☎ +61 1300 363 400
✉ certification@csiro.au

1. SCOPE

This technical specification sets out the process and requirements for the technical verification of conformity of gaseous fire-extinguishing systems for the purposes of providing evidence of conformity to a CSIRO product certification scheme.

The verification methods and requirements specified by this document extend from those required to establish conformity of systems in accordance with AS 4214:2018 Appendix A as prescribed for fire protection within maritime environments and applications.

Notes:

i. AS 4214:2018 supersedes AS ISO 14520-1:2009.

ii. The requirements of AS 4214:2018 Appendix A are identical to those prescribed by AS ISO 14520-1:2009 Appendix ZB.

iii. Many requirements and clauses of AS ISO 14520-1:2009 correlate with AS 4214:2018 and have been tabulated for the purposes of this technical specification under Section 6, Evaluation Schedule.

The current scope of this technical specification includes the mechanical components of gaseous fire-extinguishing systems, only. Mechanical components are considered to include gaseous cylinders and contained agents, discharge nozzles, valves, piping and the like.

1.1. Limitations/conditions of scope

The following requirements of AS 4214:2018 are not within the scope of this technical specification and/or evaluation of product conformity.

a. Electrical components and systems for detection, warning and control are required by AS 4214:2018 to meet the relevant requirements of the AS 1670 series of Standards, including but not limited to the following documents.

   AS 1670.1 Fire detection, warning, control and intercom systems—System design, installation and commissioning Part 1: Fire.

   AS 1670.5 Fire detection, warning, control and intercom systems—System design, installation and commissioning Part 5: Special hazards systems.

b. Requirements related to system installation or maintenance.

2. RECOGNITION FRAMEWORK

This technical specification has established recognition of the following testing and certification agencies and the test protocols they apply to establish performances requirements (refer Referenced Documents).

a. Loss Prevention Certification Board (LPCB) product certification, UK.

b. Building Research Establishment Ltd testing, Watford, UK.

c. FM Approvals, Norwood MA, USA.

Recognition of other agencies and test protocols is anticipated for future revisions of this technical specification.

3. REFERENCED DOCUMENTS

Details of the documents referenced by this technical specification are detailed in Table 1.

Table 1. List of documents referenced by this technical specification.

AS 4214:2018	Gaseous fire-extinguishing systems
AS ISO 14520-1:2009	Gaseous fire-extinguishing systems
EN 12094-4	Fixed firefighting systems. Requirements and test methods for container valve assemblies and actuators
EN 12094-5	Fixed firefighting systems. Requirements and test methods for high and low pressure selector valves and their actuators for CO_2 systems
EN 12094-7	Fixed firefighting systems. Requirements and test methods for nozzles for CO_2 systems
EN 12094-8	Fixed firefighting systems. Requirements and test methods for flexible connectors for CO_2 systems
EN 12094-10	Fixed firefighting systems. Requirements and test methods for pressure gauges and pressure switches.
EN 12094-13	Fixed firefighting systems. Requirements and test methods for check valves and non-return valves.
LPS 1230	Requirements for fire testing of fixed gaseous fire extinguishing systems
FM Class 5600	Approval Standard for Clean Agent Extinguishing Systems
AS ISO 14520 Parts 1 through 15 (2009)	Gaseous fire-extinguishing systems
AS ISO/IEC 17025:2018	General requirements for the competence of testing and calibration laboratories

4. BACKGROUND

The current revision of AS 4214 was published in 2018, following development by Standards Australia Committee FP-011. AS 4214:2018 was preceded by the publication of by AS ISO 14520 Parts 1 through 15 (2009), which was an adoption, with modifications, of the ISO 14520-2006 series. All parts of the AS ISO 14520 have been integrated into AS 4214:2018.

5. TECHNICAL VERIFICATION PROCEDURE

It is a requirement of this procedure that a proportion of the documentation submitted as evidence of conformity with AS 4214:2018 shall be records and reports from recognised testing agencies in accordance with suitable and relevant protocols, standards or specifications.

