



TYPE APPROVAL

Certificate No.:
TA-DNV-CP-0082-10602-0

Issued:
2025-02-28

Valid until:
2030-02-28

Issued for:

Glass fibre rovings

with type designation(s)

E6DR-338 Series

As specified in Annex 1

Issued to:

Jushi Group Co., Ltd.

669 Wenhua Road (S.), Tongxiang Economic Development Zone, Zhejiang 314500, P.R. China

According to:

DNV-SE-0436:2022-09 Shop approval in renewable energy

and

DNV-CP-0082:2024-09 Type approval – Glass fibre rovings

Applying:

DNV-SE-0441:2021-10 Type and component certification of wind turbines

Based on the documents listed in Annex 1.

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

Hellerup, 2025-02-28

For DNV Renewables Certification

Harrison, Christopher

Service Line Leader, Component Certification



By DAKKS according DIN EN IEC/ISO 17065 accredited Certification Body for products. The accreditation is valid for the fields of certification listed in the certificate.

Shanghai, 2025-02-28

For DNV Renewables Certification

Li, Yu Hua

Project Manager

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Product description and application

E6-338 direct roving with E6 glass formulation for weaving with silane-based sizing designed for polyurethane resin system.

Approved variants

This Type Approval covers the direct roving E6-338 with silane-based sizing for polyurethane resin system with the linear densities 600tex, 1200tex, and 2400tex with filament diameter of 17µm:

E6DR17-600-338
E6DR17-1200-338
E6DR17-2400-338

Limitations for the product

The approval is limited for application of the product in blades of wind turbines.
Any significant changes in design and/or quality of the material will render the approval invalid.

Type Approval documentation

| | |
|-------------------------------|---|
| Technical data sheet(s) | E6-388, issued by China Jushi Co., Ltd. |
| Safety data sheet(s) | Q/JS J0520-2019, Version 6, SAFE USE INSTRUCTIONS OF ROVING, Jushi Group Co., Ltd., dated 2019.08.15 |
| Test report(s) | BG210326104, Test report, Glass Fiber Roving (E6DR17-600-338), Jushi Group Co., Ltd. Testing Center, dated 2021-03-26 BG210511107, Test report, Glass Fiber Roving (E6DR17-600-338), Jushi Group Co., Ltd. Testing Center, dated 2021-05-11 BG210326105, Test report, Glass Fiber Roving (E6DR17-1200-338), Jushi Group Co., Ltd. Testing Center, dated 2021-03-26 BG210511108, Test report, Glass Fiber Roving (E6DR17-1200-338), Jushi Group Co., Ltd. Testing Center, dated 2021-05-11 BG210326106, Test report, Glass Fiber Roving (E6DR17-2400-338), Jushi Group Co., Ltd. Testing Center, dated 2021-03-26 BG210511109, Test report, Glass Fiber Roving (E6DR17-2400-338), Jushi Group Co., Ltd. Testing Center, dated 2021-05-11 Annex 3.xlsx (specimen preparation) |
| Inspection documentation | WIR-10596-A176-001, Rev.0, Workshop Inspection Report, issued by DNV, dated 2024-12-05 |
| Quality control documentation | 20319142/2, Certificate ISO 9001:2015, issued by DEKRA Certification GmbH, dated 2025-02-24 |

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Material properties

(All the values are mean values from type testing)

| Properties | Test method | E6DR17-600-338 | E6DR17-1200-338 | E6DR17-2400-338 | Unit |
|-------------------|-------------|----------------|-----------------|-----------------|-------|
| Linear density | ISO 1889 | 589 | 1208 | 2361 | tex |
| Filament diameter | ISO 1888 | 16.2 | 17.0 | 16.6 | µm |
| Loss of ignition | ISO 1887 | 0.58 | 0.59 | 0.48 | % |
| Moisture content | ISO 3344 | 0.07 | 0.07 | 0.07 | % |
| Tensile strength | ISO 3341 | 0.53 | 0.54 | 0.54 | N/tex |

Approved production sites

Jushi Group Co., Ltd.
669 Wenhua Road (S.)
Tongxiang Economic Development Zone
Zhejiang 314500
P.R. China

Last workshop inspection date: 2024-11-05

Certificate maintenance

A periodical assessment needs to be carried out 2.5 years after the issue date of the Type Approval. In the case of major changes of the approved production processes and methods during the validity time of the Type Approval, the changes shall be reported to DNV. An intermediate inspection of the production workshop(s) might be needed based on the implemented changes. A workshop holding a valid Shop Approval for manufacturing of composite materials is exempted from the periodical assessment.