DAkkS
Deutsche
Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV
Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition

Accreditation

The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory

Quality Analysis GmbH
Großer Forst 1, 72622 Nürtingen

is competent under the terms of DIN EN ISO/IEC 17025:2018 to carry out tests in the following fields:

Determination of technical cleanliness (TecSa) of components, systems and fluids using fluid extraction and air extraction, and evaluation with use of optical microscopy, SEM-EDX, RAMAN and FT-IR spectroscopy; Materialographic examinations (MAT) and analysis as part of root cause determination for damage cases of metallic and non-metallic materials; analysis of welded and soldered joints on metallic materials; measuring of coat thickness, measuring of surface oxidation and size grade determination; porosity measurement on metallic materials and layers; particle analysis of non-metallic, carbon based, organic and mineralic particles; hardness testing, hardness profile analysis and direct hardness testing on metallic materials; Industrial computed tomography (ICT) and industrial metrology technique (IMT) on components of metallic and non-metallic materials, plastics and organic materials; Chemical and physico-chemical analytics (CHA) of plastics and elastomers to determine thermal properties and composition; identification and quantification of organic and inorganic substances, materials, residues, deposits and contaminants using FT-IR and energy dispersive (EDX) spectroscopy

The accreditation certificate shall only apply in connection with the notice of accreditation of 06.07.2022 with the accreditation number D-PL-11108-01. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 6 pages.

Registration number of the certificate: **D-PL-11108-01-00**

Berlin, 06.07.2022	Ralf Egner Head of Department	Translation issued: 06.07.2022	Head of Department

The certificate together with the annex reflects the status as indicated by the date of issue.
The current status of any given scope of accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH at https://www.dakks.de/en/accredited-bodies-search.html.

This document is a translation. The definitive version is the original German accreditation certificate.

See notes overleaf.

Deutsche Akkreditierungsstelle GmbH

Standort Berlin
Spittelmarkt 10
10117 Berlin

Standort Frankfurt am Main
Europa-Allee 52
60327 Frankfurt am Main

Standort Braunschweig
Bundesallee 100
38116 Braunschweig

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council setting out the requirements for accreditation and market surveillance relating to the marketing of products. DAkkS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Co-operation (ILAC). The signatories to these agreements recognise each other's accreditations.

The up-to-date state of membership can be retrieved from the following websites:
EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iaf.nu

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Annex to the Accreditation Certificate D-PL-11108-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: **06.07.2022**

Date of issue: 06.07.2022

Holder of certificate:

Quality Analysis GmbH
Großer Forst 1, 72622 Nürtingen

Tests in the fields:

Determination of technical cleanliness (TecSa) of components, systems and fluids using fluid extraction and air extraction, and evaluation with use of optical microscopy, SEM-EDX, RAMAN and FT-IR spectroscopy; Materialographic examinations (MAT) and analysis as part of root cause determination for damage cases of metallic and non-metallic materials; analysis of welded and soldered joints on metallic materials; measuring of coat thickness, measuring of surface oxidation and size grade determination; porosity measurement on metallic materials and layers; particle analysis of non-metallic, carbon based, organic and mineralic particles; hardness testing, hardness profile analysis and direct hardness testing on metallic materials; Industrial computed tomography (ICT) and industrial metrology technique (IMT) on components of metallic and non-metallic materials, plastics and organic materials; Chemical and physico-chemical analytics (CHA) of plastics and elastomers to determine thermal properties and composition; identification and quantification of organic and inorganic substances, materials, residues, deposits and contaminants using FT-IR and energy dispersive (EDX) spectroscopy

Within the scope of accreditation marked with *, the testing laboratory is permitted, without being required to inform and obtain prior approval from DAkkS, to use standards or equivalent testing methods listed here with different issue dates. The testing laboratory maintains a current list of all testing procedures within the flexible scope of accreditation.

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of testing laboratories. Laboratories that conform to the requirements of this standard, operate generally in accordance with the principles of DIN EN ISO 9001.

The certificate together with the annex reflects the status as indicated by the date of issue.
The current status of any given scope of accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH at https://www.dakks.de/en/content/accredited-bodies-dakks.

Abbreviations used: see last page

1 Technical cleanliness of components (TecSa)

1.1 Determination of technical cleanliness of components for fluid systems *

ISO 16232 2018-12	Road vehicles - Cleanliness of components and systems (here: *except chapter 9.3.3, LIBS* *chapter 9.3.6, X-ray microtomography* *chapter 9.4, Shortened analysis*)
ISO 16232-2 2007-06	Road vehicles - Cleanliness of components of fluid circuits - Part 2: Method of extraction of contaminants by agitation (*withdrawn standard*)
ISO 16232-3 2007-06	Road vehicles - Cleanliness of components of fluid circuits - Part 3: Method of extraction of contaminants by pressure rinsing (*withdrawn standard*)
ISO 16232-4 2007-06	Road vehicles - Cleanliness of components of fluid circuits - Part 4: Method of extraction of contaminants by ultrasonic techniques (*withdrawn standard*)
ISO 16232-5 2007-06	Road vehicles - Cleanliness of components of fluid circuits - Part 5: Method of extraction of contaminants on functional test bench (*withdrawn standard*)
ISO 16232-6 2007-06	Road vehicles - Cleanliness of components of fluid circuits - Part 6: Particle mass determination by gravimetric analysis (*withdrawn standard*)
ISO 16232-7 2007-06	Road vehicles - Cleanliness of components of fluid circuits - Part 7: Particle sizing and counting by microscopic analysis (*withdrawn standard*)
ISO 16232-8 2007-06	Road vehicles - Cleanliness of components of fluid circuits - Part 8: Particle nature determination by microscopic analysis (*withdrawn standard*)

