

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Polyester Resins

with type designation(s)
K530 with variants; K531, K532 and K533

Issued to

Qualipoly Chemical Corp.
Kaohsiung, Taiwan

is found to comply with

DNV GL class programme DNVGL-CP-0083 – Type approval – Polyester resin, vinylester resin, gelcoat and topcoat

DNV GL rules for classification – High speed and light craft

Det Norske Veritas Standards' for Certification No. 2.21, Craft, 2010

Application :

Grade 1 resin 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.

This Certificate is valid until **2022-01-17**.

Issued at **Høvik** on **2017-01-18**

DNV GL local station: **Kaohsiung**

Approval Engineer: **Gisle Hersvik**

for **DNV GL**

Martin Strande
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.

Job Id:
Certificate No: **TAK00000MX**

Product description

K530 with variants; K531, K532 and K533; A thixotropic, isophthalic, unsaturated polyester resin, for spray-up / hand lay-up.

The following properties have been verified by Type Testing of cured resin:

Property	Test Method	K530		
Fracture Elongation	ISO 527	2.6 / 2.5	%	mean / msmv
Tensile Strength	ISO 527	70 / 77.8	MPa	mean / msmv
Tensile modulus	ISO 527	3388	MPa	mean
Water Absorption	ISO 62	76.6	mg	msmv (max.)
HDT	ISO 75	70.4	°C	msmv
Barcol Hardness	ASTM D2583	36	-	mean
Density	ISO 1675	1.07	g/cm ³	mean
Curing Procedure used for Type Testing		24 hrs at room temperature, 24 hrs at 50°C		

msv = Manufacturer's Specified Value, verified to be within $\pm 10\%$ of mean of Type Test results

msmv = Manufacturer's Specified Minimum Value, verified to be below mean - 2 x standard deviation of Type Test results

mean = mean of Type Test results

Type Approval documentation Tests carried out

Type Testing carried out according to **Type Approval documentation**.

Marking of product

Product shall be marked with *manufacturer's name*; **Qualipoly Chemical Corp., Taiwan** and *type designation*; **K530, K531, K532 and K533**.

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 Assessment to be performed after 2 and 3.5 years (Certificate Retention) and at renewal after 5 years (Certificate Renewal).

The main elements of the Periodical Assessment are to:

- Ensure that **Type Approval documentation** is available.
- Review design, materials, production process, and performance with respect to possible changes, in order to ensure compliance with **Type Approval documentation** and/or referenced material specifications.
- Ensure traceability between manufacturer's product marking and DNV GL Type Approval Certificate.

END OF CERTIFICATE