

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



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

[3] Type Examination Certificate Number: **IBExU02ATEXB012 X**

[4] Equipment: **NEMO® Standard Pumps**

- **NM-series with feeding screw (SF)**
types: NM045SF ... to NM148SF...
- **NM-series with feeding screw and bridge breaker-paddle or mixing-paddle (SP)**
types: NM045SP ... to NM148SP...
- **NM-series with hopper and feeding screw (SO, BO)**
types: NM015SO...to NM180SO..., NM015BO...to NM180BO...

[5] Manufacturer: **NETZSCH Mohnopumpen GmbH**

[6] Address: **Geretsrieder Straße 1**
D-84464 Waldkraiburg

[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-02-4-339 of 18.06.2002 as well as in the 1st Addition of 10.02.2003 to this certificate.

[9] Compliance with Essential Health and Safety Requirements has been assured by compliance with EN 1127-1:1997, EN 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 NEMO®-Standard-Pumps of the series mentioned in [4] shall include the following:

 **II 2G c IIB T4**
-20 °C ≤ T_a ≤ +60 °C

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Authorized for certifications Explosion Protection

(Prof. Dr. Redeker)



- Seal -

Freiberg, 10.02.2003

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

Schedule

[13]

Schedule

[14]

to TYPE EXAMINATION CERTIFICATE IBExU02ATEXB012 X

[15]

Description

NEMO® Pumps are rotary volume-displacement pumps. The main parts are the rotary part, the “rotor”, and the fixed part-“stator”. The rotor, which is formed as a standard thread screw, rotates in the stator. The rotor is driven by a coupling rod. The coupling rod operates in the fluid, inclusively double-sided joints.

The NEMO® Standard Pumps (hopper pumps) mentioned in [4] are equipped with an open hopper and with a coupling rod with an integrated feeding screw (respectively filling screw). Over these equipment the feeding of the products into the volume-displacement system (stator/rotor) is realised. The designs of the coupling rod are the same like in the standard pump (inclusively bending rod). Rotating paddles are in addition placed at the SP-pumps in the harsing of the hopper, above the pump inlet (in general on two parallel wheels).

The SF- and SP-pumps are mainly provided for the conveying of sewage sludge in which solvents may exist. With the SO- and BO-pumps can be conveyed pasty and highly viscous media of any manner.

The fluids, which are provided for conveying, in general have a residual humidity. The content of dry substance amounts 40 % at most. In dependence on the size of the design the manufacturer specifies the maximum allowable particle diameter and the diameter of a sphere for the fluid.

The hopper-pumps are not provided for the conveying of liquids, i. e. fluids of a low viscosity.

Details are contained in the documentation of the manufacturer, which are part of the test report IB-02-4-339 as well as the 1st Addition of 10.02.2003 to this report.

[16]

Test Report

The test results are recorded in the confidential test report IB-02-4-339 as well as the 1st Addition of 10.02.2003 to this report.

Summary of the Test Results:

The NEMO® Standard Pumps of the series mentioned in [4] fulfil the requirements for non-electrical devices of the type of protection c (protection by constructional safety) of the equipment group II, category 2G and fulfil the requirements for use in the explosion group IIB. Thus, they fulfil the requirements of the explosion group IIA.

The pumps are provided and are applicable for use at ambient temperatures T_a -20 °C up to +60 °C. The temperature of the conveying fluid amounts +100 °C at most.

Considering the above mentioned maximum ambient temperatures and maximum temperatures of the conveying fluid the pumps fulfil the requirements of the temperature class T4.

For the housings the following materials are allowable, without restriction: cast iron (GG 25), ductile cast iron (GGG 40.3), CrNi-steel respectively CrNiMo-steel, as special materials – special steel (1.4462, 1.4539) or Hastelloy (2.4610) and, in addition, aluminium casting for the casing of the stator. For the coating of metallic parts of housings the material ®GENAKOR 022 is allowable.

The utilisation of non-stainless steel is allowable only considering the notes mentioned in [17] „Special conditions for safe use“.

Note

The manufacturer has to guarantee, that each manufactured NEMO® Standard Pump of the series mentioned in [4] corresponds to the conditions, which are laid down in the Type Examination Certificate.

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

Before the delivery each pump must be undertaken a pressure test regarding the control of pressure resistance and tightness.

[17] Special Conditions for safe use

The pumps must not run dry. They must be equipped with a dry running protection.

The pumps must be equipped with a pressure relief device.

The pumps may be used only if their materials under the respective operation conditions resist the mechanical and/or chemical influences respectively corrosion in such a way, that the explosion protection is always guaranteed.

It has to be prevented by a corresponding material selection and/or monitoring (see operating instruction and maintenance instructions for the pumps), that light metal (for example elements of the conveying stock, tools/devices for the charging of the conveying stock) and rusty steel only can be in contact (by impact), when the surfaces are not/only less humid. This is to be realized – for example – by a corresponding material selection for paddles, screw and hopper-/pump housing (for example by using of stainless steel), or if non-stainless steel will be used:

- ensuring of continuous humid inner surfaces of the hopper, including the paddles, paddle-wheels and screw
- and/or
- exclusion of parts from light metal in the conveying stock as well as devices for the charging of the conveying stock from light metal.

The drive of the pumps and of the paddles must be co-ordinated with the current pump.

[18] Essential Health and Safety Requirements

Confirmed by norms (see [9]).



Freiberg, 10.02.2003

(Prof. Dr. Redeker)