



Hebron

An Otsuka Chemical
Group Company



www.hebronsa.es

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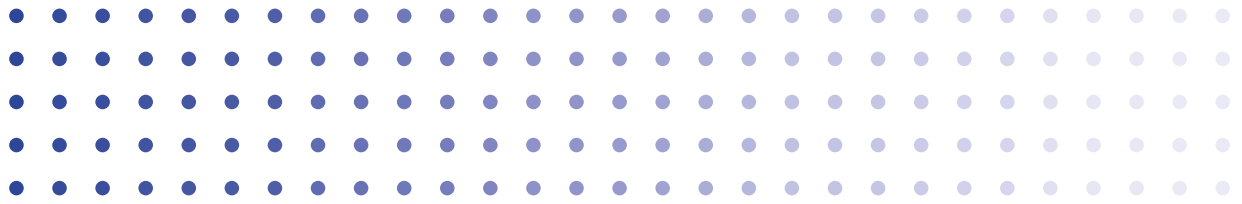
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Hebron

since 1959

Hebron, founded in 1959 in the Vall d'Hebron (district of Barcelona), was officially established in 1961 in La Llagosta. Initially, its activity was the manufacture of additives for plastics and rubbers, including the production of Azodicarbonamide. Other added value products were also manufactured such as pharmaceutical intermediates and fertilizers.

At the end of 1989, Hebron is acquired by the Japanese group Otsuka Chemical Co. Ltd, for its expansion in the European market.

Since the 1980s, Hebron has gone from selling 95% of its turnover in the Spanish market, to export more than 80% of its total sales.

Hebron has expanded its activity to the manufacture of masterbatch based on azodicarbonamide and to the commercialization of Otsuka Chemical products as its representative in the European market.

HEBRON HISTORY



1959

Foundation
in Vall d'Hebron
(district Barcelona)

Official Establishment
in La Llagosta

1961

1989

Acquired by



Otsuka

ISO 9001 Certification

2003

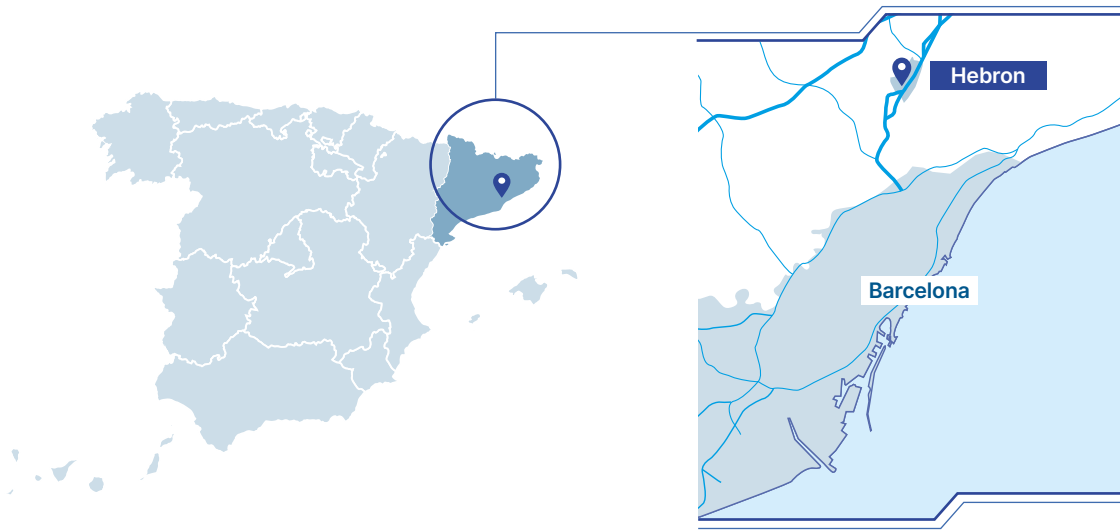
2012

Hebron became the
Otsuka Chemical
European Representative

ISO 14001 Certification

2019

Location

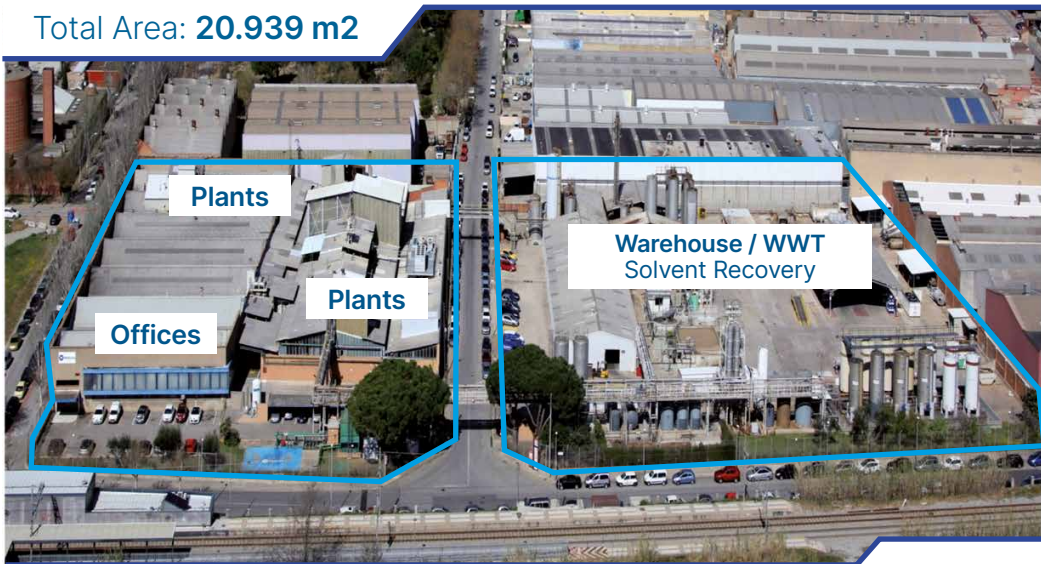


Located in Barcelona, Catalonia – Spain

Carrer Girona, 20. 08120. La Llagosta

- 30 km. from Barcelona Airport
- 20 km. from Barcelona Centre
- Near train station La Llagosta

Total Area: 20.939 m²

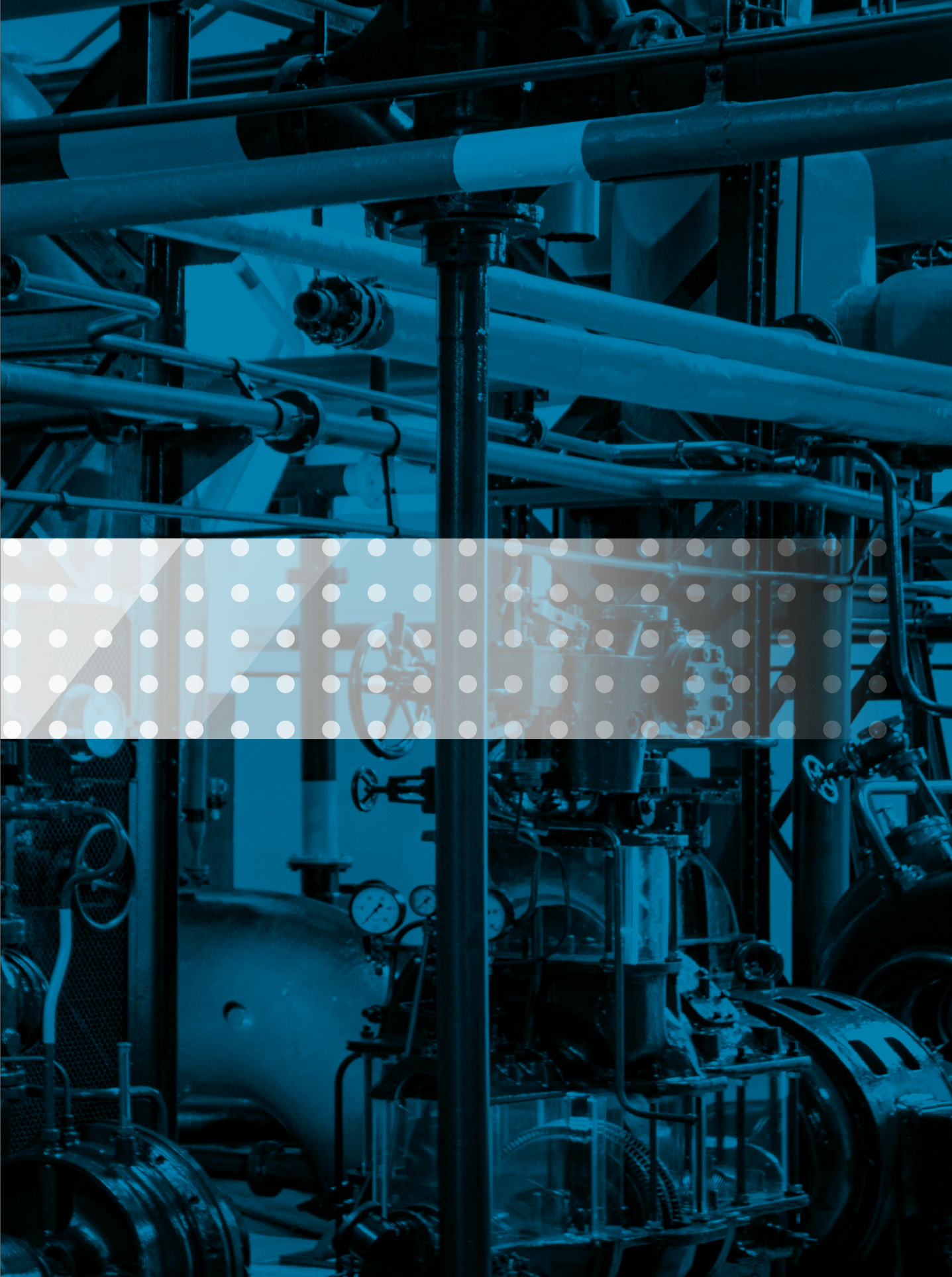


Hebron roles





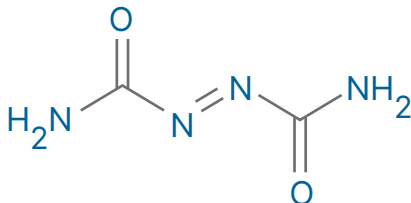
Hebron
specialty chemicals



Unifoam AZ

Pure Exothermic Blowing Agent

UNIFOAM AZ is a highly effective blowing agent designed especially for plastics, leather and rubber based on Azodicarbonamide.



UNIFOAM AZ

UNIFOAM AZ ULTRA

Common Features:

1. High gas volume giving cost effective foaming.
2. High decomposition temperature giving safe storage and handling.
3. Does not impart odour to the finished product.
4. Processing temperature 200-230 °C can be reduced to 140 °C by activation.
5. Fine homogeneous cell structure.

Specific ULTRA Features:

1. Direct dispersibility into PVC plastisol.
2. Low dust handling, and anti-caking properties.
3. Low viscosity and good automatic/pneumatic feeding properties.
4. Better dispersion properties, reduced pin holes and voids, minimizing waste.

Packaging

- 25 kg paper bag / 600 kg pallet. Others methods available upon request, always complying with transport regulations.

Dosing

- 2,5 - 10 phr. Depending on application, matrix and required density.

Main features

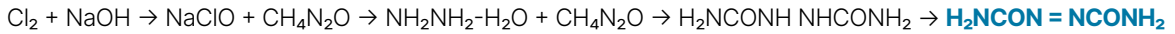
Chemical names	Azodicarbonamide Azobisformamide ADCA C,c'-azodi(formamide)
Molecular formula	C ₂ H ₄ O ₂ N ₄
Form	Powder
Average Particle size	From 3,2 to 28 µm
Decomposition Heat	86 cal/g (1 atm)
Decomposition Temperature (°C)	198 - 202
Gas yield (mL / g)	Min. 220
Recommended Process Temperature	200 - 220 °C

MAIN APPLICATIONS

As Blowing agent for extruded and molded parts of (among others):

- Mainly used for **the expansion of:**
 - PVC plastisol
 - Rigid and modified PVC, PS, ABS, PE, PP, EVA
 - Rubbers (CR, NBR, EPDM, SBR)
- Main applications:
 - Floor and wall coverings
 - Artificial leather
 - Footwear
 - Automotive components
 - Sealing strips
 - Carpet backings
 - Thermal insulation materials
 - Three layer foamed pipes

Urea is treated with dichloro and sodium hydroxide to form hydrazodicarbonamide.
 Oxidation of the resulting hydrazine derivative yields the azodicarbonamide:

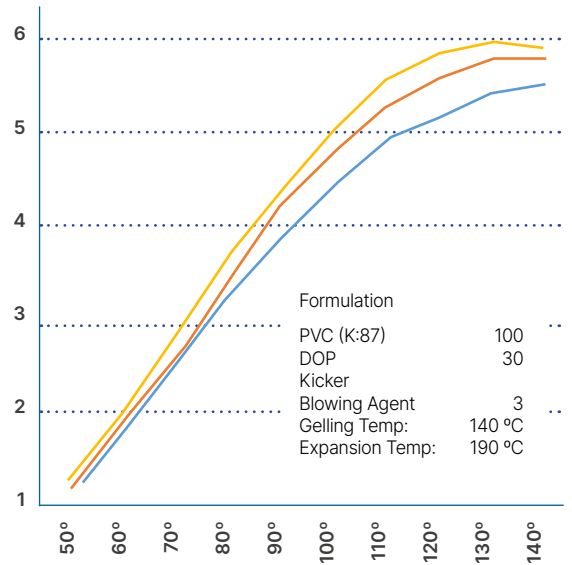


Thermal ADCA decomposition by-products

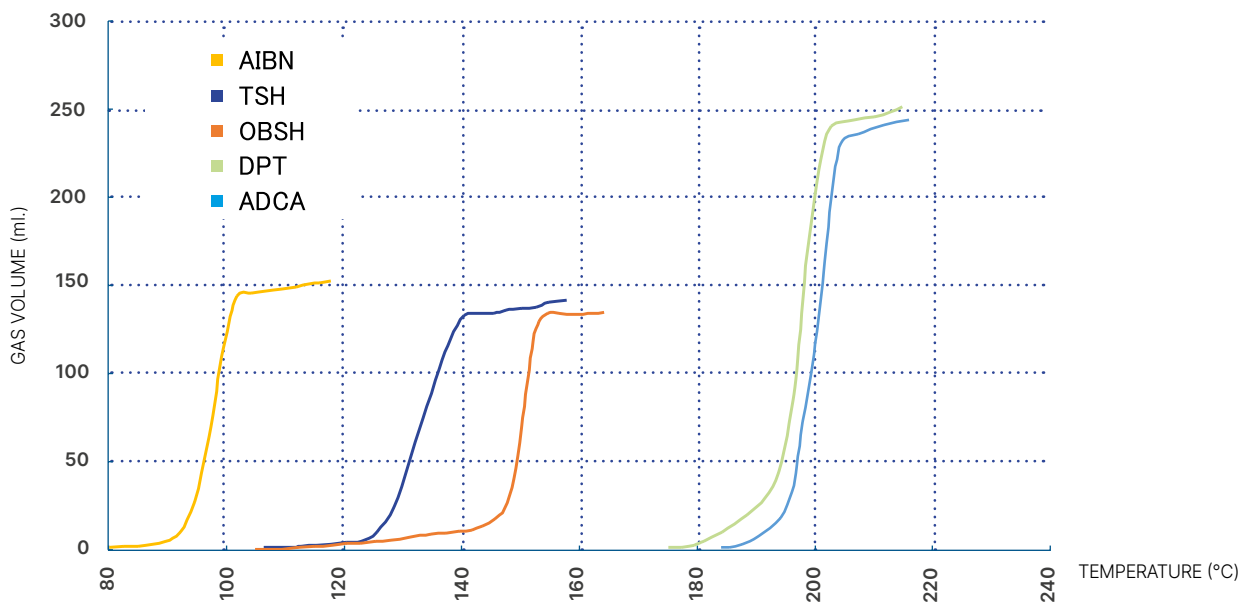
Decomposition by-products		
Gaseous portion	N ₂	65% vol. approx.
	CO	32% vol. approx.
	CO ₂	2% vol. approx.
	NH ₃	1% vol. approx.
Solid residues	Urazole	36% approx.
	Isocyanuric acid	15% aprox.
	Cyamelide	7% approx.
	Hydrazodicarbonamide	24% approx.

Expansion characteristics

VI-40 PS: 3,2 µm | VI-30 PS: 4,3 µm | VI-25 PS: 5,0 µm



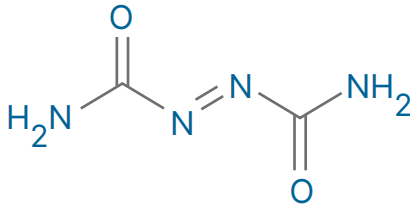
Decomposition curves for main organic foaming agent



Unifoam AZ MIX

Modified Exothermic Blowing Agent

UNIFOAM AZ modified is a highly effective blowing agent designed especially for plastics, leather and rubber based on Azodicarbonamide.



Advantages

- Density reduction up to 80%.
- Safe storage thanks to its high decomposition temperature.

Process improvements

- Lower decomposition point (being modifiable down to 140°C), allowing earlier expansion.
- Avoids mold corrosion in extrusion / injection process.
- Greater chemical inhibition of embossed vinyl coated products.
- The higher the decomposition of the ADCA grade, the higher the gas yield.
- Easy handling: low dust.

Better properties on final products:

- More whiteness.
- Better homogeneity (better dispersion of ADCA).
- High level of auto-nucleation gives a fine and uniform cellular structure.

Packaging

- 15 - 25 kg carton box / 360 - 600 kg pallet and others methods available upon request.

Dosing

- 0,5 – 10 phr. Depending on app and required density.

MAIN APPLICATIONS

- Can be used in PP, HDPE, PS, EVA copolymers, soft and rigid PVC and modified PPO matrixes.
- Inhibition of chemically embossed vinyl coated products and for PVC plastisol (floor and wall covering).
- Leather cloth, rubber and chemically cross-linked polyolefin foaming.
- Other applications: sponge rubber, shoe soles, flotation products (construction and automotive materials).
- High temperature expansion processes:
- **Injection:** For Prevention of the sink marks.
- **Extrusion:** Cable extrusion. Co-extrusion of Pipes and profiles.

Decomposition by-products

ADCA Molecular formula	C ₂ H ₄ O ₂ N ₄
Appearance	Yellow to orange powder
Odour	Odourless
Decomposition point	From 140 up to 206 °C
Gas yield	Up to 220 mL/g
Average ADCA particle size	From 3,2 up to 20 µm
Shelf life (from manufacturing date)	1 year

Market segment

For Rubber / EVA foaming

UNIFOAM Grades	Dec. Temp. (°C)	Gas Yield (ml/g)	Applications	Possible final products
ASR 01	190-196 188-196 160-164	Min. 215 Min. 200 Min. 200	Thermoplastic rubber EVA copolymers	Microcellular shoe soles Flotation products Sealing profiles
AZ VESCOX/U	151-154	Min. 205	Plasticized PVC (mainly plastisoles)	Floor and wall covering, Leather clothes

For Polyolefins

UNIFOAM Grades	Dec. Temp. (°C)	Gas Yield (ml/g)	Applications	Possible final products
AZ VI-5095 PI	196-200	Min. 220	Extrusion Pressing	Foamed sheets
AZ VI-50 ST IMP W	Approx. 198		Extrusion	Crosslinked PE foams

For soft PVC

UNIFOAM Grades	Dec. Temp. (°C)	Gas Yield (ml/g)	Applications	Possible final products
AZ M2/U AZ CP022 AZ CP032 AZ MFE-600 AZ VESCOX/U	From 141 up to 154	Min. 170 190 205	Plastisol	Floor & wall covering; synthetic Leather
CP022 i CP032: AZ 585, CP022 i CP032	185-195	Min. 185	Extrusion profiles Compounds Injection	Wires, injected parts

For rigid PVC

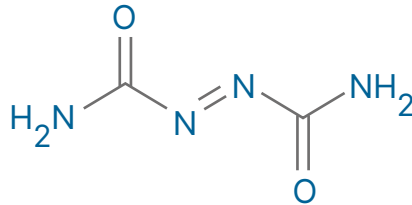
UNIFOAM Grades	Dec. Temp. (°C)	Gas Yield (ml/g)	Applications	Possible final products
MULTIFOAM Grades				
APR01	141-144	Min. 60	Rigid extrusion	Pipes; Profiles
AEPR10 AEPR14 AEPR16	160-210	Min. 50 Min. 110 Min. 220	Rigid PVC extrusion PVC compounds	Pipes; Profiles
AZXR001	155-165	Min. 190	Sheets	Mats

- Other existing products are tailor made for industrial customers.
- Extra-White product extension can be produced from each of the above grades.
- The range of UNIFOAM AZ modified is comprehensive, permitting the selection of products which decompose within the temperature range of 140 – 206 °C, encompassing the melt processing range for most thermoplastic polymers.

Unifoam AZ MB

Exothermic Blowing Agent Master Batch

UNIFOAMMB is a highly effective blowing agent in pellet form designed especially for plastics and rubber based on Azodicarbonamide. We manufacture customized grade for your application.



Advantages

- Safe storage thanks to its high decomposition temperature and for being embedded in a polymer matrix.
- Free-flowing, dust-free handling.
- The majority are not classified as dangerous good.
- It does not impart odor to the final product.
- Tailor-made grades according to customer' needs.
- Fine and regular cell structure in the final product.
- The uniform distribution of ADCA concentration reduces mixing time, improves dispersion process and gives better final product foam quality.

Packaging

- 25 kg paper bag / 600 kg pallet / 1.000 Kg Big Bags.
- Others methods available upon request.

Dosing

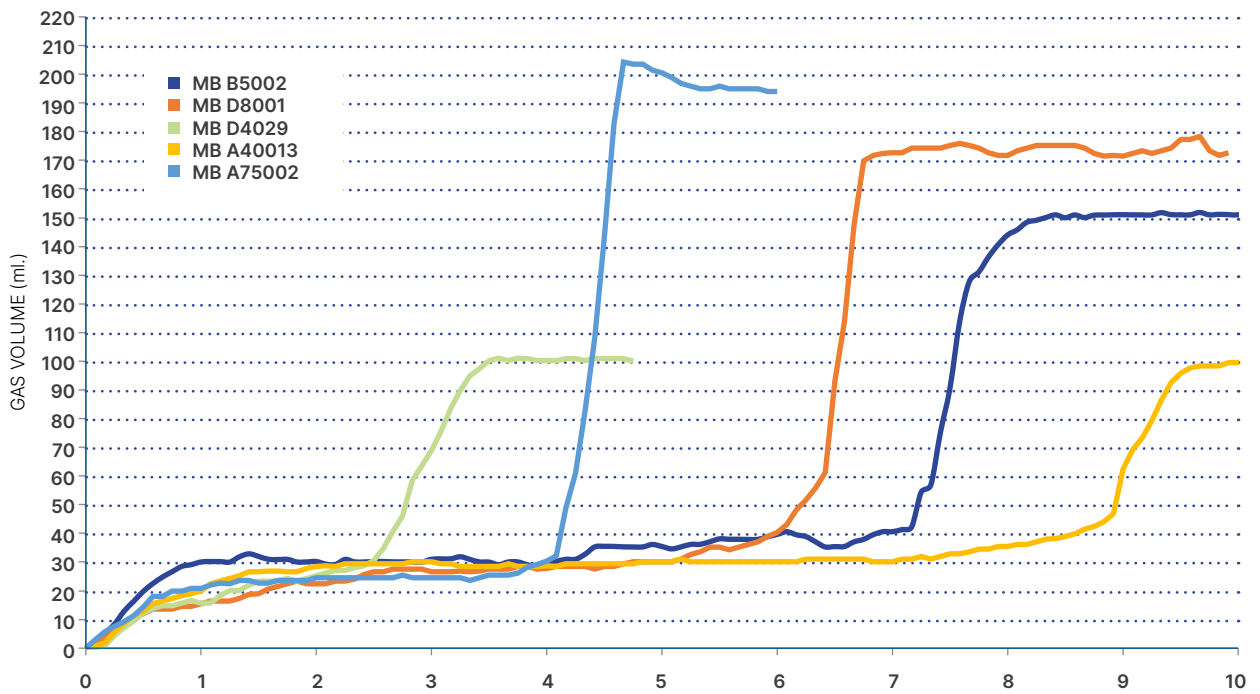
- 0,2 – 25 phr. Depending on application, matrix and required density.

MAIN APPLICATIONS

- **Processes**
- **Extrusion**
 - Telecommunication Cable, Foamed sheets of XPO, Extruded Wood Plastics Composite profiles, PVC foamed core pipes and profiles.
- **Press Molding**
 - Foamed blocks of XPO and XEVA (Shoe soles, gym floor).
- **Injection**
 - Injection parts of polyolefin and EVA, reduction Main features of "sink marks" (XPO).

Main features	
ADCA Molecular formula	C ₂ H ₄ O ₂ N ₄
Appearance	Yellow to orange pellets
Odour	Odourless
Carrier	Thermoplastics
ADCA concentrations	Up to 75%
Decomposition point (°C)	< 210 (depending on the additives)
Gas yield	Up to 180 mL/g
Bulk density	> 0,6 g/mL
Shelf life	1 year (from manufacturing date)
Additives and concentration	Kickers and other blowing agents

Grades' Gas Volume Comparison (Temp. = 205°C Sample Weight = 1 g)

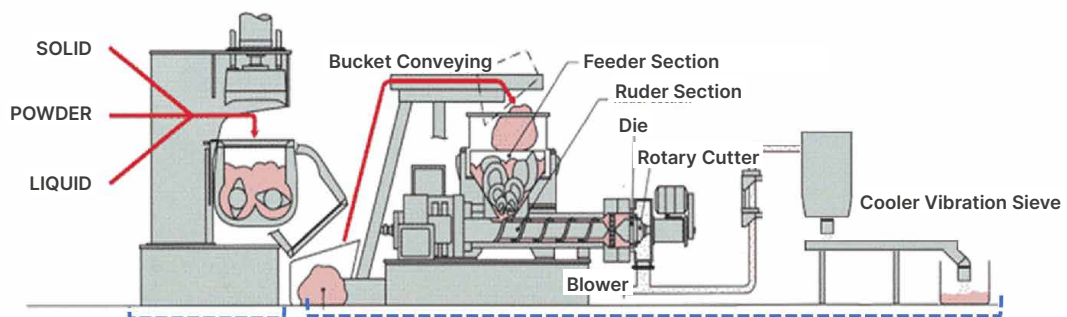


For polyolefins, Rubber and EVA foaming

Grade	% BA	Gas Volume	Density	Notes
MB D4029	40%	71	1,15	Slightly activated
MB XPO A40013	40%	69	1,058	Slightly activated
MB B5002	50%	120	1,055	
MB XPO A75002	75%	174	1,28	
MB D8001	80%	148	1,19	Slightly activated

These are reference grades. We develop customized grades under request.

MB process



KNEADING

EXTRUSION / PELLETIZING



ENDOFOAM

Endothermic Blowing Agent

ENDOFOAM is a highly effective blowing agent based on inorganic carbonic acid salts. Its masterbatch form is especially designed for plastics extrusion.

ENDOFOAM reduces final product weight for saving materials (cost saving).

Reference Values

Appearance	White pellets
Decomposition point	140-210°C
Gas yield	Min. 55 ml/g
Bulk density	Approx. 0,75 g/ml
Carrier	LDPE and EVA
Recommended processing Temp.	From 215 °C

Formats

- Powder Mix
- Masterbatch

Packaging

- 25 Kg paper bag / 600 Kg pallet (Other methods available upon request).

