# Atex Conformance
## and IBExU Reports Simplified

**BFM Global has commissioned the IBExU Institute on four occasions to test the BFM® fitting for conformance with Atex standards regulating product in potentially explosive environments.**

1. Report 1B-10-8-058 August 2010 – Tested the LM4 and the replaced Seeflex 040 and 400W
2. Report 1B-12-8-052 July 2012 – Tested Seeflex 040E
3. Report 1B-13-8-029 March 2013 – Tested Seeflex 020E and Longer Length Connectors
4. Report 1B-13-8-085 August 2013 – Tested Seeflex 040AS
5. Report 1B-15-8-038 May 2015 – Tested Seeflex 020E, with a lesser wall thickness

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 following table with further explanation and greater detail on the following pages.

| | | BFM® CONNECTOR MATERIALS | | | |
|---|---|---|---|---|---|
| PRODUCT TRANSPORT: | EXPLOSION ZONE | SEEFLEX 040E | SEEFLEX 020E | SEEFLEX 040AS | LM4 |
| FREE FALL | Dust Ex zones *Interior/Exterior: 20-22* | 1m | 1m | 2m | 1m |
| | Gas-ex Zones *Exterior 1 + 2* | Explosion Group 11a: 1m<br><br>Explosion group 11B + 11c Not applicable Except Zone 22/2: 1m | Explosion Group 11a: 1m<br><br>Explosion Group 11B + 11c Not applicable Except Zone 22/2: 1m | 2m | 1m |
| PNEUMATIC TRANSPORT | Dust Ex Zones *Interior/Exterior: 20-22* | 200mm | 200mm | 200mm | 200mm |
| | Gas-ex Zones *Exterior 1+2* | Not applicable | Not applicable | 200mm | 200mm |

***Note:*** *These results are only valid for connectors that are undamaged. Connectors that are worn or deformed should be replaced.*

## 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.

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## SEEFLEX 040AS:

The Seeflex 040AS can be used in all dust hazardous zones. Relevant section from report 1B-13-8-085 is pasted on the 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.

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## 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[1)] at Explosion Group | | |
|---|---|---|---|---|
| | | II A | II B | II C |
| LM4 | | | | |
| 1 | 20, 21, 22 | no restrictions [4)] | | |
| 2 | 20, 21, 22 | no restrictions [4)] | | |

## 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.

## ZONE DEFINITIONS:

**Zones are defined under the ATEX Guideline in Europe as follows:**

**Area Classification:** Process plants are divided into Zones (European and IEC method) or Divisions (North American method) according to the likelihood of a potentially explosive atmosphere being present.

| EUROPEAN AND IEC CLASSIFICATION | DEFINITION OF ZONE OR DIVISION | NORTH AMERICAN CLASSIFICATION |
|---|---|---|
| **Zone 0 (gases)** | An area in which an explosive mixture is continuously present or present for long periods | Class I Division 1 (gases) |
| **Zone 20 (dusts)** | | Class II Division 1 (dusts) |
| **Zone 1 (gases)** | An area in which an explosive mixture is likely to occur in normal operation | Class I Division 1 (gases) |
| **Zone 21 (dusts)** | | Class II Division 1 (dusts) |
| **Zone 2 (gases)** | An area in which an explosive mixture is not likely to occur in normal operation and if it occurs it will exist only for a short time. | Class II Division 1 (gases) |
| **Zone 22 (dusts)** | | Class II Division 2 (dusts) |

## VARIATIONS:

There are a huge range of variables that can affect the results for resistance testing. These include temperature, size (length of wire, surface size of medium), electricity used (voltage), humidity, measuring method, measuring equipment and a number of other factors.

BFM Global has used a recognised standard test for many years: Test Method ASTM D 257-07 “DC. Other testing methods and laboratories may produce differing results, BFM expect these to be within recognised tolerances.

NOTES:

The information in this report is provided based on our current knowledge. The compliance with existing local legislation, standards and guidelines is the responsibility of the end user. BFM Global reserves the right to make technical changes to the product.