

PLASTIC ADDITIVES TAILOR MADE FORMULATIONS FOR FOAMS

EPS • XEPS • XPS • XPU • XPE • XPS FOOD

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GREENCHEMICALS POLICY



OUR GOAL

- 1** Developing and promoting improved Flame Retardant solutions: environment-friendly, halogen free, low dosage, dust free, migration free.
- 2** GREENCHEMICALS is very active in finding solutions to eliminate or replace substances of very high concern (SVHC Molecules) and in providing optimized solutions considering:
 - Fire Performance and thermal stability
 - Superior Environmental and health profile (more sustainable)
 - Compatibility with polymeric matrix
 - Cost/Performance
- 3** Studying chemical/mechanical recycling techniques for all plastics, with particular attention to those that contain flame retardants.

OUR FLAME RETARDANT PRODUCTS:

Masterbatches, powder blends, compacted blends, cold extruded pellets, liquid dispersions.



MASTERBATCHES



POWDER BLENDS



COMPACTED BLENDS



COLD EXTRUDED PELLETS



LIQUID DISPERSIONS

MAIN FIELDS OF APPLICATION:

- XPS, EPS, X-EPS
- XPE, XPU
- Engineering Thermoplastics
- Reactive flame retardants

OTHER PRODUCTS:

- Antioxidants
- Uv
- Processing aids
- Colors.



Greenchemicals products comply with **REACH, CLP, SVHC, Food Contact, RoHS** regulations. **GREENCHEMICALS Srl** is determined to pursue the continuous improvement in all aspects of its work.

QUALITY MANAGEMENT SYSTEM

Greenchemicals decided to adopt Quality Management System (QMS) in compliance with **ISO 9001 STANDARD** to improve all activities associated with the quality.

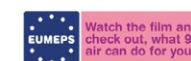


To allow a better Family management, GreenChemicals, since the beginning, supports **smart working, part time** and **flexible working time**.

MEMBERSHIP:

