


SCOPE OF ACCREDITATION OF THE TESTING LABORATORY No. AB 128

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 <p style="text-align: center;">AB 128</p>	<p>Name and address of the organization:</p> <p style="text-align: center;">BOSMAL AUTOMOTIVE RESEARCH & DEVELOPMENT INSTITUTE LTD TESTING LABORATORY Sarni Stok 93 43-300 Bielsko-Biała</p>
<p>Identification Code of domain/object (objects) of tests:</p>	<p>Domain of the tests / test objects:</p>
<p>A/6; A/26 C/4 ;C/8; C/9 C/10; C/17; C/21; C/23 E/6; E/26 F/6 G/4; G/6; G/8; G/17 G/21; G/23; G/26 H/21; H/23 J/6; J/8; J/17; J/21; J/23 L/8 N/4; N/6; N/8; N10; N/12 N/13; N/17; N/19; N/21 N/23; N/26 Q/8; Q/21; Q/23</p>	<p>Acoustic and noise tests of electrical equipment, appliances, vehicles Chemical tests, chemical analytics of chemicals, environmental samples, fuels and lubricants, parts made of: plastic, rubber, textiles, leather and fabrics Electrical and electronic tests of electrical and electronic equipment, vehicles Tests of electromagnetic compatibility (EMC) of electrical and electronic products and equipment Tests of environmental engineering of electrical and electronic equipment, construction products and materials, including plastics and rubber, textiles and leather, vehicles Flammability tests of plastics, rubber, textiles and leather Mechanical tests, metallographic tests of electrical and electronic equipment, products and construction materials, including plastics, rubber, textiles and leather, vehicles Non-destructive tests of metal products and materials Tests of physical properties of electrical, electronic equipment, products and construction materials, including plastics and rubber, glass and ceramics, personal protection equipment (PPE), fuels and lubricants, textiles, leather and vehicles Sensory tests of products and construction materials, plastic products and rubber, textiles, fabrics</p>

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This document is an attachment to the Accreditation Certificate No. AB 128 of 16.07.2015.
The accreditation status and validity of the scope of accreditation can be confirmed on the PCA website at www.pca.gov.pl

Materials Testing Department (BM) Sarni Stok 93, 43-300 Bielsko-Biała			
Tested object / product	Type of activity/tested characteristics/test methods	Reference documents	
Rubber and plastic products	Material identification Infrared spectrometric method (FTIR)	BOSMAL/I-7-41/05	
	Hardness: Range (35 to 100) °Sh	PN-EN ISO 868:2005 met. A & D	
Rubber products	Hardness: Range: (30 to 100) IRHD	ISO 48:2010 met. M (micro)	
	Strength properties: - tensile strength (up to 5 kN)	PN-ISO 37:2007 PN-ISO 37:2007/AC1:2008 ISO 37:2017	
	- tear strength (up to 5 kN)	ISO 34-1:2015	
	- compression set [temperature range: +250°C to (-40)°C]	ISO 815-1:2014 ISO 815-2:2014	
	Hysteresis in compression stresses	PN-C-04289:1987	
	Resistance to ageing: - in air - in liquids - in ozone atmosphere (static method) 25pphm to 200pphm	ISO 188:2011 ISO 1817:2015 ISO 1431-1:2012 (p.10)	
	Density Gravimetric method	ISO 2781:2008 ISO 2781:2008/Amd 1:2010	
	Brittleness temperature Range: up to -70°C Impact method	ISO 812:2017	
	Plastic products	Density Immersion method	PN-EN ISO 1183-1:2013-06 met.A
		Rockwell hardness (HRR, HRL, HRM, HRE): Range: (0 to 130) HR Rockwell method	PN-EN ISO 2039-2:2002
Impact properties Range: impact energy up to 50 J Charpy method		PN-EN ISO 179-1:2010	
Izod method		PN-EN ISO 180:2004 PN-EN ISO 180:2004/A1:2007 PN-EN ISO 180:2004/A2:2013-07	
Hardness Ball indentation method		PN-EN ISO 2039-1:2004	
Tensile strength (up to 30 kN)		PN-EN ISO 527-2:2012	
Flexural strength Range: 100 N to 30 kN		PN-EN ISO 178:2011 PN-EN ISO 178:2011/A1:2013-06	
Flexural modulus (up to 30 kN)		PN-EN ISO 178:2011 PN-EN ISO 178:2011/A1:2013-06	
Heat resistance: - deflection temperature (up to 300°C)		PN-EN ISO 75-1:2013-06 PN-EN ISO 75-2:2013-06	
- Vicat softening temperature (up to 300°C)		PN-EN ISO 306:2014-02	
Water absorption		PN-EN ISO 62:2008 p. 6.3, 6.4, 6.6	
Content of volatile substances (including water)		BOSMAL/I-7-49/05	
Melting point and glass transition temperature Range: 30°C above the extrapolated end of transition Differential scanning calorimetry method (DSC)		BOSMAL/I-7-87/02 PN-EN ISO 11357-2:2014-06 PN-EN ISO 11357-3:2013-06	

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Plastic products	Polymers decomposition temperature and decomposition rate, Measurement of volatile substances, additives and/or fillers quantity in polymer Thermogravimetry (TGA) Range: (25 to 1000)°C	PN-EN ISO 11358-1:2014-09 PV 3927:1992 ASTM D6370-99 (2014)
Products made of: metal, plastic, textiles, nonwoven materials, foams, rubber, paint-coated, galvanic-coated and uncoated	Resistance to light (Fade-Ometer)	BOSMAL/I-7-02/05 PN-EN ISO 4892-2:2013-06 met.B PN-EN ISO 16474-1:2014-02 PN-EN ISO 16474-1:2014-02, met.B PN-EN ISO 105-B02:2014-11 GMW 14162:2016 met. A, B, D
	Resistance to weather conditions (Weather-Ometer)	PN-EN ISO 4892-2:2013-06, met. A PN-EN ISO 16474-1:2014-02 PN-EN ISO 16474-1:2014-02, met.A PN-EN ISO 105-B04:1999
	Flammability Burning rate Range: (0 to 300) mm/min Horizontal burning method	PN-ISO 3795:1996 UN ECE Regulation No. 118 Series 03 DIN 75200:1980-09 FMVSS 302:1999
	Gloss value at 20°, 60° and 85° Range: (0 to 199) gloss units	PN-EN ISO 2813:2014-11
	Resistance to humidity	PN-EN ISO 6270-1:2018-02 PN-EN ISO 6270-2:2018-02 PN-EN 60068-2-78:2013-11
	Resistance to climatic conditions	PN-EN 60068-2-14:2009, Test Nb
	Fogging Range: (0 to 199) gloss units Gloss method Range: (0.1 to 5.0) mg Gravimetric method	DIN 75201:2011-11 SAE J1756:2006-08 PV 3015:1994
	Formaldehyde emission Range: (0.15 to 3) µg/ml Spectrophotometric method	VDA 275 (07.1994) PV 3925:2009 VCS 1027,2739 (03.2004) FLTM BZ 156-01:2011 Part A
	Determination of organic compounds emissions (TVOC, VOC, FOG) from materials Range: TVOC ≥ 0.12 µgC/g VOC ≥ 1 µg/g FOG ≥ 1 µg/g TD/HS-GC-MS/FID method	BOSMAL/I-7-64/03 VDA 277 (01.1995) VDA 278 (10.2011) FLTM BZ 157-01:2011 PV 3341:1995 VCS 1027,2749 (03.2004) GMW 15634:2014
	Ash content Range: ≥ 5 mg of ash Direct combustion method	PN-EN ISO 3451-1:2010 met. A PN-EN ISO 1172:2002 met. A
	Resistance to impact Dynamic method with a ball impact Range: (1 to 90) N	ISO 4532:1991
	Determination of stone-chip (grit) resistance of coatings. Multi-impact and single impact methods	PN-EN ISO 20567-1:2017-03 DIN 55996-1:2001-04
Test for sealing by water immersion method Method 2	PN-EN 60068-2-17:2001, Test Qc	
Plastic products, textiles, nonwoven materials, foams, rubber, coated and uncoated	Odour Range (1 to 6) grades Sensoric method	VDA 270:2016 PV 3900:2000 FLTM BO 131-03:2017

Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Plastic products, textiles, nonwoven materials, foams, rubber and leather	Volatile organic compounds emission (VOC) Chamber method Determination of total volatile organic compounds (VOC) concentration Range: (0.1 to 30) ppm Flame-ionisation detection method (FID)	ISO 12219-4:2013 ISO 12219-6:2017 GS 97014-3:2014 VDA 276-1:2005 PV 3942:2016
	Determination of formaldehyde and other carbonyl compounds emitted in environmental chamber Range: Formaldehyde (3.0 to 5000) µg/m ³ Acetaldehyde (5.0 to 5000) µg/m ³ Acetone (21.0 to 5000) µg/m ³ Acrolein (16.0 to 5000) µg/m ³ Isovaleraldehyde (10.0 to 5000) µg/m ³ Crotonaldehyde (13.0 to 5000) µg/m ³ Propionaldehyde (12.0 to 5000) µg/m ³ m,p-Tolualdehyde (19.0 to 5000) µg/m ³ o-Tolualdehyde (13.0 to 5000) µg/m ³ Valeraldehyde (11.0 to 5000) µg/m ³ Benzaldehyde (10.0 to 5000) µg/m ³ 2-Butanone (3.0 to 5000) µg/m ³ Butyraldehyde (15.0 to 5000) µg/m ³ 2,5-Dimethylbenzaldehyde (14.0 to 5000) µg/m ³ Cyclohexanone (2.0 to 5000) µg/m ³ Hexanal (11.0 to 5000) µg/m ³ Heptanal (8.0 to 5000) µg/m ³ Octanal (2.0 to 5000) µg/m ³ Nonanal (5.0 to 5000) µg/m ³ Decanal (3.0 to 5000) µg/m ³ Metacroleine (8.0 to 5000) µg/m ³ High performance liquid chromatography method with diode array detection method (HPLC-DAD)	ISO 16000-3:2011 BOSMAL/I-7-89/01
	Determination of volatile organic compounds (VOC) emitted in environmental chamber Range: - total (0.050 to 10.0) mg/m ³ - individual (1.0 to 350) µg/m ³ Gas chromatography with thermal desorption flame-ionization detection and mass spectrometry (TD-GC-FID-MS)	ISO 16000-6:2011
	Identification of organic compounds Gas chromatography method with thermal desorption and mass spectrometry (TD-GC-MS) with use of NIST14 mass spectra library	ISO 16000-6:2011

Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Products made of: metal, plastic, paint-coated, galvanic-coated and uncoated	Lead and Cadmium content Range: Pb (0.002 to 0.1) % Cd (0.001 to 0.1) % Inductively coupled plasma optical emission spectrometry (ICP-OES) method	BOSMAL/I-7-43/06
Galvanic coatings and paint coatings on metal and plastic (metal products and plastic products)	Chromium (Cr VI) content Range: (0.01 to 1) µg/cm ² Spectrophotometric method	PN-EN ISO 3613:2011
	Corrosion resistance to variable environmental salt-humid conditions	ASTM G85-11, met. A3 PN-EN ISO 11997-1:2017, cycle B VDA 621-415:1982
	Resistance to corrosion in salt spray NSS method	ISO 9227:2017 ASTM B117-16 DIN 50021:1988-06 FIAT 50180 (12.2007)
	Resistance to corrosion in salt spray AASS method	ISO 9227:2017 DIN 50021:1988-06 FIAT 50180 (12.2007)
	Resistance to corrosion in salt spray CASS method	ISO 9227:2017 DIN 50021:1988-06 FIAT 50180 (12.2007)
	Corrosion resistance to sulfur dioxide with general condensation of moisture	PN-EN ISO 6988:2000 PN-EN ISO 3231:2000
	Adhesion by: - Cross-cut method	PN-EN ISO 2409:2013-06
	- Pull-off method	PN-EN ISO 4624:2004 ISO 4624:2016
	- Shot peening, bending, reel in, scratch, thermal shocks methods	BOSMAL/I-7-63/03
	Coating thickness Range: (0 to 1000) µm Magnetic method	PN-EN ISO 2178:2016-06 PN-EN ISO 2361:1998 PN-EN ISO 2808:2008, met. 7C
	Coating thickness Range: (10 to 1000) µm Eddy-current method	PN-EN ISO 2808:2008, met. 7D
	Microscopic method	PN-EN ISO 1463:2006 PN-EN ISO 2808:2008, met. 6A
	Resistance to liquids	PN-EN ISO 2812-1:2018-01
	Flexibility Bend test on mandrel method	PN-EN ISO 1519:2012
	Hardness Pencil method	PN-EN ISO 15184:2013-04
	Impact (deformation) resistance Falling weight method	PN-EN ISO 6272-1:2011
	Abrasion resistance Free falling abrasion material method	PN-C-81516:1976 p. 2.2 (method A)
Taber method	ISO 15082:2016 PN-EN ISO 7784-2:2016-05	
Resistance to variable temperature	PN-EN 60068-2-14:2009 Test Na	

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Metal products	HBW hardness Range: 70 to 200 HBW1/10 70 to 200 HBW2.5/62.5 100 to 450 HBW2.5/187.5 100 to 200 HBW5/250 100 to 450 HBW5/750 100 to 450 HBW10/3000 Brinell method	PN-EN ISO 6506-1:2014-12
	Rockwell hardness Range: 50 to 88 HRA 20 to 100 HRB 20 to 70 HRC Rockwell method	PN-EN ISO 6508-1:2016-10
	HV hardness Range: 100 to 750 HV5 100 to 750 HV10 100 to 750 HV30 Vickers method	PN-EN ISO 6507-1:2018-05
	HV microhardness Range: 250 to 1000HV0.05 100 to 1000 HV0.1 100 to 1000HV0.3 50 to 1000HV0.5 50 to 1000HV1 Vickers method	PN-EN ISO 6507-1:2018-05
	Absorbed energy: KV ₂ and KU ₂ . Range: Initial energy of the pendulum hammer: 300 J Test temperature: - 23 ±5°C - reduced to -40°C Charpy pendulum impact test	PN-EN ISO 148-1:2017-02
	Mechanical properties: - yield strength, R _e - proof strength, plastic extension, R _p - tensile strength, R _m - ultimate elongation, A - reduction of area at fracture, Z Range: up to 150 kN Tensile test at room temperature	PN-EN ISO 6892-1:2016-09, met. A & B
	Grain size Reference patterns method Secant method Grain counting method Optical microscopy method	PN-EN ISO 643:2013-06 ASTM E112-13
	Microstructure: Range: Microstructure of raw materials, cast materials, annealed materials, after heat treatment, after thermochemical treatment, after plastic forming Optical microscopy method	BOSMAL/I-7-44/05 PN-EN ISO 945-1:2018-04 PN-H-04661:1975 PN-H-04505:1966 ASTM A247-17

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Metal products	Macrostructure: - surface defects, - internal defects Visual assessment method Optical microscopy method	BOSMAL/I-7-45/05
Metal tube (in full section) (ϕ_{\max} = 50 mm)	Formability Flattening method	PN-EN ISO 8492:2014-02
	Formability Drift-expanding method	PN EN ISO 8493:2005
Fasteners: bolts, nuts (M5 up to M22), screws, washers	Surface discontinuities Visual assessment method	PN-EN ISO 6157-2:2006 PN-EN 26157-1:1998
	Thread discontinuities Visual assessment method Optical microscopy method	PN-EN 26157-3:1998
	Mechanical properties Tensile method	PN-EN ISO 898-1:2013-06, w/o p.9.13 PN-EN ISO 898-5:2012 w/o p.9.4 PN-EN 28839:1999 PN-EN ISO 6157-2:2006 PN-EN ISO 898-2:2012 PN-EN ISO 898-2:2012/Ap1:2016-05 PN-EN ISO 2320:2016-02, w/o p.9.3
Products made of ferromagnetic materials	Materials surface discontinuities Magnetic-particle method (MT)	BOSMAL/I-7-08/08
Sintered metal products	Apparent hardness	PN-EN ISO 4498:2010
	Range: 70 to 200 HBW1/10 70 to 200 HBW2.5/62.5 100 to 450 HBW2.5/187.5 100 to 200 HBW5/250 100 to 450 HBW5/750 100 to 450 HBW10/3000 Brinell method	PN-EN ISO 6506-1:2014-12
	Range: 50 to 88 HRA 20 to 100 HRB 20 to 70 HRC Rockwell method	PN-EN ISO 6508-1:2016-10
	Range: 100 to 750 HV5 100 to 750 HV10 100 to 750 HV30 Vickers method	PN-EN ISO 6507-1:2018-05
	Radial crushing strength Compression method	PN-EN ISO 2739:2012
	Density Gravimetric method	PN-EN ISO 2738:2001 p. 9.1
	Oil content Gravimetric method	PN-EN ISO 2738:2001 p. 9.2
	Open porosity Gravimetric method	PN-EN ISO 2738:2001 p. 9.3