Verification of conformity of a gaseous fire-extinguishing systems for the purposes of a CSIRO product certification scheme requires the following activities detailed in Table 2.

Table 2. Verification activities required by this technical specification to verify conformity of gaseous fire extinguishing systems for the purposes of certification.

Activity	Description
1	Verification that fire tests have been conducted and/or fire extinguishing performance has been established in accordance with suitable Standard(s)
2	Verification that components tests have been conducted in accordance with suitable Standard(s)
3	Review of design and installation manual(s)
4	Review of component quality assurance program
5	Identification of system and component limitations
6	Prescription of ongoing constancy of conformity activities required for certification.

For the purposes of Activities 1 and 2, assessment of each system component to relevant the documents, or parts thereof, nominated in Table 1 is required. Evidence for conformity may be provided through validated external test, compliance, technical evaluation, or similar, reports from recognised external agencies and/or laboratories. The

documents and/or clauses relevant to system fire extinguishing performance, mechanical components, design and installation documentation and related software tools, are detailed in Section 6 of this technical specification.

The evidence of conformity to the relevant clause of the Standard, details of the review of system documentation, system limitations and any requirements for a constancy of conformity program, are to be detailed in a Technical Verification of Conformity report prepared by CSIRO's Conformity Services.

6. EVALUATION SCHEDULE

Table 3 provides the conformity evaluation schedule of a system to AS 4214:2018, indicating the applicable clauses for which evidence of conformity is required to be provided.

Clause correlation with the superseded requirements of AS ISO 14520.1-2009 is also tabulated and may be referenced and in scope where required for the technical verification purposes of certification.

Table 3. Evaluation schedule required to demonstrate conformity.

AS 4214:2018 Clause	AS ISO 14520.1-2009 Clause	Title	Evidence of conformity required	Comments
4		*Use and Limitations*		
4.1	4.1	General	-	
4.2	-	Protection of multiple enclosures	Yes	Requires provision of selector valves.
4.3	4.2	Extinguishing agents	Yes	Requires suitable evidence of fire test performance.
4.4	4.3	Electrostatic discharge	-	
4.5	4.4	Compatibility with other extinguishing agents	-	
4.6	4.5	Temperature limitations	Yes	As specified by the Producer in system documentation.
5	5	*Safety*		
5.1	5.1	Hazard to personnel	-	
5.2	5.2	Safety precautions	-	
5.3	5.3	Occupiable areas	-	
5.4	5.4	Electrical hazards	-	
5.5	5.5	Electrical earthing	-	
5.6	5.6	Electrostatic discharge	-	
5.7	ZA.2	Warning notices	-	
6	6	*System Design*		
6.1	6.1	General	-	This document provides the path for satisfying this requirement.
6.2	6.2	Extinguishing agent supply		
6.2.1	6.2.1	Quantity	-	Installation detail.
6.2.2	6.2.2	Quality	Yes	Fill certificates to be provided.
6.2.3	6.2.3	Storage container arrangement	-	Installation detail.
6.2.4	6.2.4	Storage containers		
6.2.4.1	6.2.4.1	General	Yes	AS 2030.1 requires registration of design to appropriate recognised Standard. Component tests from recognised Standard(s).Refer Verification Activity 2.
6.2.4.2	ZA.3.1	Contents indication	Yes	Gauges and indicators required to be provided.

