Resin Datasheets

Atlac 430

DSM

Product Data Sheet

DSMProduct

Chemical/physical nature

Atlac 430 is a vinyl ester based on bisphenol A epoxide, dissolved in styrene. Atlac 430 has a medium reactivity and a medium viscosity.

Major applications/Principal properties

Atlac 430 is intended for glass fibre reinforced parts with improved mechanical properties, which require outstanding chemical resistance (marine industry, tanks, vessels and apparatus, corrosion protection, hydraulic engineering, renovation of sewage systems).
Atlac 430 is suitable for hand lay up, RTM or other techniques. Laminates made from Atlac 430 show excellent long-term heat resistance and high resistance to dynamic loads.

Product specifications

Property	Range	Unit	TM
Appearance	clear	-	2265
Viscosity, 23°C	440-500	mPa.s	2013
Acid value	5-8	mgKOH/g	2401
Solid content	59-62	%	2033
Gel time (25°C -35°C) Cure time (25°C - peak) Peak temperature	10-17 18-28 140-165	Minutes Minutes °C	2625

Remarks: 100 g resin with 2.0 g Butanox LPT (AKZO-Nobel) and 1.0 g NL 49P (AKZO-Nobel)

Properties of liquid resin（typical values）

Property	Value	Unit	TM
Stability, no init., dark, 20°C	6	months	-
Flash point	33	°C	2800

Properties of cast resin (typical values)

Property	Value	Unit	TM
Tensile strength	88	MPa	ISO 527-2
Tensile E-modulus	3600	MPa	ISO 527-2
Elongation at break	5～6	%	ISO 527-2
Flexural strength	150	MPa	ISO 178
Flexural E-modulus	3400	MPa	ISO 178
Impact res.-unnotched	28	KJ/m²	ISO 179
HDT	105	°C	ISO 75A
Glass transition temp.	130	°C	DIN 53445

Curing conditions: Cure for 24 hours at R.T. Post cure for 3 hours at 100°C.
Testing conditions: temperature: 23±2°C,
relative moisture: 50±5%

Processing

Atlac 430 normally exhibits tack-free cure. However, the surface may not be cured completely. To ensure tack-free curing of surfaces exposed to air, suitable additives (e.g. paraffin solution) should be added.
The final state of cure may further be optimised by post-curing at elevated temperatures (e.g. 80 or 100 °C) for several hours. Post-curing is especially recommended if parts made from Atlac 430 are intended for contact with chemicals.
Atlac 430 may be cured using MEK-Peroxide with a low content of hydrogen peroxide (Butanox LPT), with CHP.

Guidelines before use

The resin should be conditioned at a well defined, application dependant temperature (usually 15 °C minimum for a MEKP/Co cure).

Storage guidelines

The resin should be stored indoors in the original, unopened and undamaged packaging, in a dry place at temperatures between 5°C and 30°C.
Shelf life is reduced at higher temperatures and the properties of the resin might change during storage. Exposure to sunlight should be avoided. Store in dark and in 100% light tight containers only.

Material Safety /Test methods

A material safety data sheet and test methods (TM) referred for the product are available on request.

Version: 2010/1.0
Date of issue: June 2010

Jinling DSM Resins Company., Ltd. (210002)
18th Floor, 216, Longpanzhong Road, Nanjing, China, Tel. +86 25 85493811-85493827, 85493780-85493795 ; Fax : +86 25 8556 4848 Internet : www.dsmcompositeresins.com

Approval Number: 1706515
Test Report: MAT/LAB 404M

Water Regulations Advisory Scheme Ltd.
Unit 13,
Willow Road,
Pen y Fan Industrial Estate,
Crumlin,
Gwent,
NP11 4EG

8th June 2017

Jinling Aliancys Resins Co. Ltd.
No.188, Chong Fu Road,
Nanjing Chemical Industry Park,
Nanjing,
Jiangsu,
China

WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)
MATERIAL APPROVAL

The material referred to in this letter is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6920-1:2000 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'.

The reference relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

GLASS REINFORCED PLASTICS (GRP) - MATERIAL ONLY. **5125**

'Atlac 430'. Yellow coloured, vinyl ester resin material manufactured by filament winding. For use with water up to 60°C.

APPROVAL NUMBER: 1706515
APPROVAL HOLDER: JINLING ALIANCYS RESINS CO. LTD.

The Scheme reserves the right to review approval.
Approval 1706515 is valid between June 2017 and June 2022

An entry, as above, will accordingly be included in the Water Fittings Directory on-line under the section headed, "Materials which have passed full tests of effect on water quality".

The Directory may be found at: www.wras.co.uk/directory

Yours faithfully

Jason Furnival
Approvals & Enquiries Manager
Water Regulations Advisory Scheme

WRAS MATERIAL APPROVAL - MATERIALS WHICH HAVE PASSED FULL TESTS OF EFFECT ON WATER QUALITY

The material referred to in this letter is suitable for contact with water for domestic purposes. **Approval of this material does not signify the approval of its mechanical or physical properties for any use.**

Manufacturers or applicants may only quote in their sales literature terms which are used in this letter, namely that; 'the material as listed, having passed the tests of effect on water quality, is suitable for use in contact with wholesome water'

This may be abbreviated to 'Water Regulations Advisory Scheme - Approved Material' or 'WRAS Approved Material'.

The scope of an Approval does not extend to rebranded materials unless otherwise agreed by the Scheme.

Use of the WRAS Approved Material Logo

Approval holders may use the WRAS Approved Material logo and make reference to any approval issued by WRAS Ltd. in respect of a particular material or range of materials provided the approval is, and remains valid.

Approval holders are entitled to use the logo on the packing, promotional literature and point of sale advertising Approved Materials.

Modifications to existing Approvals

It is a condition of WRAS Material Approval that NO changes or modifications to the Approved Material, be made without the Approval Holder first notifying WRAS Ltd. Full details of the proposed changes must be provided to the Scheme. Failure to comply with this condition will immediately invalidate a previously granted Approval.

Re-Approval

WRAS will write to you 1 year before the approval expires asking whether you would like to renew it. Please complete the relevant section of the MA3 application form which will be included with the letter and return to WRAS (via e-mail or post).

Please note it is the responsibility of the Approval Holder to ensure the Approval remains valid. WRAS Ltd. accepts no liability for the delay in granting approval where this is caused by circumstances outside of the Scheme's control.

SAFETY DATA SHEET

DSM

ATLAC 430

1. Identification of the substance/preparation and company/undertaking

Product name : ATLAC 430

Supplier : DSM Composite Resins AG
Stettemerstrasse 28
CH-8207 Schaffhausen
Switzerland
Tel: +41 52 6441212
www.dsm.com/drs

Emergency telephone number : Netherlands: +31 38 4569289

e-mail address of person responsible for this SDS : DSMRESINS.SDS@dsm.com

Recommended use : Resins system used in the production of fibre reinforced plastics or non-reinforced filled products.

2. Hazards identification

The preparation is classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification : R10
Xn; R20
Xi; R36/37/38

Human health hazards : Harmful by inhalation. Irritating to eyes, respiratory system and skin.

Environmental hazards : Based on the available data of this product no hazardous properties are known.

Physical/chemical hazards : Flammable.

3. Composition/information on ingredients

Substance/preparation : Preparation

Ingredient name	CAS no.	%	EC no. *	Classification	
styrene	100-42-5	35-50	202-851-5	R10 Xn; R20 Xi; R36/38	[1] [2]
methacrylic acid	79-41-4	1-5	201-204-4	Xn; R21/22 C; R35	[1] [2]
See section 16 for the full text of the R-phrases declared above					

*** EC no. means EINECS or ELINCS number.**

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit

Occupational exposure limits, if available, are listed in section 8.

4. First-aid measures

Effects and symptoms

Inhalation : Inhalation causes headaches, dizziness, drowsiness and nausea and may lead to unconsciousness. Irritating to respiratory system. Exposure can cause coughing, chest pains and difficulty in breathing.

Ingestion : Irritating to mouth, throat and stomach.

Skin contact : Causes skin irritation. Prolonged or repeated contact with skin or mucous membrane may result in irritation symptoms, such as redness, blistering, dermatitis etc.

Eye contact : Irritating to eyes. (redness and pain).

First-aid measures

General : Protection of first-aiders: Put on appropriate personal protective equipment (see section 8). Move exposed person to fresh air. Remove contaminated clothing and shoes.

Inhalation : If inhaled, remove to fresh air. Prevent cooling of the person. Keep victim at rest in half-upright position. If not breathing, give artificial respiration. Get medical attention.

Ingestion : If swallowed, rinse mouth with water (only if the person is conscious). If affected person is conscious, give plenty of water to drink. Get medical attention if symptoms appear.

Skin contact : Take off immediately all contaminated clothing. Wash with soap and water. Obtain medical attention if symptoms occur.

Eye contact : Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Get medical attention.

First aid facilities : Ensure that eyewash stations and safety showers are close to the workstation location.

5. Fire-fighting measures

Extinguishing media

Small fire

Suitable : Use dry chemical or CO_2.

Large fire

Suitable : Alcohol-resistant foam.

Unusual fire/explosion hazards : Vapour is explosive in air at temperatures higher than the flash point.

Hazardous thermal decomposition products : In case of fire, may produce hazardous decomposition products such as carbon monoxide, carbon dioxide, (dense) black smoke, aldehydes, organic acids.

Special fire-fighting procedures : Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Protection of fire-fighters : Wear suitable protective clothing. Self-contained breathing apparatus.