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Iron alloys products	Inclusion content in steel Method A Optical microscopy	PN-H-04510:1964 ASTM E45-18
	Depth of decarburization Metallographic method Hardness profile method	PN-EN ISO 3887:2018-03
	Effective depth of hardened layer after surface heat treatment Hardness profile method	PN-ISO 3754:1999
	Effective depth of carburized and hardened layer Hardness profile method	PN-EN ISO 2639:2005
	Carbon and sulfur content Range: C (0.01 to 4.5) % S (0.005 to 0.6) % High temperature combustion and IR detection method	PN-EN ISO 15350:2010
	Nitrogen content Range: (0.005 to 0.5) % Thermal conductivity method	PN-EN ISO 10720:2009
	Content of: Mn, Si, P, Cr, Ni, Mo, Co, Al, Cu, Pb, Ti, Nb, V, Sn Range: Mn (0.002 to 4.0) % Si (0.030 to 3.5) % P (0.010 to 1.0) % Cr (0.002 to 25.0) % Ni (0.002 to 12.0) % Mo (0.010 to 10.0) % Co (0.005 to 10.0) % Al (0.0050 to 10.0) % Cu (0.0050 to 6.0) % Pb (0.10 to 0.5) % Ti (0.010 to 1.5) % Nb (0.010 to 2.0) % V (0.010 to 2.0) % Sn (0.010 to 0.40) % Inductively coupled plasma optical emission spectrometry (ICP-OES) method	BOSMAL/I-7-43/06

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Iron alloys products	Content of: Mn, Si, P, Cr, Ni, Cu, W, V, Al, Ti, Mo, Nb, Co, Sn Range: Mn (0.020 to 12.0) % Si (0.10 to 4.0) % P (0.020 to 1.0) % Cr (0.020 to 26.0) % Ni (0.010 to 22.0) % Cu (0.020 to 4.1) % W (0.020 to 18.0) % V (0.020 to 4.0) % Al (0.010 to 1.5) % Ti (0.005 to 1.5) % Mo (0.010 to 5.0) % Nb (0.010 to 2.5) % Co (0.20 to 12.5) % Sn (0.010 to 0.40) % Wavelength dispersive X-ray fluorescence spectrometry (WD-XRF) method	BOSMAL/I-7-90/02
Copper products	Content of: Sn, Pb, Fe, Mn, Si, Al, Ni, P, Zn Range: Sn (0.005 to 10) % Pb (0.005 to 12) % Fe (0.010 to 6.5) % Mn (0.010 to 6) % Si (0.030 to 5) % Al (0.005 to 6) % Ni (0.010 to 10) % P (0.010 to 0.5) % Zn (0.030 to 10) % Inductively coupled plasma optical emission spectrometry (ICP-OES) method	BOSMAL/I-7-43/06
	Phosphorous content Range: (0.005 to 1.3) % Spectrophotometric method	PN-H-04740-11:1981 p.1 PN-H-04745-05:1981 p.1
	Average grain size Comparison method	PN-EN ISO 2624:1997
Aluminum and its alloys products	Content of: Si, Mg, Mn, Cu, Ni, Fe, Sn, Zn, Pb, Cr, Ti Range: Si (0.030 to 15) % Mg (0.010 to 12) % Mn (0.010 to 2.5) % Cu (0.005 to 6) % Ni (0.010 to 2.5) % Fe (0.20 to 2) % Sn (0.005 to 0.5) % Zn (0.010 to 5) % Pb (0.005 to 2.5) % Cr (0.005 to 0.6) % Ti (0.010 to 0.5) % Inductively coupled plasma optical emission spectrometry (ICP-OES) method	BOSMAL/I-7-43/06

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Aluminum and its alloys products	Content of: Fe, Si, Cu, Zn, Mg, Mn, Ni, Pb, Sn, Cr, Ti, Zr Range: Fe (0.10 to 1.0) % Si (0.10 to 1.5) % Cu (0.010 to 5.0) % Zn (0.020 to 5.0) % Mg (0.010 to 2.0) % Mn (0.010 to 1.5) % Ni (0.010 to 1.5) % Pb (0.010 to 0.50) % Sn (0.010 to 0.20) % Cr (0.010 to 0.30) % Ti (0.010 to 0.25) % Zr (0.010 to 0.20) % Wavelength dispersive X-ray fluorescence spectrometry (WD-XRF) method	BOSMAL/I-7-90/02
Zinc and its alloys products	Content of: Al, Cu, Fe, Mg, Pb, Sn, Range: Al (0.10 to 10.0) % Cu (0.050 to 4.0) % Fe (0.010 to 1.0) % Mg (0.010 to 1.0) % Pb (0.001 to 0.1) % Sn (0.001 to 0.1) % Inductively coupled plasma optical emission spectrometry (ICP-OES) method	BOSMAL/I-7-43/06
Vehicles parts (e.g. heat exchangers, pipes, housings)	Internal cleanliness	DIN 8964-1:1996-03 BOSMAL/I-7-48/03
Operating and industrial oils	Identification Infrared spectrometric method (FTIR)	BOSMAL/I-7-41/05
	Kinematic viscosity at 40°C Range: (2 to 200) mm ² /s Capillary method Dynamic viscosity (calculated)	PN-EN ISO 3104:2004
	Kinematic viscosity at 100°C Range: (2 to 25) mm ² /s Capillary method Dynamic viscosity (calculated)	PN-EN ISO 3104:2004
	Acid number Range: (0.1 to 5.0) mg KOH/g Potentiometric titration	PN-C-04049:1988 ASTM D 664-17
	Alkali number Range: (1.0 to 15.0) mg KOH/g Potentiometric titration	PN-C-04049:1988 ASTM D 4739-17
	Fuel content Range: (0.5 to 12) % (m/m) Chromatographic method	BOSMAL/I-7-86/01 ASTM D3524-14

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Greases	Dropping point Range: (130 to 300) °C Visual method	PN-ISO 2176:2011
	Cone penetration Range: (< 400)	PN ISO 2137:2011
Engine fuels	Benzene content Range: (0.1 to 20) % (V/V) Infrared spectrometric method (FTIR)	PN-EN 238:2000 PN-EN 238:2000/A1:2008
	Determination of distillation characteristic at atmospheric pressure Range: (< 400) °C Distillation method	PN-EN ISO 3405:2012
	Gum content (unwashed and washed) Range: (0.5 to 30) mg/100 ml Gravimetric method	PN-EN ISO 6246:2017-05
	Corrosiveness to copper Visual method	PN-EN ISO 2160:2004
	Density Range: (0.700 to 0.950) g/cm ³ Oscillating U-tube method	PN-EN ISO 12185:2002
	Flash point Range: < 200°C Pensky-Martens closed cup method	PN-EN ISO 2719:2016-08 met. A
	Brake fluids	Colour Visual method
Boiling point Range: <300°C Distillation method		PN-C-40005:2002 p. 5.3
pH value Range: 3 to 12 Potentiometric method		PN-C-40005:2002 p. 5.6
Thermal stability Distillation method		PN-C-40005:2002 p. 5.7.3
Vaporization Gravimetric method		PN-C-40005:2002 p.5.10
Refrigerating liquids	Ash residue Gravimetric method	PN-C-40008-02:1992
	Boiling point Range: <300°C Distillation method	PN-C-40008-03:1992
	pH value Range: 3 to 12 Potentiometric method	PN-C-40008-04:1992
	Alkali reserve Titration method	PN-C-40008-05:1993

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Car Assemblies Testing Department (BS) Sarni Stok 93, 43-300 Bielsko-Biala		
Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Machinery parts, assemblies and components	Forces: rip, pull out, push in, open and close, switch on and off, operating, (10 N to 100 kN)	BOSMAL/I-7-25/06
	Resistance to changeable mechanical load Range: - force (± 100 kN) - linear displacement (0 to 250 mm) - force moment (± 6000 Nm) - angle (0 to 90°)	BOSMAL/I-7-74/01
Machinery parts, assemblies and components and another construction components	Dependences between load: force, force moment and deformation such as: displacement, elongation, deflection, angle of rotation Range: - force (± 100 kN) - force moment ($\pm 5\,650$ Nm) - linear displacement (0 to 250 mm) - angle of rotation (0 to 90°) Method: direct or indirect measurement	BOSMAL/I-7-100/01
Mechanical coupling components of combinations of vehicles	Resistance to dynamic load Static strength Testing on the test rig	UN ECE Regulation No. 55 Series 01, Annex 6
Towing devices	Resistance to static load. Testing on the test rig	Commission Regulation (EU) No. 1005/2010, Annex 2
Automotive vehicles of categories M and N	External noise emitted by moving and standing vehicle by acoustic pressure level method Range (25 to 140) dB Direct method	UN ECE Regulation No. 51 Series 02 Annex 3 p. 3.1; 3.2, Annex 8 p. 3.1 PN-ISO 362:2003 PN-ISO 7188:2003
Shock absorbers	Damping forces by direct method during simulated operation Range: up to 25 kN	BOSMAL/I-7-51/03
Master cylinders of hydraulic braking systems of automotive vehicles and trailers	Hydraulic tightness by quantitative, qualitative, and quantitative-qualitative methods Range: up to 110 MPa	BOSMAL/I-7-18/05
	Simulated operation	BOSMAL/I-7-26/03
	Resistance to multiple repeatable pressure cycles by simulated operation method	BOSMAL/I-7-23/06
Automotive vehicles and trailers brake pipes junctions	Hydraulic tightness by quantitative, qualitative, and quantitative-qualitative methods Range: up to 110 MPa	BOSMAL/I-7-18/05
Automotive vehicles and trailers braking cylinders	Hydraulic tightness by quantitative, qualitative, and quantitative-qualitative methods Range: up to 110 MPa	BOSMAL/I-7-18/05
	Resistance to multiple repeatable pressure cycles by simulated operation method	BOSMAL/I-7-23/06

