RISE® MULTI-CABLE TRANSITS: THE RAPID SEALING SYSTEM

APPROVED FIRESTOP WATER AND GAS TIGHT
MAXIMUM SIMPLICITY OF USE
OPTIMUM FLEXIBILITY
OUTSTANDING PERFORMANCE


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brochure code : RISEcable/hb/en/mar
BEELE ENGINEERING BV
CSD INTERNATIONAL BV

BEELE Engineering and CSD International have been working in the field of water and gas tight and fireproof sealing of conduits for pipes and cables for more than 30 years. In the field of passive fire prevention, we have invested substantial amounts of money in the development of systems which are capable withstanding fires for extended periods of time. Passive fire prevention is a very complicated matter due to the fact that cable and pipe penetrations have to be designed to the actual circumstances at site and not for a laboratory test. In case of a catastrophe penetrations are subject not only to flame erosion and very high temperatures, but also to mechanical loads due to collapsing cableways and possibly a jet of fire-fighting water. This means that the performance in actual situations can differ dramatically from that in a regular fire test. In fact, the systems could only be applied as tested to guarantee the required fire safety.

And this means discussions and limitations! We have ensured that our systems will function under all circumstances, and the classification societies have awarded us signed and stamped installation drawings of our sealing systems. Approved for steel and aluminium partitions. Guaranteed safety in your installation will be the result.

The R&D department of BEELE Engineering is constantly working in the field of rubber and systems techniques to optimize the existing systems and to develop new concepts for cable and pipe conduits on board of vessels and offshore installations. Although installation of the CSD sealing systems is in fact an easy matter, a full training programme can be given in-house by our engineers. Because the advantages and possibilities of passive fire prevention and evacuation signposting can most effectively be discovered in an environment that matches the practical situation as closely as possible, we have constructed an unique research and development centre. As far is known, this R&D centre is the only institute world-wide where visitors can experience for themselves all the aspects of fire prevention and evacuation signposting systems.

Above an impression of the research and development centre with a training and schooling institute for passive fire prevention products and systems and for the improvement of evacuation signposting systems in buildings and on board ships. The centre consists of a presentation theatre seating up to 45 persons, and a mock-up covering about 500 square metres in which various evacuation signposting systems are installed to enable their effectiveness to be determined in the dark. The behaviour of escaping persons inside the test facility are recorded from a separate technical area (with an associated showroom) by means of infra-red cameras and an audio-video system. In addition the centre comprises three laboratories with a total surface area of about 300 square metres in which, respectively, large-scale fire tests, mechanical tests, and light emission investigations are performed.
RISE® multi-cable penetrations are an alternative for the casting compounds and block systems used in fire-rated/watertight bulkheads and decks.

Very easy to install.

*Time saving, space saving, weight saving.*

The very limited amount of different parts makes this system easy to handle on site. Use is made of rubber inserts (placed around the cables) and filler sleeves. The FRR/LEHF (fire resistant rubber/low grade of expansion, halogen free) rubber of the sleeves expands 5-10 times its original volume when exposed to fire. On both sides of the penetration a layer of FIWA® sealant (fire resistant, water repellent) is applied.

*Only halogen free components.*

RISE® multi-cable penetrations offer a most simple way of installation. No precise positioning of the cables in the transit needed.

The RISE® sealing system allows cables to be ducted through conduit openings in a bent, curved or oblique way without any adverse impact on sealing performance.

The RISE® sealing system gives easy access to add or remove cables in a later stage without the necessity to disassemble the whole penetration. Just cut away a piece of the FIWA® layer at both sides of the penetration, pull the cable through and refill the opening in the sealant layer.

*It is that simple!*
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

**RISE® multi-cable penetrations: based on high-tech ACTIFIRE® technology**

SYSTEM WILL BE ACTIVATED WHEN EXPOSED TO FIRE
ALL COMPONENTS ARE TOTALLY HALOGEN FREE
IN CASE OF FIRE: NON-TOXIC, LOW SMOKE INDEX
CE (MED) CERTIFICATES FOR A-0 UP TO A-60
CERTIFIED FOR H-0 UP TO H-120
APPROVED WATER TIGHT UP TO 2.5 BAR
APPROVED GAS TIGHT UP TO 1 BAR
CAN BE USED IN ARCTIC CONDITIONS
HIGH LEVEL OF EMC AND SOUND DAMPING
SHOCK AND VIBRATION PROOF
UP TO 50 YEARS SERVICE LIFE
CAPABLE OF ABSORBING TEMPERATURE CHANGES
WEATHERING, UV AND OZONE RESISTANT
NO PRE-ENGINEERING NEEDED
NO SPECIAL CONDUIT FRAMES
MINIMIZED NUMBER OF STRUCTURAL COMPONENTS
MOST COMPACT INSTALLATION
EXTREMELY SIMPLE TO INSTALL
NO INSULATION IN FRONT OF THE PENETRATION
SHORTEST POSSIBLE CONDUIT LENGTH
LESS OVERALL INSULATION NEEDED
CAN BE USED FOR CABLE AND PIPE ENTRIES
APPROVED FOR STEEL AND ALUMINIUM PARTITIONS
MAINTENANCE FRIENDLY
no time-consuming lay-outs for a RISE® multi-cable penetration

Since the cables can be ducted in random order through the conduit frame or sleeve it is not necessary to create lay-outs for the installers to be sure that the cables are ducted at the right spot in the conduit. We have a software program available for calculating the size of the conduit opening and the amount of insert sleeves and sealant for each RISE® penetration. All penetrations can be put in a database to calculate the total amount for a project (see page 39). Could it be easier?

no special conduit frames needed for a RISE® multi-cable penetration

An important benefit of being able to use round sleeves instead of square or rectangular ones is the exclusion of welding stresses in the corners and for the improved overall mechanical strength! The coamings can be made by the yard/installer: more benefits and cost-savings.

whatever conduit sleeve you have around will do for a RISE® multi-cable penetration
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

**time-saving installation of**
**RISE® multi-cable penetrations**

It’s so simple. Just place the length-wise split insert sleeves around the cables, fill up any spare space with empty sleeves and seal it off on both sides. No work for specialists. What could be easier!

