

[1] **TYPE EXAMINATION CERTIFICATE**
- Translation -



[2] Equipment intended for use in Potentially Explosive Atmospheres,
Directive 94/9/EC

[3] Type Examination Certificate Number: **IBExU02ATEXB002 X**

[4] Equipment: **BoWex® - curved-tooth gear couplings**
of the design M no. 003 with
- Standard sleeve (material PA, light) or
- conductive sleeve (material PA12CF15, black)

[5] Manufacturer: KTR Kupplungstechnik GmbH

[6] Address: Rodder Damm 170
D-48432 Rheine

[7] This equipment as well as any acceptable variation thereto is specified in the schedule to this Type Examination Certificate.

[8] IBExU Institut für Sicherheitstechnik GmbH certifies that this equipment has been found to comply with the Essential Health and Safety Requirements of the Annex II of the Directive relating to the design and construction of equipment intended for use in potentially explosive atmospheres.
The test results are recorded in the confidential test report IB-02-4-151/2 of 18.02.2002.

[9] Compliance with Essential Health and Safety Requirements has been assured by compliance with EN 1127-1:1997, prEN 13463-1:2001, prEN 13463-5:2000.

[10] If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified under [17] in the schedule to this Type Examination Certificate.

[11] This Type Examination Certificate relates only to the design and construction of the specified equipment. Further requirements of this Directive apply to the manufacture and supply of this equipment.

[12] The marking of the BoWex® - curved-tooth gear couplings mentioned in [4] shall include the following assignments in dependence on the sleeve and the dimension of the design:


a) Design M no. 003 with standard sleeve (light),
dimensions of the design M-14 and M-19

 **II 2G EEx c IIC T4**
-20 °C ≤ T_a ≤ +80 °C

b) Design M no. 003 with standard sleeve (light),
dimensions of the design M-24 up to M-65 inclusive

 **II 2G EEx c IIB T4**
-20 °C ≤ T_a ≤ +80 °C

c) Design M no. 003 with conductive sleeve (black)
dimensions of the design M-14 up to M-65 inclusive

 **II 2G EEx c IIC T4**
-20 °C ≤ T_a ≤ +80 °C

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Authorised for certifications Explosion Protection



(Prof. Dr. Redeker)



- Seal -

Freiberg, 20.02.2002

Certificates without signature and seal aren't valid. This certificate may only be duplicated completely and unchanged. In case of dispute, the German text shall prevail.

Schedule

[13] **Schedule**

[14] **to TYPE EXAMINATION CERTIFICATE IBExU02ATEXB002 X**

[15] **Description**

BoWex[®] - curved-tooth gear couplings are flexible shaft connections for a positive torque transmission and specifically suitable to compensate for axial, radial and angular shaft misalignment.

The curved-tooth gear avoids any edge pressure in the spline in case of angular and radial displacements so that BoWex[®] couplings are almost free from wear.

The material combination of steel hubs and polyamide sleeves allows for maintenance-free continuous operation.

The metallic hubs of the couplings are made from sintered moulded parts (sintered steels), which don't contain light metals, or from stainless steel.

The coupling sleeves are made from Polyamide (standard sleeve "light" from Ultramid; conductive sleeve "black" as purpose-built manufacture).

Details are contained in the documentation of the manufacturer, which are part of the test report IB-02-4-151/2 of 18.02.2002.

[16] **Test Report**

The test results are recorded in the confidential test report IB-02-4-151/2 of 18.02.2002.

Summary of the Test Results:

The BoWex[®] - curved-tooth gear couplings of the in [4] mentioned design fulfil the requirements for non-electrical devices of the type of protection c (protection by constructional safety) of the equipment group II, category 2G, temperature class T4 (for an ambient temperature T_a of -20 °C up to $+80\text{ °C}$) and fulfil – depending on the material of the sleeve - the requirements for use in the explosion group IIC or IIB. Thus, they fulfil the requirements of the temperature class T3 up to T1 as well as the explosion group IIA.

Note

The manufacturer has to guarantee, that each manufactured BoWex[®] - curved-tooth gear coupling corresponds to the conditions, which are lied down in the Type Examination Certificate.

The manufacturer has to guarantee, that the appropriate requirements of the directive 94/9/EC are fulfilled.

