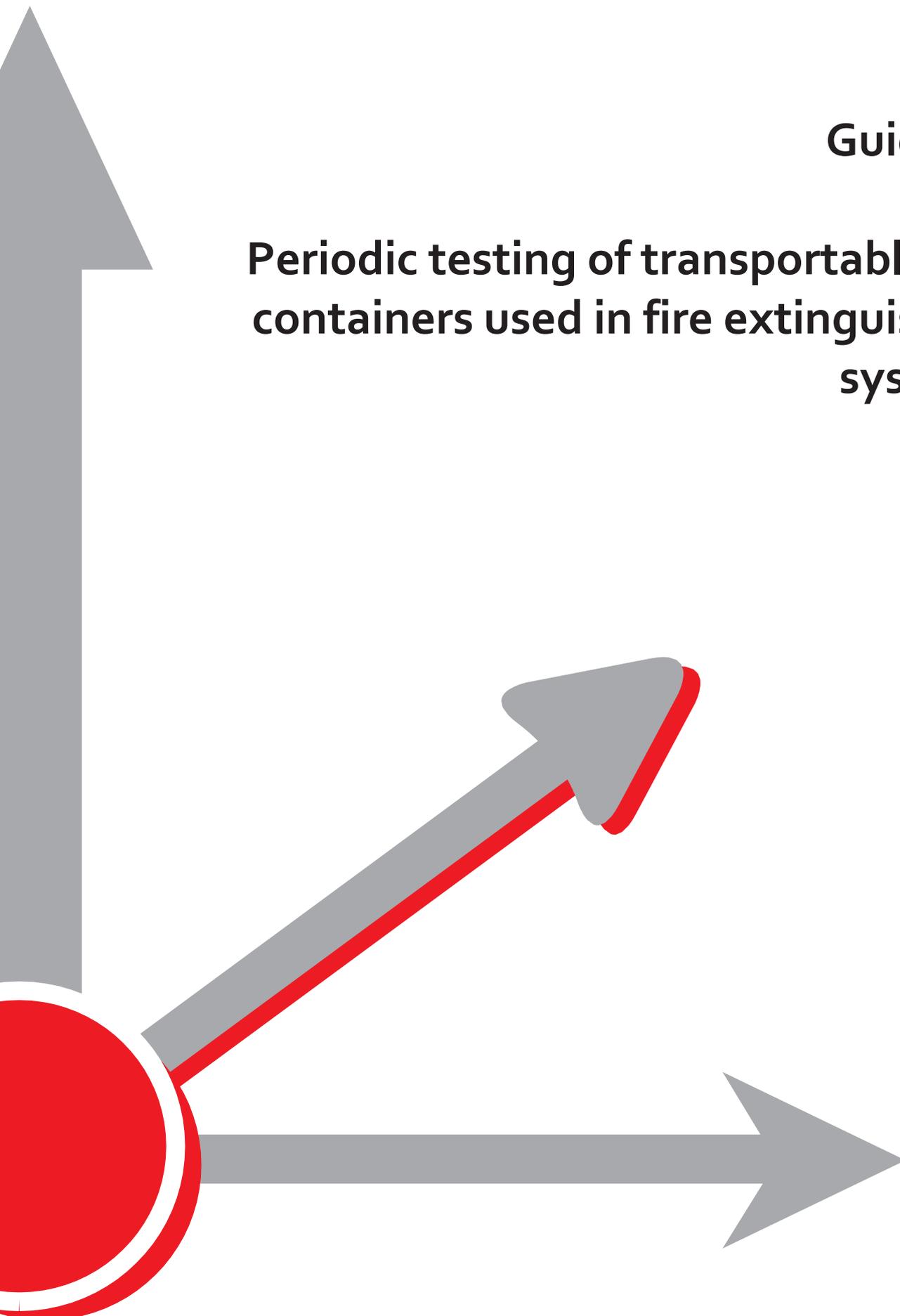


Guidance

**Periodic testing of transportable gas
containers used in fire extinguishing
systems**



Revision table

Date	Rev #	Paragraph/ Page	Change
June 2020	V1.0	-	Final release
March 2023	V2.0	-	Updated version

FOREWORD

This document is intended as a general guidance and is not a substitute for detailed advice in specific circumstances. Although great care has been taken in the compilation and preparation of this publication to ensure accuracy, Euralarm cannot in any circumstances accept responsibility for errors, omissions or advice given or for any losses arising from reliance upon information contained in this publication.