Calculate the right way, save time and money.

Ask for the installation video showing that a transit measuring 450x130 mm with 63 cables is sealed within 40 minutes.

*Substantial cost-savings.*

**no bolts, no nuts, no precise fitting work**
**with RISE® cable penetrations**

**space and weight saving properties of**
**RISE® multi-cable penetrations**

Prefabricated sealing systems are sealed with solid rubber parts. Due to the block sizes a substantial separation of the cables might occur. Fire resistant rubbers are highly filled and therefore heavy. Totally different with RISE®. The conduit opening can be substantially reduced when compared to block systems, due to the high fill capacity of RISE®, and any spare space in the conduit is filled with hollow filler sleeves. Scarcely any weight is added to the penetration even if the conduit is a bit oversized.

**substantial overall time-savings with**
**RISE® multi-cable penetrations**
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

fire tested on full scale bulkhead and deck in accordance with IMO Res. A.754(18)

Generally, multi-cable transits have to be installed as tested. It will be clear that a transit tested with only a couple of small cables will not meet an A60 classification when fully packed with heavy conductor cables. RISE® multi-cable penetrations are tested with all types of cables, from communication to power cables with small dimensions, up to cables with a dimension of 85 mm, armoured and non-armoured, at full load and according to the latest IMO Resolution A.754(18).

RISE® is successfully tested with a wide variety of cable types and sizes up to 85 mm OD

RISE® is successfully tested with more than 100 cables to enable a high cable fill capacity

RISE® is designed to duct the maximum allowable filling rate of 40% as defined in the IMO Res. A.754(18).

most compact installation ever with a RISE® multi-cable penetration
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

**fire tested with insulation at one side only in accordance with IMO Res. A.754(18)**

Section A.IV/2.2.1 of IMO Res. A.754(18) states: "A bulkhead which includes the cable transit should be constructed in accordance with 2.1.1 of the recommendation and should be insulated to class A-60 on the stiffened side, which should be the face which is not exposed to the heating conditions of the test." Systems tested with insulation at the exposed side have a limitation in the application. The bulkhead must then be totally insulated at both sides! This is not the case with RISE®.

**shortest possible conduit length, less insulation with RISE® multi-cable penetrations**

**fire tested in worst case scenarios in accordance with IMO Res. A.754(18)**

The easiest way to pass a deck test is to place the transit totally above deck. **Worst case for deck penetrations is to place the transits totally below deck.** And that is exactly the way the penetrations generally are installed! Cable penetrations should be applied as tested. This means that penetrations tested only above deck should not be placed totally below deck. RISE® multi-cable penetrations are tested [worst case] and can be welded in above, below, midway.

**any position of the transits will do for a RISE® multi-cable penetration**
RISE® MULTI-CABLE TRANSITS: 
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RISE® is based on ACTIFIRE® technology and will be activated when exposed to fire

All classes above A-0 or H-0 must have a T-rating (not exceeding 180 °C/400 °F at the unexposed side). For every technician it will be clear that when ducting cables containing a lot of copper, the length of the penetration is a determining factor here. RISE® cable penetrations have been tested with heavy conductor cables. The length of the conduit could be minimized by the use of the expanding sealant/rubber, which lengthen the penetration when exposed to fire. For A-class penetrations the conduit sleeve/frame needs to be insulated only at the insulated side of the bulkhead or at the lower side of the deck.

no fussing with extra insulation in front of the penetration and in between the cables

RISE® materials expand massively when exposed to heat or flames

Generally, rubbers used for multi-cable transit systems are made of a more or less self-extinguishing compound. The drawback, however, is that these rubbers will start charring under heat and slowly but surely will shrink due to the loss of the water content in the rubber. Not with RISE®! The rubber starts vulcanizing when exposed to heat, forming a solid rubber mass inside the penetration and an expanding char on all exposed surfaces.

all gaps will be filled automatically by the “self-correcting” RISE® cable penetration
RISE® MULTI-CABLE TRANSITS:
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approved gas and water tight
RISE® multi-cable penetration

Due to the high bonding strength and flexibility of the FIWA® sealant, the penetrations could be subjected to certified pressures up to 2.5 bar (35 Psi) without any leakage. Where rubber parts have to be strongly compressed to obtain water tightness, they will soon show permanent deformation. Also, the cable sheathings are exposed to this heavy load and will creep. This is not the case with RISE®. **Tight stays tight, with no compressive forces on the cables! CERTIFIED.**

no compression needed to obtain a watertight
RISE® multi-cable penetration

RISE® cable penetrations are artificially aged for a service life up to 50 years

What will the performance of a fire safe multi-cable penetration be after years of service? **Remember that safety is at stake here.** This is the reason why the RISE® system has been artificially aged up to 50 years, after which the expanding properties of the rubber and the sealant were compared with new material. Only minor changes were noted! Temperature cycle on the RISE® system from -40 °C to ambient to +120 °C, and back, showed that the adhesion of FIWA® holds the system tight!

