

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	MCT Brattberg AB
Address	Lyckeåborgsvagen 63, Karlskrona, 371 92, Sweden
Type	Cable Transits (Standard Fire Test)
Description	MCT Brattberg "RGS Single or Multiple Cable Rectangular Transits", for use in approved A Class steel and aluminium bulkheads and/or decks and in "CIS 100" Non-load bearing A-60 Sandwich Panel Bulkheads, as described in the attached DAD.
Trade Name	MCT Brattberg RGS Single or Multiple Cable Rectangular Transits
Specified Standard	IMO Res. MSC.61 (67)- (FTP Code) Annex 1 Part 3 IMO MSC/Circ.1120 IMO Res. MSC.307 (88)-(2010 FTP Code) Section 8 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

Surveyor to Lloyd's Register EMEA
A member of the Lloyd's Register group

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DESIGN APPRAISAL DOCUMENT

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. LR21489572SF

The undernoted documents have been appraised for compliance with the relevant requirements of International Conventions, and this Design Appraisal Document forms part of the Certificate.

This certificate is a renewal and amendment of SAS F160151/M2

EXAMINED DOCUMENTATION

TEST REPORTS

1. Tests in accordance with IMO Res. MSC.61 (67)-(FTP Code) Annex 1 Part 3:
Building Research Establishment (BRE), Watford, United Kingdom; Fire Test Reports No: 259264A dated 3 June 2010, 262822 dated 1 October 2010, 266413 dated 10 March 2011, 267923 dated 1 June 2011, 271353A dated 30 July 2012, 271353B dated 5 September 2012 and 271351 dated 7 August 2012.
2. Tests in accordance with IMO Res. MSC.307 (88)-(2010 FTP Code) Annex 1, Part 3:
BRE Global, Watford, United Kingdom; Fire Test Reports No: 282342 dated 15 February 2013 and supplementary BRE Global letter dated 6 February 2013, No: 282342A dated 25 April 2013, 290298 dated 15 May 2014, P101462-1000 Issue 1 dated 8 September 2016, P101462-1001 Issue 1 dated 14 September 2018, P101462-1002 Issue 1 dated 15 August 2018, P101462-1006 Issue 1 dated 2 February 2018, P101462-1010 Issue 1 dated 27 November 2019, P101462-1013 Issue 1 dated 1 May 2020, P101462-1021 Issue 1 dated 17 April 2020, P101462-1022 Issue 2 dated 12 May 2021 and P101462-1023 Issue 1 dated 7 December 2020.
3. Lloyds Register witness certificates: WP6137244 dated 15 June 2011 and SOUTSO/SFS/TA/SA/Test Witness-7/5/2017 dated 11 August 2017.
4. Manufacturer's Drawings No: 1210268A to 1210283A, 1210284B, 1210285A to 1210289A, 1210291B, 1210293A and 1210308 to 1210310. (Note: Drawings are for reference only; product installation and insulation arrangements to be in accordance with Conditions of Certification described below. Additionally, where differences exist between the drawings and the Certificate, the information in the Certificate must be considered correct and applied).

CONDITIONS OF CERTIFICATION

1. RGS single and multiple cable rectangular transits may be accepted in A-60 Class steel bulkheads and decks approved for General Applications (please see Notes 1&2 below) in accordance with Table 1 and associated Notes (a to g) with approved insulation arrangements, generally as described in MCT Brattberg drawings referenced in Table 1. All insulation fitted to the cable transit steel coaming/frame must overlap the end face(s) by at least 20mm. Final insulation arrangements onboard must be to the satisfaction of the project authority.

Note 1: Bulkheads approved for General Applications are those where the fire hazard can be on either or both sides of the bulkhead i.e., insulated side and/or non-insulated side.

Note 2: For deck applications, IMO considers the fire risk to be on the underside only as stated in 2010 FTP Code Annex 1 Part 3 Appendix 1 Paragraph 1.1; therefore, the cable transits were fire tested in decks in this configuration only. Applications where the fire risk is on the top side of the decks would require case-by-case approval and any additional requirements specified by the design project plan approval authority must also be complied with.

