



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	PE Composites Ltd
Address	5 A Daish Way Newport Isle of Wight, PO30 5XB United Kingdom (UK)
Type	NON LOAD BEARING PARTITION SYSTEM (JET FIRE TEST)
Equipment Description	"JETSTOP™" Non-Load Bearing Partition System Incorporating Blast Resistant Composite Panels suitable for Jet Fire Exposure from one side
Specified Standard	International Standard ISO 22899-1 "Determination of the Resistance to Jet Fires of Passive Fire Protection Materials, Part 1: General Requirements

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 22 February 2011 Expiry date 21 February 2016

Certificate No. SAS F110090

Signed

Sheet No 1 of 4

Name

M. Farrier
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.

Lloyd's Register, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register Group'. The Lloyd's Register Group assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register Group entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.

DESIGN APPRAISAL DOCUMENT

Date 22 February 2011	Quote this reference on all future communications LDSO/SFS/TA/MF
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ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS F110090

This Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

(HSL) Health & Safety Laboratory, Buxton, Derbyshire, United Kingdom, Test Report No. FP/10/32, dated August 2010. (Blast Test followed by a Jet Fire Test of same panel specimens)

Manufacturer's "Engineering Report for Jet Fire and Blast Resistant Composite Panel (sp10.50) sp10 series panels" Rev.01 dated August 2010 and drawing Nos. 700-0026, Rev.A, dated 26 April 2010 and 700-0027, Rev.1, dated 1 July 2010.

CONDITIONS OF CERTIFICATION

1. JETSTOP™ Non Load Bearing Partition System consists of: "sp10.50" composite panels constructed with a Phenolic Foam Insulation and Ceramic Insulation core bonded to E-Glass laminates and covered on the fire exposed side with a jet fire resistant ablative and mesh system, 50.8 mm thick x 1050mm wide x 1650mm high vertical panels, with butt joints to all sides and an operating nominal clearance of 1.6mm between all panels.
2. The 50.8mm thick composite panels were clamped to steel support frames at 1000mm maximum vertical spacing between supports in the blast test. The partition system to be supported by separately approved structural arrangements, as the jet fire specimen was supported by only the flanges of the steel test boxes (no backing plate fitted) and by 150mm wide structural support members in the blast test; all arrangements to be separately approved by Lloyd's Register from structural aspects.
3. Applications to be based on the 120 minute jet fire exposure test performed on a Composite Panel Specimen (see Test Results), incorporating an "JETSTOP™" Non-Load Bearing Partition System (50.8mm total nominal thickness), where the maximum temperature and integrity values derived from the test are considered suitable for the division protection.
4. Suitable approved insulation is to be applied to any other part of the protected fire exposed surfaces not covered by the partition system, in all cases. In particular, attention is to be paid to means of securing the composite panels and the prevention of heat bridging at boundaries.
5. Applications in each case to be approved by Lloyd's Register at the design stage.
6. 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.

NOTES

1. The same test report contains details of an ad hoc blast test conducted by HSL on the same panel test specimens prior to jet fire testing, with 1.0 metre vertical spacing between supports. The blast test exposed the panels to a dynamic blast pressure of 1.53 bar on the front (fire resisting) side and a minor amount of crushing damage was reported on the back face of the panel in way of the support framework.
2. No additional hydrocarbon fire tests were submitted by the manufacturer to demonstrate any performance variations between hydrocarbon fires and jet fires or specific mounting arrangements.

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- Temperature values could not be measured at the panel butt joints due to the initial joint gap of 1.6mm (part of design for blast resistance test), which closed shortly after commencement of the jet fire test and joint temperatures would have been significantly higher and must be considered in any partition applications.
- A "Classification Rating" of "JF/FIRE BARRIER/0/90" as defined in ISO 22899-1, Section 15 is considered applicable for the "JETSTOP™" Non Load Bearing Partition System.

TEST RESULTS FOR INSULATED CLADDING PANEL SYSTEM (50.8mm thick)

Integrity: 90 minutes (smoke and heat penetration was observed at joint) but no flame penetration was observed for the full duration of test (120 minutes)

Insulation: The following maximum temperature rises were recorded on the specimen panels (however no temperatures were monitored at the joint for practical reasons):

Thermocouple No. 2	after 30 minutes of exposure	45°C
Thermocouple No. 6	after 60 minutes of exposure	165°C
Thermocouple No. 6	after 90 minutes of exposure	228°C
Thermocouple No. 2	after 120 minutes of exposure	232°C

DESCRIPTION OF TEST SPECIMEN ARRANGEMENT

The panel jet fire test specimen consisted of two composite panels 50.8mm thick, 1650mm high and of 1050mm wide and 600mm wide, positioned with an open vertical butt joint with an operating nominal clearance of 1.6mm and clamped between the flanges of the re-circulation chamber and back-box with no back plate supporting the panels. Thermocouples were placed directly to the rear face of the panels in generally the same locations as ISO 22899-1, but could not measure joint temperature as there was no backplate. The panels have only one jet fire and blast resistant face.

Note: The blast exposure test consisted of a heavy steel framework of 150mm square section supporting the same two composite panels at two horizontal positions at 1000mm vertical spacing and this is representative of the final assembly.

SCOPE

The test described in the procedure ISO 22899: Part 1 is one in which some of the properties of passive fire protection materials can be determined and is designed to give an indication of how passive fire protection materials will perform in a jet fire. The dimensions of the test specimen may be smaller than typical items of structure and plant and the release of gas may be substantially less than that which might occur in a credible event. However, individual thermal and mechanical loads imparted to the passive fire protection material, from the jet fire defined in the procedure described in ISO 22899: Part 1, have been shown to be similar to those by large-scale jet fires resulting from high pressure releases of natural gas.

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Although the test method has been designed to simulate some of the conditions that occur in an actual jet fire, it cannot reproduce them all exactly and the thermal and mechanical loads do not necessarily coincide. 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 also take into account all the other factors that are pertinent to an assessment of the fire hazard for a particular end use. This test is not intended to replace the hydrocarbon fire resistance test (ISO/TR 834-3/EN 1363-2 or equivalent) but is seen as a complimentary test.

PLACE OF PRODUCTION

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Martin Farrier
Lead Specialist
Statutory Fire & Safety
London Design Support Office
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).