



Page	2 of 4
Document number	SAS F080262
Issue number	1

**DESIGN APPRAISAL DOCUMENT**

Date 27 October 2008	Quote this reference on all future communications LDSS/PAS/FITTA/MF
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**ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F080262**

This Design Appraisal Document forms part of the Certificate.

**APPROVAL DOCUMENTATION**

Health and Safety Laboratory, Harpur Hill, Buxton, Derbyshire, UK, report number PS/04/06, dated 15 March 2005.

**CONDITIONS OF CERTIFICATION**

1. This appraisal is based on the Jet Fire Resistance Test Standard. of Passive Fire protection materials. The test arrangements were generally in accordance with (UK) HSE Procedure N0. OTI 95 634 and ISO 22899-1
2. The seal consists of: seven layers comprising, Glass cloth (GF 377 Glass/Firecheck), aluminium foil, Fibrefrax SP mat, Nickel foil, Fibrefrax SP mat, CRF326 ISOKerm and EPDM/Inconel mesh cover. Fitted with a longitudinal joint fastened by straps and torque clips fitted at both ends of the seal, covered by Chartek 7 intumescent coating (12mm DFT). The Chartek 7 is to contain one layer of HK1(M) mesh inserted at mid coating thickness.
3. Seal dimensions tested: 305mm long, inner pipe diameter 214mm and outer pipe diameter 305mm.
4. This appraisal does not assess the environmental material performance such as weathering, aging, shock resistance or smoke and toxicity levels.
5. The integrity and insulation performance criteria may be assessed from the table below.
6. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that the items are of the same standard as the approved prototype.

**NOTE**

A simulated explosion blast test with an average peak overpressure of 2.537 bar, was conducted at the Advantica Spadeadam Test Facility, UK, as detailed in their report ref. Project No. R9274, dated 14 September 2006. The specimen remained intact and no significant damage was reported after testing, as detailed in the Advantica report. The results of this blast test may be considered during project appraisals by Lloyd's Register. Preparation and testing of pipe seal specimens was witnessed by a Surveyor to Lloyd's Register.

**DESCRIPTION OF TEST SPECIMEN**

One tubular test specimen 3000mm long, 214mm outer diameter, 6mm thick, steel pipe fitted into a 550mm long, 305mm outer diameter, 10mm thick steel pipe, with an annular gap covered with a flexible seal. All exposed surfaces and the ends of the seal covering the steel torque clips were covered with Chartek 7 intumescent coating.

The test specimen was jet fire tested at the HSL Laboratory, Buxton, UK, and full details of construction are contained in the referenced test report.

Page 3 of 4
Document number SAS F080262
Issue number 1

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-------------------------	-----------------------------------------------------------------------

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**Test Results: Maximum Temperatures Recorded**

EXPOSURE TIME (MINUTES)	MAXIMUM TEMPERATURE RISE (°C)	THERMOCOUPLE No. ( )
1.5	50	(14)
2.5	100	(14)
5.0	150	(15)
15.5	200	(08)
21.0	250	(08)
33.5	300	(15)
40	350	(15)
43.5	400	(15)
48.5	450	(15)
51	500	(15)

**Note:** The test was continued for 65 minutes and the maximum temperature rise was 512.5 °C (TC 15) at 63.5minutes.

**Scope**

Although the test has been designed to reproduce conditions similar to those found in a large scale jet fire resulting from a realistic release of hydrocarbons, it can not 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 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 test, it cannot reproduce them all exactly. The results of this test do not guarantee safety and should not be used alone to describe or appraise the fire hazard or the risk of materials, products or assemblies under actual fire conditions. However, they 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.

Page	4 of 4
Document number	SAS F080262
Issue number	1

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#### PLACE OF PRODUCTION

Bestobell Oilfield Products  
Ashby Road  
Shepshed  
Loughborough  
Leicestershire LE12 9EQ  
UK



M. Farrier  
Lead Specialist  
Product Approval Services  
London Design Support 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).*