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Automotive vehicles and trailers braking calipers	Hydraulic tightness by quantitative, qualitative, and quantitative-qualitative methods Range: up to 110 MPa	BOSMAL/I-7-18/05
	Resistance to multiple repeatable pressure cycles by simulated operation method	BOSMAL/I-7-23/06
Hydraulic braking systems metal pipes of automotive vehicles	Hydraulic tightness by quantitative, qualitative and quantitative-qualitative methods Range: up to 110 MPa	BOSMAL/I-7-18/05
Pipes with upended ends, tapped holes, nipples and flexible pipes' ends	Minimal burst pressure by direct method Range: up to 110 MPa	BOSMAL/I-7-19/04
Other products subjected to hydraulic pressure	Hydraulic tightness by qualitative or quantitative method Range: up to 110 MPa Direct method	BOSMAL/I-7-18/05
	Minimum burst pressure by direct measurement Range: up to 110 MPa Direct method	BOSMAL/I-7-19/04
	Resistance to multiple repeatable pressure cycles by simulated operation method Range: (0 to 250) bar Direct method	BOSMAL/I-7-23/06
Car gearboxes	Gears and bearings durability by simulated operation method	BOSMAL/I-7-17/03
Parts, assemblies and components of driveline of heavy-duty vehicles	Efficiency Testing on the test rig	Commission Regulation(EU) No. 2017/2400 Annex VI p.3
Brake discs, brake drums and brake linings of disc and drum brakes in M1 and N1-category vehicles	Friction properties Wearing Durability Load resistance Temperature resistance Dynamic friction Brake testing method under real conditions on a dynamometer with reduced inertia moment to one wheel	UNECE Regulation No. 90 Series 02 Annex 3, Annex 4, Annex 9, Annex 11 BOSMAL/I-7-91/01 BOSMAL/I-7-93/01 BOSMAL/I-7-94/01 UNECE Regulation No. 13 Series 11 Annex 4, Annex 11, Annex 15, Annex 19 BOSMAL/I-7-96/01 BOSMAL/I-7-97/01 UNECE Regulation No. 13H Series 01 Annex 3, Annex 7 BOSMAL/I-7-98/01 BOSMAL/I-7-99/01

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Brake discs, brake drums and brake linings of disc and drum brakes in L1, L2, L3, L4 and L5-category vehicles	Friction properties Wearing Durability Load resistance Temperature resistance Dynamic friction Brake testing method under real conditions on a dynamometer with inertia moment reduced to one wheel	UNECE Regulation No. 78 Series 03
Brake discs, brake drums and brake linings of disc and drum brakes including brake callipers in M1 and N1-category vehicles, as well as L1,L2, L3, L4 and L5-category vehicles	Friction properties Friction coefficient Performance indicators Wearing Wearing caused by temperature Durability Temperature resistance Noise emitted by brake	ISO 11157:2005 ISO 15484:2008 ISO 26867:2009 JASO C406:2000 SAE J2784:2009-09 SAE J2522:2014-09 JASO C436:1999 JASO C442:1977 JASO C443:2009 SAE J2707:2012-10 JASO C456:1984 JASO C427:2009 SAE J2707:2012-10 JASO 0419:2006 SAE J2928:2012-07 SAE J2521:2013-04
Brake callipers in M1 and N1-category vehicles, as well as L1, L2, L3, L4 and L5-category vehicles	Resistance to pressure , temperature and braking moment	JASO C459:2010
Electric drives	Noise level in acoustic chamber (global, third-octave and octave levels) by direct measurement in general, in one-third octave bands or octave bands	BOSMAL/I-7-42/03

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Engine Research Department (BH) Sarni Stok 93, 43-300 Bielsko-Biala		
Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Combustion engines (max. power up to 500 kW)	Performance measurement on the engine test bench	UN ECE Regulation No. 85 Series 00 Directive 80/1269/EEC, with amendments and corrections up to Directive 1999/99/EC
	Smoke measurement Range: (0 to 60)% Opacity method	UN ECE Regulation No. 24 Series 03 Directive 72/306/EEC with amendments and corrections up to Directive 2005/21/EC
	Operating parameters: - torque (0 to 3000) Nm; tensometric method - engine power (0 to 500) kW; calculated - rotational speed (0 to 10 000) rpm; impulse method - fuel consumption (0 to 150) kg/h; gravimetric method - air consumption (0 to 2 400) kg/h; thermoanemometric method Concentration: CO, CO ₂ , N ₂ O, NO ₂ , NO _x , THC, CH ₄ , NMHC, NH ₃ CO: range: (0 to 10)%; method: NDIR CO ₂ : range: (0 to 20)%; method: NDIR N ₂ O: range: (0 to 0.001)%; method: CLD NO ₂ : range: (0 to 0.01)%; method: CLD NO _x : range: (0 to 0.01)%; method: CLD THC: range: (0 to 0.02)%; method: FID CH ₄ : range: (0 to 0.02)%; method: FID NMHC: range: (0 to 0.02)%; method: FID NH ₃ : range: (0 to 0.001)%; method: LDD PM - Particulate mass gravimetric method PN - particulate number laser method	UN ECE Regulation No. 49 Series 06 Regulation (EU) 2016/1628 US EPA Regulations, Code of Federal Regulation (CFR) Title 40 – Protection of Environment, Part 1039, 1042, 1065, 1068. UN IMO Standards Tier I, II, III; Annex VI 2008, Edition 2017 Directive 94/25/EC, as amended by Directive 2003/44/EC, Regulation (EU) 1025/2012 and Directive 2013/53/EU Swiss Federal Ordinance on Air Pollution Control (OAPC) Appendix 4, Section 31, paragraph 1 and 2; Section 32, par. 2 (SN 277206) UN ECE Regulation No. 96 Series 04 UN ECE Regulation No. 120 Series 01 UN ECE Regulation No. 132 Series 01 UN ECE Regulation No. 143 Series 00

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Combustion engines (max. power up to 500 kW)	Various tests on the engine test bench	BOSMAL/I-7-46/03
The exhaust system of vehicles of category M1 and N1 as spare parts	Back pressure in the exhaust system	UN ECE Regulation No. 59 Series 02
Electric drivetrains (max. power up to 500 kW)	Net power and the maximum power after 30 minutes on the engine test bench	UN ECE Regulation No. 85 Series 00
Vehicles of categories M and N with SI and CI engines, including hybrid vehicles	Emission of gaseous and particulate matter exhaust pollutants – ambient temperatures from 14°C to 30°C (Type I Test) Concentration: CO, CO ₂ , NO ₂ , NO _x , THC, CH ₄ , PM, PN: Range: - CO: (0 to 12)% ; - CO ₂ : (0 to 20)% Method: NDIR - NO ₂ , NO _x : (0 to 1)% Method: CLD; - THC: (0 to 5)% Method: FID; - CH ₄ : (0 to 0.05)% Method: chromatographic GC-FID; - CH ₄ : (0 to 2.5)% Method: FID; - O ₂ : (0 to 22)%, Method: PMD - PM – gravimetric method; - PN – laser method. Emission: CO, CO ₂ , NO ₂ , NO _x , THC, CH ₄ , NMHC, PM, PN (calculated)	UN ECE Regulation No. 83 Series 07 Regulation (EC) 715/2007 as amended up to Reg. (EU) 459/2012 Regulation (EC) 692/2008 as amended up to Reg. (EU) 2017/1347 Directive 70/220/EEC, as amended up to Directive 2003/76/EC UN Global Technical Regulation (GTR) No. 15 Regulation (EU) 2017/1151 as amended up to Reg. (EU) 2017/1347
	Emission of gaseous pollutants in real driving conditions Measurement of concentration: CO - method: NDIR; Range (0 to 15)% NO - method: NDUV; Range (0 to 5000) ppm NO ₂ - method: NDUV; Range (0 to 2500) ppm CO ₂ - method: NDIR; Range (0 to 20)% THC - method: FID; Range (0 to 10000) ppmC ₃	Regulation (EC) 692/2008 as amended up to Reg. (EU) 2017/1347 Regulation (EU) 2017/1151 as amended up to Reg. (EU) 2017/1347
	Carbon monoxide emission at idling (Type II Test) Emission measurement: - CO – infrared method; Range: (0 to 10)% - CO ₂ – infrared method; Range: (0 to 20)% - THC – infrared method; Range: (0 to 2)% - O ₂ – chemical method; Range: (0 to 25)%	UN ECE Regulation No. 83 Series 07 Regulation (EC) 715/2007 as amended up to Reg. (EU) 459/2012 Regulation (EC) 692/2008 as amended up to Reg. (EU) 2017/1347 Directive 70/220/EEC as amended up to Directive 2003/76/EC Regulation (EU) 2017/1151 as amended up to Reg. (EU) 2017/1347