6. Accidental release measures

Personal precautions : Avoid contact with eyes, skin and clothing. Use suitable protective equipment (section 8). Consult expert immediately. Keep away from sources of ignition. Take precautionary measures against static discharges. Use explosion-proof electrical (ventilating, lighting and material handling) equipment.

Environmental precautions : Prevent entry into sewers, basements or confined areas. Dyke if necessary.

Clean-up Methods

Small spill and leak : Take up with suitable material. Place in a suitable container. Clean up affected area with a large amount of water. Keep away from incompatible materials and avoid specific conditions (See section 10).

Large spill and leak : Prevent entry into sewers, basements or confined areas. Dyke if necessary. Absorb spill with inert material (e.g. dry sand or earth) and place in a chemical waste container. Recycle, if possible. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Fire/explosion hazards Keep away from sources of ignition.

Note: see section 8 for personal protective equipment and section 13 for waste disposal.

7. Handling and storage

Handling : Use with adequate ventilation. Use suitable protective equipment. Avoid contact with eyes, skin and clothing. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Take measures against static discharge. Keep away from sources of ignition.

Storage : Store in a fireproof location. Keep in a cool place. Keep away from heat and direct sunlight.

Storage temperature : Do not store above the following temperature: 25 °C.

Note: See section 10 for stability and reactivity

8. Exposure controls/personal protection

Occupational exposure limits

Ingredient name	Occupational exposure limits
United Kingdom (UK)	
Styrene	**EH40-WEL (United Kingdom (UK), 9/2006).** WEL 15 min limit: 1080 mg/m³ 15 minute(s). WEL 15 min limit: 250 ppm 15 minute(s). WEL 8 hrs limit: 430 mg/m³ 8 hour(s). WEL 8 hrs limit: 100 ppm 8 hour(s).
methacrylic acid	**EH40-WEL (United Kingdom (UK), 9/2006).** WEL 15 min limit: 143 mg/m³ 15 minute(s). WEL 15 min limit: 40 ppm 15 minute(s). WEL 8 hrs limit: 72 mg/m³ 8 hour(s). WEL 8 hrs limit: 20 ppm 8 hour(s).

Engineering measures : Use only with adequate ventilation. Use explosion-proof electrical (ventilating, lighting and material handling) equipment.

Hygiene measures : When using do not eat, drink or smoke. Wash hands after handling compounds and before eating, smoking and using the lavatory and at the end of the day.

Personal protective equipment - Production scale

Respiratory system : Wear filter mask, filtertype A.

Skin and body : Wear suitable protective clothing.

Eyes : Safety glasses with side shields.

Hands : Wear suitable gloves.

Recommended material(s) : 8 hours (breakthrough time): Viton (0.70 mm)

Advice on personal protection is applicable for high exposure levels. Select proper personal protection based on a risk assessment of the actual exposure situation.

9. Physical and chemical properties

Physical state : Liquid. [Clear.]
Colour : Yellow.
Odour : Characteristic.
Flash point : 33 °C (estimate)
Lower explosion limit : Not available.
Upper explosion limit : Not available.
Density (g/cm³) : 1.06 g/cm³ (23°C)
Viscosity : 440 to 500 mPa.s (440 to 500 cP)

10. Stability and reactivity

Stability : Stable under recommended storage and handling conditions (see section 7). In case of incorrect use: Fire/explosion hazards.
Conditions to avoid : Keep away from heat, sparks and flame.
Materials to avoid : No special recommendations.

11. Toxicological information

Potential acute health effects

Inhalation : Harmful by inhalation. Irritating to respiratory system.
Ingestion : Irritating to mouth, throat and stomach.
Skin contact : Irritating to skin.
Eye contact : Irritating to eyes.

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
styrene	LD50 Intraperitoneal	Rat	898 mg/kg	-
	LD50 Oral	Rat	2650 mg/kg	-
	LD50 Oral	Rat	5000 mg/kg	-
	LC50 Inhalation Vapour	Rat	12 mg/m³	4 hours
	LC50 Inhalation Vapour	Mouse	9.5 mg/m³	4 hours
methacrylic acid	LD50 Dermal	Rabbit	500 mg/kg	-
	LD50 Oral	Rat	1060 mg/kg	-
	LD50 Unreported	Rat	1600 mg/kg	-

Potential chronic health effects

Chronic effects : No known significant effects or critical hazards.
Carcinogenicity : No known significant effects or critical hazards.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.
Developmental effects : No known significant effects or critical hazards.
Fertility effects : No known significant effects or critical hazards.
Denmark – Carcinogen list : Contains a substance or substances listed under National Working Environment Authorities Executive Order 140/1997.

Chronic toxicity : No specific data.

Carcinogenicity : No specific data.

Mutagenicity : No specific data.

Teratogenicity : No specific data.

Reproductive toxicity : No specific data.

International regulations lists

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
styrene	A4	2B	-	-	-	-

12. Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
Styrene	Mortality	Acute EC50 4.7 mg/L	Daphnia	48 hours
	Population	Acute EC50 0.56 mg/L	Algae	48 hours
	Mortality	Acute LC50 10 mg/L	Fish	96 hours
	Mortality	Acute LC50 29 mg/L	Fish	96 hours
	Mortality	Acute LC50 4.02 mg/L	Fish	96 hours
	Mortality	Acute LC50 25.05 mg/L	Fish	96 hours

Persistence/degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Styrene	-	-	Readily

Other adverse effects : No known significant effects or critical hazards.

13. Disposal considerations

Methods of disposal (waste of residues; contaminated packaging) : Waste must be disposed of in accordance with national and local environmental regulations.

14. Transport information

International transport regulations

Regulatory information	UN number	Proper shipping name	Class	PG*	Label	Additional information
ADR/RID Class	UN1866	Resin solution, flammable	3	III		**Hazard identification number** 30 **Limited quantity** LQ7 **CEFIC Tremcard** 30GF1-III **Remarks** This class 3 material can be considered non hazardous in packagings up to 450 L.
ADNR Class	UN1866	Resin solution, flammable	3	III		-
IMDG Class	UN1866	Resin solution, flammable	3	III		**Emergency schedules (EmS)** F-E, S-E
IATA Class	UN1866	Resin solution flammable	3	III		**Passenger and Cargo Aircraft**Quantity limitation: 60 L Packaging instructions: 309 **Cargo Aircraft Only** Quantity limitation: 220 L Packaging instructions: 310 **Limited Quantities - Passenger Aircraft** Quantity limitation: 10 L Packaging instructions: Y309

PG* : Packing group

15. Regulatory information

EU regulations

Hazard symbol or symbols :

Harmful

Risk phrases : R10- Flammable.
R20- Harmful by inhalation.
R36/37/38- Irritating to eyes, respiratory system and skin.

Contains : styrene 202-851-5

16. Other information

Full text of R phrases referred to in sections 2 and 3 - United Kingdom (UK) : R10- Flammable.
R20- Harmful by inhalation.
R21/22- Harmful in contact with skin and if swallowed.
R35- Causes severe burns.
R36/38- Irritating to eyes and skin.
R36/37/38- Irritating to eyes, respiratory system and skin.

Full text of classifications referred to in sections 2 and 3 - United Kingdom (UK) : C - Corrosive
Xn - Harmful
Xi - Irritant

Internal code : 010389WW24627

History

Date of printing : 5 June 2007.

Date of issue : 5 June 2007

Version : 3

Notice to reader

The information contained in the Safety Data Sheet is based on our data available on the date of publication. The information is intended to aid the user in controlling the handling risks; it is not to be construed as a warranty or specification of the product quality. The information may not be or may not altogether be applicable to combinations of the product with other substances or to particular applications.
The user is responsible for ensuring that appropriate precautions are taken and for satisfying themselves that the data are suitable and suffcient for the product's intended purpose. In case of any unclarity we advise consulting the supplier or an expert.

Training advice : Handling of this substance or preparation is restricted to skilled personnel only.

Sources of key data : Literature data and/or investigation reports are available through the manufacturer.

Alterations compared to the previous version : Alterations compared to the previous version are marked with a little (blue) triangle.

Atlac 430

>> Product Information <<

CHEMICAL / PHYSICAL NATURE

Atlac 430 is a vinyl ester based on bisphenol A epoxide, dissolved in styrene.

PERFORMANCE

Atlac 430 provides resistance to a wide range of acids, alkali, and bleaches for the use in corrosive environments in the chemical processing industry. The favorable combination of thermal resistance and elongation makes this resin suitable for applications exposed to intermittent temperatures.

MAJOR APPLICATIONS

Atlac 430 can be used in all fabrication methods, but is especially adapted to meet the requirements of filament winding, centrifugal casting, hand lay-up and spray-up applications.

APPROVALS

Cured non-reinforced Atlac 430 conforms to type 1310 according to DIN 16946/2 and is classified group 5 according to DIN 18820/1. According to EN13121/2 Atlac 430 is classified group 7A.

Liquid product specifications

Properties	Range	Unit	TM
Appearance	clear	-	TM 2265
Viscosity, 23°C	440-500	mPa.s	TM 2013
Density, 23°C	1060	kg/m³	TM 2160
Solid content	59-62	%	TM 2033
Gel time from 25 - 35°C	10-15	min	TM 2625
Cure time from 25°C to peak	17-24	min	TM 2625
Peak temperature	140-160	°C	TM 2625

Curing system

1.0% Accelerator NL-49P

2.0% Butanox LPT

Test methods

Test methods (TM) referred to in the tables are available on request.