RISE® multi-cable penetrations are exposed to thermal cycling tests with positive results
additional safety with RISE® multi-cable penetrations

* Naval Engineering Standard 711: Issue 2:  
  Determination of the smoke index passed
* Naval Engineering Standard 713: Issue 3:  
  Determination of the toxicity index passed
* ISO 4589 - 2 : 1996  
  Determination of the oxygen index passed
* ISO 4589 - 3 : 1996  
  Determination of the temperature index passed
* IMO Resolution A.653(16)  
  Determination of low flame spread characteristics passed
* Artificial ageing test  
  Determination of properties after 25-50 years passed
* Thermal cycling test  
  Determination of adhesion at +120 °C / ambient / -40 °C (+212 °F / ambient / -40°F) passed
* Naval Engineering Standard 510: Issue 2, Draft B:  
  Shock (100 gₙ) and vibration test (5-350 Hz) combined with 1 bar leak test afterwards passed
* Naval Engineering Standard 814:  
  Shock test, acceleration level 8378/s/s in two directions combined with 6.9 bar leak test afterwards passed
* Naval Engineering Standard 510: Issue 2, Draft B:  
  Leak test after a one hour fire test passed
* General classification  
  Helium gas leak test up to 1 bar passed
* Nordtest method NT ELEC 030, modified for conducted attenuation  
  20-100 dB
* Sound damping test  
  According to EN ISO 717-1:1996 70 dB
* Rapid rise fire test  
  According to Mil-P-24705 of the US Navy passed
* Dynamic cycling test  
  Displacement 10 mm, 100,000 cycles, frequency 0.5 Hz passed

To prove the outstanding quality and safety of the RISE® cable and pipe penetrations, the basic materials (FIWA sealant and FRR/LEHF rubber) have been subjected to additional tests. These tests have been carried out by official institutes: Warrington Fire Research and RAPRA Technologies in the United Kingdom, the Fire Technology Institute of the University of Ghent in Belgium and TNO Laboratories in The Netherlands. The RISE® cable and pipe penetrations have also been subjected to additional tests at official institutes such as DELTA Danish Electronics, Light and Acoustics Testing in Denmark, QinetiQ in England, South West Research Institute in USA and in-house under survey of the classification societies. To name some: sound tests, shock and vibration tests, rapid temperature rise tests, leak tests after a one hour fire test, EMC tests, A-0 test without insulation, dynamic cycling test, several configurations on watertightness and a helium gas leak test.
RISE® MULTI-CABLE TRANSITS: 
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EC (MED) certificates according to EUROPEAN UNION COUNCIL DIRECTIVE 96/98 EC on MARINE EQUIPMENT have been issued by BUREAU VERITAS, certificates N° 09156/B0 EC for multi-cable penetrations and extended multi-cable penetrations, N° 11301/A2 EC for EMC multi-cable penetrations, N° 11302/A2 EC for busbar penetrations and certificates N° 10035/B0 EC and N° 10710/A6 EC for single and multi-pipe penetrations for metallic and plastic pipes.

Approval certificate according to Defence Standard 07-225/1, Number S&DU/BCC/30/13/003 has been issued by QinetiQ/UNITED KINGDOM.
US Navy Approval Letter 9300 9342/Ser085 issued by Naval Surface Warfare Center, Carderock Division, based on fire tests performed in accordance with MIL-P-24705.

American Bureau of Shipping
Bureau Veritas
China Classification Society
China Corporation Register of Shipping
Det Norske Veritas
Germanischer Lloyd
Korean Register of Shipping
Lloyd’s Register of Shipping
Nippon Kaiji Kyokai
Russian Maritime Register of Shipping
Transport Canada
US Coast Guard
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

only two different components for a RISE® cable penetration: sleeves and sealant

<table>
<thead>
<tr>
<th>sleeve type</th>
<th>cable diameter</th>
<th>sleeve length (standard)</th>
<th>sleeve length (standard)</th>
<th>wall thickness</th>
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<td>5 - 7</td>
<td>160</td>
<td>210</td>
<td>3</td>
</tr>
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<td>14/8</td>
<td>7 - 9</td>
<td>160</td>
<td>210</td>
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</tr>
<tr>
<td>16/10</td>
<td>9 - 11</td>
<td>160</td>
<td>210</td>
<td>3</td>
</tr>
<tr>
<td>18/12*</td>
<td>11 - 13</td>
<td>160</td>
<td>210</td>
<td>3</td>
</tr>
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<td>20/14</td>
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<td>210</td>
<td>3</td>
</tr>
<tr>
<td>22/16</td>
<td>15 - 17</td>
<td>160</td>
<td>210</td>
<td>3</td>
</tr>
<tr>
<td>27/19*</td>
<td>17 - 21</td>
<td>160</td>
<td>210</td>
<td>4</td>
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<td>21 - 25</td>
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<td>4</td>
</tr>
<tr>
<td>35/27</td>
<td>25 - 29</td>
<td>160</td>
<td>210</td>
<td>4</td>
</tr>
<tr>
<td>39/31</td>
<td>29 - 33</td>
<td>160</td>
<td>210</td>
<td>4</td>
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<td>46/36</td>
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<td>58/48</td>
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<td>64/54</td>
<td>51 - 57</td>
<td>160</td>
<td>210</td>
<td>5</td>
</tr>
<tr>
<td>70/60</td>
<td>57 - 63</td>
<td>160</td>
<td>210</td>
<td>5</td>
</tr>
</tbody>
</table>

* filler sleeves are supplied non-split for ease of filling

Dimensions in mm

RISE® cable penetrations:
non-toxic, halogen free components

For the RISE® insert and filler sleeves, a special rubber compound was developed known as FRR/LEHF (fire resistant rubber/low grade of expansion, halogen free). When this rubber is exposed to fire or temperatures in excess of 200 °C it expands five to ten times its original volume. During the expansion of the rubber a carbonized mass is formed, which has good properties of thermal insulation.