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Vehicles of categories M and N with SI and CI engines, including hybrid vehicles	Emission of crankcase gases by crankcase underpressure method (Type III Test) Range: 1 m H ₂ O - manometric method	UN ECE Regulation No. 83 Series 07 Regulation (EC) 715/2007 as amended up to Reg. (EU) 459/2012
	Durability of anti-pollution devices by using driving tests emission measurement method, before and after vehicle ageing (Type V Test)	Regulation (EC) 692/2008 as amended up to Reg. (EU) 2017/1347 Directive 70/220/EEC, as amended up to Directive 2003/76/EC
	Emissions of CO and HC gaseous pollutants at ambient temp. -7°C (Type VI Test) Measurement of concentrations: - CO – NDIR method; Range: (0 to 12)% - THC – FID method; Range: (0 to 5)% Emission calculated	Regulation (UE) 2017/1151 as amended up to Reg. (EU) 2017/1347
	On-board diagnostic (OBD) operation test	
Heavy-duty vehicles of categories M and N with SI and CI engines, including hybrid vehicles	Emission of gaseous pollutants in real driving conditions Measurement of concentration: CO - method: NDIR; Range (0 to 15)% NO - method: NDUV; Range (0 to 5000) ppm NO ₂ - method: NDUV; Range (0 to 2500) ppm CO ₂ - method: NDIR; Range (0 to 20)% THC - method: FID; Range (0 to 10000) ppmC ₃	Regulation (EC) 595/2009 as amended up to Regulation (EU) 2017/2400 Regulation (EU) 582/2011 as amended up to Regulation (EU) 2017/2400
Vehicles of categories M and N with SI and CI engines, including hybrid and electric vehicles	Fuel consumption by the carbon balance method	UN ECE Regulation No. 101 Series 01 Regulation (EC) 715/2007 as amended up to Reg. (EU) 459/2012 Regulation (EC) 692/2008 as amended up to Reg. (EU) 2017/1347 Directive 80/1268/EEC as amended up to Directive 2004/3/EC UN Global Technical Regulation (GTR) No. 15 Regulation (EU) 2017/1151 as amended up to Reg. (EU) 2017/1347
	Electrical energy consumption by energy balance method Driving range on electrical battery power Current: range (0 to 500) A Voltage: range (0 to 1500) V	UN ECE Regulation No. 101 Series 01 Regulation (EU) 2017/1151 as amended up to Reg. (EU) 2017/1347

Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Vehicles with SI and CI engines	Emission of gaseous pollutants at idling and at idling-up speed by direct measurement of row exhaust gases Measurement of concentrations: - CO – infrared method ; Range: (0 to 10)% - CO ₂ – infrared method Range: (0 to 20)% - THC – infrared method; Range: (0 to 2)% - O ₂ – chemical method Range: (0 to 25)%	MI Decree from 31.12.2002 (D.U. No. 32, p. 262 from 2003) § 9.1 p. 2 and 3 Att. 2, as amended up to MT Decree from 09.01.2013 p.30 Directive 2009/40/EC, as amended up to Directive 2010/48/EU UN ECE Regulation No. 24 Series 03 Regulation (EC) 715/2007 as amended, up to Reg. (EU) 459/2012 Regulation (EC) 692/2008 as amended up to Reg. (EU) 2017/1347
	Smoke Range: (0 to 60)% Opacity method	Regulation (EU) 2017/1151 as amended up to Reg. (EU) 2017/1347
Catalysts for spare parts for M and N-category vehicles with SI and CI engines	Catalyst system efficiency by comparative measurement of emission of gaseous and particulate pollutants	UN ECE Regulation No. 103 Series 00 Regulation (EC) 715/2007 as amended up to Regulation (EU) 459/2012 Regulation (EC) 692/2008 (18.07.2008) as amended up to Reg. (EU) 2017/1347 Regulation (EU) 2017/1151 as amended up to Reg. (EU) 2017/1347
M and N-category vehicles equipped with additional LPG or CNG fueling retrofit	Gaseous exhaust emission Concentration: CO, CO ₂ , NO ₂ , NO _x , THC, CH ₄ . Range: - CO: (0 to 12)% ; - CO ₂ : (0 to 20)% NDIR method; - NO ₂ , NO _x : (0 to 1)% CLD method; - THC: (0 to 5)% FID method; - CH ₄ : (0 to 0.05)% chromatographic method - GC-FID; - CH ₄ : (0 to 2.5)% FID method; - O ₂ : (0 to 22)%, PMD method Emission: CO, CO ₂ , NO ₂ , NO _x , THC, CH ₄ , NMHC (calculated)	UN ECE Regulation No. 115 Series 00
	Fuel consumption by the carbon balance method	
	Maximum power on wheels Range: (0 to 258) kW Tensometric method	
	On-board diagnostic (OBD) operation test	

Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
M and N-category vehicles with SI and CI engines	<p>Emission of gaseous and particulate exhaust pollutants - JC08 tests Concentration: CO, CO₂, NO₂, NO_x, THC, CH₄, PM,PN: Range: - CO: (0 to 12)% ; - CO₂: (0 to 20)% NDIR method; - NO₂, NO_x: (0 to 1)% CLD method; - THC: (0 to 5) % FID method; - CH₄: (0 to 0.05)% chromatographic method GC-FID; - CH₄: (0 to 2.5)% FID method; - O₂: (0 to 22)%, PMD method; - PM – gravimetric method; - PN – laser method. Emission: CO, CO₂, NO₂, NO_x, THC, CH₄, NMHC, PM, PN (calculated)</p> <p>Emission of CO, HC, and CO₂ at idling</p> <p>Underpressure in the crankcase by direct measurement</p> <p>Fuel consumption by JC08 tests</p>	<p>TRIAS 31-J042(2)-02 TRIAS 31-J042(3)-02 Attachment 42 -Technical Standard</p> <p>TRIAS 99-006-01</p>
Two-wheel or three-wheel and four-wheel motor vehicles, including hybrid and electric vehicles	<p>Emission of gaseous and particulate exhaust pollutants (Type I Test) Concentration: CO, CO₂, NO₂, NO_x, THC, CH₄, PM, PN: Range: - CO: (0 to 12)%; - CO₂: (0 to 20)% Method: NDIR -NO₂, NO_x: (0 to 1)% Method: CLD; - THC: (0 to 5)% Method: FID; - CH₄: (0 to 0.05)% Chromatographic method GC-FID; - CH₄: (0 to 2.5)% Method: FID; - O₂: (0 to 22)%, Method: PMD - PM - gravimetric method; - PN - laser method. Emission: CO, CO₂, NO₂, NO_x, THC, CH₄, NMHC, PM (calculated)</p>	<p>Regulation (EU) 168/2013 Regulation (EU) 134/2014 UN Global Technical Regulations (GTR) No. 2</p>

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Two-wheel or three-wheel and four-wheel motor vehicles, including hybrid and electric vehicles	Test of carbon monoxide at idling (Type II Test) Emission measurements: - CO - infrared method; Range: (0 to 10)% - CO ₂ - infrared method; Range: (0 to 20)% - THC - infrared method; Range: (0 to 2)% - O ₂ - chemical method; Range: (0 to 25)%	Regulation (EU) No. 168/2013 Regulation (EU) No. 134/2014 UN Global Technical Regulations (GTR) No. 2
	Emission of crankcase gases by crankcase underpressure measurement (Type III Test) Range: 1 m H ₂ O - manometer method	
	Emission of CO ₂ , fuel consumption, consumption of electrical power and driving range when battery-powered by carbon balance and energy balance methods Type VII Test	
	Maximum power on wheels Tensometric method Range: (0 to 258) kW	

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Heat Exchangers Testing Department (BW) Sarni Stok 93, 43-300 Bielsko-Biala		
Tested objects / groups of objects	Type of activity/tested characteristics/test methods	Reference documents
Car heat exchangers and other elements of heat exchange systems	Resistance to working medium temperature changes	BOSMAL/I-7-53/02
	Resistance to working medium changeable pressure	BOSMAL/I-7-54/02

