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TECHNICAL OPINION

No OBAC/0240/TP/22

Subject: **Assessment of the possibility of using ductile iron fittings in potentially explosive atmospheres**

Prepared by: .....
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Approved by:
.....
Head of the OBAC Certification Body
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Cc: MATERBUD Spółka z ograniczoną odpowiedzialnością Spółka komandytowa, OBAC x 1

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1. EMPLOYER

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2. DOCUMENTS CONSTITUTING THE BASIS FOR THE ASSESSMENT OF THE SUBJECT MATTER OF THE OPINION ON COMPLIANCE WITH THE APPLICABLE REQUIREMENTS

PN-EN 1127-1:2019-10 Explosive atmospheres. Explosion prevention and protection. Part 1: Basic concepts and methodology.

Technical Report CLC/TR 60079-32-1. Explosive atmospheres. Part 32-1. Electrostatic Hazards. Guidance. April 2015.

3. SCOPE OF THE OPINION

Evaluation of fittings made of EN GJS 500-7 ductile iron in terms of ignition risk and the possibility of use in potentially explosive atmospheres based on the analysis of the results of the tests, the results in question being included in the test report referred to in section 4.1 of this Opinion.

4. MATERIALS RELATED TO THE SUBJECT MATTER OF THE STUDY

4.1. Institute for Research, Attestation and Certification OBAC Ltd. LABOREX Laboratory, Report No LL/165/2022/A. Gliwice, 26.05.2022

4.2. Product catalogue (2019 edition) of EN GJS 500-7 ductile iron fittings provided by the Employer in electronic form for the purpose of developing this assessment, covering:

- Flanged fittings described on pages 11 to 37 of the catalogue,
- Socket fittings described on pages 39 to 51 of the catalogue,
- Socket fittings with flanges described on pages 53 to 57 of the catalogue,
- Blocked fittings described on pages 59 to 68 of the catalogue.

4.3. Manufacturer's statement of 16.05.2022.

5. SUBJECT MATTER OF THE OPINION

5.1. The subject matter of the opinion is EN GJS 500-7 ductile iron fittings referred to in section 4.2 of this Opinion.

6. TECHNICAL ASSESSMENT

6.1. EN GJS 500-7 ductile iron fittings referred to in section 4.2 of this Opinion are made of the same type of construction material – EN GJS 500-7 ductile iron and are covered with the same paint coating on the outside and inside, differing in the RAL shade (see the statement referred to in section 4.3 of this Opinion).

6.2. The analysis of the presence of effective ignition sources listed in the PN-EN 1127-1 standard for the products constituting the subject matter of the opinion indicates the possibility of a source in the form of static electricity discharges. The ignition hazard caused by the accumulation of electrostatic charges on the surfaces of fittings is described in clause 7.7.2 of Technical Report CLC/TR 60079-32-1 referenced in section 2 hereof. Clause 7.7.2.1 of the Technical Report CLC/TR 60079-32-1 presents the division of pipes into conductive pipes,

diffusive pipes and non-conductive pipes. For the purposes of this opinion, tests of the surface resistivity of the external and internal coating of cast iron fittings were carried out (the identification of the test sample was included in the report referred to in section 4.1 of this opinion).

6.3. The results of laboratory measurements of surface resistivity (see section 4.1 hereof) allow the conclusion that a cast iron fitting, in accordance with the referenced Technical Report CLC/TR 60079-32-1, is treated as a non-conductive piping element (surface resistivity greater than 1MΩ/m). When the grounding condition is met, e.g. by means of burying pipes in the ground, it can be concluded that this product does not present an effective source of ignition caused by the electrostatic charge accumulation.

6.4. The assessment of EN GJS 500-7 ductile iron fittings does not cover the EN 545 standard.

6.5. The assessment of EN GJS 500-7 ductile iron fittings does not include the assessment of the electrostatic properties of gaskets and fasteners used in the joints of the fittings in question.

7. CONCLUSIONS, RECOMMENDATIONS, REMARKS

7.1. Based on the assessment, it can be concluded that EN GJS 500-7 ductile iron fittings: flanged, socket, socket with flange, and blocked ones, may be used in potentially explosive atmospheres for handling:

- liquids having high conductivity[1] as defined in the Technical Report CLC/TR 60079-32-1 Clause 7.1.4,
- liquids having medium[2] and low[3] conductivity as defined in the Technical Report CLC/TR 60079-32-1 Clause 7.1.4,

provided the requirements of clause 7.7.2.4.3 of Technical Report CLC/TR 60079-32-1 are met.

7.2. The Institute for Research, Attestation and Certification "OBAC" in Gliwice reserves the right to introduce additional requirements or conditions, if such a need arises during operation.

Checked by: .....
Maciej Bylica, MSc. Eng.

[1] – "high conductivity" as used in the clause 7.1.4 of Technical Report CLC/TR 60079-32-1
[2] – "medium conductivity" as used in the clause 7.1.4 of Technical Report CLC/TR 60079-32-1
[3] – "low conductivity" as used in the clause 7.1.4 of Technical Report CLC/TR 60079-32-1

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