The FRR/EHF rubber is absolutely HALOGEN FREE (tested according to Naval Engineering Standard NES 713: Issue 3). Furthermore the FRR/LEHF rubber has a low smoke index (NES 711: Issue 2: 1981) and a very high oxygen index (ISO 4589-2: 1996).

The wall thickness of the sleeves is so chosen as to satisfy the requirements governing adequate separation of the cables.

Sometimes conduits are extremely oversized. For ease of filling of larger remaining spaces the filler sleeves 18/12 and 27/19 can be supplied as non-split multi-units of 10 pieces bonded together.
FIWA® is a fire-resistant sealant based on a single component silicone compound. **FIWA® is also water-repellent**

**High bonding strength**

**Weathering, UV and Ozone resistant**

In the event of fire or at temperatures in excess of 200 °C the sealant expands to about five to ten times its original volume. During this process a porous mass is formed, which has excellent thermal insulation properties. In contrast to conventional materials that swell under severe heat exposure, the expansion of FIWA® sealant is not caused by intumescence, but by a chemical process (Intumescence means the occurrence of volume enlargement under the effect of heat, caused by the surface structure being inflated by fumes originating from the product). The advantage of this is that the expansion of FIWA® is not accompanied by formation of large amounts of fumes.

**optimum combination of viscosity, flow and bonding capacity of FIWA® sealant**

**PRODUCT INFORMATION**

<table>
<thead>
<tr>
<th>No.</th>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Colour</td>
<td>dark grey</td>
</tr>
<tr>
<td>02</td>
<td>Specific gravity</td>
<td>1.26 ± 0.03 g/cm³</td>
</tr>
<tr>
<td>03</td>
<td>Curing of top layer</td>
<td>1 - 2 hours</td>
</tr>
<tr>
<td>04</td>
<td>Service temperature</td>
<td>-60 °C up to +160 °C</td>
</tr>
<tr>
<td>05</td>
<td>Tensile strength</td>
<td>0.80 MPa</td>
</tr>
<tr>
<td>06</td>
<td>Elongation at break</td>
<td>80%</td>
</tr>
<tr>
<td>07</td>
<td>Hardness</td>
<td>40 Shore A</td>
</tr>
<tr>
<td>08</td>
<td>Elasticity</td>
<td>approx. 25%</td>
</tr>
<tr>
<td>09</td>
<td>Fire class</td>
<td>IMO Res. A.653(16)</td>
</tr>
<tr>
<td>10</td>
<td>Ageing</td>
<td>up to 50 years service life</td>
</tr>
<tr>
<td>11</td>
<td>Supplied in</td>
<td>cartridges, containing 310 ml</td>
</tr>
<tr>
<td>12</td>
<td>Storage</td>
<td>to be stored cool and dry min/max temperature = +5/+30 °C</td>
</tr>
<tr>
<td>13</td>
<td>Storage life</td>
<td>approx. 9 months</td>
</tr>
</tbody>
</table>

FIWA® is absolutely **HALOGEN FREE** (tested according to Naval Engineering Standard NES 713: Issue 3).

Furthermore FIWA has a low smoke index (NES 711: Issue 2: 1981) and a high oxygen index (ISO 4589-2: 1996), and low flame spread characteristics according to IMO Resolution A.653(16).
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

1) The cables can be ducted through the conduit sleeve/frame in random order. It is most important that they are not pulled too tight in order not to hamper their separation when RISE® insert sleeves are inserted. Ask for our free installation video.

2) After the cables have been ducted, RISE® insert sleeves are applied around each cable. The insert sleeves are split length-wise and can therefore be fitted around the cables in front of the conduit. See above.

QUALITY SYSTEM APPROVAL
SMS.W.I.CE.D/2357/B2 AND
ISO 9001:2001 CERTIFICATE
NLDGNG003470 ISSUED
BY BUREAU VERITAS

Sleeving the cables directly after ducting avoids overfilling of the transit.
3) The remaining free space in the conduit is filled with RISE® filler sleeves type 27/19 and 18/12.
For ease of filling the RISE® filler sleeves are delivered non-split. The ratio 27/19 to 18/12 should be about 2:1.

4) Push the insert/filler sleeves into the conduit in such a way as to leave about 20 mm free space at the front. The whole set of insert and filler sleeves should tightly fit into the conduit to offer sufficient mechanical stability.

Before applying the sealant it is advisable to check the status of the filling with insert and filler sleeves.
5) A 20 mm thick layer of FIWA® sealant is applied at each side of the conduit. Clean and dry the conduit opening and the cables thoroughly and remove any dirt, rust or oil residues before applying the sealant.

6) The conduit should be overfilled with FIWA® sealant, because some sealant will be pushed between and into the empty insert sleeves during further finishing. This will contribute to obtain higher tightness ratings.
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

7) To smooth the surface of the FIWA® sealant layer, a cloth is sprayed with water. This prevents the sealant from sticking to the cloth. Note: do not use soapwater!

8) The cloth is then used to press down the sealant layer. People with sensitive skin should use gloves when working with the FIWA®. Please refer to the Safety Data Sheet for more information.
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

9) The FIWA® sealant between the cables is pressed down and smoothed by hand or with a spatula or putty knife. This is essential to obtain an effective gas- and water tightness.

10) The surface can also be smoothed by hand. Just wet the hand thoroughly with soap and water. No dirty hands when working with FIWA® and a very neat surface is the result. People with sensitive skin should use gloves when working with FIWA®.
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

11) After smoothing is finished a last check should be taken if sufficient sealant is applied in between the cables especially at penetrations with larger amounts of cables. This is most important specially for water and gastight penetrations.