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Automotive Electrotechnics & Electronics Testing Laboratory(BE) Sarni Stok 93, 43-300 Bielsko-Biala		
Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Components/assemblies of electric and electronic equipment	Voltage (100×10^{-6} V to 1000 V)	BOSMAL/I-7-10/05
	Electric current (200×10^{-6} A to 300 A)	BOSMAL/I-7-37/05
	Resistance ($50 \times 10^{-6} \Omega$ to $100 \times 10^{12} \Omega$)	ISO 6722-1:2011 ISO 6722-1:2011/Cor1:2012 PN-EN 60851-5:2008
	Capacitance (1 pF to 100 μ F)	BOSMAL/I-7-39/04
	Inductance (100 μ H to 100 H)	BOSMAL/I-7-39/04
Components/assemblies of machinery and other devices	Environmental hazard resistance: Test A: Cold (up to $-40 \pm 2^\circ\text{C}$)	PN-EN 60068-2-1:2009
	Test B: Dry heat (up to $300 \pm 2^\circ\text{C}$)	PN-EN 60068-2-2:2009
	Test Cab: Damp heat, steady state ($30 \pm 2^\circ\text{C}$; $93 \pm 3\%$) ($30 \pm 2^\circ\text{C}$; $85 \pm 3\%$) ($40 \pm 2^\circ\text{C}$; $93 \pm 3\%$) ($40 \pm 2^\circ\text{C}$; $85 \pm 3\%$)	PN-EN 60068-2-78:2013-11
	Test Db: Damp heat, cyclic (12h+12h cycle)	PN-EN 60068-2-30:2008
	Test Na: Change of temperature ($-40 \pm 2^\circ\text{C}$ to $150 \pm 2^\circ\text{C}$)	PN-EN 60068-2-14:2009
	Test Nb: Change of temperature ($-40 \pm 2^\circ\text{C}$ to $130 \pm 2^\circ\text{C}$) with gradient $\leq 10^\circ\text{C}/\text{min}$	PN-EN 60068-2-14:2009
	Test Z/AD: Composite temperature/humidity cyclic test	PN-EN 60068-2-38:2010
	Test Fc: Vibration (sinusoidal) Range: up to 100 g (peak)	PN-EN 60068-2-6:2008
	Test Ea: Shock Range: up to 150 g (peak)	PN-EN 60068-2-27:2009
	Test Fh: Vibrations, broadband random Range: up to 70 g (RMS)	PN-EN 60068-2-64:2008
	Water resistance (tests concerning second characteristic digit 1, 2, 3, 4, 4K, 5, 6, 6K, 7, 8, 9, 9K) Test Rb 1.1 by oscillatory pipe method (max. 40 l/min) Test Rb 2, Rb 3 and Rc 1	PN-EN 60529:2003 p. 14.2.1, 14.2.2, 14.2.3; 14.2.4, 14.2.5, 14.2.6, 14.2.7, 14.2.8 PN-EN 60529:2003/A2:2014-07 PN-EN 60068-2-18:2017-08 ISO 20653:2013
	Dust penetration resistance (dust tests concerning first characteristic digit 5, 5K, 6, 6K) in dust chamber with negative pressure and dust circulation being forced	PN-EN 60529:2003 p. 13.4 PN-EN 60529:2003/A2:2014-07 ISO 20653:2013
	Thermal shock with cold water	ISO 16750-4:2010
Luminous devices powered by constant or alternating voltage	Luminous intensity distribution by goniophotometric method with rotating object (0.1 to 5×10^6) cd	BOSMAL/I-7-84/02 PN-EN 13032-1+A1:2012 PN-EN 13032-4:2015-09 CIE 70:1987 IES LM 79-08:2008 PN-EN 12966:2015-03
	Spectral and colorimetric characteristics (spectral distribution, chromaticity coordinates, correlated colour temperature)	CIE 13.3:1995 CIE 15:2004 CIE 63:1984 IES LM 79-08:2008 PN-EN 13032-4:2015-09 PN-EN 12966:2015-03

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Luminous devices powered by constant or alternating voltage	Luminance (1×10^{-8} to 3×10^5) cd/m ²	PN-E-04040-04:1983 PN-EN 13032-1+A1:2012 PN-EN 13032-4:2015-09 SAE J1757-1:2015-05 PN-EN 12966:2015-03
	Luminous flux	CIE 84:1989 PN-EN 13032-1+A1:2012 PN-EN 13032-4:2015-09 IES LM 79-08:2008
Traffic control equipment Signal heads	Luminance uniformity	PN-EN 12368:2015-07 p. 8.3
Workplaces, passageways	Illuminance (1×10^{-3} to 3×10^5) lx	PN-E-04040-03:1983 PN-EN 12464-1:2012 PN-EN 12464-2:2014-05
Components/assemblies of electric/electronic cars equipment	Voltage	PN-S-76020:1997 p. 3.3.2
	Voltage drop	PN-S-76020:1997 p. 3.3.3
	Resistance to high voltage	PN-S-76020:1997 p. 3.3.4
	Resistance to short-circuit	PN-S-76020:1997 p. 3.3.5
	Resistance to change in the polarity of the power source	PN-S-76020:1997 p. 3.3.6
	Durability	PN-S-76020:1997 p. 3.3.12
	Insulation resistance	ISO 16750-2:2012 p. 4.12
	Dielectric strength	ISO 16750-2:2012 p. 4.11
	Resistance to dump heat, steady state	PN-EN 60068-2-78:2013-11 PN-S-76020:1997 p. 3.3.9
	Thermal resistance	PN-EN-60068-2-2:2009 PN-EN-60068-2-1:2009
	Resistance to cyclical temperature changes	PN-S-76020:1997 p. 3.3.8
	Vibration resistance	PN-EN-60068-2-6:2008 PN-S-76020:1997 p. 3.3.10
	Dust and water resistance	PN-S-76020:1997 p. 3.3.13 PN-EN-60529:2003 p. 13.4; 14.2.3; 14.2.4 PN-EN 60529:2003/A2:2014-07
Cars switches	Voltage drop	BOSMAL/I-7-67/02
	Insulation resistance	
	Dielectric strength	
	Durability	
	Interchangeability of parts	
	Thermal resistance	PN-EN-60068-2-2:2009 PN-EN-60068-2-1:2009
	Resistance to cyclical temperature changes	PN-EN-60068-2-14:2009
	Humidity resistance	PN-EN 60068-2-78:2013-11
	Vibration resistance	PN-EN-60068-2-6:2008
	Dust and water resistance	PN-EN-60529:2003 p. 13.4; 14.2.3; 14.2.4 PN-EN 60529:2003/A2:2014-07
Flasher units	Start time	PN-ISO 4082-1999 p.5.5
	Frequency and duty cycle	PN-ISO 4082-1999 p.5.6
	Voltage drop	PN-ISO 4082-1999 p.5.8
	Dielectric strength	PN-ISO 4082-1999 p.5.9
	Resistance to overload	PN-ISO 4082-1999 p.5.11
	Vibration resistance	PN-ISO 4082-1999 p.5.12.2

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Flasher units	Impact resistance	PN-ISO 4082-1999 p.5.13
	Resistance to heat and cold	PN-ISO 4082-1999 p.5.14
	Operation in extreme temperatures	PN-ISO 4082-1999 p.5.15
	Durability	PN-ISO 4082-1999 p.5.16
Wire harnesses/cables of low voltage car installation	Insulation resistance Withstand voltage Voltage drop Resistance to cyclical temperature changes Squeeze test Quality of manufacturing Tightness test (bubble test) Resistance to high temperature Cold flexibility Cold flexibility after accelerated ageing Resistance to static immersion Resistance to rain Insulation shrinkage Cold Impact Active resistance	BOSMAL/I-7-69/03 ISO 6722-1:2011 ISO 6722-1:2011/Cor 1:2012 PN-EN 60068-2-14:2009 IEC 60227-2:1997+A1:2003 p. 2.1
Electrical connectors	Resistance (voltage drop) Water resistance Temperature/humidity cycling Insulation resistance Withstand voltage Connector coding and polarization Current cycles Heat ageing Free fall Dust resistance Rapid change of temperature (thermal shock) Temperature rise	PN-EN ISO 8092-2:2008
	Crimp resistance ($50 \times 10^{-6} \Omega$ to 1Ω)	PN-EN ISO 60512-2-1:2006 PN-EN ISO 60512-2-2:2006 PN-EN 60352-2:2006 PN-EN 60352-2:2006/A1:2013-10
Connectors for electronic equipment	Contact resistance - millivolt level method	PN-EN 60512-2-1:2006
	Contact resistance - test current method	PN-EN 60512-2-2:2006
	Insulation resistance	PN-EN 60512-3-1:2005
	Voltage stress test	PN-EN 60512-4-1:2006
	Voltage proof of pre-insulated crimp barrels	PN-EN 60512-4-3:2006
	Temperature rise	PN-EN 60512-5-1:2006
	Current-carrying capacity tests with current-temperature derating	PN-EN 60512-5-2:2005
	Current loading, cyclic	PN-EN 60512-9-5:2010
Climatic tests	PN-EN 60512-11-1:2002 PN-IEC 68-2-61:1994 PN-IEC 68-2-61:1994/Ap1:1999	

