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

**LEISTRITZ Turbinentechnik GmbH**
**Lempstraße 24, 42859 Remscheid**

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

**technological tests and metallographical analyses at turbine components**

The accreditation certificate shall only apply in connection with the notice of accreditation of 07.12.2018 with the accreditation number D-PL-19226-01. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 3 pages.

Registration number of the certificate: **D-PL-19226-01-00**

| | | | |
|---|---|---|---|
| Berlin,<br>07.12.2018 | Dipl.-Ing. (FH) Ralf Egner<br>Head of Division | Translation issued:<br>04.03.2019 | Head of Division |

*The certificate together with its annex reflects the status at the time of the date of issue. The current status of the scope of accreditation can be found in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH.*
*https://www.dakks.de/en/content/accredited-bodies-dakks*

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

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# Deutsche Akkreditierungsstelle GmbH

# Annex to the Accreditation Certificate D-PL-19226-01-00 according to DIN EN ISO/IEC 17025:2018

**Valid from: 07.12.2018**

Date of issue: 07.12.2018

Holder of certificate:

**LEISTRITZ Turbinentechnik GmbH**
**Lempstraße 24, 42859 Remscheid**

Tests in the fields:

**technological tests and metallographical analyses at turbine components**

**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 methods within the flexible scope of accreditation.**

**Technological tests**

| | |
|---|---|
| DIN EN ISO 6506-1<br>2015-02 | Metallic materials - Brinell hardness test - Part 1: Test method |
| ASTM E 10<br>2017 | Standard Test Method for Brinell Hardness of Metallic Materials |
| DIN EN ISO 6507-1<br>2018-07 | Metallic materials - Vickers hardness test - Part 1: Test method |
| ASTM E 384<br>2017 | Standard Test Method for Microindentation Hardness of Materials |

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

Abbreviations used: see last page

*The certificate together with its annex reflects the status at the time of the date of issue. The current status of the scope of accreditation can be found in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH.*
*https://www.dakks.de/en/content/accredited-bodies-dakks*

| | |
|---|---|
| DIN EN ISO 6508-1<br>2016-12 | Metallic materials - Rockwell hardness test - Part 1: Test method<br>(here: *Scale C*) |
| ASTM E 18<br>2017 | Standard Test Methods for Rockwell Hardness of Metallic Materials<br>(here: *Scale C*) |
| DIN EN ISO 6892-1<br>2017-02 | Metallic materials - Tensile testing - Part 1: Method of test at room temperature |
| DIN EN 2002-001<br>2007-08 +<br>Amendment 1<br>2007-08 | Aerospace series - Metallic materials - Test methods - Part 1: Tensile testing at ambient temperature |
| ASTM E 8/E 8Ma<br>2016 | Standard Test Methods for Tension Testing of Metallic Materials |
| DIN EN ISO 6892-2<br>2018-09 | Metallic materials - Tensile testing - Part 2: Method of test at elevated temperature |
| DIN EN 2002-002<br>2007-08 | Aerospace series - Metallic materials - Test methods - Part 2: Tensile testing at elevated temperature |
| ASTM E 21<br>2017 | Standard Test Method for Elevated Temperature Tension Tests of Metallic Materials |
| DIN EN ISO 148-1<br>2017-05 | Metallic materials - Charpy pendulum impact test - Part 1: Test method<br>(here: *only at room temperature*) |
| DIN EN ISO 204<br>2009-10 | Metallic materials - Uniaxial creep testing in tension - Method of test |
| DIN EN 2002-005<br>2008-09 | Aerospace series - Test methods for metallic materials - Part 005: Uninterrupted creep and stress-rupture testing |
| ASTM E 139<br>2011 | Standard Test Methods for Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials |
| DIN EN ISO 7438<br>2016-07 | Metallic materials - Bend test |

-Translation-

**Valid from: 07.12.2018**
Date of issue: 07.12.2018

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**Metallographical analyses**

| | |
|---|---|
| ASTM E 112<br>2013 | Standard Test Methods for Determining Average Grain Size |
| DIN EN ISO 643<br>2013-05 | Steels - Micrographic determination of the apparent grain size<br>(Evaluation and comparison with standard image series tables) |
| DIN 54150<br>1977-08 | Non-destructive testing - Impression methods for surface examination<br>(Replica-technique)<br>(*withdrawn standard*) |
| ASTM E 1447<br>2009 | Standard Test Method for Determining of Hydrogen in Titanium and Titanium Alloys by Inert Gas Fusion Thermal Conductivity / Infrared Detection Method |