12) For A-class penetrations the conduit sleeve/frame needs to be insulated only at the insulated side of the bulkhead or at the lower side of the deck. No extra insulation needed in front of the penetration and/or in between the cables.

to obtain optimum adhesion during the curing process of the sealant, the cables should be tightly fixed immediately after finishing the transit.
13) For vertical conduits it is advisable to select the insert sleeves a bit undersized. They will then cling to the ducted cables in such a way that they are prevented from sliding down.

14) To prevent the filler sleeves from falling out of the conduit sleeve/frame, they are bundled together to form a compact bundle. They are available in bundles of ten pieces. Contrary to the insert sleeves, filler sleeves are delivered in a non-split version.
15) The optimized viscosity and the superb adhesion properties of the FIWA® sealant make applying the sealant overhead an easy matter. FIWA® sealant does not sag and will not drip off.

A layer of FIWA® sealant can be substituted at one of both sides of the penetration with DRIFIL® sealant to optimize tightness. DRIFIL® sealant is even more adhesive than FIWA® and also has more flexibility when fully cured. **Certified system.**
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

DIAGRAMMATIC OVERVIEW OF SHIPBUILDING/OFFSHORE APPLICATIONS

L1: A-60/H-120 approved bulkhead insulation.
L2: mineral wool minimum 25 mm, density 110 kg/m³ for A-class penetrations or equivalent; for H-class penetrations ceramic fibres 128 kg/m³ or equivalent as used for the bulkhead insulation.

The FIWA layer may be substituted at one side of the penetration with DRIFIL sealant. This configuration has been tested for use between hazardous and non-hazardous areas where optimum tightness is required.

- NO EXTRA INSULATION REQUIRED AT THE FRONT OF THE PENETRATION AND/OR IN BETWEEN THE CABLES

L = 200 mm for A-class and 250 mm for H-class

length of the RISE® insert and filler sleeves 160 mm for A-class and 210 mm for H-class.

specifications for A-class according to CE certificate 09156/B0 EC and for H-class to Type Approval Certificate 11908/A0 BV both issued by Bureau Veritas also approved for busbar penetrations: CE certificate 11302/A2 EC issued by Bureau Veritas

A0-A60 / H0-H120 CABLE TRANSIT BULKHEADS
RISE® MULTI-CABLE TRANSITS:  
THE RAPID® SEALING SYSTEM

DIAGRAMMATIC OVERVIEW OF SHIPBUILDING/OFFSHORE APPLICATIONS

L1: A-60/H-120 approved deck insulation.  
L2: mineral wool minimum 25 mm, density 110 kg/m³ for A-class penetrations or equivalent; for H-class penetrations ceramic fibres 128 kg/m³ or equivalent as used for the deck insulation.

The FIWA layer may be substituted at one side of the penetration with DRIFIL sealant. This configuration has been tested for use between hazardous and non-hazardous areas where optimum tightness is required.

- NO EXTRA INSULATION REQUIRED AT THE FRONT OF THE PENETRATION AND/OR IN BETWEEN THE CABLES

non-fire rated conduits which should only be gas or water tight can be shorter in length, for ease of installation it is advisable the length of the coaming not to make shorter than 100 mm.

L = 200 mm for A-class and 250 mm for H-class

length of the RISE® insert and filler sleeves 160 mm for A-class and 210 mm for H-class.

specifications for A-class according to CE certificate 09156/B0 EC and for H-class to Type Approval Certificate 11908/A0 BV both issued by Bureau Veritas also approved for busbar penetrations: CE certificate 11302/A2 EC issued by Bureau Veritas

A0-A60 / H0-H120 CABLE TRANSIT DECKS
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

Existing installations can easily be upgraded to the RISE® sealing system using extension frames. Generally the depth of the transit frames is too short to offer the required thermal insulation during a fire. To fulfil this criterion for all types of cables a minimum depth of 200 mm is an absolute must. Otherwise the transit and the front side of the penetration have to be totally insulated. By making use of extension frames the required depth can easily be obtained.

The advantage of upgrading with RISE® is not only an improvement of the fire rating, but it also gives the option to acquire more available space for ducting extra cables. The extended RISE® penetration filled with the same configuration of cables as tested with the normal RISE® penetrations and with the same sizes, has been successfully tested according to IMO Resolution A.754(18) for use in both A0 - A60 class bulkheads and decks. CE (MED) certificate № 09156/B0 EC.
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

Remove all block components from the transit frame, if any. Remove any dirt or grease from the inside of the frame. Position the two halves of the EXTEND-A-FRAME around the bundle of cables, then push the EXTEND-A-FRAME into the transit frame. The fitting must be very tight for stability reasons. The flanges on the top and bottom of the EXTEND-A-FRAME must be firmly seated against the transit frame. Install the bolts and nuts on the top and bottom flanges. Tighten the bolts on top and bottom flanges.

The flanges are 10 mm high, corresponding with the wall thickness of the block system transits. This enables the EXTEND-A-FRAMES to fit in multi-transit units without any problems. The EXTEND-A-FRAME, positioned in the transit frame, leaves 20 mm free at the back of the transit frame for the bonding of the FIWA® sealant to that transit frame. This is necessary to obtain a tight seal. Place a RISE® insert sleeve around each cable. Any empty space is filled with RISE® filler sleeves.

Center the RISE® sleeves within the conduit so as to leave 20 mm free space at the front and the back of the transit. A 20 mm layer of FIWA® sealant is applied at both sides of the transit. Refer to the step by step installation instructions for RISE® multi-cable penetrations for final finishing of the transit.

For optimum stability, the EXTEND-A-FRAME should be spot welded or bolted to the existing frame. For larger frame configurations an option is to install a frame around the existing transit frame spot welded to the deck or bulkhead.

RISE® instantly doubles the usable space inside any block system transit frame
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

DIAGRAMMATIC OVERVIEW OF SHIPBUILDING/OFFSHORE APPLICATIONS

L1: A-60 approved bulkhead insulation.