pinfa

Phosphorus, Inorganic & Nitrogen Flame Retardants Association



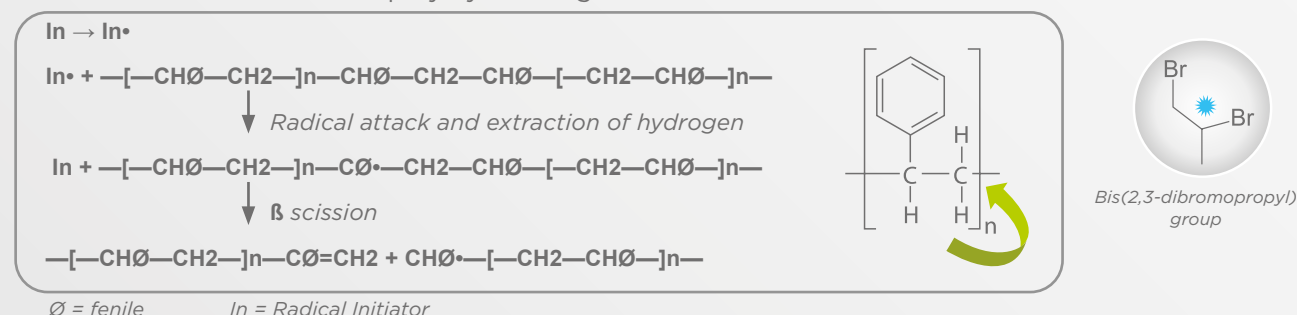


FLAME RETARDANTS IN POLYSTYRENE

FLAME RETARDANT MECHANISM IN POLYSTYRENE

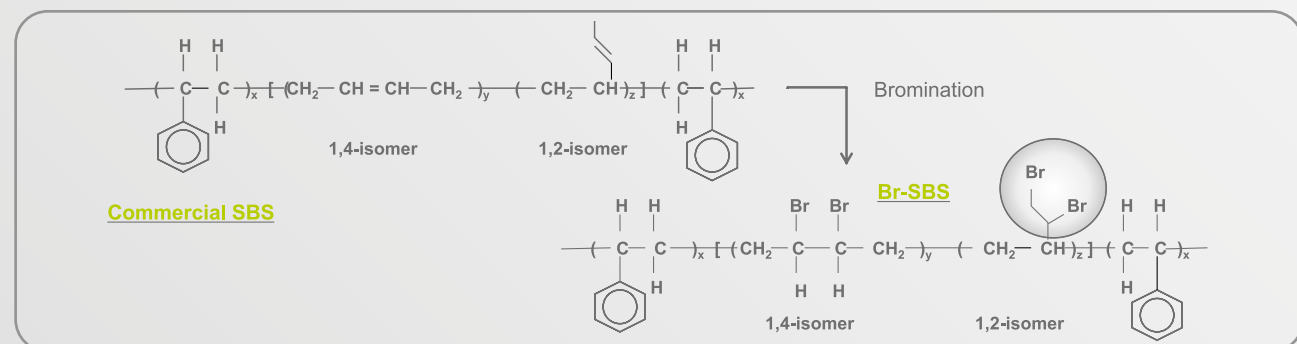
Organic Bromine compounds are very good initiators at temperatures over 280-320°C. Most effective ones are those with the bromine bonded to a secondary carbon. The bis(2,3-dibromopropyl) group is the radical initiator for this system.

Chain-scission Mechanism in polystyrene degradation:



POLYMERIC FLAME RETARDANTS IN POLYSTYRENE: HBCD FREE SOLUTIONS

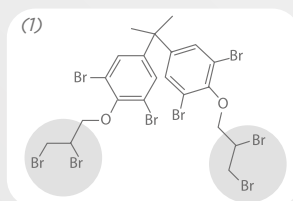
- Brominated SBS;
- Higher 1,2 isomer content on the butadiene portion means higher activity
- Total bromine level is about 66 wt%



MONOMERIC FLAME RETARDANTS IN POLYSTYRENE: HBCD FREE SOLUTIONS

Tetrabromodisphenol A bis (2,3-dibromo-propyl ether), BDDP 68 (1)

- BDDP 68 is a brominated flame retardant with 68% Br content.
- BDDP 68 is highly thermally stable and highly compatible with PS.
- It shows 2 flame retardant active groups.
- The bis(2,3-dibromopropyl) group is the radical initiator for this system.
- RECYCLING is possible.

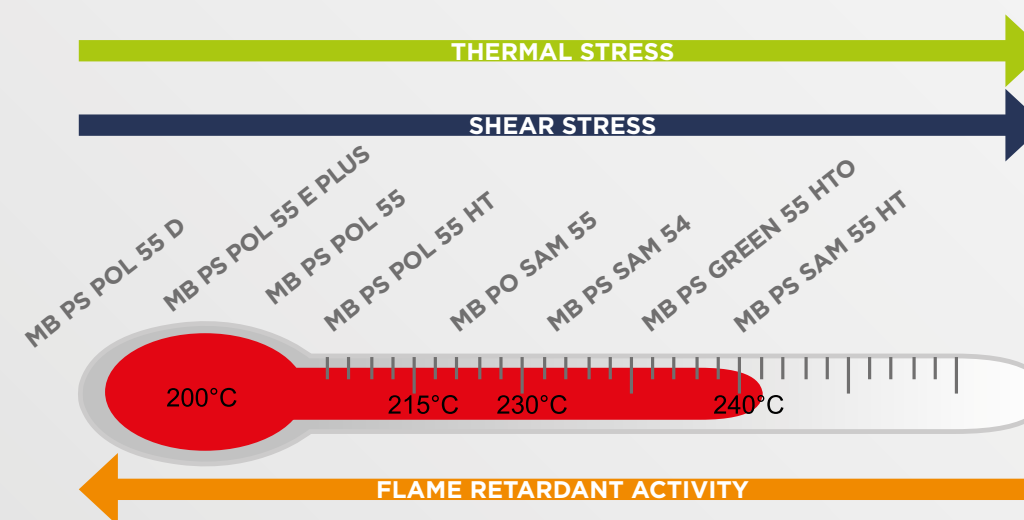


- GC BDMP66 SF are brominated flame retardants with 66% Br content.
- GC BDMP66 SF are very active and compatible with PS matrix.
- It works with synergist.
- It shows 4 flame retardant active groups.
- Aromatic Bromine shows little action.
- The bis(2,3-dibromopropyl) group is the radical initiator for this system.

