DNV·GL

Certificate No:
**TAK00001TK**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Glass Fibre Products**

with type designation(s)
**Spray Up Rovings; ER13-2400-180, ER13-3000-180**

Issued to
**Jushi Group Co., Ltd.**
**Tongxiang, ZHEJIANG, China**

is found to comply with
**DNV GL class programme DNVGL-CP-0082 – Type approval – Glass fibre rovings**
**DNV GL rules for classification – High speed and light craft**
**DNV GL standard DNVGL-ST-0342 – Craft**
**Det Norske Veritas' Standards for Certification No. 2.20, Lifeboats and Rescue Boats, 2007**

## Application :

**For use in marine vessels according to stated Rules/Standards.**

**Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

Issued at **Høvik** on **2019-10-29**
This Certificate is valid until **2024-10-28**.
DNV GL local station: **Shanghai**

Approval Engineer: **Gisle Hersvik**

for **DNV GL**

**Rikard Törnqvist**
**Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.


© DNV GL 2014. DNV GL and the Horizon Graphic are trademarks of DNV GL AS.

Job Id: **262.1-031280-1**
Certificate No: **TAK00001TK**

## Product description

Spray Up Rovings; **ER13-2400-180** and **ER13-3000-180**

*Legends:*
E: E-Glass
R: Roving
13: Nominal filament diameter, µm
2400, 3000: Weight per unit length, tex
180: Sizing code

The following indicative properties have been verified by Type Testing of laminates:

| **Properties** | **Test Method** | **ER13-2400-180** | **ER13-3000-180** | | |
|---|---|---|---|---|---|
| Tensile Strength | ISO 527-1,4 | 134,40 | 178,37 | mean | MPa |
| Tensile Modulus | ISO 527-1,4 | 11,25 | 11,14 | mean | GPa |
| | | | | | |
| Flexural Strength | ISO 14125 | 329,20 | 221,99 | mean | MPa |
| Flexural Modulus | ISO 14125 | 11,47 | 9,09 | mean | GPa |
| | | | | | |
| Fibre content | ISO 1172 | 35,69 | 34,17 | mean | % |
| Resin | | TM-107 | | | |
| Curing Procedure used for Type Testing | | 24 hrs at room temperature, 4 hrs at 80°C | | | |

*mean* = Mean of Type Test results

## Application/Limitation

Any significant changes in design and / or quality of the material will render the approval invalid.

## Type Approval documentation

## Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**.

## Marking of product

Product shall be marked with *manufacturer's name*; **Jushi Group Co., Ltd., Tongxiang, China** and *type designation*.

The marking is to be carried out in such a way that it is visible, legible and indelible. The marking of product is to enable traceability to the DNV GL Type Approval Certificate.

## Periodical assessment

The scope of the Periodical Assessment is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

Periodical assessments (for Certificate Retention and Certificate Renewal) shall be performed according to DNVGL-CP-0338.

This certificate is only valid if required Periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in https://approvalfinder.dnvgl.com

END OF CERTIFICATE