[17] **Special Conditions for safe use**

The BoWex[®] - curved-tooth gear couplings may be used only if their materials under the respective operation conditions resist the mechanical and/or chemical influences respectively corrosion in such way, that the explosion protection is always guaranteed.

The control intervals for wear which are specified by the manufacturer and which are dependent on the concrete use case of the couplings have to be observed by the user/operator.

The BoWex[®] - curved-tooth gear couplings have to be equipped with stable covers. The covers have to protect the couplings from the impact of falling objects.
In the covers may be arranged regular openings, which may not exceed the following measurements:

	Circular openings, diameter in mm	Rectangular openings, lateral length in mm
Top side of the cover	4	4
Side part of the cover	8	8

The distance between the cover and rotating parts must be at least 5 mm.

The cover must be electrically conductive and must be included in the compensation of potential. The removing of the cover is only allowed in standstill.

All screw connections for the fixing of the hub on the wheels have to be protected against self-loosening.

The user is obliged to observe the specifications of the installation instructions and maintenance instructions for each coupling. This is valid especially for the indications for use of the couplings in explosive atmospheres.

[18] **Essential Health and Safety Requirements**

Confirmed by norms (see [9]).






(Prof. Dr. Redeker)

Freiberg, 20.02.2002

1st addition to the
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- [1] Equipment: **BoWex® - curved-tooth gear couplings**
of the design M no. 003 with
- Standard sleeve (material PA, light) or
- Conductive sleeve (material PA12CF15, black)
- [2] Manufacturer: KTR Kupplungstechnik GmbH
- [3] Address: Rodder Damm 170
D-48432 Rheine
- [4] **Additions/Modifications**
- [4.1] The BoWex® - curved-tooth gear couplings of the design mentioned in [1] fulfil the requirements of the **temperature class T5** (for an ambient temperature T_a of -20 °C up to $+60\text{ °C}$) and the **temperature class T6** (for an ambient temperature T_a of -20 °C up to $+45\text{ °C}$) for non-electrical devices of the type of protection c of the equipment group II, category 2G.
The test results are recorded in the confidential test report IB-02-4-430 of 14.06.2002.
- [4.2] The BoWex® - curved-tooth gear couplings of the design mentioned in [1] fulfil the requirements for non-electrical devices of the type of protection "c" of the **equipment group II, category 2D**, maximum surface temperature T 110 °C at a maximum temperature of ambient T_a 80 °C , as well as **group I, category M2**.
The test results are recorded in the confidential test report IB-02-4-602 of 30.11.2002.
- [4.3] The notes for safety and the "Special Conditions for safe use" [17], which are given in the Type Examination Certificate IBExU02ATEXB002 X are changed and completed as follows:
a) Modification of the break 5, sentence 2, according to test report IB-02-4-602/1 of 05.12.2002:
The materials of the safety devices have to be selected according to EN 13463-1:2001. Light metal should not be used for covers with unsealed openings on the top.
b) Completion:
When using the couplings
- the user has to make sure, that no dust accumulates between the cover and the coupling. The coupling must not operate in a dust layer.
- in plants of the mining industry the cover must withstand greater mechanical loads than at the use as equipment group II.
- [5] The marking of the BoWex® - curved-tooth gear couplings mentioned in [1], shall include the following assignments according to equipment group and category:
- a) Design M no. 003 with standard sleeve (light),
dimensions of the design M-14 and M-19
-  **II 2G c IIC T4, T5 resp. T6**
 $-20\text{ °C} \leq T_a \leq +80\text{ °C}$, 60 °C resp. 45 °C
- b) Design M no. 003 with standard sleeve (light),
dimensions of the design M-14 up to M-65 inclusive
-  **II 2G c IIB T4, T5 resp. T6**
 $-20\text{ °C} \leq T_a \leq +80\text{ °C}$, 60 °C resp. 45 °C
- c) Design M no. 003 with conductive sleeve (black)
dimensions of the design M-14 up to M-65 inclusive
-  **II 2G EEx c IIC T4, T5 resp. T6**
 $-20\text{ °C} \leq T_a \leq +80\text{ °C}$, 60 °C resp. 45 °C

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- d) Design M no. 003 with with standard sleeve or conductive sleeve (black)
dimensions of the design M-14 up to M-65 inclusive



II 2D c T 110 °C
 $-20\text{ °C} \leq T_a \leq +80\text{ °C}$



I M2 c
 $-20\text{ °C} \leq T_a \leq +80\text{ °C}$

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