Typical data cured product - non reinforced

Properties	Range	Unit	TM
Density, 20°C	1145	kg/m³	-
Hardness	40	Barcol	TM 2604
Tensile strength	95	MPa	ISO 527-2
Elongation at break	6.1	%	ISO 527-2
Tensile modulus	3.6	GPa	ISO 527-2
Flexural strength	150	MPa	ISO 178
Flexural modulus	3.4	GPa	ISO 178
Impact resistance - unnotched sp.	28	kJ/m²	ISO 179
Heat Deflection Temperature (HDT)	105	°C	ISO 75-A
Glass transition temperature (Tg)	130	°C	DIN 53445

Curing system

0.5% Accelerator NL-49P

1.0% Butanox LPT

Supplier curing agents

Akzo Nobel Chemicals

Postcure

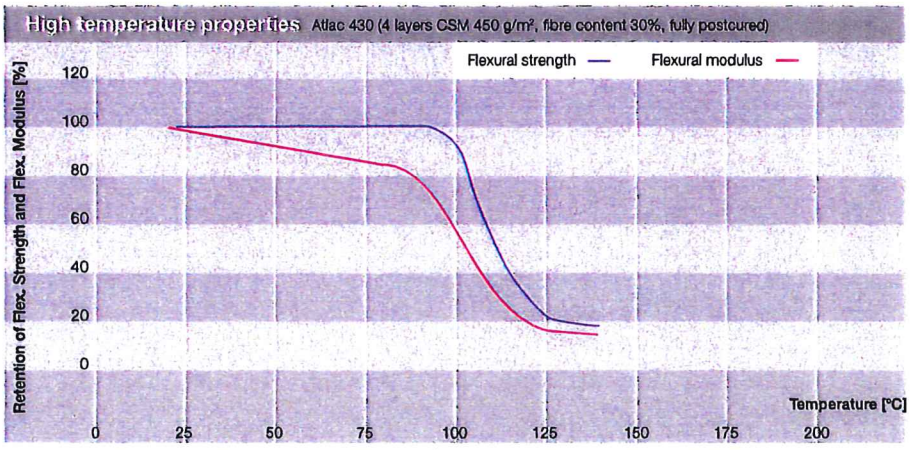
24hrs at 20°C followed by 24 hrs at 80°C

HDT and Tg postcure: 24 hrs 120°C

Atlac 430

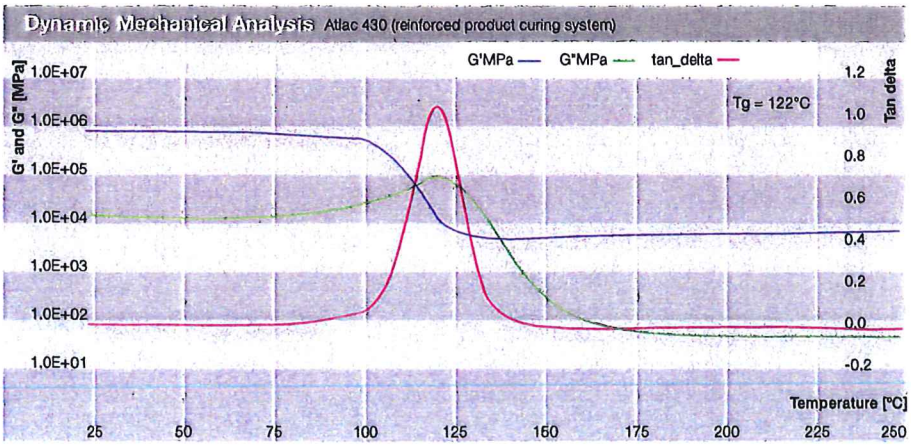
Typical data reinforced product

Curing System		Laminate build up		
0.5% Accelerator NL-49P		450 g/m² CSM	450 g/m² CSM	
1.0% Butanox LPT		450 g/m² CSM	800 g/m² WR	
Postcure 24hrs at 20°C followed by 24 hrs at 80°C		450 g/m² CSM	450 g/m² CSM	
		450 g/m² CSM	800 g/m² WR	
			450 g/m² CSM	
			800 g/m² WR	
Properties / Unit				**Test methods**
Glass content	%	38.6	39	ASTM D 2584
Tensile strength	MPa	138	146	ISO-527-2
Modulus of elasticity in eension	GPa	10	10.4	ISO-527-2
Flexural strength	MPa	210	216	ISO-527-2
Modulus of elasticity in bending	GPa	10	8.4	ISO-178
Density	kg/m³	1400		-
Impact resistance - unnotched sp.	kJ/m²			ISO-179
Linear expansion	C⁻¹	30 x 10⁻⁶		-
Thermal conductivity	W/m.K	0.20		-



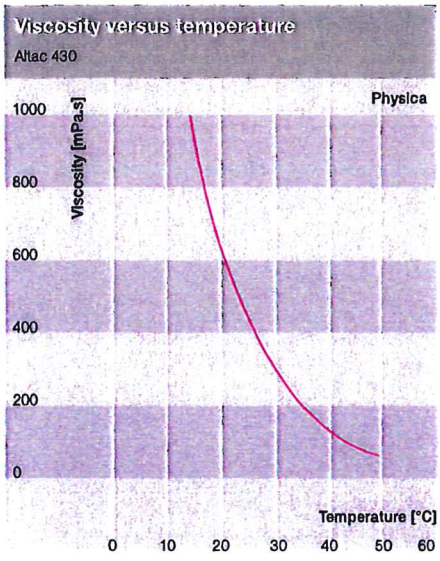
GRAPH 1:
HIGH TEMPERATURE PROPERTIES

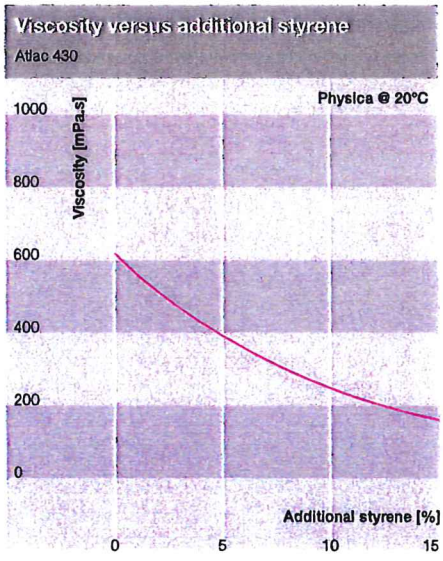
The flexural moduli and strengths of the resin over a temperature range of 20-180°C were measured according to ISO-178. The laminates were based on 4 layers of 450 g/m² chopped strand mat with a fibre content of 30% w/w. Standard cure systems have been used and all specimen have been fully postcured.



GRAPH 2:
DYNAMICAL MECHANICAL ANALYSIS (DMA)

In torsion mode the DMA measures the storage modulus (G') and loss modulus (G") of the resin (frequency is 6.22 rad/sec). Based on the moduli the tan delta (tan_δ) can be calculated. The peak in the tan_δ curve corresponds to the glass transition temperature (Tg), indicating the change from glassy to the rubbery state. Standard (post)curing systems have been used.





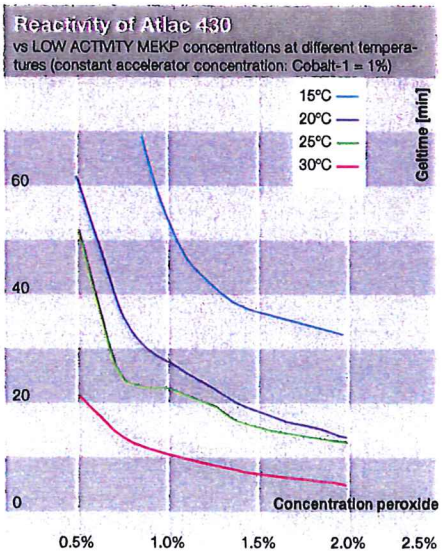
GRAPH 3A:
VISCOSITY VERSUS TEMPERATURE
GRAPH 3B:
VISCOSITY VERSUS ADDITIONAL STYRENE

The viscosity of the Atlac resin can be influenced by temperature and / or the styrene content. Additional styrene, up to approx. 5% can be used without affecting the chemical resistance and mechanical properties.

Typical geltimes, using low activity MEKP / Cobalt

Used curing agents: low activity methyl ethyl ketone peroxide (LA-MEKP), Cobalt 1% and tertiair-butyl-catechol (TBC)

Temperature	10 - 20 minutes	20 - 40 minutes	40 - 60 minutes
15°C	2.0% Cobalt-1 2.0% LA-MEKP	1.0% Cobalt-1 2.0% LA-MEKP	1.0% Cobalt-1 1.0% LA-MEKP
20°C	1.0% Cobalt-1 2.0% LA-MEKP	1.0% Cobalt-1 1.0% LA-MEKP	0.5% Cobalt-1 1.0% LA-MEKP
25°C	1.0% Cobalt-1 1.0% LA-MEKP	0.5% Cobalt-1 1.0% LA-MEKP	0.5% Cobalt-1 0.75% LA-MEKP
30°C	0.5% Cobalt-1 1.0% LA-MEKP	0.5% Cobalt-1 0.5% LA-MEKP	1.0% Cobalt-1 1.0% LA-MEKP 0.04% TBC



Typical geltimes, using BPO / amine

Used curing agents: benzoyl peroxide (BPO-50), dimethylaniline (DMA) and dimethyl-para-toluidine (DMPT)

Temperature	10 - 20 minutes	20 - 40 minutes	40 - 60 minutes
10°C	0.35% DMA + 0.05% DMPT 4.0% BPO	0.25% DMA + 0.05% DMPT 3.0% BPO	0.15% DMA + 0.05% DMPT 2.0% BPO
15°C	0.4% DMA 4.0% BPO	0.3% DMA 3.0% BPO	0.2% DMA 2.0% BPO
20°C	0.3% DMA 2.0% BPO	0.3% DMA 1.0% BPO	0.175% DMA 1.0% BPO

When curing has to take place at low temperatures (outdoor jointing or repairing, lining, etc.) and or high humidity BPO/amine curing is recommended.