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Table 1: Approved arrangements in A-60 Class steel bulkheads and decks approved for General Applications (also see Notes)

Transit type/size	Maximum Fire Rating	Approved Application	Position of tested transit in division	Approved Cable fill ratio (%)	Maximum cable diameter	Minimum Insulation arrangements		
RGS 1x1	A-60	Steel bulkheads and decks	Symmetrical or fire unexposed side only.	1.4 to 82	41	Bulkhead cable transits insulation arrangements to be generally as per MCT Brattberg drawings no: 1210274A, 1210275A, 1210277A and 1210286A.		
RGS 8x1					110	Deck cable transits insulation arrangements to be generally as per MCT Brattberg drawings no: 1210268A and 1210276A.		
RGS 8+8x7								
RGS 8+8+8x9		Steel decks only						
RGS 1x1 Back to Back Light		Steel bulkheads only			Fire exposed side (mounting flange also on fire exposed side)	30	22	Bulkhead cable transits (Back to Back) insulation arrangements to be generally as per MCT Brattberg drawings: 1210273A and 1210293A
RGS 8+8x7 BTB Light							40	
RGSFB 6x1			32	MCT Brattberg drawing: 1210308				
RGSFB 8x2		Steel bulkheads only	Fire unexposed side (mounting flange on fire exposed side)	78	50	MCT Brattberg drawing: 1210309		
RGSFB 8x2							Steel decks only	91.3

Notes

- Tested cable transits RGS 1x1 to RGS 8+8x7 (including Back to Back Standard or Light options) and all intermediate sizes may be accepted in A-60 Class steel bulkheads.
- Tested cable transits RGS 1x1 to RGS 8+8+8x9 and all intermediate sizes may be accepted in A-60 Class steel decks.
- Welded Flanged transits (RGSF) described in MCT Brattberg drawings 1210278A to 1210281A may also be accepted in A-60 Class steel bulkheads and decks.
- RGSFB cable transits (bolted flanged version) RGSFB 6x1 and RGSFB 8x2 described in Table 1 may be accepted in A-60 Class steel bulkheads (Note: Intermediate bulkhead transits above RGSFB 6x1 to be fitted in the same configuration as RGSFB 8x2 i.e., transit seal on the fire unexposed side and mounting flange on fire exposed side).
- Only one size of RGSFB transit, size: RGSFB 8x2 may be accepted in A Class steel decks.
- Bolted Flanged RGSFB transits described in (d) and (e) above may also be accepted in welded configuration (RGSF).
- Cable transits can be accepted with the approved cable fill ratio (single or range, as applicable) comprising the tested cable types of size equal to or smaller than tested. The maximum cable diameter for any intermediate transits is to be proportional to the transit size and may be determined by linear interpolation based on the internal cross-sectional area of the transit or the individual unit of multiple unit transits where the cable is to be fitted, and must be acceptable to the Project Authority.

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2. RGS single and multiple cable rectangular transits may also be accepted in A-60 Class steel bulkheads approved for Restricted Applications (please see Note 3 below) in accordance with Table 2 and associated Notes (a to b), with approved insulation arrangements generally as described in in MCT Brattberg drawing No: 1210285A.

Note 3: Bulkheads approved for Restricted Applications are those where the fire hazard is only on the insulated side of the bulkhead in all cases.

Table 2: Approved arrangements in A-60 Class steel bulkheads approved for Restricted Applications (also see Notes)

Transit type/size	Maximum Fire Rating	Approved Application	Position of tested transit in division	Approved Cable fill ratio (%)	Maximum cable diameter	Minimum Insulation arrangements
RGS 1x1	A-60	Steel bulkheads (Restricted Applications)	Symmetrical	6 to 100	23	Cable transit Insulation arrangements in Restricted bulkheads to be generally as per MCT Brattberg drawing No: 1210285A.
RGS 8x1				1.5 to 100	41	
RGS 8x3				64	40	

Notes

- (a) Tested cable transits RGS 1 to RGS 8x3 and all intermediate sizes may be accepted in Restricted A Class steel bulkheads.
- (b) Cable transits can be accepted with the approved cable fill ratio (single or range, as applicable) comprising the tested cable types of size equal to or smaller than tested. The maximum cable diameter for any intermediate transits is to be proportional to the transit size and may be determined by linear interpolation based on the internal cross-sectional area of the transit or the individual unit of multiple unit transits where the cable is to be fitted, and must be acceptable to the Project Authority.

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3. RGS single and multiple cable rectangular transits described in Conditions 1&2 and Tables 1&2 may also be accepted in approved A-0, A-15 and A-30 Class steel divisions (General or Restricted, as applicable), provided they are insulated to the same A-60 specification as in the A-60 fire tests (described in Conditions 1&2 and Tables 1&2, as applicable) and this A-60 insulation extended around the transit for a minimum distance of 200mm, on all fire risk sides of bulkheads and decks (please see Note 2 of Condition 1), as determined by the design project Plan Approval Authority. Note: The above requirement to extend A-60 insulation 200mm around the transit need not be applied for bulkhead transits described in Condition 4 and Table 3 below.
4. RGS single and multiple cable rectangular transits described in Table 3 and associated Notes (a to c) below may be accepted in approved A-0 Class steel bulkheads with no insulation fitted on or around the transit, based on separate testing conducted in accordance with IMO Res. MSC.307(88)-(2010 FTP Code) Annex 1, Part 3 Appendix 2. A.IV.2.2.1.1.