HBCD FREE FORMULATIONS

- HBCD-free FR must be thermal stabilized \rightarrow Organic or Inorganic heat stabilizers
- HBCD-free FR can be synergized \rightarrow Dicumene S-stabilizers
- HBCD-free FR must be stabilized against aggressive agents and stressfull working conditions \rightarrow Antioxidants Processing aids

EXTRUSION THERMOMETER



ADDITIVES PHYSICAL FORMS

	POWDER	- Cost - Purity	- Presence of dust - Dispersion - Dosage
	COMPACTED	- Cost - Purity	- Presence of dust - Dispersion - Dosage
	MASTERBATCH	- Dispersion - Dosage - No Dust - Synergisms	- Cost - Sometimes presence of processing aids
	LIQUID	- Dispersion - Dosage - No Dust - Synergisms	- Not always possible - Sometimes presence of liquid processing aids

BLOWING AGENT

HFC TECHNOLOGY → PHASE OUT



HFC



EASY MIXING IN PS

**SOFT COMPOUND
FAST PRODUCTION**

**EASY FOR MAKING
HIGH THICKNESS**

HIGHER COSTS

**FLUCTUATING
COSTS**

**PROGRESSIVE
PRODUCTION
REDUCTION**



CO₂



CHEAP

STABLE PRICES

ALWAYS AVAILABLE

**NOT COMPATIBLE
WITH PS**

**LOWER COOLING
POWER**

**INCREASE INTERNAL
STRESS**

**NEEDS COAGENTS,
AS GASES OR SOLID**

PROCESSING AID

NECESSARY WHEN CO₂ USED

They create a better environment for CO₂ to stay

THEY MAKE A SOFTER COMPOUND

They allow to produce at higher speed

THEY MAKE EASIER WORKING WITH Polymeric-FR

THEY ALLOW TO HAVE BETTER SKIN

NUCLEATING MASTERBATCH BASED ON TALC

Talc particle is like a small sponge, which absorb blowing agent under extrusion pressure. At atmospheric pressure blowing agents expand and growth on talc particles.

The more finer and well dispersed talc is, the lower density is got.

Spherical talc is better than laminar talc for this purpose.

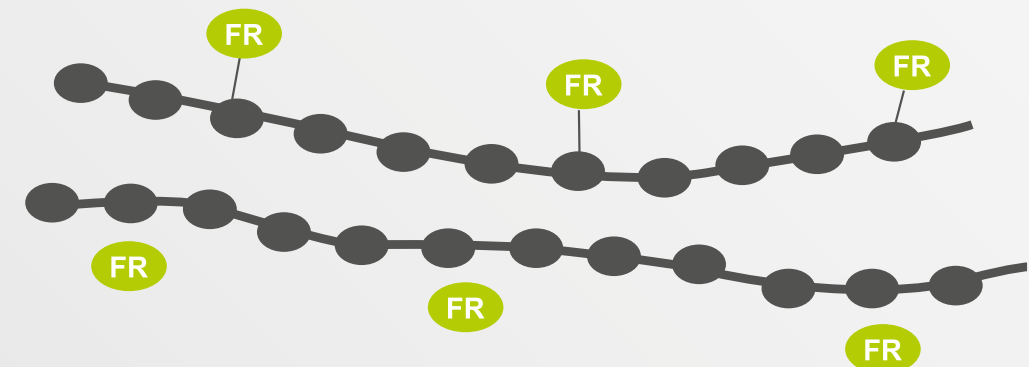
Adding some PE wax in the masterbatch helps for increasing dispersion.

REACTIVE FLAME RETARDANTS



NEW TECHNOLOGY

A Flame Retardant is considered reactive, when had been linked to the polymer through a covalent bond, or copolymerized.



Flame Retardant is linked to the polymer and dispersion is optimized;

Flame Retardant activity is double than a mixed solution;

There are no migration effect. Fire performances and mechanical properties are guaranteed for long time;

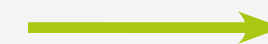
Thermal resistance increased, compared to mixing, because of additional strong bonds to the polymer;

It solves dosing problems of P based molecules;

It solves compatibility problems, between polymer and PFR

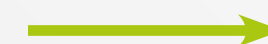
PROJECTS:

XPU



Reactive PET Polyol

PA



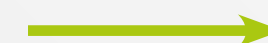
Polymer with FR copolymerized

PET



Reactive PET Polyol

XPS/EPS



Link reaction on modified PS



PRODUCTS FOR EPS

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
FLAME RETARDANTS				
GC BDMP 66 SF Reaction mass of 1,1'-(isopropylidene)bis[3,5-dibromo-4-(2,3-dibromo-2-methylpropoxy)benzene] and 1,3-dibromo-2-(2,3-dibromo-2-methylpropoxy)-5-(2-[3,5-dibromo-4-(2,3,3-tribromo-2-methylpropoxy)phenyl]propan-2-yl)benzene EC-number 944-461-4 PHYSICAL FORM: PW		EPS, XPS. Good FR efficiency.	113°C	
GC BDDP 68 Tetrabromobisphenol A bis(2,3-dibromopropyl ether) PHYSICAL FORM: GR, PW		HIPS, ABS, PP. Good thermal stability, high efficiency.	113-117°C	1% @ 299°C 5% @ 312°C 10% @ 321°C
GC D3BO 65 Tris (2,3 dibromopropyl)isocyanurate CAS n. 52434-90-9 PHYSICAL FORM: PW		PP, HIPS, ABS. Good thermal stability and efficiency.	105-115°C	1% @ 110°C 5% @ 172°C 10% @ 208°C
ANTIOXIDANTS				
GC RIANOX 1010 Tetrabimethylen(3,5-di-t-butyl-4-hydroxycinnamate)methane CAS n. 6683-19-8 PHYSICAL FORM: GR, PW, MB		Polyolefins - Engineering thermoplastics. Phenolic antioxidant, suitable for PA, PO and ABS.	110-125°C	5% @ 350°C 10% @ 365°C 25% @ 387°C
GC RIANOX 168 Tris(2,4-di-tert-butylphenyl)phosphite CAS n. 31570-04-4 PHYSICAL FORM: GR, PW, MB		Polyolefins - Engineering thermoplastics. Secondary antioxidant, generally used with THANOX 1010 and suggested for PO, PA and ABS.	183-187°C	5% @ 239°C 10% @ 250°C 25% @ 272°C
GC RIANOX 626 Bis(2,4-di-t-butylphenyl) pentaerythritol diphosphite CAS n. 26741-53-7 PHYSICAL FORM: GR, PW, MB		Polyolefins - Engineering thermoplastics. ABS, HDPE, LDPE, LLDPE, PC, PP, PVC.	160-175°C	5% @ 159°C 10% @ 215°C 25% @ 267°C
GC RIANOX 245 Triethyleneglycol-bis[3-(3-t-butyl-4-hydroxy-5-methylphenyl)propionate] CAS n. 36443-68-2 PHYSICAL FORM: GR, PW, MB		Polyurethanes - Engineering thermoplastics. Phenolic antioxidant, suitable for PA, PU, PC/ABS and SB/SBR.	76-80°C	5% @ 297°C 10% @ 312°C 25% @ 332°C
GC RIANOX 1076 Octadecyl 3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate CAS n. 2082-79-3 PHYSICAL FORM: GR, PW, MB		Engineering thermoplastics. Phenolic antioxidant, suitable for PS.	50-55°C	5% @ 260°C 10% @ 278°C 25% @ 302°C

PRODUCTS FOR EPS

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
PROCESS AIDS & STABILIZERS				
GC TCP Tricresyl Phosphate CAS n. 1330-78-5 PHYSICAL FORM: LIQ		Polyolefins. PE, PVC, Rubber, Wire&cables.	55-70 mPa·s	
GC GMS 90 Stearic acid, monester with glycerol (gms conc. ≥90) CAS n. 123-94-4 PHYSICAL FORM: PW		Plasticizer.	66,7°C	
GC DGM 95 Distilled Glycerol Monostearate CAS. n. 123-94-4 PHYSICAL FORM: PASTILLES		It can be used in plastic sector as anti-static, anti-fog or lubricant. It's a good emulsifier, dispersant, stabilizer and anti-aging starch.		
GC GMS 40 Stearic acid, monester with glycerol (gms conc. ≥ 40) CAS n. 31566-31-1 PHYSICAL FORM: FLAKES		Plasticizer.	58°-62°C	
SYNERGISTS				
GC DYCUMIL PEROXIDE Dycumil Peroxide CAS n. 80-43-3 PHYSICAL FORM: FLAKES		Synergist for Flame Retardant EPS applications. Polyolefins / elastomers (tubes, wires, tires, rubber seals).	>39°C	
GC BIPB 40 Bis (t-butylperoxy isopropil) benzene PHYSICAL FORM: PELLETS		Thermoplastic polyolefins / natural and synthetic rubber.	37-54°C	

* Other Peroxides are available upon request.

Please feel free to contact us for any other substance not mentioned in this list.
We supply material in powder, granular, masterbatch physical form and liquid dispersions.