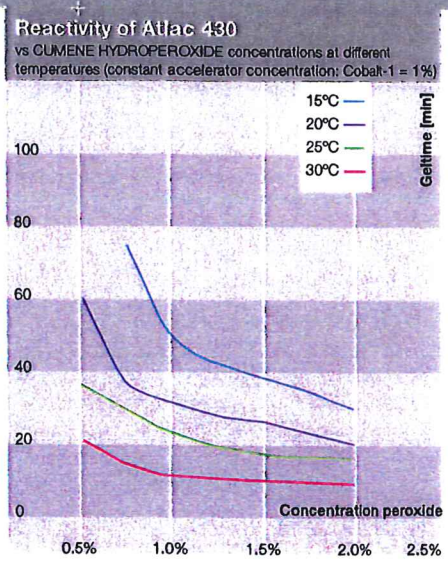
This curing system is also recommended in applications were hypochlorite or peroxides are present.

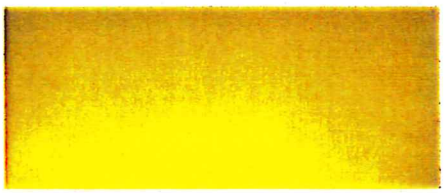
"freedom to construct"

Typical geltimes, using Cumene Hydroperoxide / Cobalt

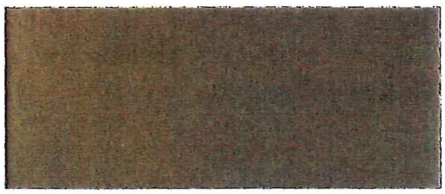
Used curing agents cumene hydroperoxide (CuHP), Cobalt 1% and TBC

Temperature	10 - 20 minutes	20 - 40 minutes	40 - 60 minutes
15°C	2.0% Cobalt-1 2.0% CuHP	1.0% Cobalt-1 2.0% CuHP	1.0% Cobalt-1 1.0% CuHP
20°C	1.0% Cobalt-1 2.0% CuHP	1.0% Cobalt-1 1.0% CuHP	0.8% Cobalt-1 1.0% CuHP
25°C	1.0% Cobalt-1 1.0% CuHP	0.7% Cobalt-1 1.0% CuHP	0.5% Cobalt-1 1.0% CuHP
30°C	0.5% Cobalt-1 1.0% CuHP	0.5% Cobalt-1 0.7% CuHP	1.0% Cobalt-1 1.0% CuHP 0.075% TBC

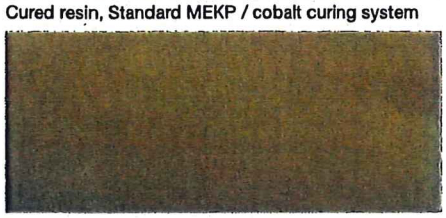




Liquid resin



Cured resin, Standard MEKP / cobalt curing system



Cured resin, BPO / amine curing system

POSTCURING

Postcuring is necessary to obtain the optimum heat and chemical resistance of the Atlac high performance resins. Recommended postcure conditions are 3 to 6 hours at 90 to 100°C – longer times and adjusted postcure schedules being required for thicker laminates and/or more complex shapes. Lower temperatures are ineffective; higher temperatures can lead to embrittlement.

TOPCOAT

Topcoats applied, as final layer in linings for the outside surface must contain paraffin wax to obtain full cure (preventing air inhibition). The resin requires about, 0.1 - 0.2 % addition of wax. The wax should have a melting point of 54 - 57°C and is best added into the resin as 10% solution in styrene. Topcoats must be cured quickly for the wax to be effective. Use a MEKP cure system to obtain a gel time of 15 minutes or less. Properly cured topcoats will not become tacky when rubbed with acetone.

INHIBITOR SYSTEMS

Control of geltime may also be achieved by the use of inhibitors; the most widely available is a 10% solution of tertiary-butyl-catechol (TBC). Additions above 0.25% can lead to undercure. Use at workshop temperature below 15°C is not recommended. TBC is not effective with cumene hydroperoxide systems.

THIXOTROPY

Atlac 430 can be made thixotropic by using the hydrofobe fumed silica types: Wacker HDK 20, Cab-O-Sil TS 720 and Aerosil R202 (1% - 2%). They should be blended into the resin using a high-shear stirrer (Cowless type). To improve a maximum thixotropic effect, it is recommended to use a wetting agent (e.g. Byk R605 – Byk Chemie). Thixotropic agents should not be used in laminates intended for service with hypochlorite solutions or fluorine. In this case, sagging can only be reduced to a minimum by very short gel times (20-25 min).

Grades of Atlac resins:

Different pre-formulated grades of Atlac available for use.

Resin Type	Grade	Remark
Atlac 430	Atlac 430	Standard
	Atlac 430 UV	Light-curable
	Atlac 430 LSE	Paraffinated
	Atlac 430 S	Extra stabilized

Curing System Datasheets

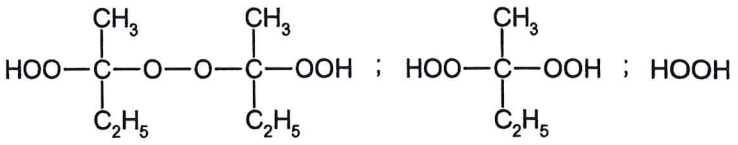
AKZO NOBEL

POLYMER CHEMICALS

Butanox® HBO-50

Product description

Methyl ethyl ketone peroxide in dimethyl phthalate



Peroxide content	:	33%
Balance	:	59% DMP, 8% MEK + diethylene glycol + water
CAS No.	:	1338-23-4; 131-11-3; 78-93-3
Einecs	:	2156612; 2050116; 2011590
TSCA	:	registered

Specification

Appearance	:	clear and colorless liquid
Total active Oxygen	:	9.8-10.0%

Physical properties

Density, 20°C	:	1180 kg/m^3
Viscosity, 20°C	:	19 mPa.s

Safety characteristics

Flash point	:	above the SADT*
SADT	:	60°C
Auto ignition temperature	:	281°C

Solubility

Insoluble in water. Soluble in phthalates.

Hazardous reactions

Oxidizing agent. Decomposes violently under the influence of heat or by contact with reducing agents. Never mix with accelerators.

Major decomposition products

Carbon dioxide, water, acetic acid, formic acid, propionic acid, methyl ethyl ketone.

Toxicological Data

LD 50, acute oral (rat)	:	1017 mg/kg (MEKP-40%)
LD 50, acute inhalation (rat)	:	17 mg/l (4 hours exposure) (MEKP-40%)
Primary skin irritation	:	Corrosive (MEKP-33%)
Eye irritation	:	Severely irritating/corrosive (MEKP-33%)
Ames test	:	Not mutagenic

Packaging

Standard packaging size for Butanox HBO-50 is 30 kg net.
Smaller packaging size available on request.

* SADT = Self Accelerating Decomposition Temperature

Applications

Butanox HBO-50 is a methyl ethyl ketone peroxide (MEKP) for the curing of unsaturated polyester resins in the presence of a cobalt accelerator at room and elevated temperatures.

The curing system Butanox HBO-50/cobalt accelerator is particularly suitable for the curing of laminating resins and lacquers when a faster gelation and initial cure speed is required than can be obtained with Butanox M-50. Moreover the manufacture of light resistant parts may be possible contrary to the curing benzoyl peroxide/amine accelerator.

For room temperature application it is necessary to use Butanox HBO-50 together with a cobalt accelerator (e.g. Accelerator NL-49P).

Dosage

Depending on working conditions, the following peroxide and accelerator dosage levels are recommended:

Butanox HBO-50	1 - 4 phr*
Accelerator NL-49P	0.5 - 3 phr

Cure Characteristics

In a high reactive standard orthophthalic resin in combination with Accelerator NL-49P (= 1% cobalt) the following application characteristics were determined:

Gel times at 20°C

2 phr Butanox HBO-50	+ 0.5 phr Acc. NL-49P	6 minutes
2 phr Butanox M-50	+ 0.5 phr Acc. NL-49P	12 minutes
2 phr Butanox HBO-50	+ 1.0 phr Acc. NL-49P	4 minutes
2 phr Butanox M-50	+ 1.0 phr Acc. NL-49P	7 minutes

Cure of 1 mm pure resin layer at 20°C

The speed of cure is expressed as the time to reach a Persoz hardness of respectively 30, 60 and 120 s.

		Persoz: 30	60	120	s
2 phr Butanox HBO-50	+ 0.5 phr Acc. NL-49P	1.6	3.0	10	h
2 phr Butanox M-50	+ 0.5 phr Acc. NL-49P	2.4	4.1	13	h
2 phr Butanox HBO-50	+ 1.0 phr Acc. NL-49P	0.8	2.3	8.2	h
2 phr Butanox M-50	+ 1.0 phr Acc. NL-49P	1.7	3.0	9.5	h

* phr = parts per hundred resin

Cure of 4 mm laminates at 20°C

4 mm laminates have been made with a 450 g/m^2 glass chopped strand mat. The glass content in the laminates is 30% (w/w).