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Electrical and electronic equipment installed in L, M, N and O-category vehicles, supplied with 12 V and 24 V DC current	Measurements of emitted disturbances	ISO 7637-2:2011 UNECE Regulation No. 10 Series 05 Annex 10
	Resistance to transient conduction along supply lines: impulses 1, 2a, 2b, 3a, 3b, 4, 5a, 5b	ISO 7637-2:2011 ISO 16750-2:2012 UNECE Regulation No. 10 Series 05 Annex 10
Rear-view mirrors for vehicles of categories L, M and N	Coefficient of reflection (total) of mirror surfaces	UNECE Regulation No. 46 Series 04 p.6.1.2.2
Laminated automotive glass for vehicles of categories L, M, N, O and T	Light transmission Optical distortion Secondary-image-separation test	Directive 92/22/EEC Annex II A, as amended, up to Directive 2001/92/EC Annex II B Directive 2009/144/EC Annex III C updated by Directive 2010/62/EU UNECE Regulation No. 43 Series 01 Annex 3, p. 9.1; 9.2; 9.3; 9.4; ISO 3538:1997 p. 5.1; 5.2; 5.3
	Mechanical strength	Directive 92/22/EEC Annex II A, as amended, up to Directive 2001/92/EC Annex II B Directive 2009/144/EC Annex III C updated by Directive 2010/62/EU UNECE Regulation No. 43 Series 01 Annex 3, p. 2.1, 2.2 ISO 3537:2015 p. 6,7
	Resistance to: - high temperature - humidity	Directive 92/22/EEC Annex II A, as amended, up to Directive No. 2001/92/EC Annex II B Directive 2009/144/EC Annex III C updated by Directive 2010/62/EU UNECE Regulation No. 43 Series 01 Annex 3, p. 5; 7
Toughened automotive glass for vehicles of categories L, M, N, O and T	Light transmission Optical distortion Secondary-image-separation test	Directive 92/22/EEC Annex II A,, as amended, up to Directive 2001/92/EC Annex II B Directive 2009/144/EC Annex III C updated by Directive 2010/62/EU UNECE Regulation No. 43 Series 01 Annex 3, p. 9.1; 9.2; 9.3; 9.4 ISO 3538:1997 p. 5.1; 5.2; 5.3
	Mechanical strength	Directive 92/22/EEC Annex II A, as amended, up to Directive 2001/92/EC Annex II B Directive 2009/144/EC Annex III C updated by Directive 2010/62/EU UNECE Regulation No. 43 Series 01 Annex 3, p. 2.1; 2.2; ISO 3537:2015 p. 6; 7

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Toughened automotive glass for L, M, N, O and T-category vehicles	Fragmentation	Directive 92/22/EEC Annex II A, as amended up to Directive 2001/92/EC Annex II B Directive 2009/144/EC Annex III C updated by Directive 2010/62/EU UNECE Regulation No. 43 Series 01 Annex 3, p. 1 ISO 3537:2015 p. 9
Heated rear windows (backlights)	Power of heating circuit Circuit continuity Temperature rise Defrosting Heat-shock resistance Durability of heating circuit Abrasion resistance	BOSMAL/I-7-85/02
Advance-warning triangles	Colour Coefficient of luminous intensity Luminance factor	UN ECE Regulation No. 27 Series 04
Retro-reflective devices for L, M, N, O and T-category vehicles	Colour	UNECE Regulation No. 3 Series 02 Directive 76/757/EEC Annex VII, as amended up to Directive 2006/96/EC Annex II
	Coefficient of luminous intensity	UNECE Regulation No. 3 Series 02 Directive 76/757/EEC Annex VII, as amended up to Directive 2006/96/EC Annex II
Vertical traffic signs	Colour	WT-ITS/19/94-PLE ed. 6 (04.06.2004) p. 5.6.4 PN- EN 12899-1:2010 p. 4.1.1.3
	Coefficient of luminous intensity	WT-ITS/19/94-PLE ed. 6 (04.06.2004) p. 5.6.5 PN-EN 12899-1:2010 p. 4.1.1.4
Rear marking plates for slow-moving M, N, O and T-category vehicles and mobile machinery	Colour	PN-S-73102:1994 p. 4.6.3 UNECE Regulation No. 69 Series 01 Annex 6
	Coefficient of luminous intensity	PN-S-73102:1994 p. 4.6.4 Regulation No. 69 UNECE Series 01 Annex 7
Rear marking plates for heavy and long vehicles	Colour	UNECE Regulation No. 70 Series 01
	Coefficient of luminous intensity	UNECE Regulation No. 70 Series 01
Direction indicators lights for vehicles of categories L, M, N, O and T	Colour of light Luminous intensity	UNECE Regulation No. 6 Series 01 p. 6; 8 Directive 76/759/EEC Annex 0 p. 6; 8, as amended up to Directive 2006/96/EC Annex II

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Front and rear position (side) lights for vehicles of categories L, M, N, O and T	Colour of light Luminous intensity	UNECE Regulation No. 7 Series 02 p. 6; 8 Directive76/758/EEC Annex 0 p. 6; as amended, up to Directive 2006/96/EC Annex II
Stop lights for vehicles of categories L, M, N, O and T	Colour of light Luminous intensity	UNECE Regulation No. 7 Series 02 p. 6; 8 Directive76/758/EEC Annex 0 p. 6; 8, as amended, up to Directive 2006/96/EC Annex II
Rear fog lights for vehicles of categories L3, L4, L5, L7, M, N, O and T	Colour of light Luminous intensity	UNECE Regulation No. 38 Series 00 Directive77/538/EEC Annex 0 p. 3; 6, as amended, up to Directive 2006/96/EC Annex II
Reversing lamps for vehicles of categories M, N, O and T	Colour of light Luminous intensity	UNECE Regulation No. 23 Series 00 p. 6; 8 Directive 77/539/EEC Annex 0 p. 6; 8, as amended, up to Directive2006/96/EC Annex II
Light-signalling devices for vehicles of category L	Colour of light Luminous intensity Luminance	UN ECE Regulation No. 50 Series 00 BOSMAL/I-7-84/02 CIE 15:2004
Headlamps for vehicles of categories L, M, N and T	Colour of light Luminous intensity Illuminance	UN ECE Regulation No. 1 Series 02 UN ECE Regulation No. 5 Series 03 UN ECE Regulation No. 8 Series 05 UN ECE Regulation No. 19 Series 04 UN ECE Regulation No. 20 Series 03 UN ECE Regulation No. 31 Series 03 UN ECE Regulation No. 56 Series 01 UN ECE Regulation No. 57 Series 02 UN ECE Regulation No. 72 Series 01 UN ECE Regulation No. 82 Series 01 UN ECE Regulation No. 98 Series 01 UN ECE Regulation No. 112 Series 01 UN ECE Regulation No. 113 Series 02 UN ECE Regulation No. 123 Series 01 BOSMAL/I-7-84/02 CIE 15:2004
Special warning lamps Warning and safety light devices Obstruction lights	Luminous intensity/ Effective luminous intensity Frequency of pulse Colour of light	UN ECE Regulation No. 65 Series 00 PN-EN 12352:2010 ICAO 9157 PART 4 "Aerodrome Design Manual" ed. 4 – 2004 BOSMAL/I-7-84/02 CIE 15:2004
Solid electrical insulating materials	Surface resistance Volume resistance Resistance to the grounding element Resistance between points (range up to 100 TΩ) Dielectric strength (voltage up to 35 kV, current up to 1 A)	BOSMAL/I-7-65/02 PN-EN 61340-2-3:2002 PN-EN 62631-1:2011 PN-EN 60243-1:2013-12

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Safety glazing materials (glass, transparent polymers) for vehicles of categories L, M, N, O and T	Haze by spectrophotometric method	ISO 3537:2015 ASTM D1003:2013 BOSMAL/I-7-72/02 UN ECE Regulation No. 43 Series 01 Annex 3 p. 4 ANSI/SAE Z-26.1:1996
Products from plastic, glass, textiles, nonwovens, foams, rubber, coatings (including painting ones)	Colour of materials reflecting and transmitting light	BOSMAL/I-7-66/02 PN-EN ISO 105-A05:2000 PN-EN ISO 105-J01:2002 PN-EN ISO 105-J03:2009 PN-ISO 7724-1:2003 PN-ISO 7724-2:2003 PN-ISO 7724-3:2003 CIE 15:2004 DIN 53236:2017-09 SAE J1545:2014-10 PN-EN ISO 11664-1:2011 PN-EN ISO 11664-2:2011 PN-EN ISO 11664-3:2013-08 PN-EN ISO 11664-4:2011 PN-EN ISO 11664-5:2016-10 PN-EN ISO 11664-6:2016-09
Delineator posts and retroreflectors	Colour Luminance factor Coefficient of luminous intensity	PN-EN 12899-3:2010
High-visibility warning clothes and accessories	Colour Coefficient of retroreflection	PN-EN ISO 20471:2013-07 PN-EN 1150:2001 PN-EN 13356:2004
Reflective materials and devices	Coefficient of luminous intensity Coefficient of retroreflection	CIE 54.2:2001

