IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Ex COMPONENT CERTIFICATE

Certificate No.: **IECEx ULBR 19.0003U** Page 1 of 4 Certificate history:

Status: **Current** Issue No: 0

Date of Issue: 2020-03-13

Applicant: **Haenke Tubos Flexiveis Ltda.**
Rua Joao Correia de Sa, 97 - Galpao 01 - Vila Nogueira
09960-320 - Diadema/SP
Brazil

Ex Component: Flexible Conduit Fittings, Types EXMM, EXMUM, EXMUF, EXUM, EXUMUF, and EXUF

This component is NOT intended to be used alone and requires additional consideration when incorporated into other equipment or systems for use in explosive atmospheres (refer to IEC 60079-0).

Type of Protection: **Flameproof "db", Dust Ignition Protection by Enclosure "tb"**

Marking: For Brass version only:

Ex db IIB+H2 Gb
Ex tb IIIC Db

For Stainless Steel version only:

Ex db IIC Gb
Ex tb IIIC Db

-20 °C ≤ T_a ≤ +80 °C

Approved for issue on behalf of the IECEx Certification Body: **Katy A. Holdredge**

Position: **Senior Staff Engineer**

Signature: (for printed version)

Date: 2020-03-13

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

UL do Brasil Certificações
Avenida Engenheiro Luis Carlos Berrini, 105 -
24 Andar - Brooklin - Sao Paulo
Brazil

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Certificate No.: **IECEx ULBR 19.0003U**

Date of issue: 2020-03-13 Issue No: 0

Manufacturer: **Haenke Tubos Flexiveis Ltda.**
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Additional manufacturing locations:

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2011 Explosive atmospheres - Part 0: General requirements
Edition:6.0

IEC 60079-1:2014-06 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

IEC 60079-31:2013 Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
Edition:2

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

BR/ULBR/ExTR19.0003/00

Quality Assessment Report:

BR/ULBR/QAR19.0001/00

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Ex Component(s) covered by this certificate is described below:

The types EXMM, EXMUM, EXMUF, EXUM, EXUMUF and EXUF are flexible conduit fittings made of stainless steel (AISI 321, AISI 304, AISI 304L, AISI 316L, or AISI 316) or a combination of stainless steel and Brass (UNS-C36000, UNS-C23000) in the sizes of 1/2", 3/4", 1", 1.1/4", 1.1/2", 2", 2.1/2", 3", and 4". They comprise of threads NPT and/or BSPT and are used to mechanically protect conductors/cables to path through. The brass version is manufactured with a stainless steel corrugated core (AISI 321, AISI 304, AISI 304L) and externally coated with a braided wires in Tomback alloy (UNS-C36000, UNS-C23000) and it may have or not an insulating coating braided synthetic on inner side.

The stainless steel version is manufactured with a stainless steel corrugated core (AISI 321, AISI 304, AISI 304L, AISI 316L, or AISI 316) and externally is coated with a braiding wires of the same material and it may have or not an insulating coating braided synthetic on inner side.

The end fittings are secured to both ends of the corrugated core with outer braid assembly by a gas tungsten arc welding (for Stainless Steel) or brazing (for Brass).

Please see Annex for additional information.

SCHEDULE OF LIMITATIONS:

- This component shall be only installed together with certified conduit sealing device entries.
- This component is intended to mechanically protect conductors/cables to path through.
- It is not allowed to increase the length of the flexible conduit by doing amendment on it with other flexible conduit or any other accessory.
- Operating Service temperature: -20°C up to +80°C.
- This Ex component shall be installed in accordance with the manufacturer's instructions during the final installation.
- Flamepaths shall not be repaired.
- BSPT threads shall be considered in final application for compliance with end equipment certification requirements.
- Flexible conduits have been considered for a maximum explosion pressure as given on tables below:

Applicable for fixed ends (type: EXMM):

Diameters	Maximum Explosion Pressure Brass	Maximum Explosion Pressure Stainless Steel
1/2"	33.33 bar	53.33 bar
3/4"	33.33 bar	53.33 bar
1"	33.33 bar	53.33 bar
1.1/4"	33.33 bar	53.33 bar
1.1/2"	33.33 bar	40 bar
2"	33.33 bar	40 bar
2.1/2"	26.66 bar	40 bar
3"	26.66 bar	40 bar
4"	23.33 bar	36.66 bar

Applicable for unions assembly (types: EXMUM, EXMUF, EXUM, EXUMUF, and EXUF):

Diameters	Maximum Explosion Pressure Brass	Maximum Explosion Pressure Stainless Steel
1/2"	20 bar	20 bar
3/4"	20 bar	20 bar
1"	20 bar	20 bar

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Annex:

Annex to IECEx ULBR 19.0003U Issue 0.pdf

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TYPE DESIGNATION

The types EXMM, EXMUM, EXMUF, EXUM, EXUMUF and EXUF are flexible conduit fittings made of stainless steel (AISI 321, AISI 304, AISI 304L, AISI 316L, or AISI 316) or a combination of stainless steel and Brass (UNS-C36000, UNS-C23000) in the sizes of 1/2", 3/4", 1", 1.1/4", 1.1/2", 2", 2.1/2", 3", and 4". They comprise of threads NPT and/or BSPT and are used to mechanically protect conductors/cables to path through. The brass version is manufactured with a stainless steel corrugated core (AISI 321, AISI 304, AISI 304L) and externally coated with a braided wires in Tomback alloy (UNS-C36000, UNS-C23000) and it may have or not an insulating coating braided synthetic on inner side.
The stainless steel version is manufactured with a stainless steel corrugated core (AISI 321, AISI 304, AISI 304L, AISI 316L, or AISI 316) and externally is coated with a braiding wires of the same material and it may have or not an insulating coating braided synthetic on inner side.
The end fittings are secured to both ends of the corrugated core with outer braid assembly by a gas tungsten arc welding (for Stainless Steel) or brazing (for Brass).

Model Designation:

a = EX	**b = End fittings**	**c= Material Type**
EX	MM - fixed male x fixed male	L - Brass
	MUM - fixed male x male union	I - Stainless Steel
	MUF - fixed male x female union	
	UM - male union x male union	
	UMUF - male union x female union	
	UF - female union x female union	

a b c L

EXa MMb Lc
a = Ex
b = fixed male x fixed male
c = Brass

EXa MUMb Lc
a = Ex
b = fixed male x male union
c = Brass

EXa MUFb Lc
a = Ex
b = fixed male x female union
c = Brass

EXa UMb Lc
a = Ex
b = male union x male union
c = Brass

EXa UMUFb Lc

a b c I

EXa MMb Ic
a = Ex
b = fixed male x fixed male
c = Stainless Steel

EXa MUMb Ic
a = Ex
b = fixed male x male union
c = Stainless Steel

EXa MUFb Ic
a = Ex
b = fixed male x female union
c = Stainless Steel

EXa UMb Ic
a = Ex
b = male union x male union
c = Stainless Steel

EXa UMUFb Ic

a = Ex
b = male union x female union
c = Brass

a = Ex
b = male union x female union
c = Stainless Steel

EXa UFb Lc
a = Ex
b = female union x female union
c = Brass

EXa UFb Ic
a = Ex
b = female x female union
c = Stainless Steel

The length of the flexible conduit fittings can be from 198 mm up to 3000 mm, taking into account, the tables 1 and 2 as below:

Table 1 - Applicable for the types: EXMUM, EXMUF, EXUM, EXUMUF, and EXUF

Size	Minimum length	Maximum length	Note
1/2”	198 mm	3000 mm	For both materials (brass and stainless steel) with union assembly.
3/4”	198 mm	3000 mm	
1”	198 mm	3000 mm	

Table 2 – Applicable for the Type: EXMM

Size	Minimum length	Maximum length	Note
1/2”	198 mm	3000 mm	For both materials (brass and stainless steel) with fixed ends.
3/4”	198 mm	3000 mm	
1”	198 mm	3000 mm	
1.1/4”	198 mm	3000 mm	
1.1/2”	198 mm	3000 mm	
2”	198 mm	3000 mm	
2.1/2”	198 mm	3000 mm	
3”	198 mm	3000 mm	
4”	198 mm	3000 mm	

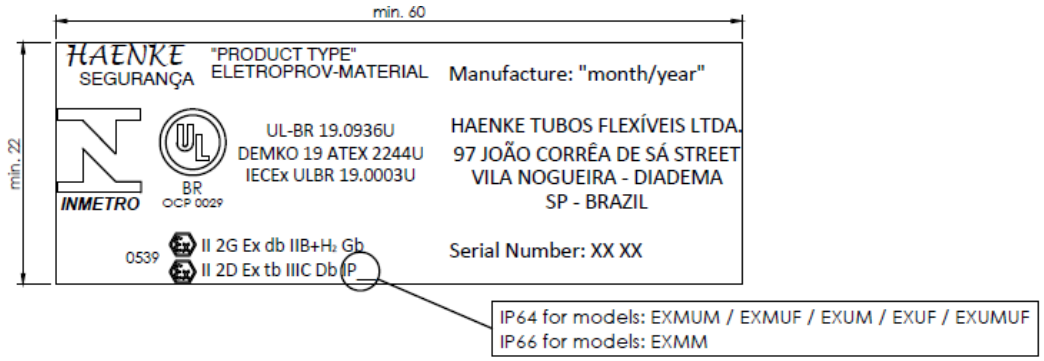
Minimum bend radius for each size, independently of the material (Stainless Steel or Brass) are as follows:

Size	Flexible Conduit with coating	Flexible Conduit without coating
1/2”	270 mm	200 mm
3/4”	280 mm	200 mm
1”	310 mm	200 mm
1.1/4”	320 mm	250 mm
1/2"	400 mm	250 mm
2”	500 mm	350 mm
2.1/2”	600 mm	405 mm
3”	750 mm	450 mm
4”	900 mm	560 mm

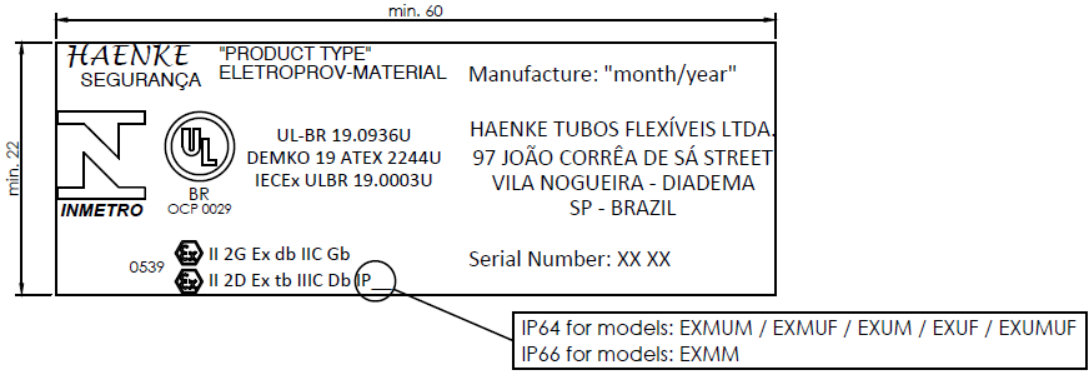
MARKING

Marking has to be readable and indelible; it has to include the following indications:

(for brass version, only)



(for Stainless Steel version, only)



ROUTINE EXAMINATIONS AND TESTS

Routine overpressure tests in accordance with IEC 60079-1:2014 clause 16 shall be conducted by using the applicable pressures below:

Table 1 – Minimum Test Pressure – Applicable for union assembly (types: EXMUM, EXMUF, EXUM, EXUMUF and EXUF)

Diameters	Manufacturer's Testing Pressure Brass	Manufacturer's Testing Pressure Stainless Steel
1/2"	30 bar	30 bar
3/4"	30 bar	30 bar
1"	30 bar	30 bar

Table 2 – Minimum Test Pressure – Applicable for fixed ends (Type EXMM)

Diameters	Manufacturer's Testing Pressure Brass	Manufacturer's Testing Pressure Stainless Steel
1/2"	50 bar	80 bar
3/4"	50 bar	80 bar
1"	50 bar	80 bar
1.1/4"	50 bar	80 bar
1.1/2"	50 bar	60 bar
2"	50 bar	60 bar
2.1/2"	40 bar	60 bar
3"	40 bar	60 bar
4"	35 bar	55 bar

There shall be no sign of permanent deformation of the joints or damage to the enclosure that will invalidate the concept of protection.

SCHEDULE OF LIMITATIONS:

- This component shall be only installed together with certified conduit sealing device entries.
- This component is intended to mechanically protect conductors/cables to path through.
- It is not allowed to increase the length of the flexible conduit by doing amendment on it with other flexible conduit or any other accessory.
- Operating Service temperature: -20°C up to +80°C.
- This Ex component shall be installed in accordance with the manufacturer's instructions during the final installation.
- Flamepaths shall not be repaired.
- BSPT threads in accordance with NBR NM ISO 7-1 shall be considered in final application for compliance with end equipment certification, including flame transmission requirements.
- Flexible conduits have been considered for a maximum explosion pressure as given on tables below:

Applicable for fixed ends (type: EXMM)

Diameters	Maximum Explosion Pressure Brass	Maximum Explosion Pressure Stainless Steel
1/2”	33.33 bar	53.33 bar
3/4”	33.33 bar	53.33 bar
1”	33.33 bar	53.33 bar
1.1/4”	33.33 bar	53.33 bar
1.1/2”	33.33 bar	40 bar
2”	33.33 bar	40 bar
2.1/2”	26.66 bar	40 bar
3”	26.66 bar	40 bar
4”	23.33 bar	36.66 bar

Applicable for unions assembly (types: EXMUM, EXMUF, EXUM, EXUMUF, and EXUF)

Diameters	Maximum Explosion Pressure Brass	Maximum Explosion Pressure Stainless Steel
1/2”	20 bar	20 bar
3/4”	20 bar	20 bar
1”	20 bar	20 bar