



Certificate No. 01-015220/0111594

## TYPE APPROVAL CERTIFICATE

This is to certify that this product complies with the Rules for the classification of ships, Part 1 - General requirements, Chapter 3 - Type approval of products.

TYPE AND DESCRIPTION OF PRODUCT:

**BRE 455**  
**Orthophthalic polyester resin**

MANUFACTURER:

**Boytek Recine Boya ve Kimya San.Tic. A.S.**  
**Istanbul**  
**TURKEY**

THE PRODUCT MEETS FOLLOWING RULES/REGULATIONS:

**CRS: Rules for the classification of ships, Part 24. – Non-metallic Materials.**

FURTHER DETAILS OF THE PRODUCT AND CONDITIONS FOR CERTIFICATION ARE GIVEN OVERLEAF.

APPROVAL IS VALID UNTIL: 2026-03-18

Place and date: Split, 2022-03-18

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**Marinko Popović, dipl.ing.**

NOTE: This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Croatian Register of Shipping of any modification or changes to the product in order to obtain a valid certificate.

**DETAILED PRODUCT DESCRIPTION:**

**Orthophthalic unsaturated polyester resin**

**Specification of the liquid resine:**

- Specific density: 1,12 g/ml
- Viscosity: 590 cp (400 – 600 cp)
- Acid number: 22,86 mg KOH/g (max. 30 mg KOH/g)
- Solid content: 62,5 % (60-65 %)
- Gel time: 10' (10'-20')
- Volume shrinkage: 7,85 %
- Thix index: min. 2,5
- Peak exotherm: 150-170 °C

**Properties of cured unreinforced resin:**

- Tensile strength (ISO 527): 63,02 N/mm<sup>2</sup>
- Tensile modules (ISO 527): 3932,6 N/mm<sup>2</sup>
- Flexural strength (ISO 14125): 98,20 N/mm<sup>2</sup>
- Flexural modules (ISO 14125): 4050 N/mm<sup>2</sup>
- Elongation at break (ISO 527): 1,6 %
- HDT-Martens (DIN 53462): 50 °C
- Hardness (Barcol ASTM D 2583): 64,8

**APPLICATION / LIMITATIONS:**

**Resin for manufacture and repair of craft and other glass reinforced plastic product in shipbuilding and industry.**

**TYPE APPROVAL DOCUMENTATION:**

**Technical documentation:**

- KOLPA Test report No.10/2022;
- KTF Test report 2181-234-07-22-003;
- FSB 10147-21022022;
- safety-technical data sheet (Boytek BRE 455).

**MARKING OF PRODUCT:**

**Name of manufacturer or trademark, Product type, Date of manufacture and type number identification (batch).**

**CONDITIONS FOR CERTIFICATION:**

**Technological parameters of the application shall be chosen according to manufacturer's instructions and to the requirements of the Rules to the Croatian Register of Shipping. For each particular case of application the technical documentation should be submitted for approval.**

**Upon request, Croatian Register of Shipping shall issue particular certificate of supervision for each manufactured quantity.**