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Road Testing Department (BD) Sarni Stok 93, 43-300 Bielsko-Biala		
Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Vehicles of category M1	Useful trunk capacity by use the measuring cuboids method	ISO 3832:2002
	Wind screen defrosting and demisting	Regulation (EU) No. 672/2010 Annex II p. 2
	Weight and its distribution on each axle, sides and wheels by use portable weighing platforms Range: 150 to 6000kg on single wheel	PN-ISO 2416:1997 Directive 95/48/EC App. to Annex II
	Interior heating effectiveness by measuring temperatures at certain locations of the car while driving	BOSMAL/I-7-62/03
Vehicles of categories M1 and N1	Wheel setting geometry: Range of measurement: - wheel convergence: $\pm 3^\circ$ - wheel's angle of heel: $\pm 5^\circ$ - stub-axle's angle of heel: $\pm 18^\circ$ - stub-axle's castor angle: $\pm 18^\circ$ - wheel's steering angle: $\pm 20^\circ$ - front wheels' displacement: $\pm 2^\circ$	BOSMAL/I-7-11/04
	Centre of gravity situation by car's weight method horizontally and with one axle upraised	ISO 10392:2011 w/o p.7
	Maximum speed by non-contact method on a straight track or oval ring Range: up to 190 km/h	BOSMAL/I-7-83/02 UN ECERegulation No. 68 Series 00 p. 5.5.1; 5.5.3; 5.5.4
	Acceleration intensity by non-contact method on a straight track Range: up to 190 km/h	BOSMAL/I-7-83/02
	Incorrectness of odometer's readings by comparison with values measured by non-contact method	BOSMAL/I-7-59/03
	Incorrectness of speedometer's readings by comparison with values measured by non-contact method	UN ECE Regulation No. 39 Series 01 p. 5.3
	Fuel consumption characteristics by volumetric method in the road test Range: 60 l/h	BOSMAL/I-7-58/02
	Fuel consumption at constant speed by volumetric method in the road test Range: 60 l/h	UN ECE Regulation No. 84 Series 00 Annex 4, p.3.3.1
	Oil consumption under on-road conditions by gravimetric method	BOSMAL/I-7-13/07

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Vehicles of categories M1 and N1	Tire tread abrasibility under on-road conditions by supervised exploitation method	BOSMAL/I-7-92/02
	U-turn diameter by marking drive track with liquid under the moving vehicle	BOSMAL/I-7-60/02
	Durability, reliability and functionality during mileage accumulation over various routes	BOSMAL/I-7-61/03
Vehicles of categories M1 and N1 with hydraulic brakes	Braking systems efficiency by road and speed measured by non-contact method	UN ECE Regulation No. 13 Series 11 Annex No. 4 (w/o Annex No. 13) UN ECE Regulation No. 13H Series 01 Annex No. 3 (w/o Annex No. 6) UN ECE Regulation No. 90 Series 02 Annex No. 3 (w/o p. 2.2) and Annex No. 11 (w/o p. 3 and 4) Directive 98/12/EC Annex II
Vehicles of categories M1, N1 and N2	In-use fuel consumption by volumetric method in the road test Range: 60 l/h	BOSMAL/I-7-12/04
Car parts, sub-assemblies and sets	Assemblability in workshop conditions	BOSMAL/I-7-14/03
Vehicles of categories M2 and M3	Fuel consumption in SORT road cycle Volumetric method in the road test Range: 60 l/h	UITP Project SORT Standardized On-Road Test Cycles New Edition UITP 2014 D/2014/0105/1
Vehicles of categories M1, N1 and T	Engine starting efficiency under different temperature conditions Range of temperature: (-40 to +50) °C	BOSMAL/I-7-73/01
Vehicles of category T	Maximum design speed	Directive 2009/60/EC corrected by Directive 2010/62/EC
	Checking the speed regulator regarding the maximum design speed	Directive 2009/144/EC corrected by Directive 2010/52/EC and by Directive 2010/62/EC
	Effectiveness of the braking systems by measuring the braking distance and delay as well as speed by non-contact method	Directive 76/432/EEC App. II as amended, up to Directive 97/54/EC
Mechanical coupling components of combinations of vehicles	The installation and the position on the vehicle	UN ECE Regulation No. 55 Series 01, Annex No. 7
Vehicles of category N	Dimensions of vehicle external projections by use of models and special equipment	UNECE Regulation No. 61 Series 00
Vehicles of categories M, N and O	Installation of tyres	Commission Regulation (EU) 458/2011

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Gauge and Standards Room - Metrology (BP) Sarni Stok 93, 43-300 Bielsko-Biala		
Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Metal, plastic (stiff) and glass products	External, internal, mixed and indirect dimensions: - up to 5000 mm on the surface by direct, comparison method (with accuracy up to 1 mm), - up to 3000 mm by direct, coordinate, contact method (with accuracy up to 0.005 mm), - up to 300 mm by direct, contact-free method (with accuracy up to 0.001 mm) - up to 200 mm by direct, differential method (with accuracy up to 0.001 mm)	BOSMAL/I-7-32/05 BOSMAL/I-7-78/01 BOSMAL/I-7-79/01 BOSMAL/I-7-80/02 BOSMAL/I-7-81/02 BOSMAL/I-7-82/01
	Angular dimensions: - arm of an angle up to 3000 mm by direct, contact method (with accuracy up to 1') - arm of an angle up to 300 mm by direct, contact-free method (with accuracy up to 10')	BOSMAL/I-7-32/05 BOSMAL/I-7-79/01 BOSMAL/I-7-80/02 BOSMAL/I-7-81/02 BOSMAL/I-7-82/01
	Surface roughness: - parameters defined in the norm PN-EN ISO 4287:1999 by direct, contact method with accuracy up to 0.02 μm - flat surfaces, - cylindrical surfaces along axis of symmetry	PN-EN ISO 4288:2011
	Shape deviations: a) straightness by direct, contact method - up to 3000 mm (with accuracy up to 0.005 mm), b) flatness - max. surface 3000x1200 mm by direct, contact method c) circularity by direct, contact method - up to \varnothing 1200 mm (with accuracy up to 0.005 mm), d) cylindricity by direct, contact method - up to \varnothing 1200 mm and L <3000 mm (with accuracy up to 0.005 mm).	BOSMAL/I-7-32/05 BOSMAL/I-7-78/01 BOSMAL/I-7-79/01 BOSMAL/I-7-80/02 BOSMAL/I-7-81/02 BOSMAL/I-7-82/01

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Metal, plastic (stiff) and glass products	Position deviations: a) parallelism - up to 3000 mm by direct, contact method (with accuracy up to 0.005 mm), - up to 300 mm by direct, contact-free method (with accuracy up to 0.002 mm) b) perpendicularity - up to 3000 mm by direct, contact method (with accuracy up to 0.005 mm) - up to 300 mm by direct, contact-free method (with accuracy up to 0.002 mm) c) position - up to 3000 mm by direct, contact method (with accuracy up to 0.005 mm) - up to 300 mm by direct, contact-free method (with accuracy up to 0.002 mm) d) concentricity - up to 1200 mm by direct, contact method (with accuracy up to 0.005 mm) - up to 300 mm by direct, contact-free method (with accuracy up to 0.002 mm) e) coaxiality - up to 1200 mm by direct, contact method (with accuracy up to 0.005 mm) - up to 300 mm by direct, contact-free method (with accuracy up to 0.002 mm) f) symmetry - up to 3000 mm by direct, contact method (with accuracy up to 0.005 mm) - up to 300 mm direct, contact-free method (with accuracy up to 0.002 mm) Complexity deviation - radial and axis run-out	BOSMAL/I-7-32/05 BOSMAL/I-7-78/01 BOSMAL/I-7-79/01 BOSMAL/I-7-80/02 BOSMAL/I-7-81/02 BOSMAL/I-7-82/01
	Pitch diameter of external, metric thread M4 to M32 three measuring wires method (with accuracy up to 0.002 mm)	BOSMAL/I-7-36/03
	Internal, metric thread dimensions M4 to M32 - by plug gauge	PN-ISO 1502:1998

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Tested object / product	Type of activity/tested characteristics/test methods	Reference documents
Rubber and plastic products (flexible) with limitations as a result of flexibility of the objects	External, internal, mixed, indirect dimensions: - up to 5000 mm on the surface by direct, comparison method (with accuracy up to 1 mm), - up to 3000 mm by direct, contact method (with accuracy up to 0.2 mm), - up to 300 mm by direct, contact-free method (with accuracy up to 0.1 mm)	BOSMAL/1-7-32/05 BOSMAL/1-7-79/01 BOSMAL/1-7-81/02 BOSMAL/1-7-82/01
	Angular dimensions: - arm of an angle up to 3000 mm by indirect, contact method (with accuracy up to 20'), - arm of an angle up to 300 mm by direct, contact-free method (with accuracy up to 10')	BOSMAL/1-7-32/05 BOSMAL/1-7-79/01 BOSMAL/1-7-81/02 BOSMAL/1-7-82/01

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The accreditation amendments list

The status of amendments: the primary version – A

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