BAM
Bundesanstalt für
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und -prüfung

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Certificate

N°: BAM/ZBF/001/17

Hereby it is confirmed by the BAM Certification Body, that the

Material "„Aluminum-bronze alloy""

of the manufacturer

Hebei Botou Safety Tools Co. Ltd.
No. 2 Wugang Road, Industrial Park
Botou City
Hebei Province
062150
China

meets the requirements of **BAM Standard operating procedure „StAA-NEG-005": „StAA zur Schlagfunkenprüfung von Werkstoffpaarungen" dated 2017-03-01** and thus the non-sparking tools made of this material are appropriate for use in potentially explosive atmospheres of zone 1 and/or 21 according to Directive 1999/92/EC of all explosion groups (I, IIA, IIB & IIC) according to IEC 60079-20-1 (2010), if the terms and conditions set out in the annex to this certificate are met.

The certification is based on certification contract N° **BAM-ZBF-0013-2016-HEBEI BOTOU** and comprises according to standard ISO/IEC 17065:2012 a design-type test with the manufacturer's declaration of conformity (BAM Certification system I). The products certified by BAM may be labelled with the certification mark "BAM design-type tested" / "BAM Baumustergeprüft".

The certificate is valid until August 30th, 2022.

BAM test report 17012446 dated 2017-07-24 as well as procedure N° BZS-GS/120/16 form the basis of this certificate.

For Bundesanstalt für Materialforschung und -prüfung (BAM)
Unter den Eichen 87,12205 Berlin, **2017-08-31**

Dr. R. Schmidt
BAM Certification Body

Dr. R. Grätz
BAM Assessor

Distribution list: 1st Certificate holder 2nd BAM Certification Body

Conditions for use of the certified material

The non-sparking tools made of the certified material "Aluminium-bronze alloy" are appropriate for use in potentially explosive atmospheres of the zones 1 and/or 21 of all explosion groups (I, IIA, IIB & IIC), if the following terms and conditions are met:

- The material composition of this material shall comply with the material composition of the tested sample, namely:

    - Aluminum-Bronze Alloy:
      ≥ 99.0 % Cu+Al+Ni+Fe+Mn;
      10.0 % to 12.0 % Al; 4.0 % to 6.0 % Ni; ≤ 5.8 % Fe+Mn; hardness: 221-291 HB
      (see letter from Hebei Botou Safety Tools Co. Ltd. dated January 19th, 2016)

- The intended use of the tools made of the certified material shall be described by the certificate holder in such a manner that the max. absorption of mechanical energy during a possible impact of the tools on steel with the composition set out in the following does not exceed 61 Nm. This corresponds to a falling height of 10 metres of a tool with a weight of for example 6 N (approx. 600 g).

  Composition of the steel: mild steel/heat treatable steel, Steel grade 45, 1.0503, not hardened, surface sandblasted, according to letter from Hebei Botou Safety Tools Co. Ltd. dated July 13th, 2017:

    - 0.42 % to 0.5 % C, 0.5 % to 0.8 % Mn, 0.17 % to 0.37 % Si, < 0.3 % Ni, < 0.04 % S, < 0.035 % P, < 0.25 % Cr, < 0.3 % Cu.

  The impact plates used for testing in our laboratory were made of steel with the composition set out above.

- the carbon content of the mild steel/heat treatable steel as well as its hardness have a great influence on the generation of mechanically generated impact sparks. They must not be modified nor must the carbon content of 0.49 % be exceeded. The steel must not be hardened or surface hardened.

Berlin, 2017-08-31

Place, Date

BUNDESANSTALT FÜR MATERIALFORSCHUNG UND -PRÜFUNG (BAM) 51

Signature BZS