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This document is intended solely for stakeholders in relation to maintenance and use of fire protection systems on the state of affairs concerning its subject. Whilst every effort has been made to ensure its accuracy, readers should not rely upon its completeness or correctness, nor rely on it as legal interpretation. Euralarm will not be liable for the provision of any incorrect or incomplete information.

Note: The English version of this document is the approved Euralarm reference document.

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1 BACKGROUND

There is currently some confusion on the date at which extinguishing agent containers are required to be submitted for periodic testing under the Pressure Equipment Directive (PED), the Transportable Pressure Equipment Directive (TPED) and Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), as stated in the relevant Standards.

This Euralarm guidance gives recommendations on how fire extinguishing system containers should be treated.

NOTE: The word 'container' is used extensively in the fire protection standards such as EN 15004, whereas the word 'cylinder' is often used in other European Standards. This guidance document uses 'container' throughout, but Euralarm recognises that 'cylinders' is also commonly used in the industry. They should be interpreted as meaning the same.

2 SAFETY

All containers used in fixed gaseous fire extinguishing systems, must meet the required safety checks and be of sound condition. Ideally the containers should be filled by those acting under the authority of the Original Equipment Manufacturer (OEM), but always in strict accordance with the OEM's processes and utilising only parts approved by the OEM for their specific equipment.

Failure to follow the correct procedures, may result in a number of potential hazards:

- Compromise to human safety levels, property damage and environmental issues through contamination, leakage and catastrophic failure.
- Inadvertent release of the fire extinguishing system.
- Corrosion occurring to the containers and valves and consequential effects, such as catastrophic failure.
- Contamination of the agent.
- Damage to the systems hardware or other equipment.
- Inefficiency of the system performance.
- Reduced fire extinguishing capability.
- Leakage of the fire extinguishing system containers.
- Inability of the system to meet the requirements of relevant standards and certification.

3 PERIODIC INSPECTION OF CONTAINERS

Gaseous fire extinguishing containers (e.g. HFC-227ea, FK 5-1-12, HFC-23, HFC-125, HB-55, IG-541, IG-01, IG-55, IG-100 and CO₂ etc) have to comply with Directive 2010/35/EU on transportable pressure equipment (TPED). Within the directive the owner has the obligation to keep the containers in conformity with Annexes to Directive 2008/68/EC including obligations for periodic inspection.

Directive 2008/68/EC regulates the inland transport of dangerous goods, with several notified exception per country (Annexes). Directive 2008/68/EC refers to the ADR the European Agreement concerning the International Carriage of Dangerous Goods by Road.

Gaseous fire extinguishing containers are covered by packaging instruction P200 or P206 in ADR.

Under the requirements of the 2023 ADR, standards EN ISO 18119 and EN ISO 10460, must be followed.

ADR does not apply to the carriage of uncleaned empty static storage vessels (extinguishing containers), see 1.1.3.1 (f).

Carriage of filled containers beyond their expiry date is only allowed for the purpose of inspection or disposal, see 4.1.6.10.

What does this mean for installed extinguishing containers, specifically in relation to the ADR?

- If the container is moved from one location to another, ADR applies.
- If the container is to be repaired or disposed of, ADR applies.
- Containers that are fully or partially charged may only be carried for inspection or disposal. Only where the inspection is positive can they be refilled.
- In case of complete and full discharge of the container, ADR does not apply as the container is now empty.
- After a discharge it may be considered convenient to conduct periodic inspection if the container is close to its next test date.
- Expired containers that are fully or partially charged may only be carried for inspection or disposal. When beyond their expiry date they can only be refilled following inspection and recertification.

Nationally applicable legal regulations on operational safety must be observed and complied with. Local requirements, which may supersede the periodic inspection requirements according to ADR must also be complied with. Refer to documents referenced in Section 8 as examples.