AS 4214:2018 Clause	AS ISO 14520.1-2009 Clause	Title	Evidence of conformity required	Comments
6.2.4.3	ZA.3.2	Marking	Yes	AS 2030.1 marking requirements apply. Evidence of cylinder markings required.
6.2.4.4	6.2.4.4	Manifold storage containers	Yes	Requires provision of check valves.
6.2.4.5	6.2.4.5	Operating temperatures	-	Installation detail.
6.3	6.3	Distribution		
6.3.1	6.3.1	General	Yes	Requires provision of pressure gauges and over-pressure relief devices.
6.3.2	6.3.2	Piping	-	Installation detail of reticulation.
6.3.3	6.3.3	Fittings	-	Installation detail of reticulation
6.3.4	6.3.4	Pipe and valve supports	-	Installation detail of reticulation
6.3.5	6.3.5	Valves	Yes	Component tests to recognised Standard(s) required. Refer Verification Activity 2.
6.3.6	6.3.6	Nozzles		
6.3.6.1	6.3.6.1	Nozzle choice and location	Yes	Component tests to recognised Standard(s) required. Refer Verification Activity 2.
6.3.6.2	6.3.6.2	Nozzles in ceiling	-	Installation detail
6.3.6.3	ZA.5	Marking	Yes	
6.3.6.4	6.3.6.4	Filters	Yes	
6.3.7	6.3.7	Pressure reducing orifice assembly	Yes	
6.4	6.4	Detection, actuation and control systems		
6.4.1	6.4.1	General	-	
6.4.2	6.4.2	Automatic detection	-	
6.4.3	6.4.3	Operating devices		
6.4.3.1	6.4.3.1	Automatic operation	-	
6.4.3.2	6.4.3.2	Manual operation	-	
6.4.3.3	6.4.3.3	Manual mechanical release	-	
6.4.4	6.4.4	Control equipment		
6.4.4.1	6.4.4.1	Electric control equipment	-	
6.4.4.2	6.5	Local Control Station (LCS)	-	
6.4.4.3	6.4.4.2	Pneumatic control equipment	Yes	If provided by system.
6.4.5	6.4.5	Audible alarms and visual warning devices	-	
7	7	Extinguishing Agent System Design		
7.1	7.1	General		
7.2	7.2	Specifications, plans and approvals	-	Installation detail.
7.3	7.3	System flow calculations		
7.3.1	7.3.1	General	Yes	System calculation / design tool to be validated by recognised agency.
7.3.2	7.3.2	Friction losses	Yes	To be provided by validated system calculation / design tool or method.
7.3.3	7.3.3	Pressure drop	Yes	To be provided by validated system calculation / design tool or method.
7.3.4	7.3.4	Valves and fittings	Yes	To be provided by validated system calculation / design tool or method.
7.3.5	7.3.5	Liquefied gases - Specific requirements	Yes	To be provided by validated system calculation / design tool or method (If liquefied gases used by system).
7.4	7.4	Enclosures	-	Installation detail.

AS 4214:2018 Clause	AS ISO 14520.1-2009 Clause	Title	Evidence of conformity required	Comments
7.5	7.5	Extinguishing agent concentration requirements		
7.5.1	7.5.1	Flame extinguishment	Yes	To be provided by validated system calculation / design tool or method. Evidence of system fire extinguishing performance to recognised Standard(s) required. Refer Verification Activity 1.
7.5.2	7.5.2	Inerting	Yes	To be provided by validated system calculation / design tool or method.
7.6	7.6	Total flooding quantity		
7.6.1	7.6.1	General	-	
7.6.2	7.6.2	Liquefied gases	Yes	To be provided by validated system calculation / design tool or method.
7.6.3	7.6.3	Non-liquefied gas	Yes	To be provided by validated system calculation / design tool or method.
7.7	7.7	Altitude adjustment	Yes	To be provided by validated system calculation / design tool or method.
7.8	7.8	Duration of Protection	Yes	System design(s) to provide a minimum hold time of 10 minutes.
7.9	7.9	System performance		
7.9.1	7.9.1	Discharge time		
7.9.1.1	7.9.1.1	Liquefied extinguishing agent	Yes	To be provided by validated system calculation / design tool or method.
7.9.1.2	7.9.1.2	Non-liquefied extinguishing agent	Yes	To be provided by validated system calculation / design tool or method.
7.9.2	7.9.2	Extended discharge	-	
8	8	*Commissioning and acceptance*		
8.1	8.1	General	-	
8.2	8.2	Tests		
8.2.1	8.2.1	General	-	
8.2.2	8.2.2	Enclosure check	-	
8.2.3	-	Review of design calculations	-	
8.2.4	8.2.3	Review of mechanical components	-	
8.2.5	8.2.4	Review of enclosure integrity	-	
8.2.6	8.2.5	Review of electrical components	-	
8.2.7	8.2.7 – 8.2.9	System functional test	-	
8.2.8	8.2.10	Completion of functional tests	-	
8.3	8.3	Completion certificate and documentation	-	
8.4	-	Block plan	-	
9	*9*	*Maintenance*		
9	9.3	Maintenance	-	AS 4214 refers to AS 1851 for maintenance requirements.
-	9.1	General		
-	9.2	Inspection		
-	9.4	Training		