The following parameters were determined:
- Time-temperature curve.
- Speed of cure expressed as the time to achieve a Barcol hardness (934-1) of 0-5 and 25-30 respectively.
- Residual styrene content after 24 h at 20°C and a subsequent postcure of 8 h at 80°C.

		Gel time min.	Time to Peak min.	Peak exotherm °C
2 phr Butanox HBO-50	+ 0.5 phr Acc. NL-49P	8	26	58
2 phr Butanox M-50	+ 0.5 phr Acc. NL-49P	13	36	44
2 phr Butanox HBO-50	+ 1.0 phr Acc. NL-49P	4	18	79
2 phr Butanox M-50	+ 1.0 phr Acc. NL-49P	8	26	64

		Barcol 0-5 h	Barcol 25-30 h	Res. styrene 24 h 20°C %	Res. styrene + 8 h 80°C %
2 phr Butanox HBO-50	+ 0.5 phr Acc. NL-49P	<1	12	5.8	0.3
2 phr Butanox M-50	+ 0.5 phr Acc. NL-49P	3	15	6	0.3
2 phr Butanox HBO-50	+ 1.0 phr Acc. NL-49P		<1	4.7	0.1
2 phr Butanox M-50	+ 1.0 phr Acc. NL-49P		1	5	0.1

Pot life at 20°C

Pot lives were determined of a mixture of Butanox HBO-50 and a non-preaccelerated UP resin at 20°C.

2 phr Butanox HBO-50	18 h
4 phr Butanox HBO-50	10 h

Recommended Handling Procedures and First Aid

Protective equipment and handling instructions	- Use safety goggles or face shield and gloves. - Extra ventilation recommended. - Use clean equipment and tools of inert material, such as stainless steel, polyethylene, glass. - All equipment should be earthed. - Do not pipet by mouth. - Avoid contact with rust. - Never bring peroxide into direct contact with accelerators. - Never weigh out in the storage room.
Storage conditions	Keep container tightly closed in a well-ventilated place. Temperature max. +25°C. Keep away from reducing agents e.g. amines, acids, alkalis, heavy metal compounds (e.g. accelerators, driers, metal soaps). Never weigh out in the storage room.
Storage stability	Only when stored under these recommended storage conditions, the product will remain within the Akzo Nobel specifications for a period of at least three months after delivery.
Fire fighting	Extinguish a small fire with powder or carbon dioxide; then apply water to prevent re-ignition. Extinguish a big fire with large amounts of water, applied from a safe distance.
Spillage	Mix with e.g. vermiculite. Sweep up with dustpan and brush of inert material, flush the remainder with water. Remove the waste to a safe place. The waste should NOT be confined.
Disposal	According to local regulations.
Spillage on clothes	Remove contaminated clothes. Examine skin. If skin contact, wash or shower; apply a lanolin-based ointment. Launder clothes normally.
Eye contact	Rinse with plenty of water for at least 15 minutes. Seek medical advice.
Skin contact	Wash with plenty of water (and soap) or shower, afterwards apply a lanolin-based ointment. Seek medical advice.
Ingestion	Rinse mouth. Give water to drink. Seek medical advice. Do NOT induce vomiting.
Inhalation	Move to fresh air, rest, half-upright position. Loosen clothing. Seek medical advice.

For more detailed information reference can be made to the SDS of this product.

AKZO NOBEL

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AKZO NOBEL

SAFETY DATA SHEET
According to EC-directive 2001/58/EC

BUTANOX HBO-50

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product label name	Methyl ethyl ketone peroxide, solution in dimethyl phthalate
Supplier	Akzo Nobel Polymer Chemicals bv Stationsplein 4 PO Box 247 NL-3800 AE Amersfoort Tel.: +31-334676767
Emergency telephone	+ 31 570679211 (Fax. + 31 570679801) Akzo Nobel Polymer Chemicals bv -Deventer-NL
Intended use	curing agent.

2. COMPOSITION/INFORMATION ON INGREDIENTS

This product is to be considered as a preparation in conformance to EC directives.
Information on hazardous ingredients

Chemical description Methyl ethyl ketone peroxide, solution in dimethyl phthalate

Composition / information on ingredients

Number	% w/w	CAS-number	Chemical name	
1	33.0	1338-23-4	Methyl ethyl ketone peroxide	
2	59.0	131-11-3	Dimethyl phthalate	
3	1.0	78-93-3	Methyl ethyl ketone	
Number	**EC-number**	**Annex-1 number**	**Symbol(s)**	**Risk-phrase(s)**
1	215-661-2		C E	R02 R22 R34 R07
2	205-011-6		none	none
3	201-159-0	606-002-00-3	F Xi	R11 R36 R66 R67

Other information Balance: non-hazardous ingredients

3. HAZARDS IDENTIFICATION

May cause fire.
Harmful if swallowed.
Causes burns.

4. FIRST AID MEASURES

Symptoms and effects Harmful if swallowed. Causes burns. Causes injury to the cornea and eyelids. Risk of serious damage to eyes.

First aid

General	Call a physician immediately.
Inhalation	Move to fresh air, rest, half upright position, loosen clothing. Oxygen or artificial respiration if there is difficulty in breathing. Remove contaminated clothing. Always seek medical attention.
Skin	Remove all contaminated clothing immediately. Wash off with plenty of soap and water. Always seek medical advice. Launder clothes before reuse.
Eye	Rinse immediately and as long as possible with plenty of water. Eyelids should be held away from the eyeball to ensure thorough rinsing. Always seek medical advice.
Ingestion	Rinse mouth with water. Do NOT induce vomiting. Call a physician immediately !

Advice to physician Symptomatic treatment is advised.

5. FIRE-FIGHTING MEASURES

Extinguishing media	Carbon dioxide, dry chemical powder, dry sand, water, foam.
Unsuitable extinguishing media	halones.
Special exposure hazards	CAUTION: reignition may occur. Decomposition under effect of heating. If involved in a fire, it will support combustion. In case of fire and/or explosion do not breathe fumes.
Hazardous decomposition/ combustion products	Carbon dioxide, Water, Acetic acid, Formic acid, Propanoic acid, Methyl ethyl ketone
Protective equipment	Wear suitable protective clothing. Wear self contained breathing apparatus.
Other information	Extinguish a small fire with powder or carbon dioxide then apply water to prevent re-ignition. Cool closed containers with water.

AKZO NOBEL

SAFETY DATA SHEET
According to EC-directive 2001/58/EC

BUTANOX HBO-50

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Do not breathe fumes/vapour. Avoid contact with skin and eyes. For personal protection see Section 8.
Environmental precautions	Do not allow to enter drains or water courses.
Methods for cleaning up	Collect as much as possible in a clean container for (preferable) reuse or disposal. Cover the remainder with inert absorbent (e.g. vermiculite) for disposal. Keep contents moist. The waste should NOT be confined.
Other information	CAUTION: reignition may occur.

7. HANDLING AND STORAGE

Handling	Never weigh out in the storage room. When using do not eat, drink or smoke. Do not pipet by mouth. Do not breathe fumes/vapour. Handle in well ventilated areas. Keep away from reducing agents (e.g. amines), acids, alkalies and heavy metal compounds (e.g. accelerators, driers, metal soaps). Keep product and emptied container away from heat and sources of ignition. Confinement must be avoided. Avoid shock and friction. Avoid contact with skin and eyes.
Fire and explosion prevention	Use explosion protected equipment. Keep away from sources of ignition - No smoking.
Storage requirements	Store in accordance with local/national regulations. Keep away from food, drink and animal feedingstuffs. Store in a dry well ventilated place away from sources of heat and direct sunlight. Keep only in the original container. For maximum quality store below 25 °C. Keep container upright to prevent leakage.
Other information	It is recommended to use electrical equipment of temperature group T3. Wash hands thoroughly after handling or contact. Keep working clothing separately and do not take them home.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls	Ensure good ventilation and local exhaustion of the working area. Explosion proof ventilation recommended.

Exposure limits

Name			
Methyl ethyl ketone peroxide	OES-STEL	1.5 mg/m³	
Methyl ethyl ketone	OES-TWA	600.0 mg/m³	Can be absorbed through skin ,
	OES-STEL	899.0 mg/m³	Can be absorbed through skin ,
Dimethyl phthalate	OES-TWA	5.0 mg/m³	
	OES-STEL	10.0 mg/m³	

Personal protection

Respiratory	In case of insufficient ventilation wear suitable respiratory equipment (respirator with Filter AX).
Hand	Wear suitable protective gloves of neoprene or synthetic rubber.
Eye	Wear eye/face protection.
Skin and body	Wear suitable protective clothing.
Other information	Launder clothes before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	liquid
Colour	clear and colourless
Odour	faint
Boiling point/range	Do not distill (Decomposes)
Melting point/range	turbid < -10 °C
Flash point	Above the SADT value
Flammability	not determined
Autoignition temperature	Test method not applicable. (See Section 7)
Explosive properties	no
Explosion limits	not applicable
Oxidizing properties	not applicable
Vapour pressure	not determined
Density	1180 kg/m³ (20 °C)

BUTANOX HBO-50

Bulk density	not applicable
Solubility in water	Partly miscible with water.
Solubility in other solvents	phthalates
pH value	weak acid
Partition coefficient n-octanol/water	not determined
Relative vapour density (air=1)	not determined
Viscosity	approx. 16 mPa.s (20 °C)
Active oxygen content	9.8-10.0 %
Peroxide content	33 %
SADT	60 °C. See also Section 10: Other information.
Specific conductivity	not determined

10. STABILITY AND REACTIVITY

Stability	SADT - (Self accelerating decomposition temperature) is the lowest temperature at which self accelerating decomposition may occur with a substance in the packaging as used in transport. A dangerous self-accelerating decomposition reaction and, under certain circumstances, explosion or fire can be caused by thermal decomposition at and above the following temperature 60 °C. Contact with incompatible substances can cause decomposition at or below the SADT.
Conditions to avoid	Avoid temperatures above 25 °C. Avoid shock and friction. Confinement must be avoided.
Materials to avoid	Avoid contact with rust, iron and copper. Contact with incompatible materials such as acids, alkalies, heavy metals and reducing agents will result in hazardous decomposition. Do not mix with peroxide accelerators. Use only Stainless steel 316, PVC, polyethylene or glass-lined equipment.
Hazardous decomposition products	Acetic acid, Formic acid, Propanoic acid, Methyl ethyl ketone
Other information	Emergency procedures will vary depending on conditions. The customer must have an emergency response plan in place. Contact Akzo Nobel for assistance with developing an emergency response plan.

