

# Declaration of Compliance:

In Accordance with EU Regulations 2014/34/EU

Equipment for use in Potentially Explosive Atmospheres



|                                   |   |
|-----------------------------------|---|
| <b>ISSUED BY:</b>                 | BFM® Global Limited<br>PO Box 66-087<br>Beachaven 0749<br>Auckland<br>New Zealand   |
| <b>ISSUED ON:</b>                 | 25 October 2017   |
| <b>FOR THE FOLLOWING PRODUCT:</b> | BFM® fitting, comprising of BFM® spigot and BFM® connector. The BFM® connector materials are set out in the table on page 2.  |
| <b>MANUFACTURED BY:</b>           | BFM® Global Limited<br>PO Box 66-087<br>Beachaven 07 49<br>Auckland<br>New Zealand  |
| <b>CONFIRMATION:</b>              | <p>BFM® Global has commissioned the IBExU Institute on six occasions to test the BFM® fitting for conformance with ATEX standard (Regulation 2014/34/EU) regulating product in potentially explosive environments.</p> <ol style="list-style-type: none"><li>1. Report 1B-10-8-058 August 2010 – Tested the BFM® concept and LM4 material</li><li>2. Report 1B-12-8-052 July 2012 – Tested Seeflex 040E</li><li>3. Report 1B-13-8-029 March 2013 – Tested Seeflex 020E and Longer Length Connectors</li><li>4. Report 1B-13-8-085 August 2013 – Tested Seeflex 040AS</li><li>5. Report 1B-15-8-038 May 2015 – Tested Seeflex 020E, with a lesser wall thickness</li><li>6. Report 1B-16-8-071 June 2016 - Tested modifications to BFM® Connectors</li><li>7. Report 1B-17-8-0027 June 2017 - Tested Flexi &amp; Flexi Earthed</li></ol> |

Taking these reports and detailed communication with IBExU into consideration, we can advise on the BFM® fitting with standard diameters ranging from 100 to 1650mm. We have summarised results in the table on page 2, with further explanation and greater detail on the following pages.

## Product Summary Table:

|                     |  | BFM® CONNECTOR MATERIALS (NO RINGS)   |               |       |  |
|---------------------|--|---|---------------|-------|--|
| PRODUCT TRANSPORT:  | EXPLOSION ZONE   | SEEFLEX 040E, 020E  | SEEFLEX 040AS | LM4   | FLEXI EARTHED & FLEXI  |
| FREE FALL           | Dust Ex zones Interior/Exterior: 20-22   | 1m  | 2m            | 1m    | Flexi Earthed: 3m<br>Flexi (without Earth): 1m<br><i>(only permissible for dust with min. ignition energy &gt;=30mj)</i> |
|                     | Gas-ex Zones Exterior 1 + 2<br><i>(Inner Zones 0-2 permissible for connector material 040AS ONLY!)</i> | Explosion Group 11a & 11b: 1m<br>Explosion group 11c: Not applicable except Zone 22/2: 1m | 2m            | 1m    | Not applicable   |
| PNEUMATIC TRANSPORT | Dust Ex Zones Interior/Exterior: 20-22   | 200mm   | 200mm         | 200mm | Not suitable for this application  |
|                     | Gas-ex Zones Exterior 1+2<br><i>(Inner Gas-ex zones not permissible)</i>                               | Not applicable  | 200mm         | 200mm | Not applicable   |

|                     |  | BFM® CONNECTOR MATERIALS (WITH RINGS) |   |                |          |                |          |
|---------------------|--|---------------------------------------|---|----------------|----------|----------------|----------|
| PRODUCT TRANSPORT:  | EXPLOSION ZONE   | SEEFLEX 040E & 020E                   |   | SEEFLEX 040AS  |          | LM4            |          |
|                     |  | SS RINGS                              | PE RINGS  | SS RINGS       | PE RINGS | SS RINGS       | PE RINGS |
| FREE FALL           | Dust Ex zones Interior/Exterior: 20-22   | 1m                                    | 1m  | 2m             | 2m       | Not applicable | 1m       |
|                     | Gas-ex Zones Exterior 1 + 2<br><i>(Inner Zones 0-2 permissible for connector material 040AS ONLY!)</i> | Not applicable                        | Explosion Group 11a & 11b: 1m<br>Explosion Group 11c: Not applicable except Zone 22/2: 1m | Not applicable | 2m       | Not applicable | 1m       |
| PNEUMATIC TRANSPORT | Dust Ex Zones Interior/Exterior: 20-22   | 200mm                                 | 200mm   | 200mm          | 200mm    | Not applicable | 200mm    |
|                     | Gas-ex Zones Exterior 1+2<br><i>(Inner Gas-ex zones not permissible)</i>                               | Not applicable                        | Not applicable  | Not applicable | 200mm    | Not applicable | 200mm    |

**Note:** - 'SS Rings' means Stainless Steel Rings, 'PE Rings' means plastic rings.  
 - These results are only valid for connectors that are undamaged. Connectors that are worn, deformed or have any rings exposed should be replaced.

## Product Compliance Detail:

### SEEFLEX 040E & 020E:

The BFM® fitting with Seeflex 040E connector can be used in all Dust Zones. Below is the key conclusion from Report 1B-12-8-052.