Table 3: Approved arrangements in A-0 Class steel bulkheads only (also see Notes)

Transit type/size	Approved Application	Position of tested transit in bulkhead	Approved Cable fill ratio	Maximum cable diameter	Minimum Insulation arrangements
RGS 8x1	A-0 Class Steel bulkheads only	Symmetrical or fire unexposed side only.	40%	39	Insulation not required on or around the transit as per MCT Brattberg drawings 1210284B and 1210288A.
RGS 2x1 back to back				24	
RGS 8+8x7 back to back				100	

Notes

- (a) Only one size as-tested single frame cable transit RGS 8x1 may be accepted in A-0 Class steel bulkheads.
- (b) Tested cable transits RGS 2x1 Back to Back up to RGS 8+8x7 Back to Back and all intermediate sizes may be accepted in A-0 Class steel bulkheads.
- (c) Cable transits can be accepted with the approved cable fill ratio (single or range, as applicable) comprising the tested cable types of size equal to or smaller than tested. The maximum cable diameter for any intermediate transits is to be proportional to the transit size and may be determined by linear interpolation based on the internal cross-sectional area of the transit or the individual unit of multiple unit transits where the cable is to be fitted, and must be acceptable to the Project Authority.

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5. Types: RGSFB and RGB/RGG cable transits are approved for use in the as-tested 100mm thick type: "CIS 100 A-60 Sandwich Panel Bulkhead" only, using steel mounting flange and M8 steel bolts, with as-tested arrangements as described in Table 4 and associated Notes (a to c) below. Use of these transits in other types of sandwich panel bulkheads are outside the scope of this certificate and would require case-by-case approval.

Table 4: Approved arrangements of RGSFB and RGB/RGG cable transits in as-tested 100mm thick type: "CIS 100 A-60 Sandwich Panel Bulkhead" only (also see Notes)

Transit type/size	Maximum Fire Rating	Approved Application	Position of tested transit in the sandwich panel bulkhead	Approved Cable fill ratio (%)	Maximum cable diameter	Minimum Insulation arrangements
RGSFB 2x1	A-30	"CIS 100" A-60 Sandwich Bulkhead only	Fire unexposed side (mounting flange on fire exposed side)	20 to 60%	34	Transits to be fully insulated with 75mm thick, 100kg/m ³ SeaRox SL 620 or equivalent on the side opposite to the transit mounting flange and insulation retained within a 0.6mm thick, 60mm deep steel insulation holder with a 60mm wide flange, generally as described in MCT Brattberg drawings 1210287A and 1210291B.
RGSFB 2x1	A-60		Fire exposed side (mounting flange on fire unexposed side)			
RGSFB 8+8x3	A 60		Fire Exposed or Fire unexposed side (General Applications)		50	
RGB / RGG 8+8x3	A-60		Fire exposed side (mounting flange on fire unexposed side) only			

Notes

- (a) Tested cable transits RGSFB 2x1 up to RGSFB 8+8x3 and all intermediate sizes may be accepted, restricted to fire exposed side or fire unexposed side or unrestricted to any one side of the bulkhead as per the tested configurations described above. RGSFB 2x1 fitted on fire unexposed side (mounting flange on fire exposed side) is restricted for A-30 applications only.
- (b) Only one tested size of RGB/RGG cable transit, RGB/RGG 8+8x3 may be accepted, restricted to fire exposed side of bulkhead only.
- (c) Cable transits can be accepted with the approved cable fill ratio (single or range, as applicable) comprising the tested cable types of size equal to or smaller than tested. The maximum cable diameter for any intermediate transits is to be proportional to the transit size and may be determined by linear interpolation based on the internal cross-sectional area of the transit or the individual unit of multiple unit transits where the cable is to be fitted, and must be acceptable to the Project Authority.
6. RGS single and multiple cable rectangular transits may be accepted in approved A-60 Class aluminium bulkheads and decks in accordance with Condition 7, Table 5 and associated Notes (a to b) below with approved insulation arrangements, generally as described in MCT Brattberg drawings no:1210269A to 1210272A.
7. Aluminium bulkheads and decks in all cases must be insulated with an approved system on all fire risk sides (as determined by the design project Plan Approval authority; also see Note 2 of Condition 1) to prevent the core temperature exceeding 200°C and all transits fitted to such divisions must be insulated with an approved A-60 system, generally as described in MCT Brattberg drawings referenced in Table 5. All insulation fitted to the transit coaming/frame must overlap the end face(s) by at least 20mm.

