

Certificate Of Fire Approval

This is to certify that the product detailed below will be accepted for compliance with the applicable Lloyd's Register Rules and Regulations and with the International Convention for the Safety of Life at Sea, (SOLAS), 1974, as amended, for use on ships and offshore installations classed with Lloyd's Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits etc.

Manufacturer	LOROWERK K.H. Vahlbrauk Gmbh & Co. KG
Address	Kriegerweg 1, 37581, Bad Gandersheim, Germany
Type	Pipe Penetration (Standard Fire Test)
Description	Fire Resisting Single Steel Pipe, Circular Penetration System – Type: “LORO-X” for applications in A Class steel bulkheads and decks.
Trade Name	“LORO-X” Single Steel Pipe, Circular Penetration System.
Specified Standard	IMO Res. MSC.307(88)-(2010 FTP Code) Annex 1, Part 3 IMO MSC.1/Circ.1488

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 EMEA of any modification or changes to the equipment in order to obtain a valid Certificate.

The Design Appraisal Document and its supplementary Type Approval Terms and Conditions form 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.

Saji Abraham

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DESIGN APPRAISAL DOCUMENT

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21456131SF

The undernoted documents have been appraised for compliance with the relevant requirements of International Conventions.

This Design Appraisal Document forms part of the Certificate.

This certificate is a renewal of SAS F160303

EXAMINED DOCUMENTATION

Test Reports

DMT GmbH & Co. KG Test Laboratory for Fire Protection, Dortmund, Germany; Fire Test Reports No: DMT-DO-53-032, DMT-DO-53-033, DMT-DO-53-034 and DMT-DO-53-043, all dated 10.12.2015

CONDITIONS OF CERTIFICATION

1. For applications in A-60 Class steel bulkheads and decks with approved insulation arrangements (Tables 1 and 2 below describe the details of penetrations tested in A-60 Class bulkheads and decks respectively and the maximum fire rating achieved in each case). Penetrations that achieved lower fire ratings such as A-30 when tested in A-60 Class steel decks are restricted for applications in A-30 Class steel decks and they shall be fitted with at least the same as-tested A-60 Class insulation arrangements (including any insulation fitted on the penetration itself in the tests) for a minimum distance of 200mm around the penetration on the underside in decks and insulation to be extended along the steel pipes for minimum lengths identified in Table 2.
2. For applications in A-0, A-15 and A-30 Class steel bulkheads and decks, all penetrations that achieved A-60 in the A-60 Class fire tests (described in Tables 1 and 2) shall be fitted with the same as-tested A-60 Class insulation arrangements (including any insulation fitted on the penetration itself in the tests) for a minimum distance of 200mm around the penetration on both sides in bulkheads and at least on the underside in decks and insulation to be extended along the steel pipes for minimum lengths identified in Tables 1 and 2.
3. The above mentioned A-60 Class insulation arrangements should be additional to any thermal or acoustic insulation, but may include any fire rated insulation (e.g. A-15, or A-30) already fitted on the bulkhead or deck and/or on the penetration itself, such that the total fire rating is A-60.

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Table 1: Approved arrangements in A-60 Class Steel Bulkheads

"LORO-X" Pipe Penetration type	Maximum fire rating achieved	Approved Applications- General ^(a) or Restricted	Pipe Material	Pipe Inner dia x minimum wall thickness (mm)	Sealing material used at the connections between pipe and penetrations	Minimum insulation arrangements
08200.040C	A-60	General	Stainless-steel	40 x 1.6	Art.No. 00911.040X (NBR)	Penetration and pipe to be insulated using Paroc Marine Wired Mat 100 (density: 100 kg/m ³ ; thickness: 80 mm) or equivalent, for minimum length 500 mm on both the fire exposed side and fire unexposed side of steel bulkhead in all cases.
08200.040X	A-60	General	Galvanised steel	40 x 1.5	Art.No. 00911.040X (NBR)	
08200.050X	A-60	General	Galvanised steel	50 x 1.5	Art.No. 00911.050X (NBR)	
08200.125X	A-60	General	Galvanised steel	125 x 2.5	Art.No. 00911.125X (SBR)	
08201.040C	A-60	General	Stainless-steel	40 x 1.6	Art.No. 00911.040X (NBR)	
08201.040X	A-60	General	Galvanised steel	40 x 1.5	Art.No. 00911.040X (NBR)	
86255.050C	A-60	General	Stainless-steel	50 x 1.5	Art.No. 00911.050X (NBR)	
86255.050X ^(b)	A-60	General	Galvanised steel	50 x 1.5	Art.No. 00911.050X (NBR)	

- (a) General Applications refer to installation arrangements where the Plug-in sleeve or Inner pipe welded to penetration coaming (depending on the penetration type) may be fitted to any one side (fire exposed side or fire unexposed side) of the steel bulkheads
- (b) Pressure pipes used in conjunction with Type: 08200.050X bulkhead penetrations to be fitted with NK Clip (Art.No.: 08070.050X); clip to be fully concealed by the fire rated insulation

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Table 2: Approved arrangements in A-30 or A-60 Class Steel Decks (as applicable, depending on the maximum rating achieved in the tests)