Dosing

- Sink mark prevention 0,1-1,5%
- Injection moulding: 0,5-4 %
- Extrusion: 1-3 %
- Nucleation: 0,1-1 %

Gas yield mL/g	Decomposition Temperature (°C) Polymer	Polymer Carrier (%)
32 - 140	160 - 250	20 - 70

Advantages

- The majority are safe for food contact applications (USA FDA and EU regulation 10/2011).
- Slow decomposition and endothermicity allows an easier control of process conditions.
- Blowing agents available in powder mix or in masterbatch.
- High blowing agent concentrations (higher 50 %) while keeping quality.
- Innocuous and safe blowing agents.
- Does not leak out of plastic or rubber.
- It does not give any odor.
- Dust-free handling (MB).
- Excellent nucleating properties.
- Smoother surface and Excellent regular structure of the final product properties are achieved if accompanied by a gas counterpressure or a core back process.

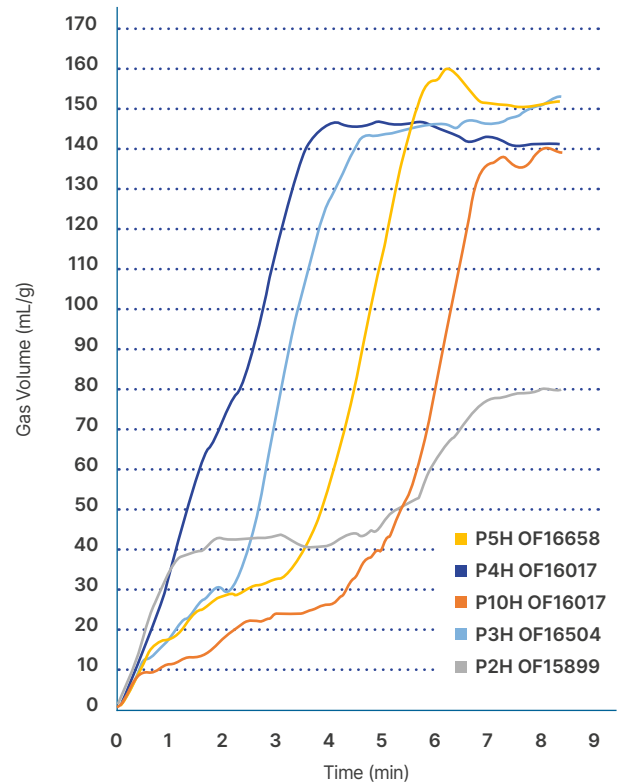
Grades	P-2H	P4H	P5H	P3H
Decomposition Temperature (°C)	170-220	170-210	150-170	200-250
Gas Volume (mL/g)	100-105	125-135	115-125	95-100

MAIN APPLICATIONS

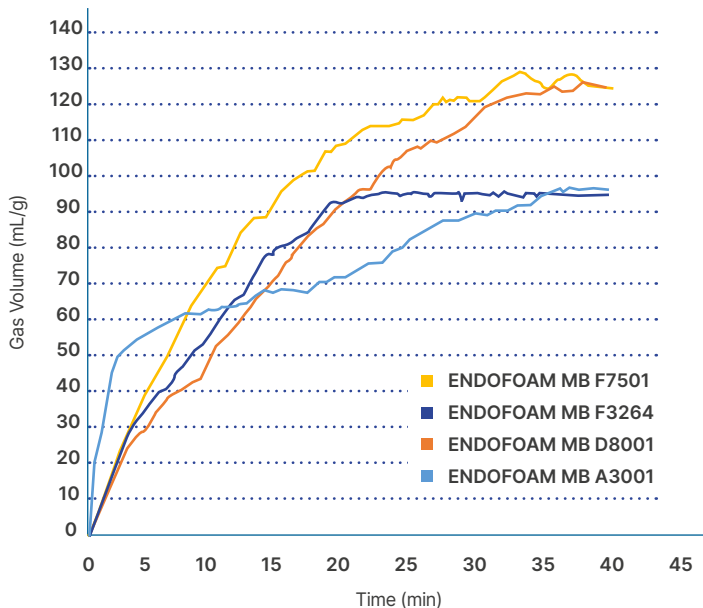
As Blowing agent for extruded and molded parts of (among others):

- **PP**
 - Pipes
 - Profiles
- **PVC**
 - Profiles
 - Cables
 - Footwear sole
 - Wall covering
- **PO**
 - Building materials
 - Food packaging (Thin wall packaging)
 - Transit packaging (pallet, boxes, etc.)
 - Automotive (instrument, door panel...)
 - Caps, synthetic cork and closures
- **PS**
 - Construction
 - Food packaging
- **WPC**
- **XPS**
- **Others**
 - As nucleating agent for physical foaming.

MB Vol gas °Cg



MB VOI gas °C g



End product example



ENDOFOAM PHF

Unexpanded microspheres

ENDOFOAM PHF is a highly effective physical foaming agent consisting on expandable microspheres. These are spherical thermoplastic micro balloons, containing a liquid hydrocarbon. When heated, the internal pressure of the gas increases and the thermoplastic shell softens, resulting in a dramatic increase in the volume of the microspheres and the gas remains within the spheres.

Formats	Packaging	Dosing
<ul style="list-style-type: none"> • Powder • Masterbatch 	<ul style="list-style-type: none"> • 50 Kg carton drum / 200 Kg pallet (Other methods available upon request) 	<ul style="list-style-type: none"> • Only this Blowing Agent: 2 -5 % • Mixing Blowing Agents: 0,1 - 1%

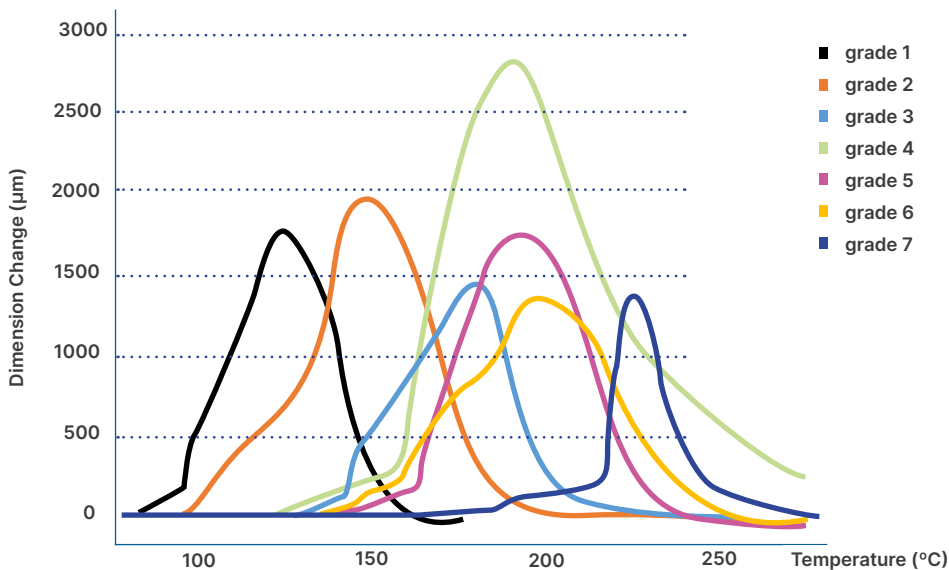
MAIN FEATURES

- Soft touch.
- Excellent and uniform cell structure: it is the only closed-cell expansion agent.
- Elastic resilience & compressibility: it can significantly increase the flexibility and tenacity of materials.
- Modification of the surface: adding different particle size microsphere can generate surface modification effects (leather suede effect, matting, etc.)
- Light weight: dosing 2 % microsphere can reduce over 20% weight.
- Cost decrease.
- Foaming properties without chemical reaction.
- Easy handling and processing: unexpanded microspheres are non hazardous products.

REFERENCE VALUES

Appearance	White microscopic spheres
Density (before expansion) Kg/m3	1000
Density (after Expansion) Kg/m3	< 20
Volume size expansion	Up to 100-fold
Particle diameter increase	Up to 5 times
Gas released	No gas release

GRADE COMPARISON GRAPH



MAIN APPLICATIONS AND ADVANTAGES

	Plastic & Rubber	Coating	Adhesive	Others
Applications	<ul style="list-style-type: none"> • Shoe soles • Thermoplastics/ Engineering plastics • GMT • WPC • Sealing strips/Silicon Rubber • Leather: PVC/PU 	<ul style="list-style-type: none"> • Architectural coating • Printing ink & Textile 	<ul style="list-style-type: none"> • Sealants • Thermal release taps 	<ul style="list-style-type: none"> • Paper & Board • Toy clay • Artificial • Marble
Advantages	<ul style="list-style-type: none"> • Perfect Foaming • Good Compressibility & Elasticity • Low Density, Light-weight • Soft and Smooth touch • Reduce raw material usage • Better insulation performance • Reduce warping and deformation • Good impact performance 	<ul style="list-style-type: none"> • Reduce thermal conductivity • Reduce the coating unit area dosage • Light weight and reduce the load on the wall • Improve construction efficiency • Increase bulk and thickness • Striking 3-D appearance 	<ul style="list-style-type: none"> • Reduce density • Increase bulk and thickness • 1% microspheres brings 20% more covered area • Thermal insulation • Shorter curing time • Less Cracking • Better expansion ratio • Easily remove 	<ul style="list-style-type: none"> • Extrusion profiles • Compounds • Injection



Adipic Dihydrazide – hardener and cross-linking agent

Our adipic acid dihydrazide is used as latent curing agent for improving the storage stability of epoxy resin, acrylic resin and other thermosetting resins that are used in various business fields as **paints, sealants, coatings, adhesives** among others.

Advantages

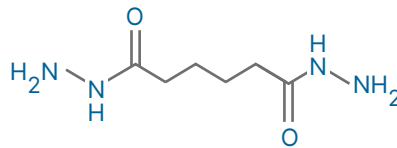
- Environmentally friendly.
- Long pot life and high T_g .
- Reactivity at ambient temperature.
- No need of catalyst to achieve high conversions.

MAIN APPLICATIONS

- Epoxy-based and acrylic-based adhesives.
- Powder Paints.
- Acrylic emulsions.
- Light-sensitive resins.
- Coatings & Sealants.

General Properties

Chemical Formula



CAS No.

1071-93-8

Appearance

White crystalline powder

Melting Point

177 - 183

Solubility

Water

12,54 g

Ethanol

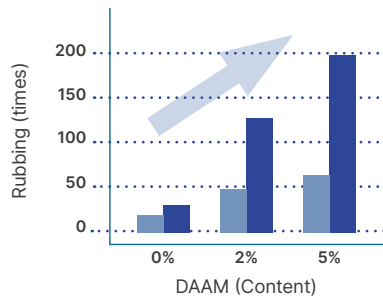
1,30 g

Ether

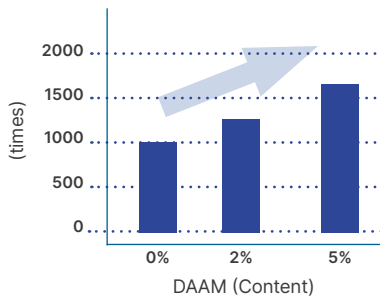
Insoluble

ACRYLIC RESIN (Crosslinking acid agent)

