

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Vinyl Ester Resins

with type designation(s)
Daron® 120, Daron® 121

Issued to

AOC AG
Schaffhausen, SH, Switzerland

is found to comply with

DNV class programme DNV-CP-0083 – Type approval – Polyester resin, vinylester resin, gelcoat and topcoat
DNV rules for classification – High speed and light craft
DNV standard DNV-ST-0342 – Craft

Application :

Grade 1 vinyl ester resin for construction of laminates made of fibre reinforced plastics.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Hamburg** on **2023-07-07**

This Certificate is valid until **2028-07-06**.

DNV local unit: **Augsburg**

Approval Engineer: **Joachim Rehbein**

for **DNV**

Thorsten Lohmann
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

Daron™ 120: pre-accelerated vinylester resin

Daron™ 121: pre-accelerated, thixotropic vinylester resin

The following properties have been verified by type testing:

Property	Test Method	Daron 120	unit	
Fracture Elongation	ISO 527	3,2	%	mean
Tensile Strength	ISO 527	72	MPa	mean
Water Absorption	ISO 62	41	mg	mean
HDT	ISO 75	85	°C	mean
Barcol Hardness	ASTM D2583	38	-	msv
Density	ISO 1675	1,12	g/cm ³	msv

Curing Procedure used for type testing: cured with 1.5% Butanox M-50; 24hrs at 23°C followed by 8hrs at 50°C. 24hrs at 23°C followed by 4hrs at 90°C (HDT test)

msv = Manufacturer's Specified Value, verified to be within ±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

Manufactured by

AOC Italia Srl, Via Rodi, 5, 24040 Filago, Bergamo (BG), Italy.

Responsibility

The company stated on the front page of this certificate takes the responsibility that both design and production are following Rules, Standards and/or Regulations listed on page 1 of this certificate.

Application/Limitation

Grade 1 vinylester resin for vacuum infusion and hand lay-up.

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

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* and *type designation, batch number, place of manufacture*.

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 type approval certificate.

Periodical assessment

A production site with a valid Approval of Manufacturer (AoM) certificate for material in question is exempted from the obligation concerning retention and renewal assessments.

For a production site without a valid AoM certificate, periodical assessments are required after two years and after 3.5 years (retention survey) and for renewal after 5 years (renewal survey). Refer to DNV-CP-0338, Sec.4.

This certificate is only valid if required periodical assessments are carried out with satisfactory results or an AoM certificate for production site is in place. To check the validity of this certificate, please look it up in

<https://approvalfinder.dnv.com>

END OF CERTIFICATE