

# Laboratory Approval

Statement No.: **LA-159/125395518/2018, Rev. 00**

Name and address of the company:

Linset & CO Srl.  
Via Filippo Turati, 12,  
61032 Zona Industriale Bellocchi PU  
Italy

Type of Application:

Mechanical Testing of fibre reinforced plastics  
Further informations are given in the attached Annex.

Testing Methods:

Coupon Testing according to the referenced standards

Referenced Standard:

This Laboratory Approval attests compliance with the referenced standards listed in the annex.

The Laboratory Approval is valid until 2020-05-18

Cologne, 2018-06-29



i.A. Thomas Nägler



i.A. Federico Oswald

TÜV Rheinland Industrie Service GmbH  
Certification Body for Wind Turbines  
Am Grauen Stein, D-51105 Köln

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## Referenced standards:

ISO 527-4 : 1997-04 – Plastics - Determination of tensile properties - Part 4: Test conditions for isotropic and orthotropic fibre-reinforced plastic composites

ISO 527-5 : 2009-07 – Plastics - Determination of tensile properties - Part 5: Test conditions for unidirectional fibre-reinforced plastic composites

ISO 1172 : 1996-12 – Textile-glass-reinforced plastics – Prepregs, moulding compounds and laminates – Determination of textile-glass and mineral-filler content – Calcination method

ISO 14126 : 1999-09 – Fibre-reinforced plastic composites — Determination of compressive properties in the in-plane direction

ISO 14129 : 1997-12 – Fibre-reinforced plastic composites - Determination of the in-plane shear stress/shear strain response, including the in-plane shear modulus and strength, by the  $\pm 45^\circ$  tension test method

ISO 14130 : 1997-12 – Fibre-reinforced plastic composites – Determination of apparent interlaminar shear strength by short beam method

ASTM D 792 : 2013 – Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement

ASTM D 2344 / D 2344M : 2016 – Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates

ASTM D 2734 : 2016 – Standard Test Methods for Void Content of Reinforced Plastics

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## Referenced standards:

ASTM D 3039 / D 3039M : 2017 – Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials

ASTM D 3171 : 2015 – Standard Test Methods for Constituent Content of Composite Materials

ASTM D 3410 / D 3410M : 2016 – Standard Test Method for Compressive Properties of Polymer Matrix Composite Materials with Unsupported Gage Section by Shear Loading

ASTM D 3418 : 2015 – Standard Test Method for Transition Temperatures and Enthalpies of Fusion and Crystallization of Polymers by Differential Scanning Calorimetry

ASTM D 3518 / D 3518M : 2013 – Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a  $\pm 45^\circ$  Laminate

## Approval Basis:

Laboratory inspection on Mai 17<sup>th</sup> to 18<sup>th</sup> 2018

## General remarks:

The Laboratory Approval is based on the evaluation of the quality system, testing procedures and the laboratory examination on Mai 17<sup>th</sup> and 18<sup>th</sup> 2018, according to TÜV Rheinland internal procedures.

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## Conditions:

Substantial modifications within the organization and the equipment of the laboratory, as well as the process flow which will have impacts to the test processes and quality of the testing, have to be communicated in written form to TÜV Rheinland.

Whenever deviations regarding the referenced standards occur, the laboratory company has certain time to fulfill corrective actions. If deviations are unavoidable, the reasons have to be sufficiently documented and communicated in advance. If deviations are not properly documented, not shown in the test results and are not communicated, the Laboratory Approval loses its validity.

The testing has to be performed under the supervisory personnel **Luca Frausini** and/or **Paolo Francia**. TÜV Rheinland must be informed if the supervisory personnel changes.

## Conclusion:

All questions during the inspection were satisfactory answered by LinseT personnel. Used equipment and tooling meet the requirements for composite testing. The storage conditions are adequate.

**End of Annex**