

**The Appendix is an integral part of
Certificate of Accreditation No: 276/2024 of 11/06/2024**

Accredited entity according to ČSN EN ISO/IEC 17025:2018:

BONATRANS GROUP a.s.
CAB number 1244, Metallurgical Testing Laboratory
Revoluční 1234, 735 94 Bohumín

Testing laboratory locations:

- | | | |
|----|--|--------------------------------|
| 1. | Destructive Testing Laboratory, DT | Revoluční 1234, 735 94 Bohumín |
| 2. | Non-Destructive Testing Laboratory, NDT | Revoluční 1234, 735 94 Bohumín |
| 3. | Fatigue Testing Laboratory, FT | Revoluční 801, 735 94 Bohumín |

The laboratory provides opinions and interpretations of the test results.

Tests:

Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Tested subject	Degrees of freedom ³
1	Destructive Tests			
1.1 ¹	Brinell hardness test	ČSN EN ISO 6506-1; ASTM E10-23	Metallic materials, engineering and metallurgical products	-
1.2 ¹	Vickers hardness test	ČSN EN ISO 6507-1	Metallic materials, engineering and metallurgical products	-
1.3 ¹	Rockwell hardness test	ČSN EN ISO 6508-1; ASTM E18-22	Metallic materials, engineering and metallurgical products	-
1.4 ¹	Charpy pendulum impact test	ČSN EN ISO 148-1	Metallic materials, engineering and metallurgical products	-
1.5 ¹	Tensile testing	ČSN EN ISO 6892-1; ASTM E8/E8M-24	Metallic materials, engineering and metallurgical products	-
1.6 ¹	Fracture toughness test	ASTM E399-23	Metallic materials, engineering and metallurgical products	-
1.7 ¹	Determination of C, Mn, Si, P, S, Cr, Ni, Cu, Mo, V, B, Ti, Zr, Co, W, Nb, As, Pb, Sn, Al by spark atomic emission spectrometry	SOP 60-841 (ASTM E415-21; HŽ 42 0591)	Low-alloy steels	-
1.8 ¹	Macrographic examination by sulphur print (Baumann method)	ISO 4968; ASTM E1180-08	Metallic materials, engineering and metallurgical products	-
1.9 ¹	Macroscopic examination by etching method	ISO 4969; ASTM E381-22	Metallic materials, engineering and metallurgical products	-

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Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Tested subject	Degrees of freedom ³
1.10 ¹	Determination of the apparent grain size by comparison method	ČSN EN ISO 643, cl. 7.1.2; ISO 643, cl. 7.1.2	Metallic materials, engineering and metallurgical products	-
1.11 ¹	Determination of volume fraction	ASTM E562-19 ^{e1}	Metallic materials, engineering and metallurgical products	-
1.12 ¹	Determination of content of non-metallic inclusions	ČSN ISO 4967, cl. 6.2; ISO 4967, cl. 6.2	Metallic materials, engineering and metallurgical products	-
2	Non-Destructive Tests			
2.1 ²	Ultrasonic Test	SOP 60-965 (ČSN EN 13261+A1:2011; ČSN EN 13261; EN 13261:2009+A1:2010; EN 13261)	Railway axles	-
2.2 ²	Ultrasonic Test	SOP 60-955 (ČSN EN 13262+A2:2011; ČSN EN 13262; EN 13262:2004+A2:2011; EN 13262) SOP 60-964 (ČSN EN 13262+A2:2011; ČSN EN 13262; EN 13262:2004+A2:2011; EN 13262)	Railway wheels	-
2.3 ²	Magnetic Particle Test	SOP 60-965 (ČSN EN 13261+A1:2011; ČSN EN 13261; EN 13261:2009+A1:2010; EN 13261)	Railway axles	-
2.4 ²	Magnetic Particle Test	SOP 60-955 (ČSN EN 13262+A2:2011; ČSN EN 13262; EN 13262:2004+A2:2011; EN 13262)	Railway wheels	-

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Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Tested subject	Degrees of freedom ³
3	Fatigue Tests			
3.1 ³	Fatigue test using an electrohydraulic test machine	SOP 60-700 (ČSN EN 13262, cl. 4.2.4; EN 13262, cl. 4.2.4)	Railway wheels	-
3.2 ³	Fatigue test using a resonance test machine	SOP 60-710 (ČSN EN 13262, cl. 4.2.4; EN 13262, cl. 4.2.4)	Railway wheels	-
3.3 ³	Fatigue test using a resonance test machine	SOP 60-710 (ČSN EN 13261, cl. 4.2.3; EN 13261, cl. 4.2.3)	Railway axles	-
3.4 ³	Fatigue test using a resonance test machine	SOP 60-710 (ČSN EN 13260, cl. 4.2.2; EN 13260 cl. 4.2.2)	Railway wheelsets	-
3.5 ³	Fatigue test on reduced test specimens	SOP 60-707 (ČSN EN 13261, cl. 4.2.3; EN 13261, cl. 4.2.3)	Railway axles and metallic materials	-
3.6 ³	Testing of coating resistance to cyclic mechanical load	SOP 60-707 (ČSN EN 13261, Annex J; EN 13261, Annex J)	Coating systems for railway applications	-
3.7 ³	Assessment of coating resistance to impact	SOP 60-711 (ČSN EN 13261, Annex G; EN 13261, Annex G)	Coating systems for railway applications	-
3.8 ³	Assessment of coating resistance to chipping	SOP 60-712 (ČSN EN 13261, Annex H; EN 13261, Annex H)	Coating systems for railway applications	-
3.9 ³	Measurement of residual stress by X-ray diffraction method	SOP 60-720 (ČSN EN 15305; EN 15305)	Metallic materials, engineering and metallurgical products	-
3.10 ³	Brake test	SOP 60-735 (ČSN EN 13979-1, cl. 7.2, Annex B.2; EN 13979-1, cl. 7.2, Annex B.2)	Railway wheels	-

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Ordinal number ¹	Test procedure / method name	Test procedure / method identification ²	Tested subject	Degrees of freedom ³
3.11 ³	Determination of residual stresses using the strain gauge cutting method	SOP 60-702 (ČSN EN 13262, cl. 4.5, Annex C; EN 13262, cl. 4.5, Annex C)	Railway wheels	-
3.12 ³	Measurement of axial residual stresses using the strain gauge cutting method	SOP 60-701 (ČSN EN 13261, cl. 4.6, Annex E; EN 13261, cl. 4.6, Annex E)	Railway axles	-

¹ asterisk at the ordinal number identifies the tests, which the laboratory is qualified to carry out outside the permanent laboratory premises; the numerical index at the test ordinal number identifies the location carrying out the test (the identification of the locations is given on the first page of this document)

² if the document identifying the test procedure is dated, only these specific procedures are used. If the document identifying the test procedure is not dated, the latest valid edition of the specified procedure is used (including any changes)

³ the laboratory does not apply a flexible approach to the scope of accreditation

Explanations:

Standard abbreviation	Assignment
ASTM	American standard
HŽ	Iron Metallurgy Standard of Ocelářská unie a.s.
SOP	Standard operating procedure

"This document is an appendix to the certificate of accreditation. In case of any discrepancies between the English and Czech versions, the Czech version shall prevail, both for the certificate appendix and the certificate itself. "