In accordance with the results in Table 1 and [1] the tested BFM® Material Seeflex 040E can be used without restrictions in all dust explosion hazardous areas (dust explosion hazardous zones are possible both inside and outside of the BFM® connector), if the mechanical design of the BFM® connector is as per [1].

Report 1B-15-038 shows that the slight difference between Seeflex 040E and 020E does not affect limitations on use.

### CONNECTOR SIZES:

The IBExU concludes that the BFM® fitting with Seeflex 040E and 020E connectors of all diameters conform to Atex regulations in all Dust Zones with a length of up to 1m for free fall and 200mm for pneumatic conveyance. Diameters greater than 650mm are not suitable for Gas Zones. Product variations outside this range would need to be tested independently.

### SEEFLEX 040AS:

The Seeflex 040AS can be used in all Dust Hazardous Zones. Relevant section from report 1B-13-8-085 is pasted below.

In accordance with the test results and [1] the tested BFM® Material Seeflex 040AS can be used without restrictions in all dust explosion hazardous areas (dust explosion hazardous zones are possible both inside and outside the BFM® connector), if the mechanical design of the BFM® connector is as per [1] (length of the BFM® connector: 200 mm).

### CONNECTOR SIZES:

**For all Dust Zones:** The IBExU concludes that the BFM® fitting conforms to Atex regulations with diameters 100mm to 1650mm with a length of up to 2m long for free fall and 200mm long for pneumatic conveyance.

**For Outer Gas Zones 1 & 2:** The IBExU concludes that the BFM® fitting conforms to Atex regulations with all standard diameters (up to 650mm) and a length of up to 2m long for free fall and 200mm for pneumatic conveyance.

Sizes outside this range would need to be tested independently.

### LM4:

The BFM® fitting with LM4 connectors can be used in all Dust Hazardous Zones. It is also suitable in Outer Gas Zones 1 and 2. Relevant section from report 1B-10-8-058 is pasted below.

| Zone outside | Zone inside and/or outside | Permissible surface of the BFM <sup>1)</sup> at Explosion Group |      |      |
|--------------|----------------------------|---|------|------|
|              |                            | II A  | II B | II C |
| <b>LM4</b>   |                            |   |      |      |
| 1            | 20, 21, 22                 | no restrictions <sup>4)</sup>                                   |      |      |
| 2            | 20, 21, 22                 | no restrictions <sup>4)</sup>                                   |      |      |

### CONNECTOR SIZES:

The IBExU concludes that the BFM® fitting with LM4 connectors conforms to Atex regulations, as above, with all diameters and lengths of up to 1m long for free fall and 200mm for pneumatic conveyance. Diameters over 650mm are not suitable for Gas Zones.

**FLEXI CONNECTORS:**

**STANDARD FLEXI CONNECTORS:** The BFM® fitting with a Flexi connector can be used in all Dust Zones, exactly the same as our Seeflex 040E and 020E Connectors. Below is the assessment from Report IB-17-8-0027.

*If the spiral wire is not earthed, the tube lengths are limited - as before - to 1 m for the materials Seeflex 040E & Seeflex 020E.*

**CONNECTOR SIZES:**

The IBExU concludes that the BFM® fitting with a standard Flexi Connector is as per Seeflex 040E and 020E ie. connectors of all diameters conform to ATEX regulations in all Dust Zones with a length of up to 1m for free fall.

**STANDARD BFM® FLEXI EARTHED CONNECTORS:**

The BFM® fitting with a Flexi connector can be used in all Dust Zones. Below is the assessment from Report IB-17-8-0027.

*Tube lengths up to 3m are permitted if the spiral wire is earthed*

**Note:** Although connecting to earth (spigot) on one end of the BFM® Flexi Earth is sufficient, BFM® Global strongly recommends connecting both ends to earth. This acts as a safety measure should one end become disconnected or should the Flexi wire break for any reason. It also helps with equipotential bonding with upstream and downstream apparatus.

**RINGS:**

The Seeflex 040E, 020E and 040AS connectors with rings can be used in all Dust Hazardous Zones. The use of Plastic rings has no effect on the ATEX rating of the material, however Stainless Steel rings are not suitable for use in any Gas Zones.

Below is the key conclusion from Report IB-16-8-071 relating to the use of Stainless Steel rings in Dust Zones:

**Provided that the stainless steel rings are completely encapsulated by the respective plastic material, the materials Seeflex 040 and Seeflex 400W [1], Seeflex 040E [2], Seeflex 040AS [4] as well as Seeflex 020 and Seeflex 020E [3], [5] will not cause any hazard when handled in areas with explosive dusts.**

A check of the condition of ringed connectors to ensure the Stainless Steel rings are not exposed is recommended as part of regular health and safety maintenance procedures.

**KEVLAR COVERS:**

Kevlar Covers can be used for Interior Dust explosion areas without modification, subject to the ATEX rating of the inner connector (as per the Product Summary Table on page 2).

The use of Kevlar Covers in Exterior Dust Zones is not certified. However, the IBExU concludes that if the fastening ring at each end is earthed to the outside of the corresponding spigots, then the Kevlar Cover can be used for Exterior Dust Zones.

Kevlar Covers are not certified for use in any Gas Zones.

**SIGNED ON BEHALF OF BFM® GLOBAL LTD:**

**BLAIR MCPHEAT**  
DIRECTOR