- NO EXTRA INSULATION REQUIRED AT THE FRONT OF THE PENETRATION AND/OR IN BETWEEN THE CABLES

For optimum stability, the EXTEND-A-FRAME should be spot welded to the existing frame. For larger frame configurations an option is to install a frame around the existing transit frame spot welded to the bulkhead.

A0-A60 CABLE TRANSIT BULKHEADS
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

DIAGRAMMATIC OVERVIEW OF SHIPBUILDING/OFFSHORE APPLICATIONS

L1: A-60 approved deck insulation.
L2: mineral wool minimum 25 mm, density 110 kg/m³ or equivalent.

- NO EXTRA INSULATION REQUIRED AT THE FRONT OF THE PENETRATION AND/OR IN BETWEEN THE CABLES

For optimum stability, the EXTEND-A-FRAME should be spot welded to the existing frame. For larger frame configurations an option is to install a frame around the existing transit frame spot welded to the deck.

A0-A60 CABLE TRANSIT DECKS

specifications for A-class according to CE certificate 09156/B0 EC issued by Bureau Veritas
Adding extra cables is an easy job. Cut away the sealant layer at both sides of the penetration with a knife or a hollow punch in a tapering shape as shown above. This creates a good foundation for the sealant mass to be applied later.

Pull the cable through one of the empty filler sleeves with an inner diameter more or less corresponding to the outer diameter of the cable. Refill the opening in the sealant layer at both sides of the penetration with sufficient FIWA® sealant.
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

If the empty filler sleeves are not fitting to the size of the cable to be ducted, a number of these insert sleeves must be removed from the penetration.
Install a fitting insert sleeve (with some filler sleeves if necessary) in the open space in the penetration.

Pull the cable through the fitting insert sleeve that has now been installed. Refill the openings cut in the sealant layer at both sides of the penetration with sufficient FIWA® sealant. The FIWA® sealant is pressed down firmly and smoothed with a damped cloth.
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

For the EMC protection of cable penetrations entering shielded areas, an electrically conductive sealant/flexible rubber is developed for the RISE® multi-cable penetrations type EMC. Tests carried out in our laboratories have shown that the electrical resistance from braiding to mass is about 1-2 ohm.

Attenuation tests at DELTA Electronics Testing/Denmark have proven the outstanding damping properties of the RISE® EMC sealing system.

In case the penetrations have to be only EMC proof, the length of the conduit can be reduced substantially. Only 40 mm CONDUCTON® putty/flexible rubber for the conductive filling of the cavity in between the layers of FIWA® sealant can be used. The CONDUCTON® flexible rubber is most easy to apply. The attenuation with the flexible rubber is the optimum; the attenuation of the CONDUCTON® putty is less.

UV and ozone resistant. Gas and water tight. Fire safe. CE certificate 11301/A2 EC.

Attenuation tests at DELTA Electronics Testing/Denmark have proved the good attenuation values achieved by the RISE®-EMC system based on a single layer of CONDUCTON® flexible rubber.

Damping: 35-85 dB.

The RISE®-EMC system based on 2 layers of 40 mm CONDUCTON® flexible rubber.

Damping: 52->100 dB.

A RISE®-EMC penetration based on the conductive putty shows a lower value.

Damping: 10-30 dB.
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

two different solutions for a RISE®-EMC cable penetration: rubber or putty

CONDUCTON® flexible rubber is used to fill the cavity around the ducted cables in the conduit sleeve in stead of making use of the putty. This rubber can be modelled by hand and offers the highest attenuation.

CONDUCTON® flexible rubber is absolutely HALOGEN FREE and has a toxicity index of 0,00 (tested according to Naval Engineering Standard NES 713: Issue 3).


CONDUCTON® flexible rubber fullfills the criteria for use on board of UK Navy vessels.

very high attenuation values with RISE®-EMC cable penetrations feasible

CONDUCTON® putty is an electrically conductive sealing putty based on a single component silicone compound. The level of attenuation obtained with any of the RISE®-EMC transits is partly dependent on:

a) the distance between the ducted pipe and the penetration wall
b) the contact surface with the conductive materials
c) the compact filling of the conductive mass
d) the condition of the contact surface in the conduit pipe

PRODUCT INFORMATION

<table>
<thead>
<tr>
<th>01) colour</th>
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<tbody>
<tr>
<td>02) specific gravity</td>
<td>1.4 ± 0.03 g/cm³</td>
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<tr>
<td>03) curing of top layer</td>
<td>1 - 2 hours</td>
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<td>04) service temperature</td>
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<tr>
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<td>06) elongation at break</td>
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<td>07) hardness</td>
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<td>08) elasticity</td>
<td>approx. 25%</td>
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<tr>
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<td>&lt; 100 Ω</td>
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<tr>
<td>13) storage life</td>
<td>approx. 9 months</td>
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RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

1) At the place where the CONDUCTON® flexible compound is to be applied, the penetration should be bare steel without primer and thoroughly cleaned to ensure effective connection to earth.

2) Remove the cable sheathing over a length that is 40 mm shorter than the length of the penetration, in such a way that the front face of the exposed braiding is situated about 20 mm inside the conduit at both sides.

3) RISE® sleeves 120 mm shorter in length than the penetration are then fitted around the ducted cables and pushed into the penetration. The exposed braiding should extend 40 mm outside the sleeves.

4) The remaining space inside the penetration is then packed with RISE® filler sleeves. Push the filler sleeves into the penetration in the same way as the sleeves fitted around the cables. Make sure that the sleeves fit tightly.

5) Push the insert/filler sleeves into the penetration in such a way as to leave about 60 mm free space at both sides. Take care that the exposed braiding extends 40 mm outside the sleeves at each side.