11. TOXICOLOGICAL INFORMATION

Name	Methyl ethyl ketone peroxide 33%.
Acute toxicity	
Oral LD50	rat:1017 mg/kg (Methyl ethyl ketone peroxide 40%)
Dermal LD50	rat:4000 mg/kg (Methyl ethyl ketone peroxide 40%)
Inhalation LC50	rat:17 mg/l ; 4 hours exposure time (Methyl ethyl ketone peroxide 40%)
Irritation	
Skin	Corrosive (Methyl ethyl ketone peroxide 33%)
Eye	Severely irritating / Corrosive (Methyl ethyl ketone peroxide 33%)
Genotoxicity	Ames test: Not mutagenic
Name	Dimethyl phthalate
Acute toxicity	
Oral LD50	rat: >2400 mg/kg
Dermal LD50	rabbit: >10.000 mg/kg
Inhalation LC50	9300 mg/m³ (6.5 hours)
Irritation	
Eye	Minimally irritating
Name	Methyl ethyl ketone.
Acute toxicity	
Oral LD50	rat: 2737 mg/kg
Dermal LD50	rabbit 6480 mg/kg
Inhalation LC50	rat 23.5000 mg/m³
Irritation	

Skin	Moderately irritating
Eye	Moderately irritating

12. ECOLOGICAL INFORMATION

Name	Based on: Methyl ethyl ketone peroxide 33%
Ecotoxicity	
fish	Acute toxicity, 96h-LC50 = 44.2 mg/l. (Poecilia reticulata.)
bacteria	Activated sludge respiration inhibition test EC50 = 48.0 mg/l.
Fate	
Degradation Biotic	Readily biodegradable (Closed bottle test).
Name	Based on: Dimethyl phthalate
Ecotoxicity	
algae	Selenastrum capricornutum: 39.8 mg/l (96h-IC50)
Fate	
Other information	Bio Concentration Factor (BCF) fish 5.4 (24 hours)
Name	Based on: Methyl ethyl ketone
Ecotoxicity	
fish	Lepomis macrochirus: 96h-LC50: 3.22 g/l
Fate	
Degradation Biotic	Readily biodegradable.
Other information	Naturally occuring substance

13. DISPOSAL CONSIDERATIONS

Product	Waste disposal in accordance with regulations (most probably controlled incineration).
Contaminated packaging	According to local regulations.
Other information	For further advice contact manufacturer.

14. TRANSPORT INFORMATION

Land transport (ADR/ RID)

ADR class	5.2	**ADR/RID item no.**	5b / 5b
RID class	5.2	**ADR/RID packing group**	
TREM-Card	CEFIC TEC(R)- 52G01B / 52GP1-L	**UN number**	3105
Proper Shipping Name	Organic peroxide type d, liquid; (Methyl ethyl ketone peroxide.)		
Other information	Label(s); 5.2		

Sea transport (IMDG-code/ IMO)

IMO/IMDG code		**Class**	5.2
Packing group	II	**UN number**	3105
EMS	5.2-01	**MFAG**	
Marine pollutant	no		
Proper Shipping Name	Organic peroxide type d, liquid; (Methyl ethyl ketone peroxide (s))		
Other information	Label(s); 5.2		

Air transport (ICAO-TI/ IATA-DGR)

ICAO-TI/IATA-DGR		**UN number**	3105
Class	5.2	**Packing group**	
Proper Shipping Name	Organic peroxide type d, liquid; (Methyl ethyl ketone peroxide (s))		
Other information	Label(s); 5.2		

15. REGULATORY INFORMATION

Chemical description	Methyl ethyl ketone peroxide, solution in dimethyl phthalate

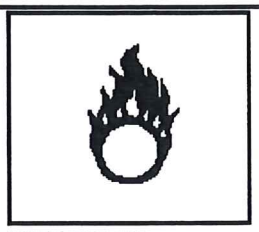
Labelling according to EC directives

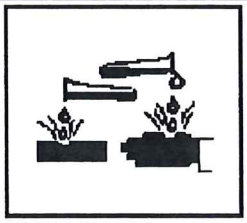
EC-number	not applicable

AKZO NOBEL

SAFETY DATA SHEET
According to EC-directive 2001/58/EC

BUTANOX HBO-50





Symbol(s)	OXIDIZING (O)	CORROSIVE (C)
R(isk) phrase(s)	R7. May cause fire. R22. Harmful if swallowed. R34. Causes burns.	
S(afety) phrase(s)	S3/7. Keep container tightly closed in a cool place. S14. Keep away from reducing agents (e.g. amines), acids, alkalies and heavy metal compounds (e.g. accelerators, driers, metal soaps). S36/37/39. Wear suitable protective clothing, gloves and eye/face protection. S45. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S50. Do not mix with peroxide-accelerators or reducing agents.	
Other information	Substance and/or product listed in Directive 96/82/EC.	
Wassergefährdungsklasse (WGK)	1 (VwVwS Anhang 4 Nr. 3)	

16. OTHER INFORMATION

This information only concerns the above mentioned product and does not need to be valid if used with other product(s) or in any process. The information is to our best present knowledge correct and complete and is given in good faith but without warranty. It remains the user's own responsibility to make sure that the information is appropriate and complete for his special use of this product.

R-phrase information

Chemical name	**Risk-phrase(s)**	
Methyl ethyl ketone peroxide	R02 R22 R34 R07	Risk of explosion by shock, friction, fire or other sources of ignition Harmful if swallowed Causes burns May cause fire
Dimethyl phthalate	none	NONE
Methyl ethyl ketone	R11 R36 R66 R67	Highly flammable Irritating to eyes Repeated exposure may cause skin dryness or cracking Vapours may cause drowsiness and dizziness

History

Date of printing/ pdf file generated	18-09-2002	
Revision	3.37	
Composed by	J.W. Wessels.	J.M.G.M. Reijnders.
Changes were made in section	6,7,8,13,15	

Multi-end Roving - Products catalog

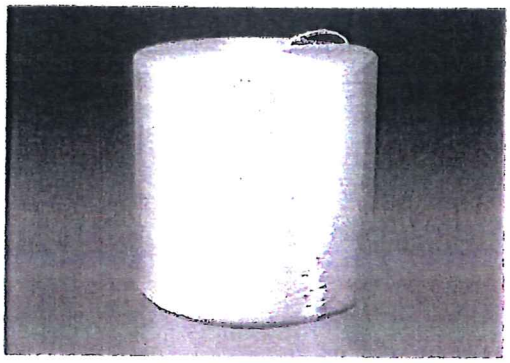
Alkali-free fiberglass multi-end roving is formed by multi strand fiberglass. Such rovings are divided into hard multi-end roving and soft multi-end roving. Hard multi-end roving is of some stiffness and mainly used in spray-up and SMC processes.

- **Product Number - ECT107EB-2400**

CPIC® FIBERGLASS

107EB

合股纱



产品牌号

ECT107EB–2400

- ECT　　玻璃类型(无碱)
- 107EB　　浸润剂牌号
- 2400　　粗纱线密度（Tex）

产品说明

合股纱，连续板材用纱，用于管道石膏板和墙体板。适用于聚酯树脂（UP）、乙烯基树脂（VE）和石膏；

产品特点	技术指标						
•浸润速度适中，树脂渗透性好，良好的排泡性能，优异的制品力学强度和耐腐蚀耐老化性能；	浸润剂类型	粗纱线密度[tex(g/km)]	纤维直径（%）	含水率（%）	可燃物含量（%）	体积密度(g/cm3)	硬挺度(mm
	——	ISO1889	ISO1888	ISO3344	ISO1887	-	ISO3375
	硅烷型	公称值±5%	公称值±1	≤0.10	公称值±0.20	公称值±0.05	公称值±20

规格参数

产品牌号	可选玻璃类型	纤维直径[μm]	原丝线密度[tex(g/km)]	线密度[tex(g/km)]	体积密度(g/cm3)	硬挺度(mm)	可燃物含量（%）
107EB-2400	ECT/ECR	12	48±5	2400	1.40	145	0.85

包装方式

每个纱团用热收缩膜或拉伸膜进行包装，然后放入托盘或纸箱，每个托盘可放入48个或64个纱团。

卷重（kg）	纱卷公称尺寸（mm）			卷装量（团）	托盘尺寸[mm]长*宽*高	每托重量（kg）
15~18	外径	内径	高度	48	1120*1120*940	720~864
	280	152/162	260	64	1120*1120*1200	960~1152

存储

•请将玻璃纤维产品存放于干燥和凉爽的环境中，如若不用，请勿打开包装物，以免受潮。

备注：如果有特殊要求，请与我们联系。

地址：重庆市大渡口区建桥工业园区B区
邮编：400082　网站：www.cpicfiber.com
技术支持. 电话：(+86-23)68157743 (+86-23)68157178
市场部. 电话：(+86-23)68157828 (+86-23)681577586 传真：(+86-23)68157822
销售部. 电话：(+86-23)68157818 (+86-23)68157583 传真：(+86-23)68157813

ISO 9001　ISO 14001　OHSAS 18001

Primer & Top Coat Datasheets

SPU-222

Fiberglass / Steel / Superstructure Protective Coating

SURFACE PREPARATION

Surface must be properly prepared. Remove all oil, dust, grease, dirt, loose, and foreign materials to ensure adequate adhension.