**abbreviations used:**

| | |
|---|---|
| ASTM | American Society for Testing and Materials |
| DIN | German Institute for Standardization |
| EN | European Standard |
| ISO | International Organization for Standardization |

**-Translation-**

**Valid from: 07.12.2018**
Date of issue: 07.12.2018

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## Deutsche Akkreditierungsstelle GmbH

Signatory to the Multilateral Agreements of
EA, ILAC and IAF for Mutual Recognition

# Accreditation

The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory

**Leistritz (Thailand) Ltd.**
**789/117 Moo 1, Pinthong Industrial Estate 1, Nongkham, Sriracha**
**20110 Chonburi, THAILAND**

is competent under the terms of ISO/IEC 17025:2005 to carry out tests in the following fields:

**mechanical-technological tests (tensile test and hardness test), metallographic tests and spectrographic tests of metallic materials in aerospace and turbine technology**

The accreditation certificate is valid until 03.10.2021. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 3 pages.

Registration number of the certificate: **D-PL-17240-01-00**

Berlin, 04.10.2016

Ralf Egner
Head of Division

See notes overleaf.

# Deutsche Akkreditierungsstelle GmbH

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Spittelmarkt 10
10117 Berlin

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Europa-Allee 52
60327 Frankfurt am Main

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Bundesallee 100
38116 Braunschweig

The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkkS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkkS.

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 Cooperation (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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# Deutsche Akkreditierungsstelle GmbH

# Annex to the Accreditation Certificate D-PL-17240-01-00 according to DIN EN ISO/IEC 17025:2005

Period of validity: 04.10.2016 to 03.10.2021 Date of issue: 04.10.2016

Holder of certificate:

**Leistritz (Thailand) Ltd.**
**789/117 Moo 1, Pinthong Industrial Estate 1, Nongkham, Sriracha**
**20110 Chonburi, THAILAND**

Tests in the fields:

**mechanical-technological tests (tensile test and hardness test), metallographic tests and spectrographic tests of metallic materials in aerospace and turbine technology**

Abbreviations used: see last page

## 1 Mechanical-technological tests

### 1.1 Hardness Tests

| | |
|---|---|
| DIN EN ISO 6506-1<br>2015-02 | Metallic materials - Brinell hardness test - Part 1: Test method |
| DIN EN ISO 6507-1<br>2006-03 | Metallic materials - Vickers hardness test - Part 1: Test method |
| ASTM E 10-01<br>2015-12 | Standard Test Method for Brinell Hardness of Metallic Materials |
| ASTM E 384-11<br>2011-08 | Standard Test Method for Vickers Hardness and Knoop Hardness of Metallic Materials<br>(here: *only Vickers Hardness)* |

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## 1.2 Tensile Tests

| | |
|---|---|
| DIN EN ISO 6892-1<br>2009-12 | Metallic materials - Tensile testing - Part 1: Method of test at room temperature<br>(here: *Method B*) |
| DIN EN ISO 6892-2<br>2011-05 | Metallic materials - Tensile testing - Part 2: Method of test at elevated temperature<br>(here: *Method B*) |
| DIN EN 2002-001<br>2006-11 | Aerospace series - Metallic materials - Test methods - Part 1: Tensile testing at ambient temperature |
| DIN EN 2002-002<br>2006-11 | Aerospace series - Metallic materials - Test methods - Part 2: Tensile testing at elevated temperature |
| ASTM E 8/E 8M<br>2015-05 | Standard Test Methods for Tension Testing of Metallic Materials |
| ASTM E 21-09<br>2009-06 | Standard Test Methods for Elevated Temperature Tension Tests of Metallic Materials |

## 2 Metallographic tests

| | |
|---|---|
| ASTM E 112-10<br>2013-10 | Standard Test Methods for Determining Average Grain Size<br>(here: *Section 10: Comparison Procedure*) |

## 3 Spectrographic tests

| | |
|---|---|
| ASTM E 1447<br>2009-00 | Standard Test Method for Determination of Hydrogen in Titanium and Titanium Alloys by the Inert Gas Fusion Thermal Conductivity/ Infrared Detection Method |
| A-04.005_LTL<br>2013-04 | Hydrogen Testing |