Solvent Resistance

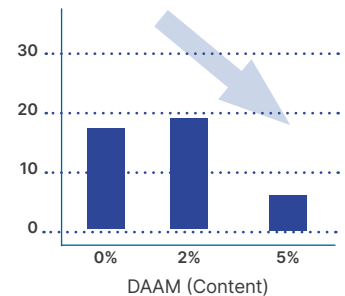


Scrub Resistance



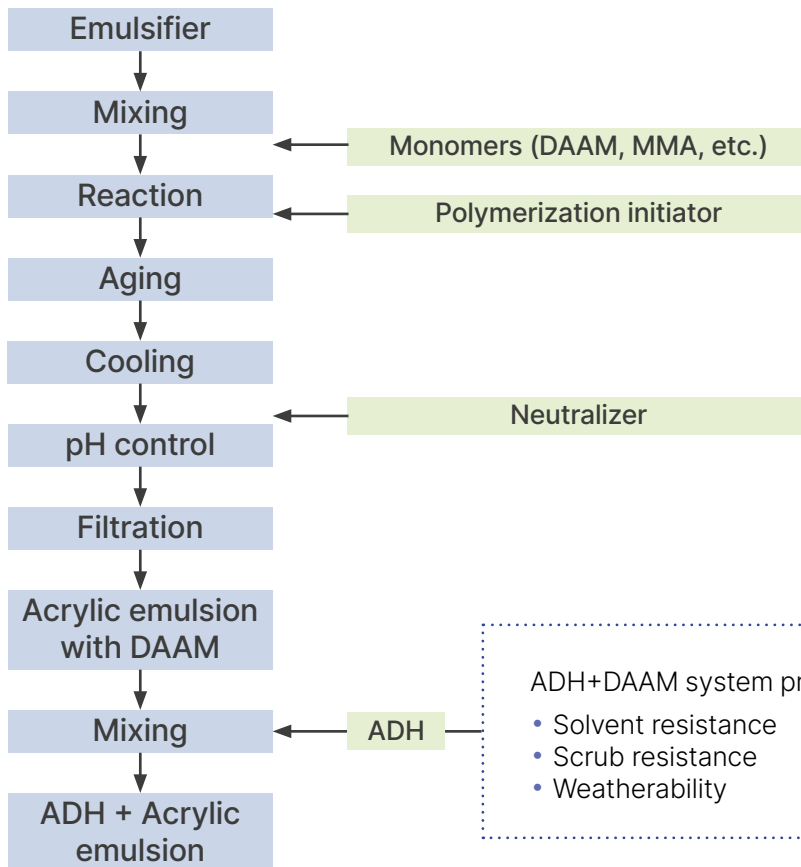
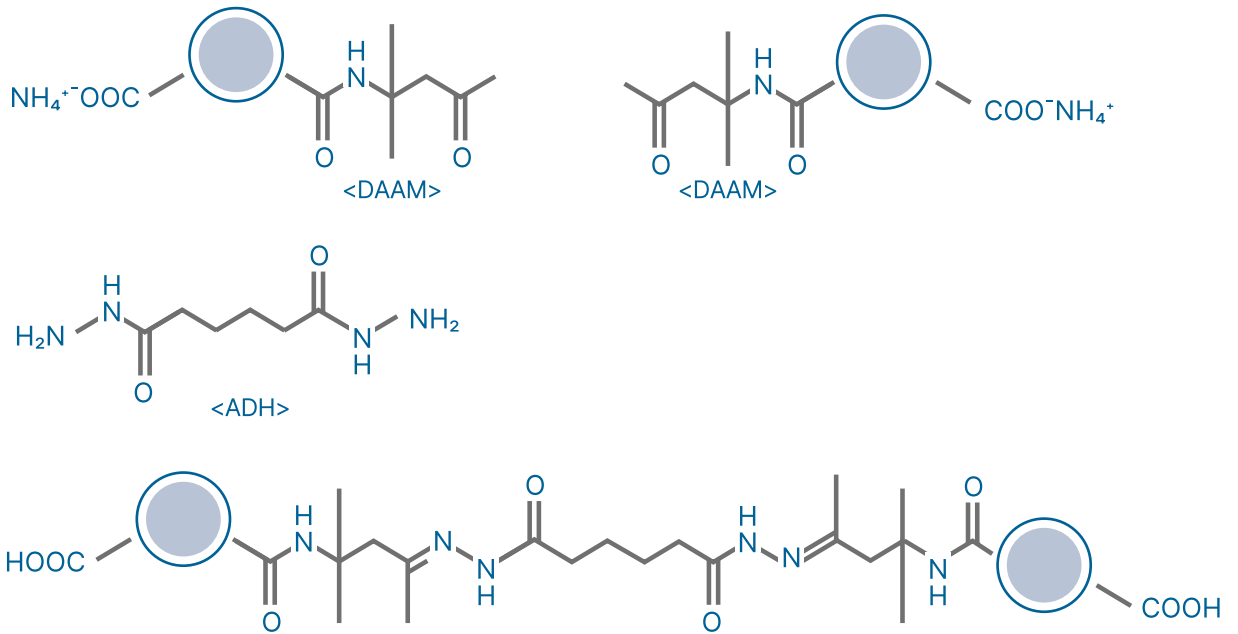
*Dipping in water at 23 degree Cx1 day

Water Adsorption



*In reference to ASTM D2486-06 formatted coatings with TiO₂ (PVC=22%)

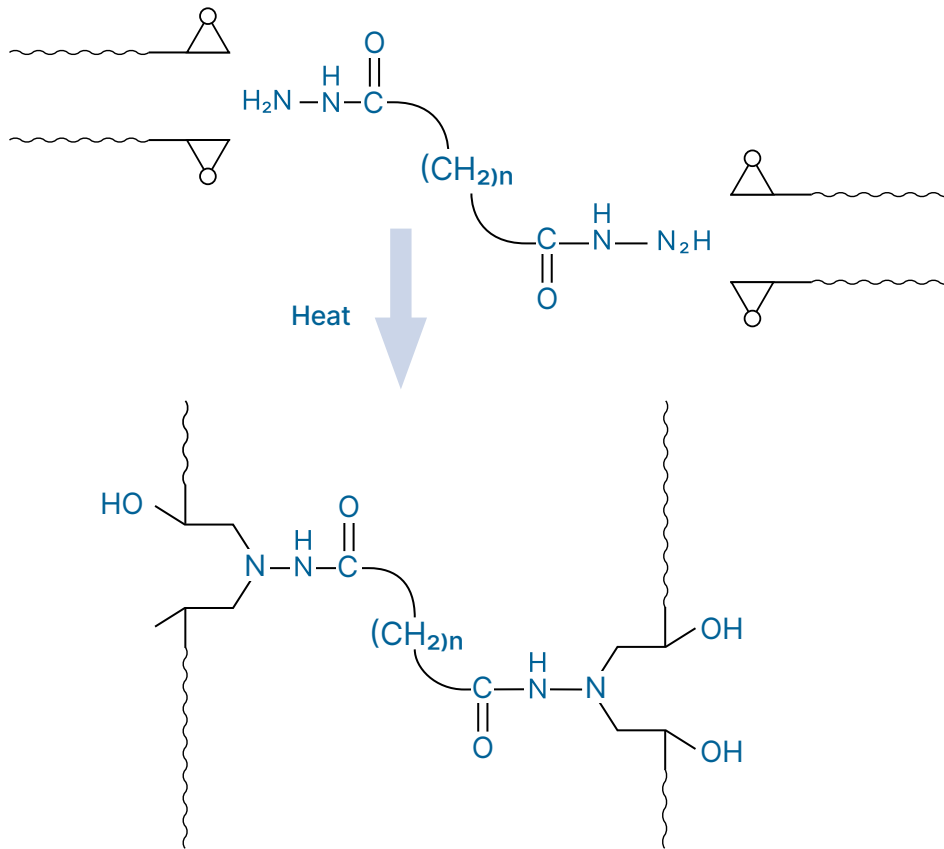
CROSS-LINKING AGENT - Reaction with Acrylic Emulsion using DAAM



ADH+DAAM system produces:

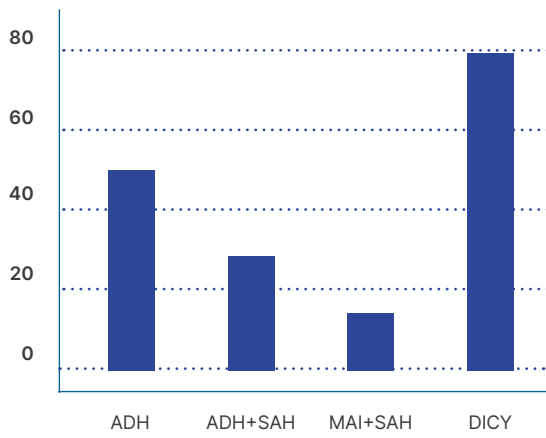
- Solvent resistance
- Scrub resistance
- Weatherability

EPOXY RESIN - Hardener (Curing agent)

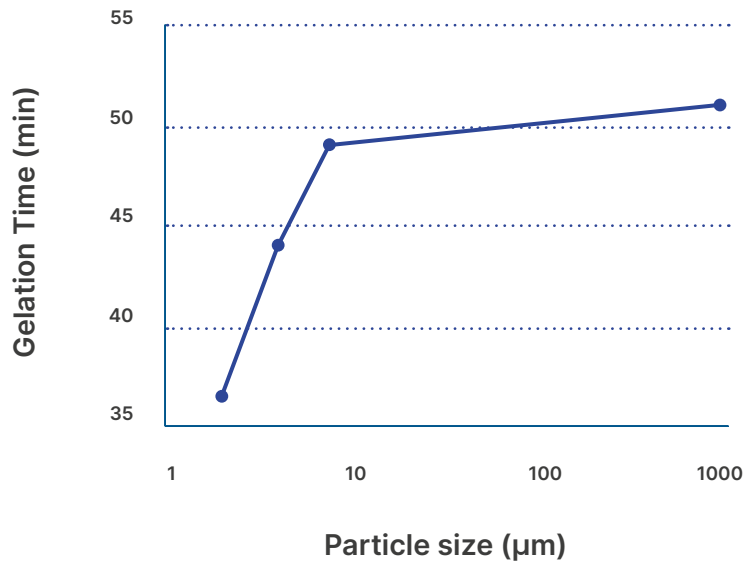


		ADH	DICY
Formulation (phr)			
Epikote828 (epoxy resin)		23	11
Results			
Active hydrogen equivalent(1)		43,5	21
Pot life		>90	>90
Gel time (min)	160 °C	8	>30
	140 °C	49	>80
	120 °C	>60	-
Hardening condition (°C x min)		145 x 90	187 x 180
Tg (°C, TMA)		120	68

Effect of accelerator and hardener (140°C)



Effect of the particle size (140°C)



Ceramic microfiber used for reinforcement

Advantages

- High purity and very regular shape of microfibers.
- High strength and low hardness.
- Microscopic reinforcements demonstrate result in superior sliding properties and better resistance to friction.
- High thermal stability.

Applications

- Protective coatings.
- Reinforcement additive for plastic compounds.
- Heat insulation.
- Heat resistance.
- Filtering properties.
- Filtering and frictional characteristics.

Packaging

- 10 kg paper bag / 200 kg per pallet.

Dosing

- The dosage is adjusted according to the desired end product features.

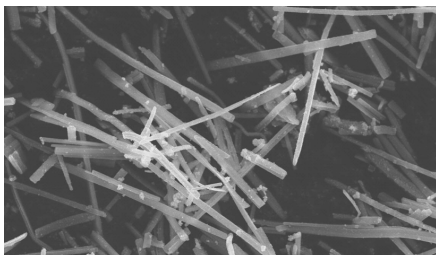
Fricfonal materials containing TISMO instead of asbestos:

- Increase friction by ~50%, and - Show ~32% less wear desired end product features.

Good recyclability

	Initial value	After pelletized	After molding
TISMO	100	87	80
Glass fiber	100	23	10

TISMO microfibers

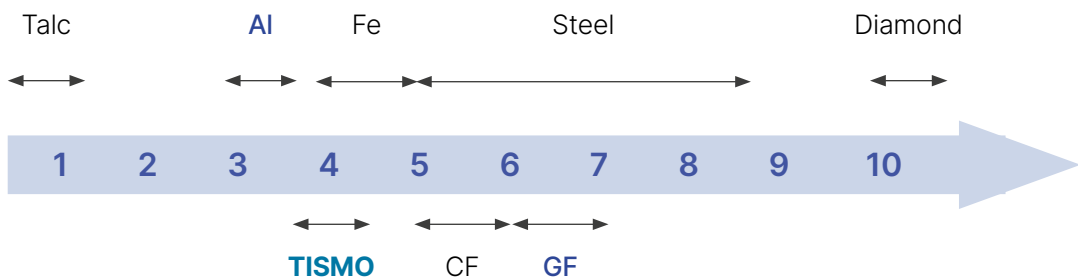


General Characteristics

Chemical composition	$K_2O \cdot 8TiO_2$
Appearance	White fiber
Bulk Density	Max. 0,2 g / l
Average fiber length	10 – 20 μm
Average fiber Diameter	0,3 – 0,6 μm
Moisture	Max. 0,7%
Melting point	1.300 °C
Tensile strength	700
Elastic modules	$2,8 \times 10^4$
pH	8-9
Tensile degree of elasticity	280 GPa
Tensile strength	7 GPa
Shelf Life	6 months

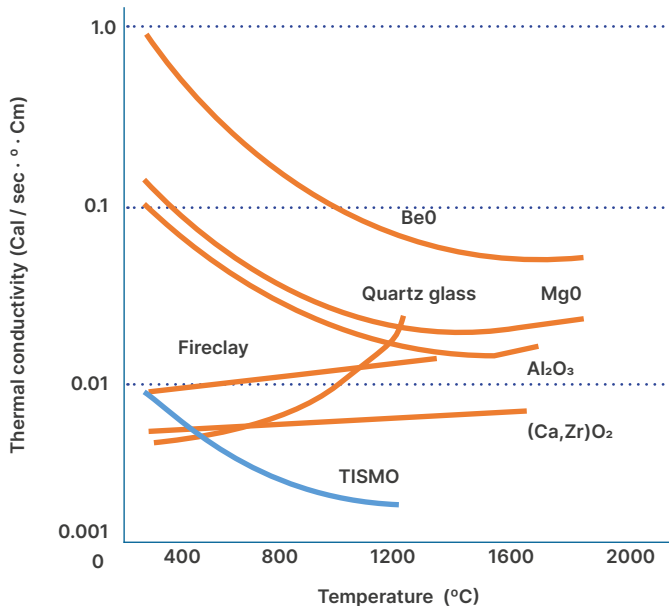
Type	Potassium Titanate	PAN Carbon Fiber Glass Fiber		Glass Fiber
	Tismo D	High Intensity Grade	High modulus Grade	EGlass
Chemical Composition	K 2O·8TiO2	Graphite	Graphite	—
Color/Shape	White Fiber	Long Black Fiber	Long Black Fiber	Transparent Long Fiber
Average Fiber Length	10~20 μ m	—	—	—
Average Fiber Diameter	0.3~0.6μ m	7~9μm	7~9μm	9~13μm
Absolute Gravity	3.3~3.4	1.7	1.8	2.6
pH	8~9	—	—	—
Melting Point	1,300~1,350°C	—	—	800°C (Softening Point)
Tensile Strength	7G Pa	3.1G Pa	2.5G Pa	2.7G Pa
Elasticity/Elongation	0.60%	1.30%	0.60%	4.00%
Tensile Degree of Elasticity	280G Pa	230G Pa	400G Pa	70G Pa
Moh's Hardness	4	5~6	5~6	6~7