Steel surfaces shall be dry and clean, free from any dirt, grease, oil and other contamination before priming and spraying or brush.

APPLICATION CONDITIONS

Temperature:
Air and surface: -20°C~40 °C
At lease 3 °C above dew point
Relative humidity: ⩽90%

Contact us for detailed application information.

STORAGE CONDITIONS

- The A component is affected by moisture and must be protected from moisture contamination. Containers are factory sealed with an inert gas to prevent contamination. Keep all containers tightly closed during storage. For further storage after opening, containers must be purged with nitrogen gas or dry air and tightly sealed to protect from moisture contamination.
- Store drums and pails in a cold, dry and ventilated location between 15°C and 40°C.
- Keep away from rain and sun.
- Keep away from fire and heat source.

CURE TIME

Surface dry (25°C)	*⩽ 30 minute*
Hard film (25°C)	*⩽ 2 hrs*
Recoat time	*Minimum ⩽ 30 minute*
	Maximum ⩽3 hours

Due to rapid cross-linking, recoating must be done as soon as the first coat is dry.
If maximum recoat time is exceeded, abrade surface before recoating.
Consult us for recommended recoat procedures.

THINNING

DO NOT THIN!

MIXING INSTRUCTIONS

Thoroughly mix container of B component with mixer for a minimum of 5 minutes prior to application.

SAFETY PRECAUTIONS

Consult MSDS sheet before use. Use proper ventilation and respiratory equipment when spraying. Protect skin and eyes. Follow disposal methods in accordance with local and federal disposal regulations.

This product is intended for industrial use by properly trained professional applicators only.

Published technical data and instructions are subject to change without notice. Contact Us representative for additional technical data and instructions.

Foshan Shunde Lelin Qishuo Building Materials Factory
Address: No.3 Building, 3 Xingi Lianfu One Road, Xinan Village, Leliu Street, Shunde District, Foshan City.

SPU-222

Fiberglass / Steel / Superstructure Protective Coating

PRODUCT DESCRIPTION

SPU-222 is a fast set, spray / hand-applied, two component chemically curing acrylic polyurethane coating. It has a gloss finish with very good gloss retention. To be used as topcoat in atmospheric enviroments. chemistry allows this material to be tolerant of moisture and lower temperatures during application. This means that high humidity and hidden moisture in surface has minimal effect on the application of this product.

- Fast cure, short downtime, but not-sagging
- Moisture and temperature insensitivity during processing
- UV resistance
- High thermal stability
- Excellent anti-corrosive properties
- Resistant to solvents, caustics and many acids
- Extraordinary physical properties
- Excellent bond strengths to both concrete & steel substrate, fiberglass
- Seamless, flexible, slick and non-porous
- WRAS Approved
- Anti-skid purpose with aggregates added
- Easy to clean

RECOMMENDED USES

Designed for use as a seamless, anti-corrosion coating system for protective application of concrete, steel and fiberglass surfaces. Ideally suited for use in various substrates.
including:

- Aerial pipeline coating
- Underground pipeline coating
- Wastewater pipe coating
- Fuel pipeline coating
- Gas pipeline coating
- Chemical steel storages & containments coating
- Concrete and fiberglass surface, marine topside, deck and superstructure.

PRODUCT CHARACTERISTICS

Typical Use	:	*Marine / Aguatic Coating*
Color	:	*Optional*
Shelf Life	:	*6 months, unopened at 15~40°C*
Gel Time	:	*30 minutes*
Mix Ratio		
(Primer) SPU-221	:	*4 (A) : 1(B) (Liter)*
(Top Coat) SPU-222	:	*4 (A) : 2(B) (Liter)*

Recommended Spreading Thickness: *20 μm for top coat, 15 μm for primer.*
Recommended 1 layer of primer with 2 layers of top coats for total coverage.

Drying time is temperature, humidity, and film thickness dependent.

Foshan Shunde Lelin Qishuo Building Materials Factory
Address: No.3 Building, 3 Xingi Lianfu One Road, Xinan Village,
Leliu Street, Shunde District, Foshan City.

Approval Number: 1903532
Test Report: J-00325077

Water Regulations Advisory Scheme Ltd.
Unit 13,
Willow Road,
Pen y Fan Industrial Estate,
Crumlin,
Gwent,
NP11 4EG

23rd April 2019

Foshan Shunde Leliu Qishuo Building Materials Factory
NO.3 Xinglianfu One Road,
Block 3 Xin'an Village Leliu Street,
Shunde District,
Foshan City,
China

WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)
MATERIAL APPROVAL

The material referred to in this letter is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6920-1:2000 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'.

The reference relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

COATINGS, PAINTS & LININGS - FACTORY APPLIED PIPE & FITTINGS COATINGS. **5030**

'Top Spu-222, A & B and Primer Spu-221, A & B'. Factory applied, grey coloured acrylic polyurethane coating consisting of a two-part primer and a two-part top coat. Mix in accordance with manufacturer's data sheet dated 5th May 2018. Cure for 48 hours@25°C. For use with water up to 23°C.

This material is only approved for the curing conditions that appear on the approval. If the cure conditions are varied from those specified on the approval then the material is not covered by the scope of the approval.

APPROVAL NUMBER: 1903532
APPROVAL HOLDER: FOSHAN SHUNDE LELIU QISHUO BUILDING MATERIALS FACTORY

The Scheme reserves the right to review approval.
Approval 1903532 is valid between March 2019 and March 2024

An entry, as above, will accordingly be included in the Water Fittings Directory on-line under the section headed, "Materials which have passed full tests of effect on water quality".

The Directory may be found at: www.wras.co.uk/directory

Yours faithfully

Jason Furnival
Approvals & Enquiries Manager
Water Regulations Advisory Scheme

WRAS MATERIAL APPROVAL - MATERIALS WHICH HAVE PASSED FULL TESTS OF EFFECT ON WATER QUALITY

The material referred to in this letter is suitable for contact with water for domestic purposes. **Approval of this material does not signify the approval of its mechanical or physical properties for any use.**

Manufacturers or applicants may only quote in their sales literature terms which are used in this letter, namely that; 'the material as listed, having passed the tests of effect on water quality, is suitable for use in contact with wholesome water'

This may be abbreviated to 'Water Regulations Advisory Scheme - Approved Material' or 'WRAS Approved Material'.

The scope of an Approval does not extend to rebranded materials unless otherwise agreed by the Scheme.

Use of the WRAS Approved Material Logo

Approval holders may use the WRAS Approved Material logo and make reference to any approval issued by WRAS Ltd. in respect of a particular material or range of materials provided the approval is, and remains valid.

Approval holders are entitled to use the logo on the packing, promotional literature and point of sale advertising Approved Materials.

Modifications to existing Approvals

It is a condition of WRAS Material Approval that NO changes or modifications to the Approved Material, be made without the Approval Holder first notifying WRAS Ltd. Full details of the proposed changes must be provided to the Scheme. Failure to comply with this condition will immediately invalidate a previously granted Approval.

Re-Approval

WRAS will write to you 1 year before the approval expires asking whether you would like to renew it. Please complete the relevant section of the MA3 application form which will be included with the letter and return to WRAS (via e-mail or post).

Please note it is the responsibility of the Approval Holder to ensure the Approval remains valid. WRAS Ltd. accepts no liability for the delay in granting approval where this is caused by circumstances outside of the Scheme's control.

NSF INTERNATIONAL LABORATORIES
Unit 30 | Fern Close | Pen-Y-Fan Ind Est | Oakdale | Gwent | NP11 3EH | UK
Tel: +44 (0) 1495 236260 wales@nsf.org | www.nsf.org

TEST REPORT

Customer: C0462650

Foshan Shunde Leliu Qishuo building materials
Factory
NO.3 Xinglianfu one road
Block 3 Xin'an village Leliu st
Shunde district
Foshan city,
China

Result	This product has satisfied the criteria set out in BS 6920: Part 1: 2014 "Specification" and thus is suitable for use with cold water but not hot water.
Customer Name	Foshan Shunde Leliu Qishuo building materials Factory
Product	Acrylic Polyurethane coating: (Top Spu-222, A & B / Primer Spu-221, A & B)
Test Undertaken	BS 6920: 2014 - Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water
Job Number	J-00325077
PAMS Number	182459

Thank you for having your product tested by NSF Wales Ltd.

Please contact your Account Manager if you have any questions or concerns pertaining to this report.

