



CERTIFICATE

BAM/ZBF/001/23

2nd version

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			
for impacts against	<input checked="" type="checkbox"/>	steel	
	<input type="checkbox"/>	concrete	
with a maximal impact energy of	61	Nm	
in potentially explosive atmospheres with the fuel gases	<input checked="" type="checkbox"/>	of explosion groups I, IIA, IIB	Explosion groups according to DIN EN ISO/IEC 80079-20-1:2020-09
	<input checked="" type="checkbox"/>	acetylene	
	<input checked="" type="checkbox"/>	of explosion group IIC	

meets the requirements of **BAM Standard operating procedure StAA-GAS-005 „StAA zur Schlagfunkenprüfung von Werkstoffpaarungen“** approved April 2023 and thus non-sparking tools made of this material are appropriate for use in potentially explosive atmospheres of zone 1 and/or Z1 (in accordance with the European Directive 1999/92/EC) for the fuel gases listed above, if the terms and conditions set out in the annex to this certificate are complied with.

The certification is based on certification contract **BAM-ZBF-0002-2022-HEBEI BOTOU** dated 24th October 2022 and comprises according to standard DIN EN ISO/IEC 17065:2013 a design-type test with the manufacturer's declaration of conformity (BAM Certification system I).

The materials certified by BAM may be labelled with the certification mark "BAM Design-type tested" and/or "BAM Baumustergeprüft".

The certificate is valid until 9th July 2028.

BAM test report **23004760** dated 30th June 2023 and procedure No. BZS-GS/031/22 and /021/24 are constituent parts of this certificate.

Bundesanstalt für Materialforschung und -prüfung (BAM)

Unter den Eichen 87, 12205 Berlin, **17th September 2024**

By order

Dr. J. Sunderkötter
BAM Certification Officer

By order

Dr. M. Schmidt
BAM Assessor



Please check this certificate's validity in our Certification Register:
<https://netzwerke.bam.de/Netzwerke/Content/DE/Downloads/Bzs/Zertifizierungsregister.html>

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Conditions for use of the certified material

The certification of the material **Aluminum-Bronze Alloy** is only valid if the following terms and conditions are met.

Already smallest modifications of the properties of the material and the impact partner can alter fundamentally the spark pattern and thus the ignition probability. Thus, it is not possible to transfer the test results to other materials.

Certified material pairing

Material: Aluminum-Bronze Alloy

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

- Material composition:
 - o > 99.0 % Cu+Al+Ni+Fe+Mn
 - o 10.0 % – 12.0 % Al
 - o 4.0 % – 6.0 % Ni
 - o < 5.8 % Fe+Mn
- Hardness: HB 221-291 HRC 20 31
- Reference: test report from Hebei Botou Safety Tools Co. Ltd. dated November 26th, 2022, received on 17th January 2023

Impact Partner: mild steel/heat treatable steel

- Properties: Steel grade 45, material No. 1.0503, not hardened
- Material composition:

o 0,44 % C	o 0,016 % – 0,022 % Cu
o 0,2 % Si	o 0,037 % – 0,039 % Cr
o 0,54 – 0,55 % Mn	o 0,02 % – 0,036 % Ni
o 0,011 % – 0,019 % P	o 0,021 % – 0,042 % Al
o 0,005 % – 0,015 % S	
- The impact plates used for testing in our laboratory were made of steel with the composition set out above. The impact plates were coated with epoxy resin powder (Fused epoxy resin powder, see letter from Botou Safety Tools Co. Ltd. dated 17th January 2023).
- Reference: according to Hebei Jingye Cut Deal Co., Ltd. dated 17th May 2022, received on 17th January 2023 and letter dated 8th June 2023.

Use of the tools made of the certified material

During a possible impact of the tools on the above-mentioned impact partner the **maximum absorption of mechanical energy must not exceed 61 Nm.**

This corresponds to a falling height of 10 metres of a tool with a maximum weight of approx. **600 g.**