6) Then apply layers of CONDUCTON® flexible rubber strips 40 mm wide against the inside wall of the penetration.

7) Pack the free space inside the penetration with lengths of strip. Compress the filling from time to time firmly to obtain a solid mass of flexible rubber and a good contact with the coaming/sleeve.

8) Pack the remaining small spaces around the cables with spare pieces of flexible rubber strip. Then press them down firmly with a piece of wood in order to obtain a good contact with the braiding.

9) Firmly press down the mass once more by hand. This is extremely important to ensure effective conductivity. Then apply the CONDUCTON® flexible rubber at the other side of the penetration in a similar way.
10) At both sides of the penetration about 20 mm free space should be present to enable the application of the FIWA® fire safe, water tight sealing compound. First clean the inside wall of the penetration very thoroughly.

11) To smooth the surface of the FIWA® sealant layer, a cloth is sprayed with water. This prevents the sealant from sticking to the cloth. Note: do not use soap water!

12) The cloth is then used to press down the sealant layer. People with sensitive skin should use gloves when working with the FIWA®. Please refer to the Safety Data Sheet for more information.

13) The surface can also be smoothed by hand. Just wet the hand thoroughly with soap and water. People with sensitive skin should use gloves when working with the FIWA®.

14) For A-class penetrations the conduit sleeve/frame needs to be insulated only at the insulated side of the bulkhead or at the lower side of the deck.

The level of attenuation obtained is partly dependent on:
- a) the distance between the ducted cable and the penetration wall
- b) the contact surface with the conductive materials
- c) the compact filling of the conductive mass
- d) the condition of the contact surface in the conduit pipe

If the damping values are not required to comply with extremely high requirements, a 40 mm thick layer of CONDUCTON® flexible rubber at one side of the penetration will be sufficient. The penetration can be 40 mm shorter.

For RISE®-EMC Multi-Cable Penetrations use can also be made of the CONDUCTON® sealing putty. The attenuation is less than with the CONDUCTON® flexible rubber.
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

DIAGRAMMATIC OVERVIEW OF SHIPBUILDING/OFFSHORE APPLICATIONS

L1: A-60 approved deck insulation.

non-fire rated conduits which should only be gas or watertight can be shorter in length.
The length of the coaming should not be shorter than 80 mm.

- NO EXTRA INSULATION REQUIRED AT THE FRONT OF THE PENETRATION AND/OR IN BETWEEN THE CABLES

specifications for A-class according to CE certificate 11301/A2 EC issued by Bureau Veritas
also approved for multi-cable transits:
CE certificate 09156/B0 EC issued by Bureau Veritas
also approved for busbar penetrations:
CE certificate 11302/A2 EC issued by Bureau Veritas

A0-A60 CABLE TRANSIT BULKHEADS
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

DIAGRAMMATIC OVERVIEW OF SHIPBUILDING/OFFSHORE APPLICATIONS

L1: A-60 approved deck insulation.
L2: mineral wool minimum 25 mm, density 110 kg/m² or equivalent.

Non-fire rated conduits which should only be gas or watertight can be shorter in length. The length of the coaming should not be shorter than 80 mm.

- NO EXTRA INSULATION REQUIRED AT THE FRONT OF THE PENETRATION AND/OR IN BETWEEN THE CABLES

Specifications for A-class according to CE certificate 11301/A2 EC issued by Bureau Veritas
Also approved for multi-cable transits:
CE certificate 09156/B0 EC issued by Bureau Veritas
Also approved for busbar penetrations:
CE certificate 11302/A2 EC issued by Bureau Veritas

A0-A60 CABLE TRANSIT DECKS
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

Today in shipbuilding frequently busbar systems are used instead of heavy conductor cables. When penetrating divisions, the busbar conduits have to fulfill the requirements of the IMO Resolution A.754(18). A busbar as such is not specified in the IMO Resolution. Busbars can be regarded closer to pipes than cables. The RISE® sealing system can be easily applied for the fire safe sealing of such penetrations. Inside the busbar a firestop, as for instance ACTIFOAM®, should be installed to prevent flame and smoke spread through the inside of the busbar system.

The RISE® sealing system also is used for metallic and plastic pipe penetrations. These type of penetrations have been successfully tested according to IMO Resolution A.754(18) for use in both A0 - A60 class bulkheads and decks. Based on the outcome of the fire tests with pipe penetrations, the RISE® sealing system can be used for busbar penetrations in a similar way. Officially tested according to IMO Resolution A.754(18). CE (MED) certificate N° 11302/A2 EC.
RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

1) Contrary to the RISE® cable transits only filler sleeves type 18/12 and 27/19 are used for filling the space in the conduit. For ease of installation RISE® filler sleeves are supplied non-split. The ratio 27/19 to 18/12 should be about 2:1.

3) Push the filler sleeves into the conduit in such a way as to leave about 20 mm free space at the front. The whole set of filler sleeves should tightly fit into the conduit to offer sufficient mechanical stability.

4) At both sides of the penetration about 20 mm free space should be present to enable the application of the FIWA® fire safe, water tight sealing compound. First clean the inside wall of the penetration very thoroughly.

5) The conduit should be overfilled with FIWA® sealant, because some sealant will be pushed between and into the empty insert sleeves during further finishing. This will contribute to obtain higher tightness ratings.

6) To smooth the surface of the FIWA® sealant layer, a cloth is sprayed with water. This prevents the sealant from sticking to the cloth. Note: do not use soap water!

7) The cloth is then used to press down the sealant layer. People with sensitive skin should use gloves when working with the FIWA®. Please refer to the Safety Data Sheet for more information.