Other responsibilities would apply that are outside of the direct requirements of the ADR.

- Different test intervals may be recommended by a manufacturer for the valve or other container components.
- The owner must check the proper functioning and safe condition of extinguishing systems, at least once a year by qualified persons or experts for reasons of operational safety.
- Compliance with the requirements of the F-Gas Regulations.

Post Brexit, attention should be given to the choice of accredited Inspection Body:

- For containers destined to remain in EU/NI the periodic testing and recertification as Pi (π) must be by an EU Notified Body.
- For containers destined to remain in GB the periodic testing and recertification as Pi (π) or Rho (ρ) (post 1 January 2023) must be by a GB Appointed Body.

4 REUSE OF CONTAINER VALVES

The container valve seal is normally achieved by:

- Parallel thread complete with O-ring (typically associated with halocarbons).
- Taper thread where the seal is achieved through thread distortion (typically with CO₂ and non-liquifiable inert gases).

4.1 Parallel Threaded Valves

Container valves using parallel threads may be reused after removal from containers when the following conditions are met:

- The valve connection thread to the container and valve outlet threads are inspected to ensure they are within tolerance, undamaged and have no visual material degradation.
- The valve has been refurbished in accordance with ISO 22434:2011, OEM's procedures and only by those who are accredited to do so. Valves must be refurbished with OEM approved components as a requirement to retain their product listing(s), as well as meet legal requirements.

4.2 Taper Threaded Valves

Euralarm firmly recommends for the following safety reasons that all removed taper threads valves are not reused.

- Taper threads are often found to be outside of the design tolerances after a single fitment and removal.
- This out of tolerance can result in over torquing of the valve to achieve the correct seal, and may lead to a catastrophic failure of the valve.
- This damage should be considered when replacement valves are no longer available or become obsolete.

5 MOISTURE CONTROL / COMPOSITION OF MIXTURES

It is vitally important, once hydrostatic testing has been carried out, the containers are thoroughly dried prior to refilling. Failure to ensure that containers are thoroughly dried can result in stress corrosion cracking. A moisture content of maximum 12 PPM, and/or a dew-point 20°C under the cylinder temperature marking (whatever is driest) will render moisture related corrosion impossible. A moisture content within the relevant part of EN 15004 must not under any circumstances be exceeded.

The gas filling process must be controlled to ensure the dryness of the gas. Where applicable such as in the case of inert gas mixtures confirm the correct composition, for example by gas chromatography analysis after filling.

6 CHECK LIST

The following check list covers the important steps to ensure that the safety of the container is maintained during periodic inspection processes and during the filling process afterwards.

- As an absolute minimum always ensure that all relevant standards are followed, and their requirements are integrated in the processes, instructions and procedures covering this type of work.
- Only companies certificated to carry out testing are used.
- Excessive use of PTFE must strictly be avoided. Do not exceed the specification of ISO 13341.
- Water used for hydraulic testing shall be maintained free of Chlorides, Ammonia and other contaminants with corrosive properties.
- Water must be removed prior to refilling and a correct level of dryness exists prior to refilling.
- Where applicable Gas Chromatograph sampling is carried out to ensure that the correct mix of inert gas blends has been achieved after filling.

7 QUALITY OF RECYCLED AGENT

Any recycled agent must meet the original specification, per EN 15004. Guidance is available in the FIA guidance document on Recycled Halocarbon Extinguishing Agents. <https://www.fia.uk.com/resourceLibrary/guidance-document-on-recycled-halocarbon-extinguishing-agents.html>

8 REFERENCES

- ADR 2023, UNECE: <https://unece.org/transport/standards/transport/dangerous-goods/adr-2023-agreement-concerning-international-carriage>
- Transportable Pressure Equipment, Health and Safety Executive: <https://www.hse.gov.uk/cdg/pressure.htm>
- The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG 2009) Update Regulations: <http://www.hse.gov.uk/cdg/manual/adrcarriage.htm>
- VCA: <https://www.vehicle-certification-agency.gov.uk/dangerous-goods/tanks-pressure-receptacles/>

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