Moh's hardness



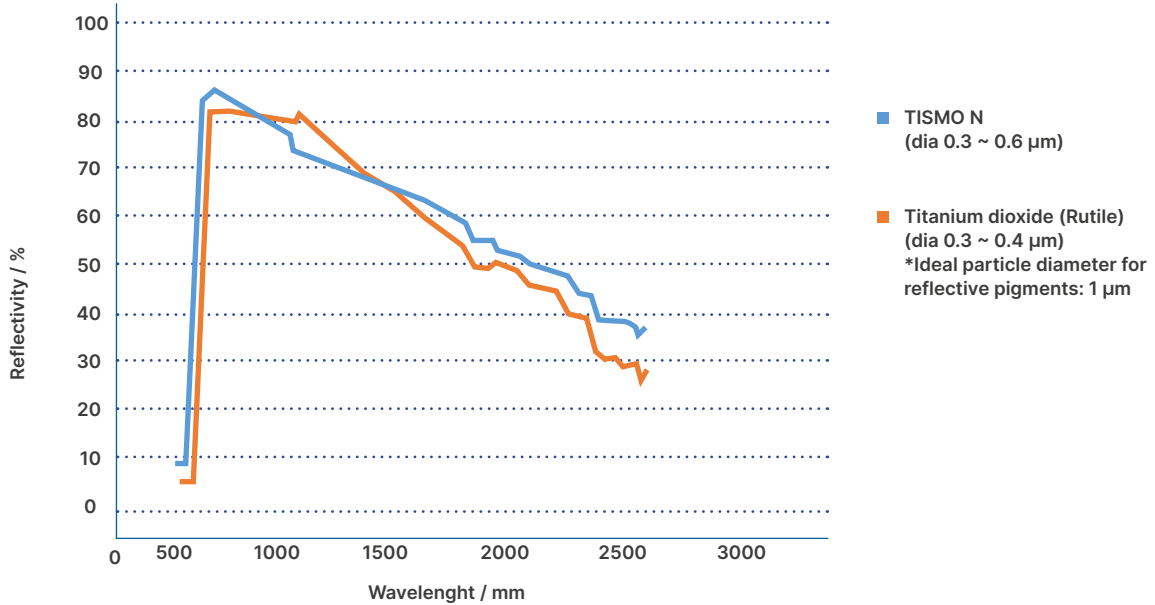
RESINS	TYPICAL APPLICATIONS
ROM	Watch gears, camera gears, micromotor gears, tape recorder parts
PBT	Keyboard switches, connectors, micromotor parts, relays, cams, plugs
66 – nylon	Bearings, cams, gears, coil bobbins, pulleys, retainers
6 – nylon	Bearings, gears, industrial use fasteners, door closers, bobbins, buttons
Special nylon	Sliding parts, muffler gears, thin parts, mechanisms & sporting goods parts
Denatured PPE	Copier parts, floppy disk drive parts, printer parts, thin housings
PPS	Copier parts, sliding parts, automobile parts
ABS	Copier parts, plated parts, clock parts, Sporting goods parts
PVC	Pearl sheet, magnetic tape, covered tubing
PP	Audio equipment parts, vacuum formed parts, automobile parts

Heat Resistant: Thermal Insulation

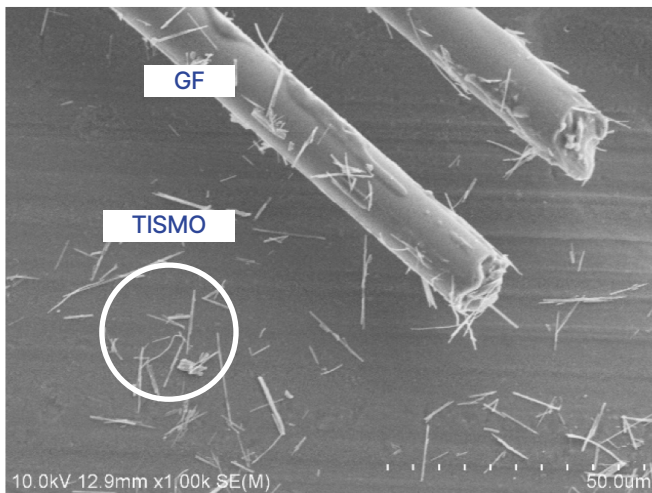


Comparison of thermal conductivity between potassium hexatitanate fiber-sintered material vs other heat-resistant material-sintered materials.

Heat Reflection: Whiteness



- Exhibits very low thermal conductivity due to its material properties (unique crystal structure).
- Not only TISMO fiber can reflect short wavelengths as TiO₂, but also give reinforcing and heat resistant properties.



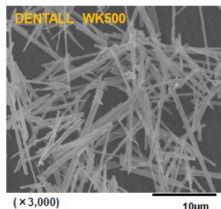
SEM: Difference in size between GF and Tismo

DENTALL WK500

Additive that improves the electrical conductivity of resins and paints

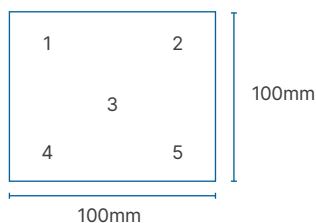
DENTALL is a ceramic fiber coated with a nano-conductive layer. It is mainly used to improve the electrical conductivity of the material in which it is added. It has a stable conductivity in several exposure scenarios and in a wide concentration range, as well as an excellent dispersibility and colorability.

Appearance	Light Grey
Smell	Odourless
Resistance	1-20 Ω
Whiteness	~79 (L value)
Average fiber length	5-15 μm
Specific surface area	15-25 m^2/g (BET)
Moisture	> 1,5
pH (dispersed in water)	3 - 5
Bulk viscosity	0,2 - 0,4 g/cm^3
Dispersibility	Water and toluene
Melting point	1400 - 1450 $^{\circ}\text{C}$

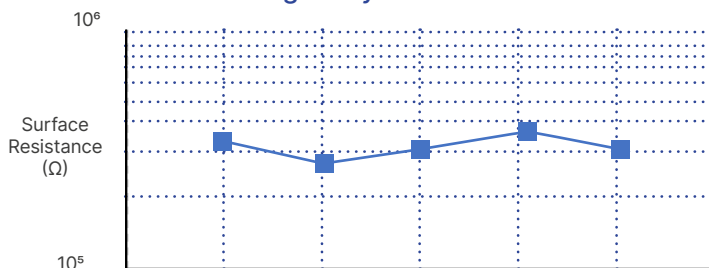


Detail WK 500

Measuring Points



Regularity of surface Resistance



Advantages

- Stable conductivity.
- Homogeneous conductivity.
- Excellent dispersibility.
- Colourability for white and transparent types.
- Conductivity over a wide range, which is consistent, and easy control (10^{-4} - 10^{-9} Ω).

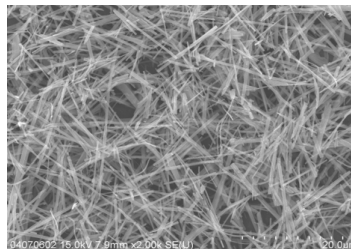
Packaging

- Supply in a 10 kg paper bag and in a 200 kg pallet.

Dosage / Concentration

- 10 - 30 wt % depending on the application.

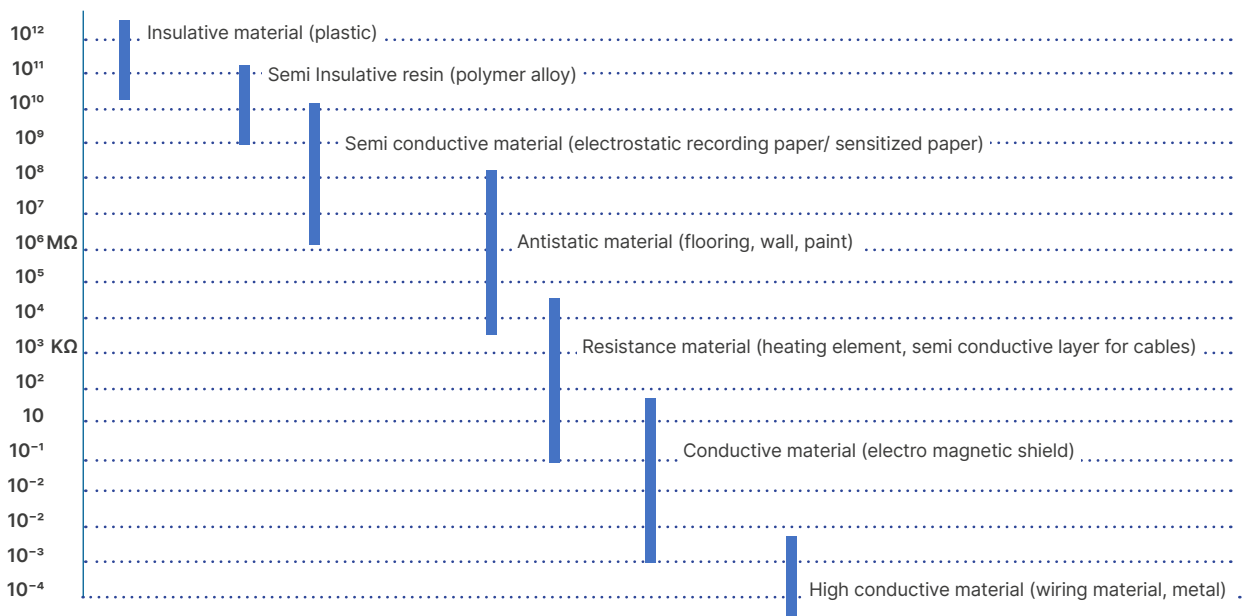
Fibers dispersion in the coating



APPLICATIONS

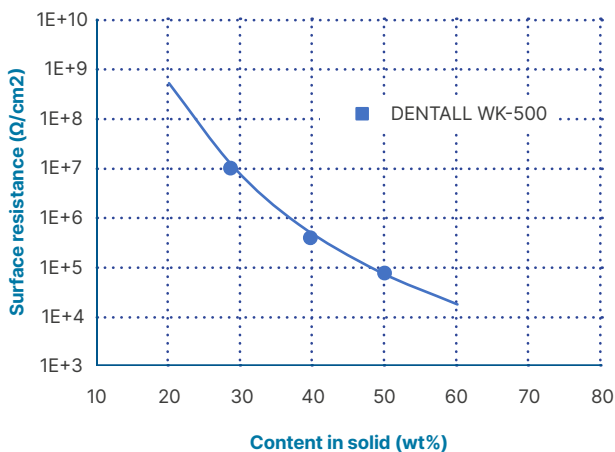
- Coatings (adhesives, composites, paints...).
- Electrostatic discharge (ESD) parts.
- Conductive films.
- Layout and electrostatic printing.
- Anti-static floors and walls.

Resistivity ($\Omega \cdot \text{Cm}$)

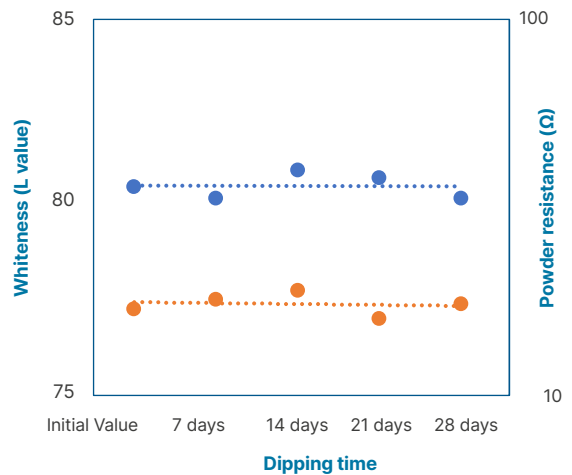


Conductivity vs. Content in Chlorinated PP

Water Adsorption

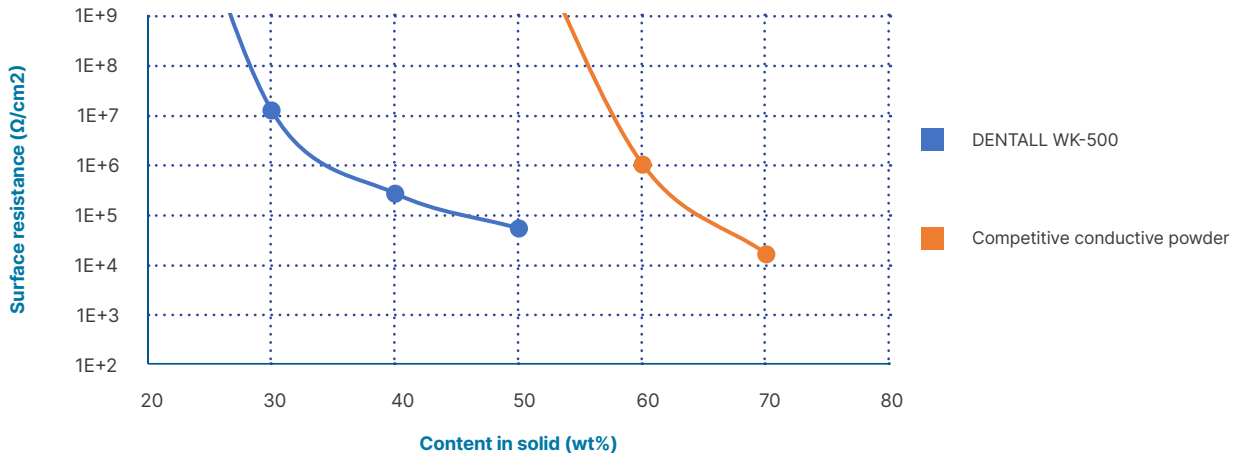


Acid and alkaline resistance (Dipping in under 10% HCL and NaOH)



Conductivity vs. Content in acrylic resin

Solvent base paint



Conductive Primer (10% Dentall WK-500)

Formulation	Surface resistance (Ω/cm ²)	Adhesion Test (JIS K- 5600)	Paint thickness (μm)
Water base	2-5 × 10 ⁶	0	15 - 20
Solvent base	1-5 × 10 ⁶	0	15 - 20
non-halogen Solvent	1-5 × 10 ⁶	0	15 - 20
Solvent base (pellet)	2-5 × 10 ⁶	0	15 - 20



Plastic **compound** based on titanate fibers (TISMO) that provides reinforcement and other physical properties to final products.