8) The surface can also be smoothed by hand. Just wet the hand thoroughly with soap and water. People with sensitive skin should use gloves when working with the FIWA®.

9) For A-class penetrations the conduit sleeve/frame needs to be insulated only at the insulated side of the bulkhead or at the lower side of the deck. *No extra insulation needed in front of the penetration.*
CONDUCTON® is an electrically conductive putty based on a single component silicone compound. CONDUCTON® is also water-repellent. The putty adheres well to metal subsurfaces and is reasonably elastic. CONDUCTON® contains components with a unique morphology to obtain the necessary high grade of conductivity. CONDUCTON® has a measured resistance of 50-60 Ohm. Optimum contact with the cable or structure to be shielded is essential for effective EMC protection. Measurements have shown that the attenuation is in the range of 10 - 30 dB, when applied with a surface contact of 40 mm for pipe and cable penetrations. CONDUCTON® is used for the RISE®/EMC and the SLIPSIL®/EMC systems.

DRIFIL® is a water-repellent sealant based on a single-component silicone compound. In developing DRIFIL® sealing compound, high priority was focused on its power of adhesion to subsurfaces as occurring in the construction sector, and to cable sheathing and metal and plastic pipes. In addition, special attention was given to the permanent flexibility of the sealant in order to permit minor settlements and movements of the cable/pipe bunch after the sealant has set. The purpose of this is to ensure that the seal remains intact in the longer term even in spite of possible mechanical loading. DRIFIL® sealant has a very short setting time. The top layer is rapidly tack-free.

FIWA® is a fire-resistant sealant based on a single component silicone compound. FIWA® is also water-repellent. The sealant adheres well to most subsurfaces occurring in the building industry, and is permanently elastic. In the event of fire or at temperatures in excess of 200 °C the sealant expands to about five to ten times its original volume. During this process a porous mass is formed which has excellent thermal insulation properties. In contrast to conventional materials that swell under severe heat exposure, the expansion of FIWA® is not caused by intumescence, but by a chemical process. The advantage of this is that the expansion of FIWA® is not accompanied by the formation of fumes.

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RISE® MULTI-CABLE TRANSITS: THE RAPID® SEALING SYSTEM

ease of calculation with RISE® cable and pipe penetrations

After the entry of the dimensions of the conduit opening and the amount and outer diameters of the ducted cables or pipes, the software calculates the amount of RISE® sleeves and FIWA® sealant.
A drawing appears on the screen showing also the remaining free space in the conduit opening.
All calculatedtransits can be stored in a database.
Prints order/calculation forms.

Can be downloaded from our website http://www.beele.com.
Call us for a free CD and/or your registration number!
Feature for automatic update via our website every time the program is started.

we are there with full support for RISE® cable and pipe penetrations
ARTIST IMPRESSION OF THE FIRST PHASE OF THE NEW FACTORY NEXT TO OUR R&D CENTRE

1) machines specially developed for compounding and processing of rubbers under controlled conditions to obtain optimum quality
2) machines specially developed for compounding and manufacturing of all types of sealants under controlled processing
3) moisture treatment installation and processing equipment for manufacturing of electrically conductive sealants and rubbers
4) a complete line of injection moulding presses ranging from 40 tons up to 400 tons for manufacturing sealing plugs and other rubber components
5) processing installation for after-curing of rubber products to obtain the required compression set (long term behaviour)
6) extruder line including cooling system and cutting and slitting installation for manufacturing insert and filler sleeves for the RISWAT system
7) fully automatic extruder lines with a length of 20 meters, including cooling system and automatic cutting, slitting and sorting installation for manufacturing rubber insert and filler sleeves and rubber strips of the RISE system
8) extruder line to manufacture luminescent profiles and hoses
9) line of injection moulding machines ranging from 50 up to 200 tons for manufacturing plates of the ULEPSI tank supports and luminescent YFESTOS floor coverings
10) completely equipped die-making shop for the in-house producing of all tooling for rubber and plastics manufacturing
11) modern laser equipment for engraving the type codes in the dyes for rubber manufacturing and for marking products with barcodes and 2D-matrix codes
12) mixing and airless spraying facilities for the NOFIRNO boards

With most advanced systems and technologies we are able to offer highest quality products.
MAXIMUM SIMPLICITY OF USE
OPTIMUM FLEXIBILITY
OUTSTANDING PERFORMANCE


ASK FOR THE SEPARATE BROCHURES ON OUR PRODUCT RANGES:
* RISE® MULTI-CABLE TRANSIT SYSTEM
* RISE® SEALING SYSTEM FOR SINGLE AND MULTI-PENETRATIONS FOR PLASTIC AND METALLIC PIPES
* RISWAT® GAS AND WATERTIGHT CABLE AND PIPE DUCTS
* CSD® SEALING PLUGS FOR METALLIC AND PLASTIC PIPE ENTRIES
* SLIPSIL® SEALING PLUGS FOR PIPE ENTRIES
* BEESEAL® MULTI-PIPE AND CABLE PENETRATIONS
* CSD®-SQ MULTI-CABLE TRANSITS
* LEAXEAL® HIGH PRESSURE GRIP SEALS
* ACTIFOAM® TEMPORARY SEALS
* FIRSTO® FIRESTOPS FOR CABLE TRAY PENETRATIONS
* ULEPSI® TANK SUPPORTS FOR BITUMEN TANKERS
CONDUIT SEALING DEVICES OF AN AMAZING SIMPLICITY WITH AN OUTSTANDING PERFORMANCE

BEELE Engineering and CSD International have been involved with fire, water and gas tight sealing for more than 30 years. We have developed and tested products proven to provide the utmost in sealing protection around the world. To receive our complete civil construction and/or marine products catalogues, please contact your distributor or local representative.

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