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Table 5: Approved arrangements of cable transits in A-60 Class aluminium bulkheads and decks (also see Notes)

Transit type/size	Maximum Fire Rating	Approved Application	Position of tested transit in division	Approved Cable fill ratio (%)	Maximum cable diameter	Minimum Insulation arrangements
RGS 1x1	A-60	Aluminium bulkheads and decks	Symmetrical or fire unexposed side only.	40 to 80%	50	Bulkhead cable transits insulation arrangements to be generally as per MCT Brattberg drawings no: 1210270 A and 1210271 A.
RGS 8+8x7						Deck cable transits insulation arrangements to be generally as per MCT Brattberg drawings no: 1210269 A and 1210272 A

Notes

- (a) Tested cable transits RGS 1x1 up to RGS 8+8x7 and all intermediate sizes may be accepted in approved A-60 Class Aluminium bulkheads or decks.
 - (b) Cable transits can be accepted with the approved cable fill ratio (single or range, as applicable) comprising the tested cable types of size equal to or smaller than tested. The maximum cable diameter for any intermediate transits is to be proportional to the transit size and may be determined by linear interpolation based on the internal cross-sectional area of the transit or the individual unit of multiple unit transits where the cable is to be fitted, and must be acceptable to the Project Authority.
8. Consisting of: MCT Brattberg Mild Steel, Stainless Steel or Aluminium frames minimum 60mm deep and 10mm thick and either bolted on one side or fully welded to the division on both sides; and filled with MCT Brattberg 60mm thick Lycron self-lubricating transit blocks. The types: "Standard Insert Blocks", "Addblocks", "U-Blocks", "Machined blocks to suit non circular services", "Handi-blocks", "Plugs" and "Wraps" are also accepted.
 9. Back to back transits are fitted in mild steel sleeves minimum 200mm deep made of 10mm thick steel on the ends and 12mm thick on the sides and fully welded to the steel division on both sides
 10. Frame types: RGS, RGSO, RGSF, RGSFO, RGSFBO, RGB, RGS btb, RGSC, RGSFB, RGSK, and RGSR.
 11. The cable transit 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.
 12. Cable transits 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.
 13. 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 and method of application and installation, and manufacturer's instructions.
 14. 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.

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15. 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.

NOTE

1. As per Section 2.2.6 of Appendix A.4 or IMO Resolution A.754 (18) the cable transits above have been tested with a range of different types of cables including a range of different conductors sheathing and insulation materials.

ADDITIONAL AD HOC TEST RESULTS (For Information only; outside the scope of this Fire Type Approval Certificate)

1. Various RGS transits were subjected to a hydrostatic pressure test of 5 Bar and a pneumatic pressure test of 4 bar. For water and gas tight applications reference should be made to the manufacturer's instructions.
2. The transit seal was subject to a blast overpressure with an average value of 0.773 bar for a duration of 240 milliseconds detailed in report on blast loading on steel bulkheads fitted with flexible seals, dated April 1994 by British Gas PLC at Spadeadam.
3. EMP (Electro Magnetic Pulse) type also accepted.
4. MCT Brattberg pressure test reports: 11201 and 110202 dated 15 June 2011
5. Back to back arrangements of RGS 2x 1 and RGS 8x1 cable transits with various cables and pipes and sealed with a mix of standard blocks, Add blocks, Handi-blocks, stay plates, end packing STG-1 and press wedge PTG-120, were subjected to separate hydrostatic and pneumatic pressure tests with pressure applied between the RGS seals in the Back to Back frames, increasing pressure in steps every 5 minutes and then held at 6bar water pressure and 4 bar pneumatic pressure with no reported leakage for 30minutes, as detailed in DNV-GL report no.N141GRC2 dated 22 November 2017.
6. RGSF 8x1 Single frame cable transit comprising Handi-blocks with plugs, stay plates and press wedge PTG-120 was subjected to a hydrostatic test increasing pressure in steps and maintained at 6bar for 60minutes followed by a pneumatic test increasing pressure in steps and maintained at 7bar for 30minutes with no reported leakage as described in DNV report no: N141NMEK dated 14th November 2018.
7. RGSF 2x1 and RGSF 8x1 Single frame cable transits comprising cables and pipes, spare blocks, standard blocks, Add-blocks, Handi-blocks, U-Blocks, stay plates, STG end packing and PTG press wedge were subjected to a hydrostatic test increasing pressure in steps and maintained at 6bar for 60minutes with no reported leakage as described in MCT Brattberg test report no: 190614 dated 18th October 2019. The tests were witnessed by Lloyd's Register.

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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).