1.2 Determination of particulate contamination of functionally relevant automotive components *

VDA Band 19 2004	Inspection of Technical Cleanliness - Particulate Contamination of Functionally Relevant Automotive Components (here: *chapter D, E, F.1 to F.4*)
VDA Band 19.1 2015	Inspection of Technical Cleanliness - Particulate Contamination of Functionally Relevant Automotive Components (here: *except chapter 8.3.3, LIBS* *chapter 8.3.6, X-ray microtomography* *chapter 8.4, Shortened Analysis*)

1.3 Determination of particulate contamination of fluids *

ISO 4405 1991-05	Hydraulic fluid power - Fluid contamination - Determination of particulate contamination by the gravimentric method
ISO 4407 2002-04	Hydraulic fluid power - Fluid contamination - Determination of particulate contamination by the counting method using an optical microscope

2 Materialography (MAT)

2.1 Hardness test *

DIN 50190-3 1979-03	Hardness depth of heat-treated parts; determination of the effective depth of hardening after nitriding
DIN 50190-4 1999-09	Hardness depth of heat-treated parts - Part 4: Determination of the fusion hardening depth and the fusion depth *(withdrawn standard)*
DIN EN 10328 2005-04	Iron and steel - Determination of the conventional depth of hardening after surface heating
DIN EN ISO 6507-1 2018-07	Metallic materials - Vickers hardness test - Part 1: Test method
DIN EN ISO 2639 2003-04	Steels - Determination and verification of the depth of carburized and hardened cases

2.2 Analysis of welded joints *

DIN EN ISO 9015-2 2016-10	Destructive tests on welds in metallic materials - Hardness testing - Part 2: Microhardness testing of welded joints
DIN EN ISO 17639 2013-12	Destructive tests on welds in metallic materials - Macroscopic and microscopic examination of welds

2.3 Analysis of soldered joints

VA-1060-001 2020-08	Analysis of soldered joints

2.4 Microscopic testing *

DIN 30901 2016-12	Heat treatment of ferrous materials - Determination of the depth and form of appearance of the internal oxidation
DIN EN ISO 643 2020-06	Steels - Micrographic determination of the apparent grain size
DIN EN ISO 1463 2021-08	Metallic and oxide coatings - Measurement of coating thickness - Microscopical method
VDG Specification P201 2002-05	Volume deficits of castings made of non-ferrous metals
VDG Specification P202 2010-09	Volume Deficits of Castings Made from Aluminium, Magnesium, and Zinc Casting Alloys
VDA Band 19.1 2015	Inspection of Technical Cleanliness - Particulate Contamination of Functionally Relevant Automotive Components (here: *chapter 8.3.2, SEM/EDX* *chapter 8.3.4, Raman spectroscopy* *chapter 8.3.5, IR (Infrared spectroscopy)*)
ISO 16232 2018-12	Road vehicles - Cleanliness of components and systems (here: *chapter 9.3.2, SEM/EDX* *chapter 9.3.4, Raman spectroscopy* *chapter 9.3.5, IR (infrared spectroscopy)*)

3 Industrial computed tomography (ICT)

AA-1030-002 2021-11	Determination of dimensional and form deviations on components, defect analyzes, assembly analyzes, 3D nominal-actual comparison on the basis of CAD data, implementation and documentation of prototype, initial sample and series tests by means of industrial computertomography

4 Industrial metrology technique (IMT)

AA 1030-003 2020-07	Determination of dimensional and form deviations on components of different materials, implementation and documentation of prototype, initial sample and series tests with the help of tactile 3D-coordinate metrology with the option of a turntable as well as 3D nominal-actual comparison on the basis of CAD data

5 Chemical analytics

5.1 Thermal analytics of plastics *

DIN EN ISO 11358-1 2014-10	Plastics - Thermogravimetry (TG) of polymers - Part 1: General principles
DIN EN ISO 11357-1 2017-02	Plastics - Differential scanning calorimetry (DSC) - Part 1: General principles
DIN EN ISO 11357-2 2020-08	Plastics - Differential scanning calorimetry (DSC) - Part 2: Determination of glass transition temperature and step height
DIN EN ISO 11357-3 2018-07	Plastics - Differential scanning calorimetry (DSC) - Part 3: Determination of temperature and enthalpy of melting and crystallization

5.2 Investigation of unknown substances, materials, residues and deposits *

DIN ISO 22309 2015-11	Microbeam analysis - Quantitative analysis using energy-dispersive spectrometry (EDS) for elements with an atomic number of 11 (Na) or above
Ph.Eur.10.4 2.2.24 03-2022	Investigation or identification of unknown substances in organic and inorganic materials using Fourier Transform Infrared Spectroscopy (FTIR)
ASTM E 1252 1998	Standard Practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis

Abbreviations used:

AA	Work instruction of Quality Analysis GmbH
CHA	Chemical analytics
DIN	German Institute for Standardization
EN	European Standard
ICT	Industrial computed tomography
IEC	International Electrotechnical Commission
IMT	Industrial metrology technique
ISO	International Organization for Standardization
MAT	Materialography
Ph.Eur.	European Pharmacopeia
TecSa	Technical cleanliness
VDA	Association of the Automotive Industry
VA	Operation procedure of Quality Analysis GmbH
VDG	Association of German Foundry Experts