AS 4214:2018 Clause	AS ISO 14520.1-2009 Clause	Title	Evidence of conformity required	Comments
Appendix A		Marine	Yes	If the system is specified for maritime applications. This document is derived from the requirements for listing of a Marine system. Maritime systems may use CO_2 as an extinguishing agent which are otherwise not covered by this technical specification.
Appendix B		Working Documents	-	Installation details
Appendix C		Discharge Test	-	Commissioning test
Appendix D	AS ISO 14520.2-2009	CF3I Extinguishing Agent	Yes	If relevant to system specification
Appendix E	AS ISO 14520-5-2009	FK-5-1-12 Extinguishing Agent	Yes	If relevant to system specification
Appendix F	AS ISO 14520.6-2009	HCFC Blend A Extinguishing Agent	Yes	If relevant to system specification
Appendix G	AS ISO 14520.8-2009	HFC 125 Extinguishing Agent	Yes	If relevant to system specification
Appendix H	AS ISO 14520.9-2009	HFC 227ea Extinguishing Agent	Yes	If relevant to system specification
Appendix I	AS ISO 14520.10-2009	HFC 23 Extinguishing Agent	Yes	If relevant to system specification
Appendix J	AS ISO 14520.11-2009	HFC236fa Extinguishing Agent	Yes	If relevant to system specification
Appendix K	AS ISO 14520.12-2009	IG-01 Extinguishing Agent	Yes	If relevant to system specification
Appendix L	AS ISO 14520..13-2009	IG-100 Extinguishing Agent	Yes	If relevant to system specification
Appendix M	AS ISO 14520..14-2009	IG-55 Extinguishing Agent	Yes	If relevant to system specification
Appendix N	AS ISO 14520..15-2009	IG-541 Extinguishing Agent	Yes	If relevant to system specification
Appendix O		Safe Personnel Exposure Guidelines	-	

6.1. Suitability of External Evidence

Assessment of the suitability of external agencies (laboratory) evidence shall be conducted in accordance with the CSIRO Recognition Framework.

Evidence of conformity, in the form of endorsed test reports written in English, are required to be submitted in full. Where test reports were originally produced in a language other than English, suitable translations may be supplied in addition. Submitted external test reports must provide sufficient detail to describe the product being evaluated in full and in detail, and establish that an evaluation schedule was designed and applied to each component submitted to the external agency.

External evidence can only be accepted where verification between the product submitted for evaluation and the specimens in the endorsed test report is considered a critical requirement. Where external reports do not provide sufficient product identification, additional evaluation to specified requirements (testing) may be required.

6.2. Certificates of Conformity

Certificates, such as those published by a Conformity Assessment Body, do not provide direct and sufficient detail for the purposes evaluation for conformity in accordance with this technical specification.

7. REPORTING

The conformity verification report shall include relevant information specified as follows:

a) A statement of conformity with reference to AS 4214:2018 and unambiguous designation of the following:
   - all system components evaluated in accordance with this technical specification.

b) All other information in accordance with the reporting requirements of Australian Standard AS ISO/IEC 17025-2005.