



CERTIFICATE OF FIRE APPROVAL

This is to certify that

The product(s) detailed below will be accepted for compliance with the applicable Lloyd's Register Rules and Regulations for use on offshore installations classed with Lloyd's Register, and for use on offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits etc.

Manufacturer	Roxtec International AB
Address	Box 540 S-371 23 Karlskrona Sweden
Type	PIPE AND CABLE PENETRATION JET FIRE PROTECTION SYSTEM
Description	Multi Cable and Pipe (Rectangular) Transit - Type: "Roxtec RM Module Multi-Diameter Penetration Seals" for Jet Fire applications
Specified Standard	Health & Safety Executive, Offshore Technology Report OTI 95 634 "Jet Fire Resistance Test of Passive Fire Protection Materials"

The attached Design Appraisal Document forms part of this certificate.

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue 7 March 2016 Expiry date 6 March 2021

Certificate No. SAS F160134 Signed 

Sheet No 1 of 4 Name S. Abraham
Surveyor to Lloyd's Register EMEA
A Member of the Lloyd's Register Group

Note:

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd's Register of any modification or changes to the equipment in order to obtain a valid Certificate.

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DESIGN APPRAISAL DOCUMENT

Date 5 May 2016	Quote this reference on all future communications MTES/SAS/TA/SA/WP25742200
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ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F160134

This Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

SINTEF, Norwegian Fire Research Laboratory, Norway, Fire Test Report No. NBL-107332, dated 3 June 2005.

CONDITIONS OF CERTIFICATION

1. Integrity and insulation performance criteria to be assessed from the test results below
2. Consisting of: a double layer of rectangular "Roxtec RM Module Multi-Diameter Penetration Seals" fitted into a suitably insulated division approved for the same fire performance rating, as described below
3. Applications in each case to be approved by Lloyd's Register at the design stage
4. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that items are of the same standard as the approved prototype

TEST RESULTS

Duration of Test:	122 minutes	
Integrity:	122 minutes - No flaming observed on the unexposed face	
Insulation:		
Thermocouple No.	Thermocouple Position	Time to Reach 180°C (mins)
1*	Penetration Seal	66
5*	Bulkhead (Unexposed Side)	57
11-18	Steel Pipe Penetrations	>122
19-28	Cable Penetrations	>122
	Maximum Temperature Rise	
1*	After 30 minutes of exposure ~ 127°C	
5*	After 60 minutes of exposure ~ 193°C	
5*	After 90 minutes of exposure ~ 289°C	
5*	After 120 minutes of exposure ~ 313°C	

* Thermocouples 1 and 5 are positioned 25mm away from the outer surface of the insulation surrounding the unexposed side of the penetration.

NOTE

The above jet fire test results may be applied for the cable and pipe penetration device when used in a bulkhead or deck application, subject to both the penetration device and the bulkhead or deck being fitted with the same insulation arrangements as those used in the fire test.



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DESCRIPTION OF THE TEST SPECIMEN

Panel test in accordance with OTI 95 634, comprising of a 10mm thick mild steel plate penetrated with 5 cables (outside diameters: 10, 18, 24, 29 and 79mm) and 4 steel pipes (outside diameters: 10, 18, 25, and 30mm).

The cables and pipes penetrate the panel through two layers of type "RM Modules" comprised of 60mm thick elastomer blocks, stay plates and compression wedges, contained in rectangular steel frames, separated by a space of 230mm filled with ceramic fibre insulation "Firemaster X-607" of nominal density 128kg/m³ and fixed within a steel support box 10 mm thick of approximate dimensions 539mm x 305mm x 350mm (LxHxD).

The unexposed side of the panel was insulated with 125mm "Firemaster X-607, nominal density of 128kg/m³. The back and sides of the penetration box are insulated with 100mm thick "Firemaster X-607", nominal density 96kg/m³, retained by 3mm stainless steel pins and spring washers.

SCOPE

Although the test has been designed to reproduce conditions similar to those found in a large-scale jet fire resulting from realistic release of hydrocarbons, it cannot guarantee a specific degree of protection from the myriad of possible jet fires. The Jet Fire Resistance Test, or indeed large-scale demonstrations, cannot therefore be used to confer a universal resistance rating for a specified time in the way that a standard furnace test confers a hydrocarbon rating. Hence, this test does not give a rating analogous to the "H" rating derived from the hydrocarbon fire resistance test but is seen as a complimentary test.

Although the method specified has been designed to simulate some of the conditions which occur in an actual jet fire, it cannot reproduce them all exactly. The results of this test do not guarantee safety but may be used as elements of a fire risk assessment for structures or plant. This should take into account all of the other factors which are pertinent to an assessment of the fire hazard for a particular end use.



Lloyd's
Register

Lloyd's Register EMEA

71 Fenchurch Street, London, EC3M 4BS

Telephone 020 7423 2416 Fax 020 7423 2053

Email med@lr.org

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ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F160134

PLACE OF PRODUCTION

Roxtec International AB
Box 540
S-371 23 Karlskrona
Sweden

Saji Abraham
Senior Specialist
Statutory Fire and Safety
Marine Technology and Engineering Services
Lloyd's Register EMEA

Supplementary Type Approval Terms and Conditions

This certificate and Design Appraisal Document relates to type approval, it certifies that the prototype(s) of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein, it does not mean or imply approval for any other use, nor approval of any products designed or manufactured otherwise than in strict conformity with the said prototype(s).