Report Date 20-MAR-2019

Report Authorisation M Rees

Matthew Rees - Materials Laboratory Supervisor

UKAS TESTING
0626

Result Summary Section

Test	Result
Odour and flavour of water BS 6920: Part 1: 2014, Clause 4 - 23°C	Pass
Appearance of Water BS 6920: Part 1: 2014, Clause 5	Pass
Growth of Microorganisms BS 6920: Part 1: 2014, Clause 6	Pass
Extraction of substances that may be of concern to public health BS 6920: Part 1: 2014, Clause 7 - 23°C	Pass
Extraction of Metals BS 6920: Part 1: 2014, Clause 8 - 23°C	Pass

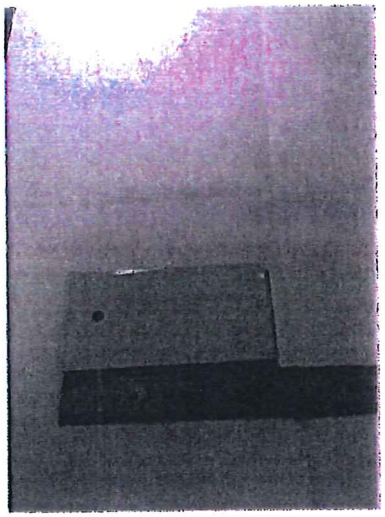
Sample Details

Date of Receipt of Application Form	20/12/18
Date of Receipt of Product for Test	15/11/18
Date Test Sample Prepared	08/2018
Product	Acrylic Polyurethane coating: (Top Spu-222, A & B / Primer Spu-221, A & B)
Nature of Material	Acrylic Polyurethane coating
Date Test Sample Manufactured	08/2018
Batch Number	Not provided
Receipt Conditions	Good Condition
Receipt Packaging	White paper
Product Manufacturer	Qingdao Jialian Research and Production Division
Product Manufacturing Site	China
Tradename and Reference of Product	Top coating: Spu-222(A) Spu-222(B), Primer coating: Spu-221(A) Spu-221(B)
Method of Manufacture	Mixing
Typical Use of the Product	Coating in contact with potable water
Substrate	Glass
Method of Application	Brush applied
Number and Thickness of Coats Applied	One coat of both top and primer, both 20 microns
Ambient Temperature at Time of Application	25 °C
Curing Time	48 hours
Curing Temperature	25 °C
Curing Place	Manufacturers facility
Preparation and Curing Conditions in Accordance with Manufacturer's Instructions	Yes
Nature of Product	Two part factory applied coating
Sampling Procedure	Random
Address of Product Manufacturer	A1 Zhonglian 25 Industrial Park 12 Shangqing RD, Qingdao China
Submitting Organization	International Certification Services (H.K.) Limited (as applicants representative)

Sample Preparation

Description/Appearance of the product	Grey, opaque, rigid coating
Length	120 mm
Width	60 mm
Thickness	6 mm
Surface area of one article	16560.0 mm2
Number of articles constituting a sample	1
Surface area for test	16560 mm2
Calibration mark of test container	1 L

Job Attachments:



Grey, opaque, rigid coating

Odour and flavour of water BS 6920: Part 1: 2014, Clause 4 - 23°C

Methodology: BS 6920: Part 2: Section 2.2 and in-house method PROC/MAT 004 and 006.

Date Leaching Test Started: 4-MAR-2019

First Extract - Chlorinated Test Water

Panellist	Odour Descriptor	Flavour Descriptor	Flavour Dilution Number
1	None	None	1
2	None	None	1
3	None	None	1

First Extract - Chlorine Free Test Water

Panellist	Odour Descriptor	Flavour Descriptor	Flavour Dilution Number
1	None	None	1
2	None	None	1
3	None	None	1

On the basis of these results the samples of this product referred to in this report have been found to conform to the requirements of BS 6920: Part 1: 2014, Clause 4.

Appearance of Water BS 6920: Part 1: 2014, Clause 5 - 23°C

Methodology: BS 6920: Part 2: Section 2.3 and in-house methods PROC/MAT 004, PROC/MAT 027 (colour) and PROC/MAT 030 (turbidity).

Date Leaching Test Started: 15-JAN-2019

First Extract

Name	Blank	Extract	Test Sample Effect
Colour (Hazen)	<2	<2	<2
Turbidity (FNU)	<0.1	<0.1	<0.1

On the basis of these results the samples of this product referred to in this report have been found to conform to the requirements of BS 6920: Part 1: 2014, Clause 5.

Growth of Microorganisms BS 6920: Part 1: 2014, Clause 6

Methodology: BS 6920: Part 2: Section 2.4 and in-house method PROC/MIC 001.

Date Test Started: 8-JAN-2019

Incubation temperature: (30 ±1) °C

Units: mg $L^{-1} O_2$

Mean Dissolved Oxygen Difference	Day 49
Test Sample	0.9
Positive Reference (paraffin wax)	6.6
Negative Reference (glass)	-0.2

Mean Dissolved Oxygen	Day 49
Test Water Control	7.8

Comments: Coating has split and peeling from panel

On the basis of these results the samples of this product referred to in this report have been found to conform to the requirements of BS 6920: Part 1: 2014, Clause 6.

Extraction of substances that may be of concern to public health BS 6920: Part 1: 2014, Clause 7 - 23°C

Methodology: BS 6920: Part 2: Section 2.5 and in-house methods PROC/MAT 004 and PROC/MIC 004.

Date Leaching Test Started: 15-JAN-2019

Cell concentration used: 5×10^5

Cell morphology: Confluent growth of elongated cells, some round cells and cell debris. Media orange/pink in colour.

Sample/Control	Cell Morphology	Response
Test Sample	Confluent growth of elongated cells, some round cells and cell debris. Media pink in colour.	Non-Cytotoxic
Blank	Confluent growth of elongated cells, some round cells and cell debris. Media pink in colour.	Non-Cytotoxic
Negative Control	Confluent growth of elongated cells, some round cells and cell debris. Media pink in colour.	Non-Cytotoxic
Positive Control	All cells rounded and mainly still in suspension. Media pink in colour.	Cytotoxic

On the basis of these results the samples of this product referred to in this report have been found to conform to the requirements of BS 6920: Part 1: 2014, Clause 7.

Extraction of Metals BS 6920: Part 1: 2014, Clause 8 - 23°C

Methodology: BS 6920: Part 2: Section 2.6 and in-house methods PROC/MAT 006 (leachate preparation) and PROC/ING 003 (ICPMS analysis).

Date Leaching Tests Started: 22-JAN-2019

First Extract

Metal (µg/L)	MAC (µg/L)	LOD (µg/L)	Blank (µg/L)	Sample 1 (µg/L)	Sample 2 (µg/L)
Aluminium	200	20	<20	<20	<20
Antimony	5	0.5	<0.5	<0.5	<0.5
Arsenic	10	1	<1	<1	<1
Boron	1000	100	<100	<100	<100
Cadmium	5	0.5	<0.5	<0.5	<0.5
Chromium	50	5	<5	<5	<5
Iron	200	20	<20	<20	<20
Lead	10	1	<1	<1	<1
Manganese	50	5	<5	<5	<5
Mercury	1	0.1	<0.1	<0.1	<0.1
Nickel	20	2	<2	<2	<2
Selenium	10	1	<1	<1	<1

Analytical Method - ICPMS Inductively Coupled Plasma Mass Spectrometry
MAC - Maximum admissible concentration
LOD - Required limit of detection

On the basis of these results the samples of this product referred to in this report have been found to conform to the requirements of BS 6920: Part 1: 2014, Clause 8.

<< *Testing Laboratories* >>	Flag	Id	Address
All work performed at: (Unless otherwise specified)	→	NSF_WALES	NSF Wales Ltd. 30 Fern Close Pen-Y-Fan Industrial Estate, Oakdale Gwent, NP11 3EH UK

NOTES

1. This report is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service (UKAS). NSF Wales is UKAS accredited against ISO/IEC 17025:2005 for calibration and testing, laboratory numbers 0248 and 0626 respectively. For details of the laboratory Schedule of Accreditation please see the UKAS website (www.ukas.org).
2. The laboratory provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes.
3. Where a measurement reported is outside the specification limit by a margin less than the measurement uncertainty, the result of the test will be reported as indeterminate and the measurement uncertainty for the test will be quoted alongside the result. Measurement uncertainties for tests are held on file by the laboratory and available on request.
4. Opinions and interpretations in this report are outside the scope of UKAS Accreditation.
5. The results specified in this report relate only to the sample(s) of the product submitted for testing. Any change in the source or nature of the product or materials used in the product, method of manufacture or application could affect the performance of the product.
6. This test report does not constitute approval or endorsement of the product by either NSF Wales or its parent companies.
7.
8. Any queries regarding this report should be addressed to the authorised signatory at NSF Wales. Copies of reports are retained by NSF Wales for ten years after issue.
9. Non UKAS accredited tests or tests which have been subcontracted will be identified in the following manner:
   - Tests marked † are not included in the laboratory's ISO 17025 accreditation schedule.
   - Tests marked ‡ have not been performed by NSF Wales and have been performed at an approved subcontract laboratory.
10. We draw to your attention that reports issued by the accredited test laboratories do not of themselves constitute approval by the Water Regulations Advisory Scheme or the test laboratory. Only a letter from the Scheme, citing a Directory Reference number can be regarded as indicating approval.
11. Materials and products intended for use by public water supply company in the preparation or conveyance of water may need to satisfy more comprehensive toxicological requirements as specified by the Drinking Water Inspectorate. These additional requirements are necessary to ensure water Company usage compiles with Regulation 31 of the Water Supply (Water Quality) Regulations 2010.