General Characteristics		General Characteristics		General Characteristics	
Grade	NTE 264	Grade	OA 30	Grade	BT 213
Matrix	PA66	Matrix	POM	Matrix	PBT
Specific gravity	1,38 g/cm ³	Specific gravity	1,68 g/cm ³	Specific gravity	1,32 g/cm ³
Water absorption rate	1,00%	Water absorption rate	0,20%	Tensile strength	55 Mpa
Tensile modules	119 MPa	Tensile modules	111 Mpa	Elongation at break	13,6 %
Tensile strain at yield	3,7%	Tensile strain at yield	3,5%	Flexural strength	81 MPa
Flexural strength	177 Mpa	Flexural strength	169 Mpa	Flexural modulus	2,7 GPa
Flexural modulus	7,5 Pa	Flexural modulus	8,8 Gpa	Izod impact (notched)	78 J/m
Izod impact (notched)	39 J/m	Izod impact (notched)	44 J/m	Heat deformation temperature	156 °C (0,45 MPa)
Heat deformation temperature	225 °C	Heat deformation temperature	153 °C	Heat deformation temperature	82 °C (1,82 MPa)
Heat expansion coef.	2,5×10 ⁻⁵ m/m/K	Heat expansion coef.	3.0×10 ⁻⁵ m/m/K	Friction coefficient	0,26
Friction coefficient	0,15	Friction coefficient	0,28	Sp. Abrasion volume	2,9×10 ⁻³ mm3/N* km
Abrasion ratio	6×10 ⁻⁴ mm3/N*km	Abrasion ratio	0.296X10 ⁻¹ mm3/N*km	Sp. Abrasion of counterpart	0,0 mm ³ /N*km
Abrasion rate of opponent material	10 ⁻¹ mm3/N*km	Abrasion rate of opponent material	10 ⁻¹ mm ³ /N*km		

Features:

- Sliding performance
- Accuracy of dimension
- Hardness
- Surface smoothness



- **Features:** Microreinforcement
- **Conventional material:** Metal
- **Adoption reason:** Extension of microreinforcement and provision of good sliding performance at cog of gear



- **Features:** Microreinforcement
- **Conventional material:** Metal
- **Adoption reason:** Extension of microreinforcement and provision of good sliding performance at cog of gear



Packaging

- 25 kg in an aluminium sealed paper moisture-proof bag / 500 kg pallet



Resin: Engineering Plastics



TISMO: Potassium Titanate



Pelletizing



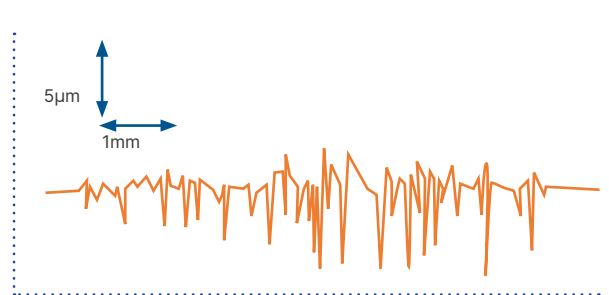
Performance Compound POTICON

Surface roughness of molding



Poticon NTE264
PA66 Base TISMO30%

Ra= 0.05



GF30wt%
PA66 Base

Ra= 0.80

POTICON
30 wt% TISMO

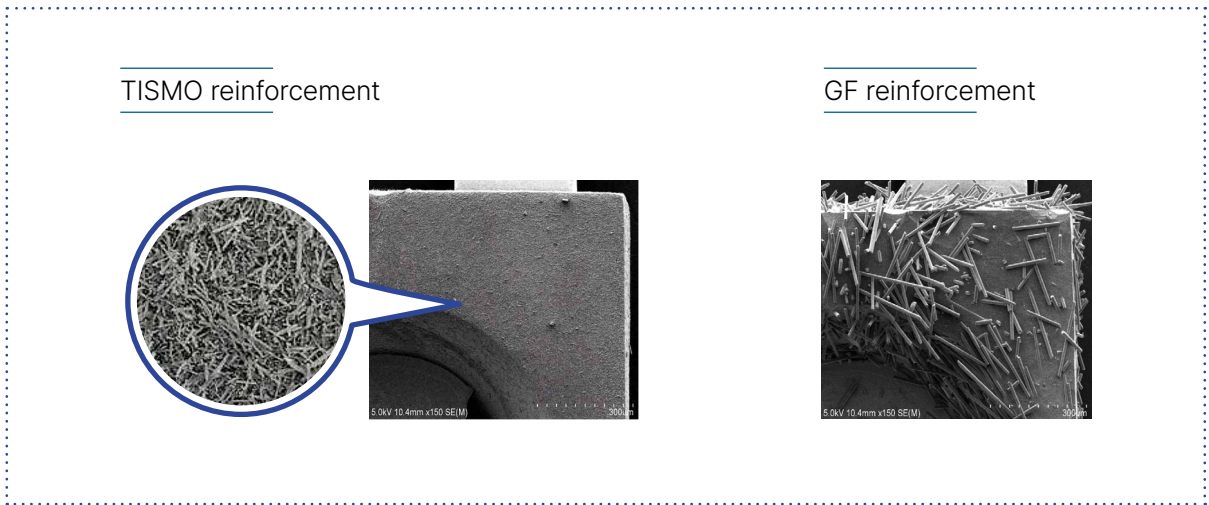


Glass Fiber

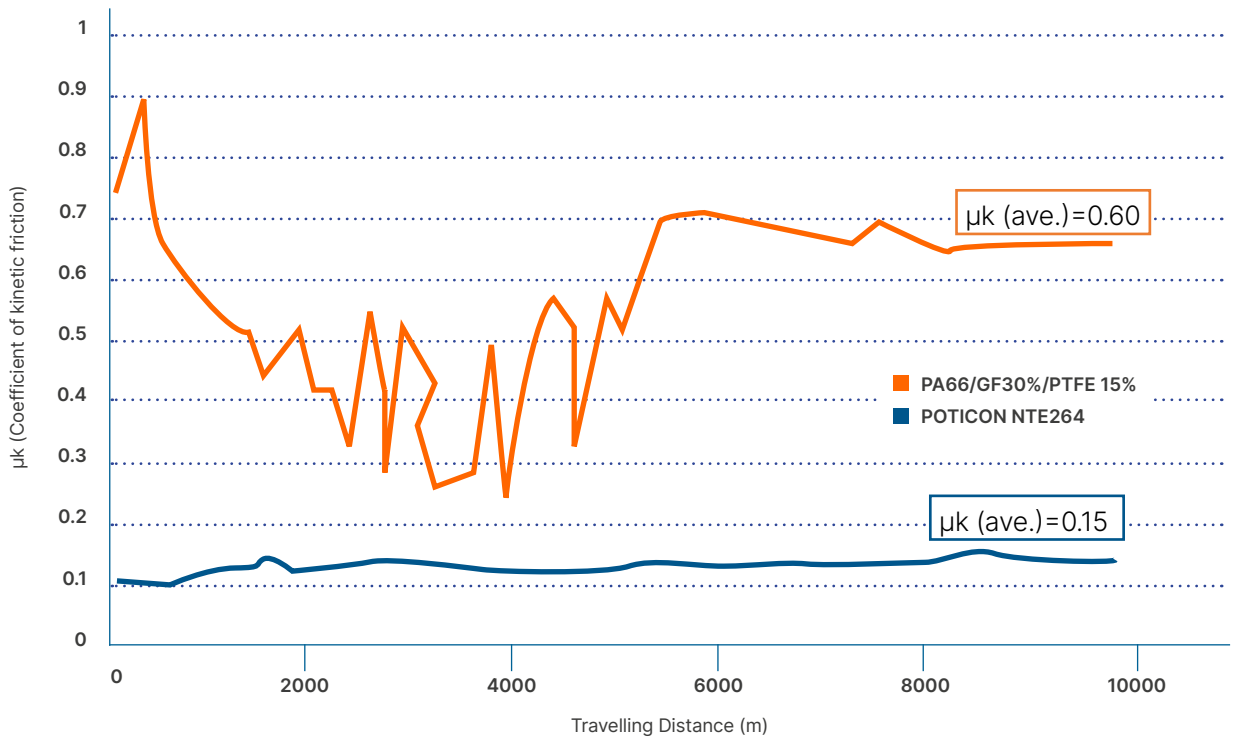


Al: 5056

70 wt% PA66 base both samples
Test conditions: Face pressure P=1MPa, Sliding velocity
V=0.3m/sec, Test time T=10min

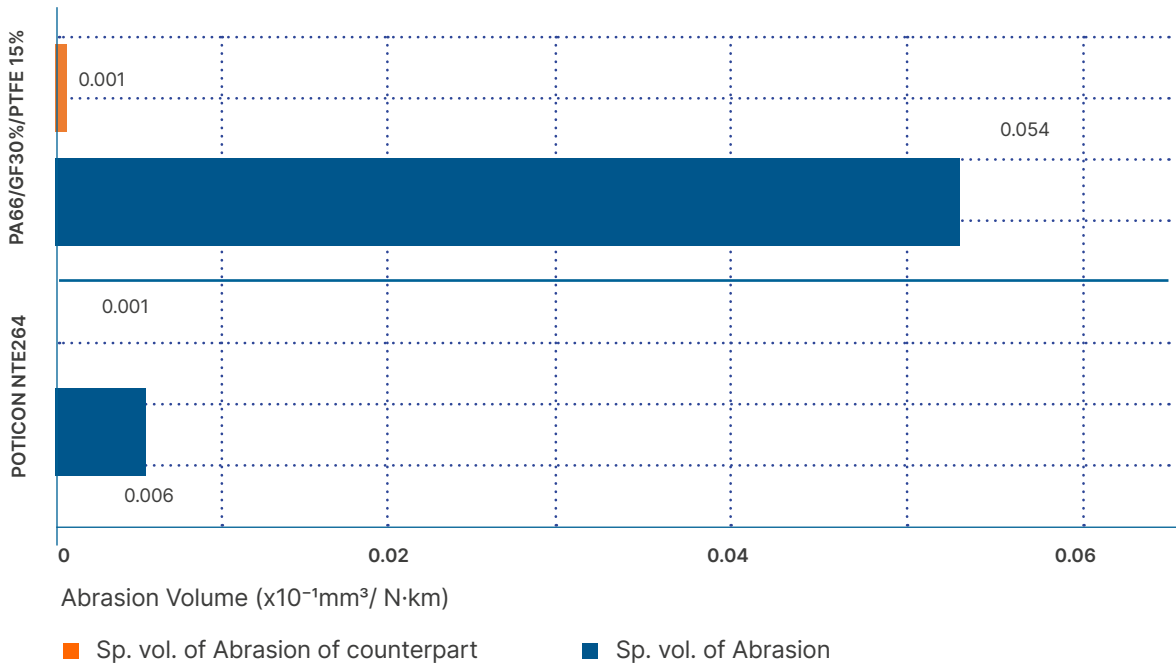


Comparison of Sliding Property of PA66-based POTICON and (PA66/GF30%/PTFE15%)



Test conditions: Face pressure P=1Mpa, Sliding velocity V=0.3/sec, Traveling distance L=10km

Comparison of Sliding Property of PA66-based POTICON and (PA66/GF30%/PTFE15%)



Test conditions: Face pressure $P=1\text{Mpa}$, Sliding velocity $V=0.3/\text{sec}$, Traveling distance $L=10\text{km}$

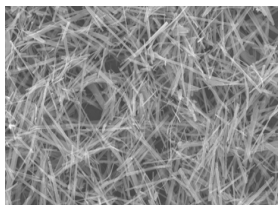
Main benefits

- Microscopic reinforcement.
- Easy processing.
- Excellent abrasion property.
- Surface smoothness.
- Small parts production.
- Easy recyclability.
- Excellent sliding: allows unrestricted movement on aluminium and free-cutting steel surfaces without the need for lubrication.

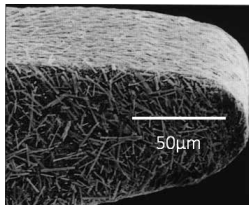
POTICON 3D FILAMENT

Fiber-reinforced with TISMO used for functional parts

Make 3D printing more practical! FDM filament made of Poticon which is fiber reinforced with Otsuka Chemical's TISMO enables not only "shape recognition," but also "durable parts" and "small-volume and multi-line production."



TISMO
(Potassium titanate fiber)



Injection mold
Reinforcing precision parts

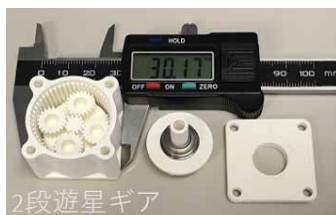
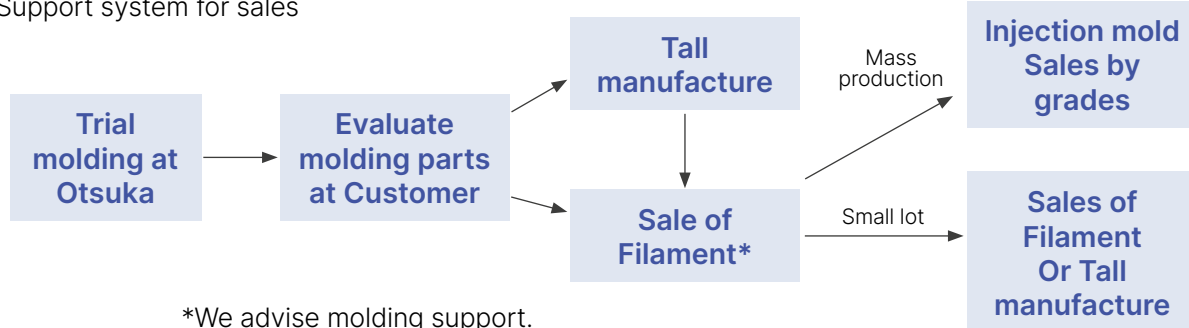


Poticon
FDM Filament



Poticon
FDM molding

Support system for sales



Advantages of POTICON filament:

- Durability evaluation prototype
- Small lot mass production
- Cost reduction of prototype
- Shortened delivery time for prototype parts
- Weight reduction of parts

- 1 Mechanical strength close to injection molded products of Nylon resin base (*LEXTER™ is a bio-based polyamide made from Mitsubishi Gas Chemical).
- 2 Long-term stable modeling without damage of the printer nozzle.
- 3 Can be used directly from molding and simplified post processing reduced to 141 °C by activation.

