



Certificate no.:
TAK00002GH

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Fire Retardant Resins

with type designation(s)
R-802FR

issued to

Yong Shun Chemical Co., Ltd.
Taoyuan, Taiwan Region

is found to comply with

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

Application:

Fire retardant 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 **2025-04-09**

This Certificate is valid until **2030-04-08**.

for **DNV**

DNV local unit: **Kaohsiung**

Approval Engineer: **Gisle Hersvik**

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 USD 300 000.

Product description

R-802FR: Fire-retardant vinylester resin for hand lay-up, spray up and filament winding operations.

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

Properties	Test Method	Results		
Tensile Strength	ISO 527-2	71.6	MPa	mean
Fracture Elongation	ISO 527-2	2.6	%	mean
Tensile Modulus	ISO 527-2	3852	MPa	mean
Water Absorption	ISO 62	14.7	mg	mean
Heat Deflection Temperature, HDT	ISO 75-2, Method A	67.0	°C	mean
Glass transition temperature, T _g (tan σ)	ISO 6721-5	92.88	°C	mean
Barcol Hardness	ASTM D2583	43	-	mean
Density	ISO 1183-1	1.206	g/cm ³	mean
Oxygen Index, cured resin	ASTM D2863	27.7	-	
Fire retardant	ISO 5660-1. LSA code, MSC/Circ.1006	pass	-	
Curing procedure used for Type Testing	24 hrs at room temperature, 8 hrs at 80°C			

Legend:

mean = Mean of Type Test results

Application/Limitation

The approval covers the variant stated above.

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 in accordance with **Type Approval documentation**

Marking of product

Product shall be marked with *manufacturer's name*: **Yong Shun Chemical Co., Ltd., Taiwan Region**, *type designation*: **R-802FR**, *lot number*, *gross weight/net weight* and *manufacturing date*.

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

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 assessments (for Certificate Retention / Certificate Renewal) shall be performed according to DNV-CP-0338.

This certificate is only valid if required Periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in <https://approvalfinder.dnv.com>

END OF CERTIFICATE