

# TYPE APPROVAL

Certificate No.:  
TA-DNV-CP-0434-11127-0

Issued:  
2024-09-12

Valid until:  
2029-09-11

Issued for:

## Carbon Fibre Product

with type designation(s)

## Quadraxial Carbon Fibre Fabric (-45°/90°/+45°/0° in the range of 400 – 1200 g/m<sup>2</sup>)

As specified in Annex 1

Issued to:

## Sky Advanced Materials Kft.

East Gate Business Park A1 221/12, 2151 Fót, Hungary

According to:

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

and

**DNV-CP-0434:2021-09 Type approval – Uni- and multi-axial multi-ply fabrics made of carbon fibres**

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, 2024-09-12

For DNV Renewables Certification

**Bente Vestergaard**  
Service Line Leader



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.

Hamburg, 2024-09-12

For DNV Renewables Certification

**Bernhard Krüger**  
Project Manager

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## 1.1 Product description and application

Quadraxial fabric made of carbon fibres typically used in the field of Wind Energy, Marine and Industry.

## 1.2 Approved variants

SKY X Q2-Y T5Z-W13 and SKY X Q2-Y T5Z-T73

With:

X: Number for areal weight in g/m<sup>2</sup> ranging from 400 g/m<sup>2</sup> to 1200 g/m<sup>2</sup>

Y: Number for width in mm ranging from 100 mm to 2540 mm

The -W13 fabric is made from carbon fibre roving Zoltek PX3505015W-13 or PX3505030W-13 for epoxy resin

The -T73 fabric is made from carbon fibre roving Zoltek PX3505015T-73 and PX3505030T-73 for vinyl ester resin

Typical filament diameter: 7.2 µm

## 1.3 Type Approval documentation

|                               |                                                                                                                                                                                                                                                                           |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Technical data sheet(s)       | SKY X Q2-Y T5Z-W13, rev. 1, Sky Advanced Materials, 2024-05-30<br>SKY X Q2-Y T5Z-T73, rev. 1, Sky Advanced Materials, 2024-05-30<br>SKY400Q2-127-T5Z-W13, rev. 1, Sky Advanced Materials, 2024-05-30<br>SKY1200Q2-127-T5Z-W13, rev. 1, Sky Advanced Materials, 2024-05-30 |
| Safety data sheet(s)          | CF-01, ZOLTEK™ PX Carbon Fiber, Zoltek, 2020-09-02                                                                                                                                                                                                                        |
| Test report(s)                | B087/24, Qualification Triaxial and Quadraxial Fabrics, Applus IMA, 2024-09-11                                                                                                                                                                                            |
| Inspection documentation      | WIR-06214_11126_11127-001-0, Workshop Inspection Report, DNV, 2024-07-02                                                                                                                                                                                                  |
| Quality control documentation | 24 100 2548, ISO 9001:2015 Certificate, ÉMI-TÜV SÜD Kft., 2022-11-04<br>Several CoA's                                                                                                                                                                                     |

## 1.4 Material properties

| Property            | Test Method | SKY X T2-Y T5Z-W13           | SKY X T2-Y T5Z-T73           | Unit             |
|---------------------|-------------|------------------------------|------------------------------|------------------|
| Ply construction    | n/a         | -45°/90°/+45°/0°<br>balanced | -45°/90°/+45°/0°<br>balanced | [-]              |
| Mass per unit area  | ISO 3374    | 400 – 1200 ±5%               | 400 – 1200 ±5%               | g/m <sup>2</sup> |
| Thickness           | ISO 5084    | 1.00 – 2.00                  | 1.00 – 2.00                  | mm               |
| Width               | ISO 5025    | 100 – 2540 ±5%               | 100 – 2540 ±5%               | mm               |
| Resin compatibility | n/a         | Epoxy                        | Vinyl ester                  | [-]              |

The roving size shall not exceed 50.000 filaments

## 1.5 Approved production site

Sky Advanced Materials Kft.

East Gate Business Park A1, 221/12

2151 Fót

Hungary

Last workshop inspection date: 2024-06-26

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## 1.6 Certificate maintenance

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. A periodical assessment is carried out 2.5 years after the issue date of the Type Approval, to verify that the conditions for the type approval have not been altered. An intermediate inspection of the production workshop might be needed based on the implemented changes. A workshop holding a valid Shop Approval for manufacturing of composite materials for the respective material type is exempted from a periodical assessment.