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**abbreviations used:**

| | |
|---|---|
| A-04.005_LTL | Test Instruction of Leistritz (Thailand) Ltd. |
| ASTM | American Society for Testing and Materials |
| DIN | German Institute for Standardization |
| EN | European Standard |
| ISO | International Organization for Standardization |

## *AKTUELLE LISTE ALLER PRÜFVERFAHREN IM FLEXIBLEN AKKREDITIERUNGSBEREICH*

| Norm | Title | Ausgabe Datum | Freigegeben am |
|---|---|---|---|
| DIN EN ISO 6506-1 | Metallische Werkstoffe - Härteprüfung nach Brinell | 01.02.2015 | 09.04.2018 |
| ASTM E 10 | Standard Test Method for Brinell Hardness of Metallic Materials | 01.01.2018 | 19.02.2019 |
| DIN EN ISO 6507-1 | Metallische Werkstoffe - Härteprüfung nach Vickers | 01.07.2018 | 01.07.2018 |
| ASTM E 384 | Standard Test Method for Vickers Hardness of Metallic Materials | 01.10.2022 | 13.01.2023 |
| DIN EN ISO 6508-1 | Metallische Werkstoffe - Härteprüfung nach Rockwell-Verfahren (Skalen C) | 01.12.2016 | 18.05.2018 |
| ASTM E 18 | Standard Test Method for Rockwell Hardness of Metallic Materials (Scale C) | 01.01.2022 | 17.11.2022 |
| DIN EN ISO 6892-1 | Metallische Werkstoffe - Zugversuch - Prüfverfahren bei Raumtemperatur (Methode B) | 01.06.2020 | 01.06.2020 |
| DIN EN 2002-1 | Luft- und Raumfahrt - Metallische Werkstoffe - Zugversuch - Prüfverfahren bei Raumtemperatur | 01.08.2007 | 05.07.2018 |
| ASTM E 8/E 8Ma | Standard Test Method for Tension Testing of Metallic Materials | 01.01.2022 | 18.11.2022 |
| DIN EN ISO 6892-2 | Metallische Werkstoffe - Zugversuch - Prüfverfahren bei erhöhter Temperatur (Methode B) | 01.09.2018 | 01.06.2020 |
| DIN EN 2002-2 | Luft- und Raumfahrt - Metallische Werkstoffe - Zugversuch - Prüfverfahren bei Hochtemperatur | 01.08.2007 | 05.10.2018 |

## *AKTUELLE LISTE ALLER PRÜFVERFAHREN IM FLEXIBLEN AKKREDITIERUNGSBEREICH*

Leistritz
TURBINE TECHNOLOGY

| Norm | Title | Ausgabe Datum | Freigegeben am |
|---|---|---|---|
| ASTM E 21 | Standard Test Method for Elevated Temperature Tension Testing of Metallic Materials | 01.01.2020 | 01.01.2020 |
| DIN EN ISO 148-1 | Metallische Werkstoffe - Kerbschlagbiegeversuch nach Charpy (nur bei RT) | 01.05.2017 | 20.07.2018 |
| DIN EN ISO 204 | Metallische Werkstoffe - Einachsiger Zeitstandversuch unter Zugbeanspruchung | 01.04.2019 | 04.09.2019 |
| DIN EN 2002-5 | Luft- und Raumfahrt - Metallische Werkstoffe - Kriech und Zeitstandversuch unter konstanter Zugbeanspruchung | 01.09.2008 | 16.07.2018 |
| ASTM E139 | Standard Test Methods for conducting Creep, Creep-Rupture, and Stress-Rupture Test of Metallic Materials | 01.01.2011 | 16.07.2018 |
| DIN EN ISO 7438 | Metallische Werkstoffe - Biegeversuch | 01.03.2021 | 10.09.2021 |
| ASTM E 112 | Standard Test Method for Determining Average Grain Size | 01.01.2013 | 06.08.2018 |
| DIN EN ISO 643 | Stahl - Mikrophotographische Bestimmung der scheinbaren Korngröße (Auswertung und Vergleich mit genormter Bildreihentafel) | 01.06.2020 | 01.06.2020 |
| DIN 54150 | Zerstörungsfreie Prüfung - Abdruckverfahren für die Oberflächenprüfung (Replica-Technik) | 01.08.1977 zurückgezogen | 11.09.2018 |
| ASTM E 1447 | Standard Test Method for Determining of Hydrogen in Titanium an Titanium Alloys | 01.01.2022 | 17.11.2022 |