

# 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**

for **DNV GL**

This Certificate is valid until **2024-10-28**.

DNV GL local station: **Shanghai**

Approval Engineer: **Gisle Hersvik**

**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.



## Product description

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

### Legends:

E: E-Glass

R: Roving

13: Nominal filament diameter,  $\mu\text{m}$

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

1. Previous Type Approval Certificate No. K-6310.
2. Assessment Report from DNV GL Shanghai of 2019-05-10.
3. Letter from Jushi Group Co., Ltd. of 2019-05-10 (Declaration).
4. Testing Center, Jushi Group Co., Ltd., Report Nos. BG190304102 (ER13-2400-180), BG190304103 (ER13-3000-180) of 2019-03-25.
5. ISO 9001 Audit Report (DEKRA).
6. Application for Type Approval of 2019-03-25.
7. Email from DNV GL Shanghai of 2015-05-05, including; Assessment Report of 2015-05-05 and Application Letter from Jushi of 2015-01-29.
8. Email from DNV Shanghai of 2011-05-09, incl. Survey Report of 2011-05-09, Declaration of Conformity from Jushi of 2011-04-08, Application Letter from Jushi of 2011-04-08 and DNV Approval Documents 2011 issued by Jushi, Test Report Nos. BG110402001, BG110402002 and BG110402003 of 2011-04-02

## 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*.



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

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