“LORO-X” Pipe Penetration type	Maxi- mum fire rating achieved	Approved Application- General ^(a) or Restricted ^(b)	Position of Plug-in sleeve or Inner pipe welded to Penetration coaming	Pipe Material	Pipe Inner dia x minimum wall thickness (mm)	Sealing material used at the connections between pipe and penetrations	Minimum length of insulation ^(c) to be fitted on penetrati on and pipe
08200.040C	A-60	General	Fire exposed side or Fire unexposed side	Stainless- steel	40 x 1.6	Art.No. 00911.040X (NBR)	500
08200.040X	A-60	General	Fire exposed side or Fire unexposed side	Galvanised Steel	40 x 1.5	Art.No. 00911.040X (NBR)	500
08200.050X ^(d)	A-60	General	Fire exposed side or Fire unexposed side	Galvanised Steel	50 x 1.5	Art.No. 00911.050X (NBR)	500
08200.125X	A-60	General	Fire exposed side or Fire unexposed side	Galvanised Steel	125 x 1.5	Art.No. 00911.125X (SBR)	1000
08200.200C	A-60	Restricted	Fire unexposed side (topside of the deck)	Stainless- steel	200 x 3	Art.No. 00911.200X (SBR)	1000
08200.200X	A-60	Restricted	Fire unexposed side (topside of the deck)	Galvanised Steel	200 x 3	Art.No. 00911.200X (SBR)	1000
08201.040C	A-60	Restricted	Fire unexposed side (topside of the deck)	Stainless- steel	40 x 1.6	Art.No. 00911.040X (NBR)	500
08201.040X	A-60	Restricted	Fire exposed side (underside of the deck)	Galvanised steel	40 x 1.5	Art.No. 00911.040X (NBR)	500
08201.200C ^(d)	A-60	Restricted	Fire unexposed side (topside of the deck)	Stainless- steel	200 x 3	Art.No. 00911.200X (SBR)	1000

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Table 2: Approved arrangements in A-30 or A-60 Class Steel Decks (as applicable, depending on the maximum rating achieved in the tests)-continued....

“LORO-X” Pipe Penetration type	Maxi- mum fire rating achieved	Approved Application- General ^(a) or Restricted ^(b)	Position of Plug-in sleeve or Inner pipe welded to Penetration coaming	Pipe Material	Pipe Inner dia x minimum wall thickness (mm)	Sealing material used at the connections between pipe and penetrations	Minimum length of insulation ^(c) to be fitted on penetrati on and pipe
08201.200X ^(d)	A-60	Restricted	Fire unexposed side (topside of the deck)	Galvanised steel	200 x 3	Art.No. 00911.200X (SBR)	1000
86255.050C	A-60	Restricted	Fire exposed side (underside of the deck)	Stainless- steel	50 x 1.5	Art.No. 00911.050X (NBR)	500
86255.100C ^(d)	A-30 only	Restricted	Fire exposed side (underside of the deck)	Stainless- steel	100 x 1.5	Art.No. 00911.100X(SBR)	1000
86255.050X ^(d)	A-60	Restricted	Fire exposed side (underside of the deck)	Galvanised steel	50 x 1.5	Art.No. 00911.050X (NBR)	1000
86255.100X	A-60	Restricted	Fire exposed side (underside of the deck)	Galvanised steel	100 x 2	Art.No. 00911.100X (SBR)	1000

- (a) General Applications refer to installation arrangements where the plug-in sleeve or Inner pipe welded to penetration coaming (depending on the penetration type) may be fitted to any one side (fire exposed side or fire unexposed side) of the steel decks without restrictions
- (b) Restricted Applications refer to installation arrangements where the Plug-in sleeve or Inner pipe welded to Penetration coaming (depending on the penetration type) must be fitted on only one side (fire exposed side or fire unexposed side) of the steel decks as identified in Table 2 in all cases
- (c) Paroc Marine Wired Mat 100 (density: 100 kg/m³; thickness: 40 mm) or equivalent to be fitted on the pipe and penetration on the fire exposed side (underside) of deck
- (d) For deck penetration types: 08200.050X, 86255.050X, 86255.100C, 08201.200C, 08201.200X, pipe insulation is to be secured using 115mm long 2mm thick galvanised steel hooks at all joints

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4. "LORO-X" Pipe penetration consists of a steel pipe passing through a welded steel sleeve. All connections between pipes and penetration sleeves are sealed using sealing materials identified in Tables 1 and 2 and fully protected by the fire rated insulation.
5. The pipe penetration installation/welding arrangements must be as-tested, in accordance with manufacturer's specifications and to the satisfaction of the attending project surveyor. Any additional requirements specified by the project surveyors for special applications (for example, installations in high stress locations) must also be complied with.
6. Pipe penetrations are to be fitted with the as-tested insulation materials in all cases. Any alternative insulation system proposed must be acceptable to the final Project Authority as being equivalent, at least in fire performance, material properties, thickness and density as the fire tested insulation system. Final insulation arrangements onboard must be to the satisfaction of the attending project surveyor in all cases.
7. Composition, application and installation of subcomponents, including adhesives, seals and any fire retardants, to be maintained in production and used in accordance with originally tested composition formula.
8. 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.
9. The certificate holder is solely responsible for the products supplied under this Certificate and to ensure that their products are fully compliant with the relevant statutory regulations and designed, manufactured and installed to the same quality and specifications as the prototype tested, including components that are designed and manufactured by third parties.

PLACE OF PRODUCTION

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Germany



Saji Abraham
Senior Specialist
Fire & Safety, Statutory Discipline Team
UK&I Technical Support Office, Marine & Offshore
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).