1 Mechanical strength close to injection molded products by Nylon resin base

The physical properties of LEXTER* are similar to PA6, and POTICON 3D modeling parts can be used for injection molded products. We also have various Poticon grades with a wide range of properties for injection molding.

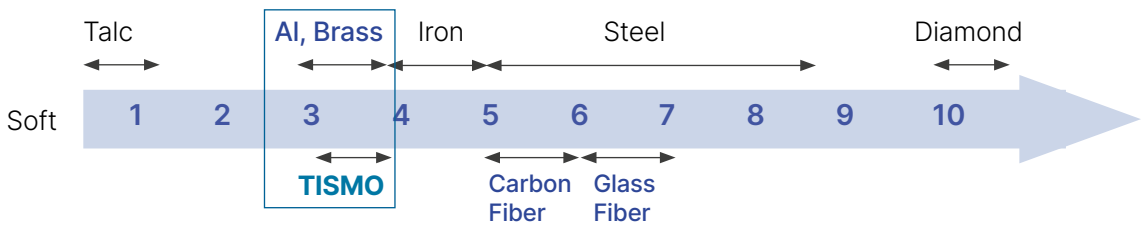
*LEXTER™ is a bio-based polyamide made from Mitsubishi Gas Chemical

Material	Feature		Tensile strength (MPa)	Bending strength (MPa)	Flexural modulus (GPa)	deflection temp. under load (°C) 0.45MPa
	mold	test	ISO 527-1	ISO178	ISO 178	ISO75-2/B
Neat LEXTER*	3D mold		72	103	2.6	80
Poticon filament NTL34M	3D mold		114	187	7.0	96
	Injection mold		91	140	5.6	93
Poticon filament NTL36	3D mold		134	209	9.7	110
	Injection mold		110	171	8.0	103

2 Long-term stable modeling without scraping the printer nozzle

Because TISMO has a Moh's hardness of 4 and is softer than glass fiber and carbon fiber, it does not grind soft metal nozzles (aluminum or brass).

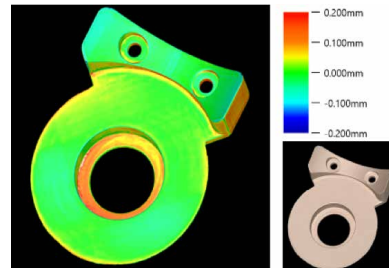
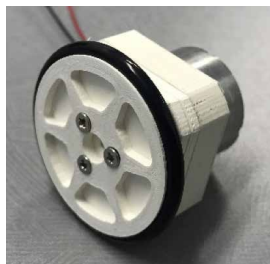
Moh's hardness (TISMO does not grind aluminum or brass.)



3 Can be used directly from molding and simplified post-processing

It can be used for driving/sliding parts such as self propelled robot body and gears.

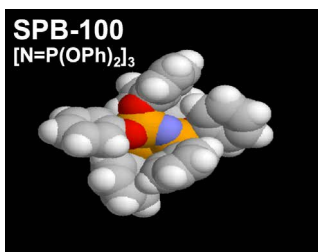
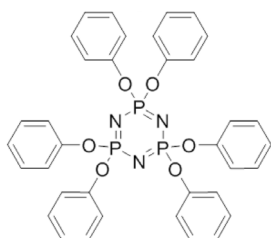
Excellent smoothness without polishing.



SPB-100

Halogen-free flame retardant

SPB-100 is a phosphazene compound for the **non-halogen flame retardant market** developed by Otsuka Chemical. This compound is composed of phosphorus and nitrogen atoms which provide flame retardancy properties. Our material offers superior moisture and heat resistance.



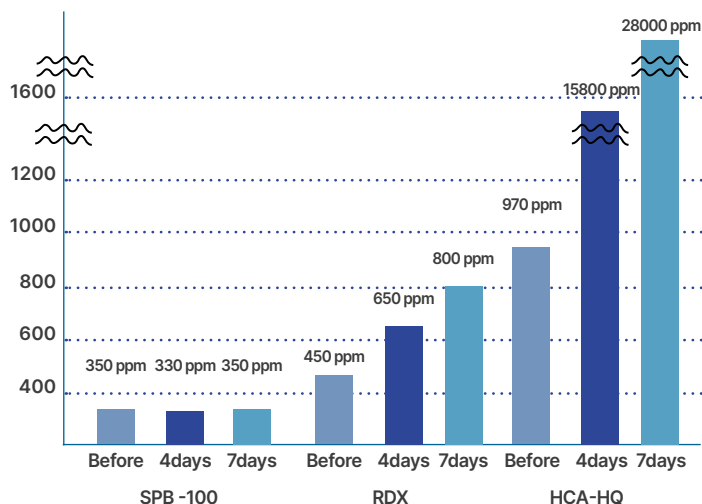
Advantages

- Non-halogen green chemistry.
- Outstanding hydrolysis resistance.
- Superior heat resistance; it can be used in a variety of engineering plastics.
- Melts with heat and dissolves in solvents, it can be used in wide range of applications.

Applications

- Circuit boards adhesives.
- Functional sealants.
- High frequency components.
- Adhesives.
- FR paints and coatings.
- Electronic casings and connectors.

Absorption properties:



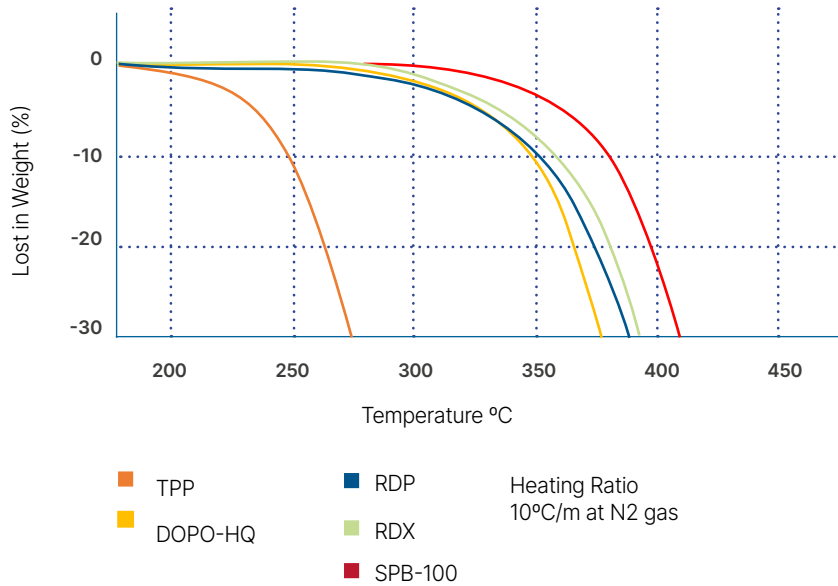
General properties

Appearance	White-pale yellow granule
Decomposition point	360 °C
Melting point	90 - 110 °C
5% weight loss temperature	> 350 °C
Moisture	< 0,1 %

Solubility (100 ml solvent)

MEK	70
Toluene	43
Cyclohexanone	95
Acetone	47
N-N Dimethylformamide	86
Methanol	0,1
Ethanol	0,2
Ethylene glycol Mono methyl ether	6,2
Propylene glycol Mono methyl ether	5,8

Thermal properties:



PC/ABS

- Test type: UL-94 Vertical Burning Test .
- Sample preparation: mixing, molding in twin-screw extruder, and injection.
- Sample Thickness: 1.6mm.

PC/PBT

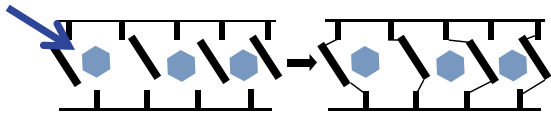
- Test type: UL-94 Vertical Burning Test.
- Sample preparation: mixing, molding in twin-screw extruder, and injection.
- Sample Thickness: 1.6mm.

FR	PC resin (phr)	ABS (phr)	FR (phr)	PTFE (phr)	UL-94 (phr)	FR	PC resin (phr)	ABS (phr)	FR (phr)	PTFE (phr)	UL-94 (phr)
SPB-100	75	25	7.5	0.5	V-1	SPB-100	75	25	7.5	0.5	V-0
RDX	75	25	7.5	0.5	V-2	RDX	75	25	7.5	0.5	V-1
SPB-100	75	25	10	0.5	V-1	SPB-100	75	25	10	0.5	V-0
RDX	75	25	10	0.5	V-2	RDX	75	25	10	0.5	V-0
SPB-100	75	25	12.5	0.5	V-0	SPB-100	75	25	12.5	0.5	V-0
RDX	75	25	12.5	0.5	V-0	RDX	75	25	12.5	0.5	V-0

EPOXY RESINS - Compatibility

		Epoxy resin			
		Cycloalipatic	Novolac		Bisphenol A
		Dicyclopentadiene (HP7200)	O-cresol (EOCN1020-65)	Salicylic aldehyde (EPPN 502H)	Bisphenol A (Epikote 828)
Curing agent	Bisphenol A (LF4871)	●	●	●	●
	Novolac (TD2096)	●			
	Aromatic amine (DDS)	●	●	●	

SPB-100



Sample preparation method: A glass cloth was impregnated in epoxy varnish and dried at 160°C. The obtained prepregs were lapped over 8 layers. The copper films (18µm) were overlapped on both sides. The sample was pressed at 170°C, at 4Mpa pressure in order to obtain a 1.6mm glass epoxy copper-clad laminate.

Comp.	Mat. name	Equivalent	Conc%	wt.%	Comp.	Evaluation item	Results
Epoxy resin	EXA-7200H-80M	282	80	35	Epoxy resin	UL-94	V-0
Phenol resin	LA-7051	124	70	18	Phenol resin	Solder resistancy (°C)	>260
Flame retardant	SPB-100	-	-	10	Flame retardant	Hygroscopic rate (%)	0.2
Filler	Al(OH)3	-	-	20	Filler	Peel strength (kN/m)	1.2
Curing agent	EMI	-	-	0.07	Curing agent	Glass transition temp. (°C)	138
Solvent	PGM	-	-	45	Solvent	Dielectric constant (1MHz)	4.1

OTHER PHOSPHAZENE FLAME RETARDANTS

Grades	Form	T _d (°C)	Remarks
SPV-100	Liquid	>350	<ul style="list-style-type: none"> Reactive type (Allylphenol). Constituting the thermosetting resin.
SPH-100	Powder	340	<ul style="list-style-type: none"> Reactive type (Hydroxyl Group). Possible to use as curing agent.
BP-PZ	Powder	447	<ul style="list-style-type: none"> Difficult to dissolve in Organic Solvent & water.

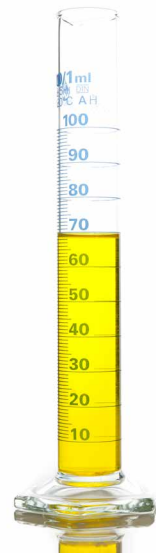
*These products are not EU REACH registered.

EPOVINSTAB H-800 D

Epoxidized soya bean oil

EPOVINSTAB H-800 D is a commonly used plasticizer and co-stabilizer for PVC.

Appearance	Viscous liquid
Colour	2-3 Gardner
Refractive index (20°)	1,4700-1,4750
Iodine index	3 g/100 max.
Oxirane index	Min. 6,4%
Acidity index	0,5 mg/1g max.
Density	0,983-1,003 g/ml
Recommended Storage & handling T	≥ 25 °C
CAS NUMBER	8013-07-8
NUMBER REACH	01-2119471314-43-0004



Packaging

- 200 kg drums, 1000 kg containers and bulk in road tanker.

Dosing

- 1 - 3 phr for rigid PVC and,
3 - 20 phr for flexible PVC.

Features

- Improvement of UV light stability.
- Sustainable product.
- **In PVC formulations:** Strong synergistic effect with a wide range of heat stabilizers for PVC (particularly with Ca/Zn and Ba/Zn stabilizers) adding good lubricating effect.

Advantages

- PVC plasticizer and co-stabilizer.
- Epoxy reactive diluent.
- Pigment dispersing agent for inks and paints.
- EPOVINSTAB H-800 D has been approved in several countries for food contact applications.

CHEMCATCH

Aldehyde Scavenger Agent

Chemcatch chemically scavenges residual aldehydes preventing the release to the open environment.

General features		
Grade	H - 1100	
Color	Crystalline White	
Appearance	Powder	
Purity	≥ 95 %	
Melting Point (°C)	185	
Shelf life	1 year	
Performance	1 g of CHEMCATCH H - 1100 to remove 0,2-0,3 g of formaldehyde. 1 g of CHEMCATCH H - 1100 to remove every 0,3-0,4 g of acetaldehyde.	
Solubility (g/100 g solvent at rt)	Water	0,1
	Ethanol	0,4
	Toluene	< 0,1
	Ethyl acetate	Not soluble

Packaging

- 15 kg cardboard box and 360 kg pallet.

Dosing

- 0,05 – 0,15% vs. POM resin.

General features	
Grade	L and W
Color	Crystalline
Appearance	Liquid
Shelf life	6 months
Performance	10 mL of CHEMCATCH L remove 0,3-0,4 g of Formaldehyde and 0,5-0,6 g of Acetaldehyde. 20 mL of CHEMCATCH W remove 0,3-0,4 g of Formaldehyde.

Packaging

- 200 Kg drum or 1000 Kg IBC.

Dosing

- For wood based products:
Flat smooth surface side 30~40g/m² and lattice plane side 50~70g/m² varying according to initial aldehyde emissions of the product and the final emissions wanted.
- For other applications:
2-5 mg/cm² according to aldehyde emission level.

