

### Standard in the process of the ISO17025 accreditation

| Standard         | Version | Description  |
|------------------|---------|--|
| ASTM D3039       | -17     | Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials  |
| DIN EN ISO 527-4 | 2022-03 | Plastics - Determination of tensile properties - Part 4: Test conditions for isotropic and orthotropic fibre-reinforced plastic composites |
| DIN EN ISO 527-5 | 2010-01 | Plastics - Determination of tensile properties - Part 4: Test conditions for isotropic and orthotropic fibre-reinforced plastic composites |

### Standards with OEM Certification

| Standard     | Standard | Standard  |
|--------------|----------|---|
| BMW AA-0428  | 2022.09  | Lap Shear Strength  |
| BMW GS 93016 | 2021.08  | Thermoplastics - Selection list                             |
| BMW GS 97036 | 2017.02  | Dynamic mechanical analysis (DMA) on polymers and adhesives |

### Additional standards

#### Tensile test

| Standard           | Version | Description   |
|--------------------|---------|---|
| DIN EN 2561        | 1995-11 | Aerospace series - Carbon fibre reinforced plastics - Unidirectional laminates - Tensile test parallel to the fibre direction     |
| DIN EN 2597        | 1998-08 | Aerospace series - Carbon fibre reinforced plastics; unidirectional laminates - Tensile test perpendicular to the fibre direction |
| DIN EN ISO 527-1   | 2019-12 | Plastics - Determination of tensile properties - Part 1: General principles   |
| DIN EN ISO 527-2   | 2012-06 | Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics                      |
| DIN EN ISO 527-3   | 2003-07 | Plastics - Determination of tensile properties - Part 3: Test conditions for films and sheets                                     |
| DIN EN ISO 6892-1  | 2014-01 | Metallic materials - Tensile testing - Part 1: Method of test at room temperature   |
| DIN EN ISO 6892-2  | 2018-09 | Metallic materials - Tensile testing - Part 2: Method of test at elevated temperature   |
| DIN EN ISO 26203-2 | 2012-01 | Metallic materials - Tensile testing at high strain rates - Part 2: Servo-hydraulic and other test systems                        |
| ISO 18872          | 2007-02 | Plastics - Determination of tensile properties at high strain rates   |

#### Compressive test

| Standard          | Version | Description   |
|-------------------|---------|---|
| ASTM D6641        | -16     | Standard Test Method for Compressive Properties of Polymer Matrix Composite Materials Using a Combined Loading Compression (CLC) Test Fixture |
| DIN 50106         | 2016-11 | Testing of metallic materials - Compression test at room temperature  |
| DIN EN ISO 6603-1 | 2000-10 | Plastics - Determination of puncture impact behaviour of rigid plastics - Part 1: Non-instrumented impact testing                             |
| DIN EN ISO 6603-2 | 2002-04 | Plastics - Determination of puncture impact behaviour of rigid plastics - Part 2: Instrumented impact testing                                 |
| DIN EN ISO 14126  | 2000-12 | Fibre-reinforced plastic composites - Determination of compressive properties in the in-plane direction                                       |

#### Bending test

| Standard         | Version | Description  |
|------------------|---------|--|
| ASTM D790        | -17     | Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials                      |
| ASTM D2344       | -16     | Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates   |
| ASTM D6272       | -17     | Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials by Four-Point Bending |
| DIN EN ISO 178   | 2019-08 | Plastics - Determination of flexural properties  |
| DIN EN ISO 14125 | 2011-05 | Fibre-reinforced plastic composites - Determination of flexural properties   |

### Shear test

| Standard         | Version | Description  |
|------------------|---------|--|
| ASTM D732        | -17     | Standard Test Method for Shear Strength of Plastics by Punch Tool  |
| ASTM D3518       | -18     | Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of $\pm 45^\circ$ Laminate  |
| ASTM D7078       | -12     | Standard Test Method for Shear Properties of Composite Materials by V-Notched Rail Shear Method  |
| DIN EN ISO 14129 | 1998-02 | Fibre-reinforced plastic composites - Determination of the in-plane shear stress/shear strain response, including the in-plane shear modulus and strength, by $\pm 45^\circ$ tension test method |
| JIS K 7214       | 1985    | Testing methods for shear strength of plastics by punch tool   |

### Fracture mechanics

| Standard         | Version | Description  |
|------------------|---------|--|
| ASTM D5528       | -13     | Standard Test Method for Mode I Interlaminar Fracture Toughness of Unidirectional Fiber-Reinforced Polymer Matrix Composites                                     |
| ASTM D7905       | -18     | Standard Test Method for Determination of the Mode II Interlaminar Fracture Toughness of Unidirectional Fiber-Reinforced Polymer Matrix Composites               |
| ASTM E1820       | -17     | Standard Test Method for Measurement of Fracture Toughness   |
| DIN EN ISO 179-1 | 2006-05 | Plastics - Determination of Charpy impact properties - Part 1: Non-instrumented impact test  |
| DIN EN ISO 14130 | 1998-02 | Fibre reinforced plastic composites - Determination of apparent interlaminar shear strength by short beam-method   |
| DIN EN ISO 14272 | 2014-07 | Resistance welding - Destructive testing of welds - Specimen dimensions and procedure for cross tension testing of resistance spot and embossed projection welds |
| DIN EN ISO 14273 | 2016-11 | Resistance welding - Destructive testing of welds - Specimen dimensions and procedure for tensile shear testing resistance spot and embossed projection welds    |

### Physicochemical analysis

| Standard           | Version | Description   |
|--------------------|---------|---|
| DIN 16459          | 2019-12 | Determination of the fiber volume content of fiber-reinforced plastics by thermogravimetric analysis (TGA)  |
| DIN 51045-1        | 2005-08 | Determination of the thermal expansion of solids - Part 1: Basic rules  |
| DIN EN ISO 1183-1  | 2019-09 | Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pycnometer method and titration method |
| DIN EN ISO 3219-1  | 2021-08 | Rheology - Part 1: Vocabulary and symbols for rotational and oscillatory rheometry  |
| DIN EN ISO 3219-2  | 2021-08 | Rheology - Part 2: General principles of rotational and oscillatory rheometry   |
| 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                        |

### Quality

| Standard             | Version | Description   |
|----------------------|---------|---|
| DIN EN ISO/IEC 17025 | 2018-03 | General requirements for the competence of testing and calibration laboratories |

Additional tests on demand