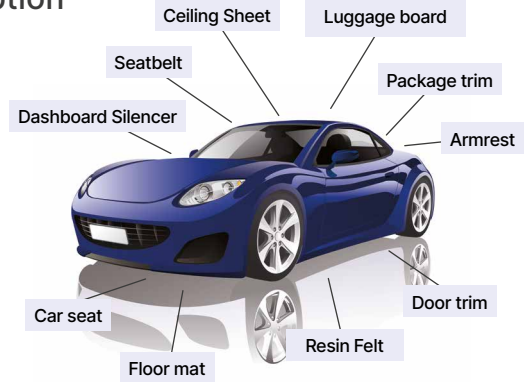
Advantages

- Easy to use (just coat or spread).
- Anti-release reaction.
- Quick and very effective aldehydes catcher.
- Selective and excellent long-lasting ability for neutralizing the hard-to-remove smell from the air.
- Availability of liquid grades internally developed at Hebron.

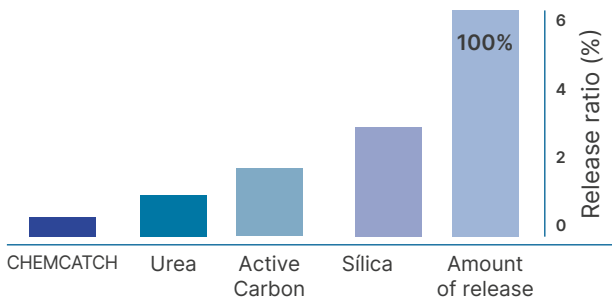
Aldehyde Catcher Agent – Chemical adsorption

MAIN APPLICATIONS

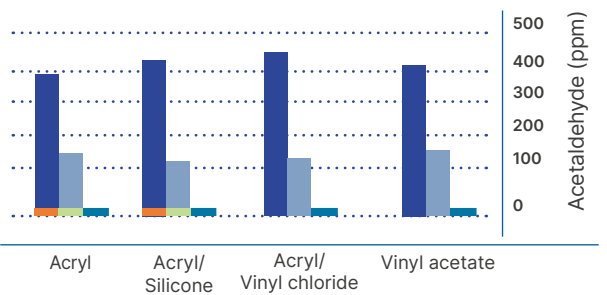
- Wood based products
- Residential and car interiors
- Natural Leathers
- Paint
- Textiles
- Construction materials
- POM



Control ability for re-emission



Acetaldehyde adsorption vs. Chemcatch concentration

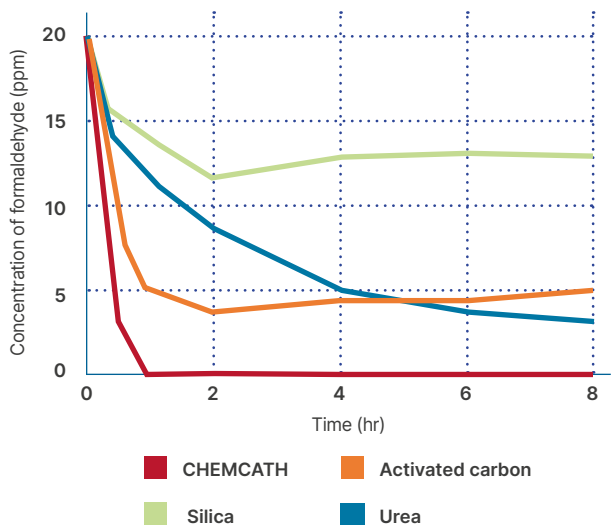


Acetaldehyde and formaldehyde concentrations

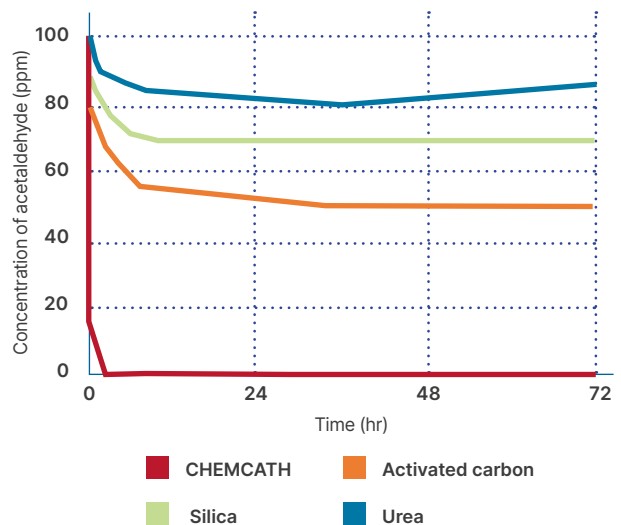
Nº	Sample	Formaldehyde (µ/TP)	Acetaldehyde (µ/TP)
1	No Chemcatch	0,1	55
2	CHEMCATCH H-1100	Not detected	8

Nº	Sample	Formaldehyde (µ/TP)	Acetaldehyde (µ/TP)
1	No Chemcatch	0,21	0,22
2	CHEMCATCH	0,05	0,10

Chemcatch adsorption ability for formaldehyde



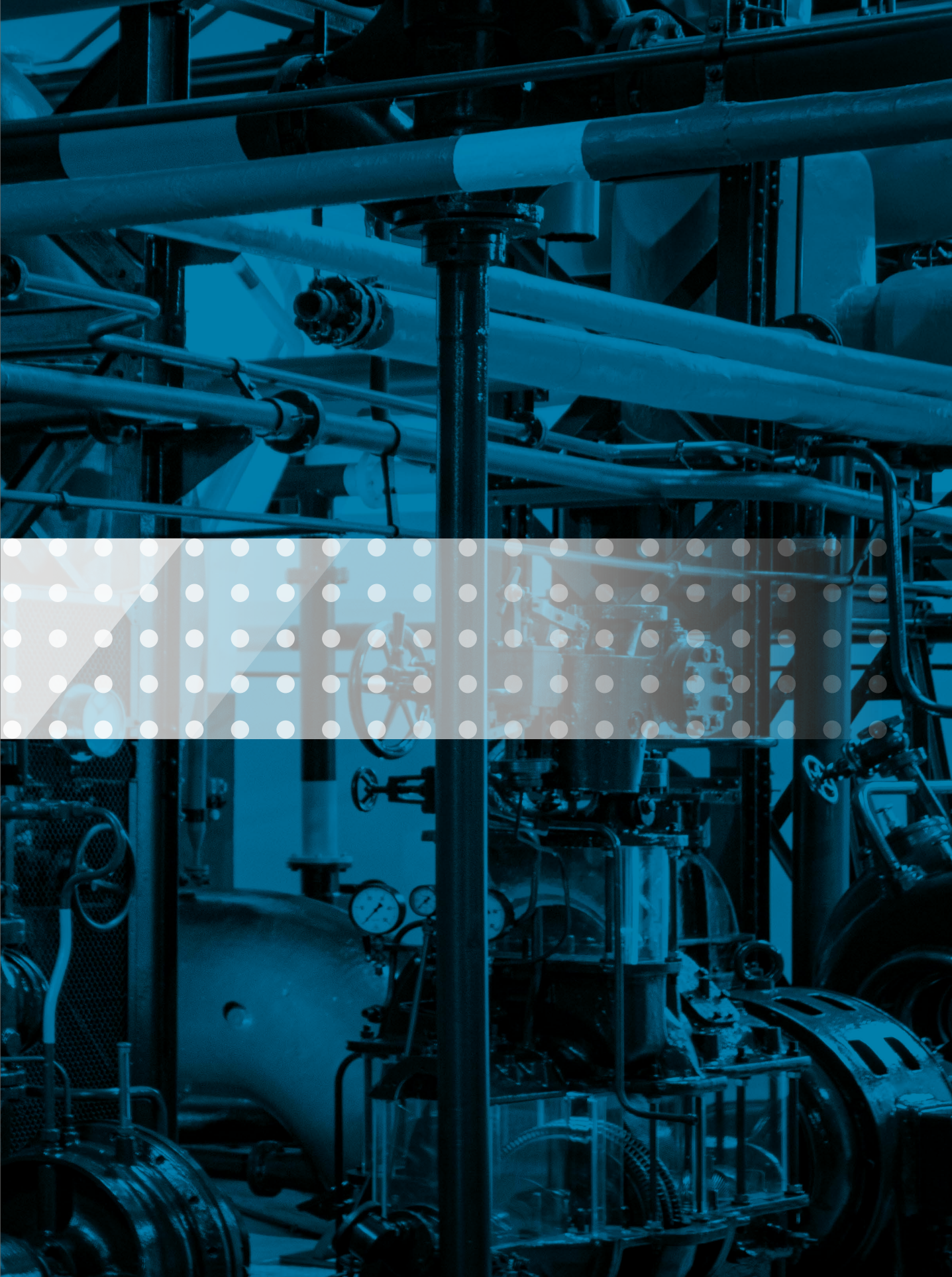
Chemcatch adsorption ability for acetaldehyde





Hebron
fine chemicals



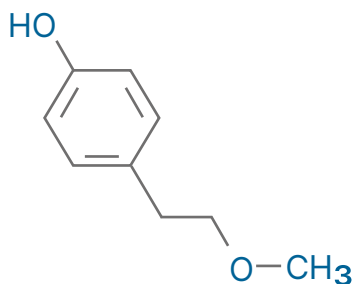


PHME

4-(2-Methoxyethyl)phenol

Pharmaceutical Intermediate

- PHME is elaborated by reacting methyl vinyl ether and 4-bromonitrobenzene.
- It is utilized for the preparation of the API metoprolol.

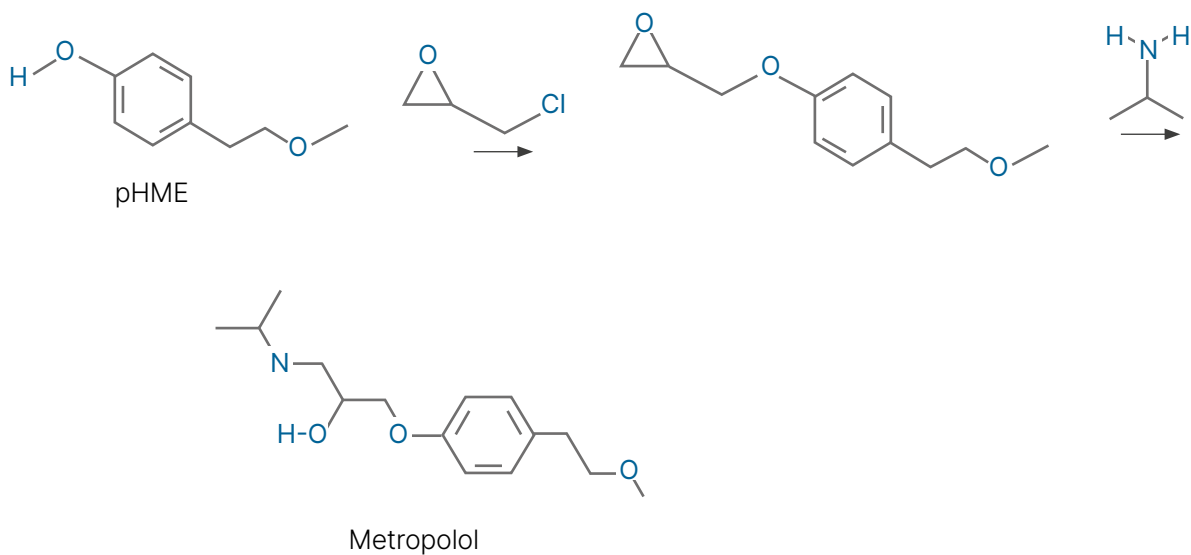


Synonyms	4-(2-methoxyethyl)-phenol; p-(2-Methoxyethyl) phenol; pMEP
Molecular Formula	C9H12O2
Molecular Weight	152,19 g/mol
Appearance	Colourless, transparent paste
Colour (APHA)	30 max
Purity	> 99,5 %
PCP	< 0,1%
OTBCL (%)	400 max
Melting Point	42- 44 °C
Heavy metal content (ppm)	20 max.
CAS Number	56718-71-9
EC Number	260-354-9
Comply with CLP and REACH registered.	

Chemical and Physical Properties

Boiling Point:	239,93 °C. @ 760.00 mm Hg (est)
Vapor Pressure:	0.025000 mmHg @ 25.00 °C. (est)
Flash Point:	208.00 °F. TCC (97.80 °C.) (est)
logP (o/w):	1.474 (est)
Topological Polar Surface Area	29.5 Å ²
Complexity	95.7
Soluble in water	8422 mg/L @ 25 °C (est)

- The API Metoprolol is synthesized from pHME



- Metoprolol is used to treat: high blood pressure, chest pain due to poor blood flow to the heart, disturbances of cardiac rhythm, hypertension, angina, acute myocardial infarction, supraventricular tachycardia, anxiety disorders.



Hebron services





Together with our mother company Otsuka Chemical Co., we are a fully integrated and adaptable CDMO partner for small and medium size agrochemical, pharmaceutical and nutritional supplement producer companies needing to develop and commercialize amides or/and Amino Acid precursors synthesized through cyanation reaction.

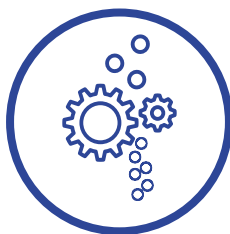
As a fine chemical synthesizer and manufacturer for more than 40 years, Hebron works under high ISO quality standards, highest compliance value and soft-GMP rules ensuring robust quality assurance.

- Annual production capacity up to 300 Tons.
- Our activity license allows us to use and storage NaCN.
- Flexible production in campaigns
- Fully automated fine chemical plant.

Solutions at every step



**Organic molecule
synthesis**



**Process Development
and Scale up**



**Regulatory affair,
product safety &
Compliance Services**



**Quality and analytical
management**



REACH & CLP advisement





Hebron

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