PRODUCTS FOR XEPS

PRODUCT NAME	APPLICATION	DESCRIPTION
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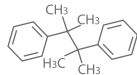
FLAME RETARDANT MASTERBATCHES

MB PS POL 55 PHYSICAL FORM: MB	Polymeric HBCD free solution for XPS.	Polymeric FR masterbatch on PS carrier with heat stabilization and synergist.
MB PS SHARP 45 PHYSICAL FORM: MB	HBCD free solution for XPS, thermal stable, cost effective.	Very active Monomeric FR masterbatch based on PS carrier stabilized and synergized.

ANTIOXIDANTS

GC AOX PS Mixture of antioxidants PHYSICAL FORM: GR, PW	Mixture of Antioxidants studied for FR XPS applications.	
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SYNERGISTS

GC DICUMENE 90 Dicumene CAS n. 1889-67-4 PHYSICAL FORM: PW	 Polyolefins - Engineering thermoplastics. Synergist for Flame Retardant XPS applications.	M.P./S.R. Viscosity: 100-110°C 
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PROCESS AID & STABILIZERS

STARAID EV G 30 PHYSICAL FORM: MB	Processing aid MB for XPS based on fat organic acid ester on EVA.	Processing aid masterbatch, based on GMS and carried on EVA.
STARAID PE OL 20 PHYSICAL FORM: MB	Processing aid MB for XPS based on fat organic acid amide on PE.	Processing aid masterbatch, based on OLEAMIDE or EUROCAMMIDE and carried on EVA.



PRODUCTS FOR XPS

PRODUCT NAME	APPLICATION	DESCRIPTION
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FLAME RETARDANT MASTERBATCHES

MB PO SAM 55 PHYSICAL FORM: MB	HBCD free solution for XPS, very thermal stable , low price.	Masterbatch based on monomeric solution on Polyolefine carrier; thermal stable, very good skin properties on final product, low price.
MB PS SAM 54 PHYSICAL FORM: MB	HBCD free solution for XPS, very thermal stable , low price.	Masterbatch based on monomeric solution on Polystyrene carrier; thermal stable, very good skin properties on final product, low price.
MB PS SAM 45 PHYSICAL FORM: MB	HBCD free solution for XPS, very thermal stable , low price.	Masterbatch based on monomeric solution on Polystyrene carrier; thermal stable, very good skin properties on final product, low price and no talc.
MB PS POL 55 PHYSICAL FORM: MB	Polymeric HBCD free solution for XPS.	Polymeric FR masterbatch on PS carrier with heat stabilization and synergist.
MB PS POL 55 E PHYSICAL FORM: MB	Polymeric HBCD free solution for XPS.	Polymeric FR masterbatch on PS carrier with heat stabilization and synergist, no talc.
MB PS POL 55 D PHYSICAL FORM: MB	Polymeric HBCD free solution for XPS, highest efficiency.	Very active Polymeric FR masterbatch on PS carrier with heat stabilization and synergist.
MB PS POL 55 R PHYSICAL FORM: MB	Polymeric HBCD free solution for XPS, cost effective.	Polymeric FR masterbatch on PS carrier with heat stabilization and synergist, very good skin properties on final product.
MB PS GREEN 55 PHYSICAL FORM: MB	Polymeric HBCD free solution for XPS, cost effective.	Thermal stable Polymeric FR masterbatch on PS carrier, synergized.
MB PS SHARP 45 PHYSICAL FORM: MB	HBCD free solution for XPS, thermal stable, cost effective.	Very active Monomeric FR masterbatch based on PS carrier stabilized and synergized.
MB PS SHARPOL 55 PHYSICAL FORM: MB	Brominated flame retardant HBCD free solution for XPS.	Combination of monomeric and polymeric flame retardant masterbatch in a polystyrene matrix.

Please feel free to contact us for any other substance not mentioned in this list.
We supply material in powder, granular, masterbatch physical form and liquid dispersions.

PRODUCTS FOR XPS

PRODUCT NAME	APPLICATION	DESCRIPTION
MB PS YAS 54 PHYSICAL FORM: MB	HBCD free solution for XPS thermal and share stabilized.	MFR-Brominated Flame retardant masterbatch, in polymeric matrix. It has superior Flame retardand properties because it containsa synergist.



BLOWING AGENTS

GC HFC 152A/DME Difluoroethane / dimethylether CAS n. 75-37-6 & 115-10-6 PHYSICAL FORM: LIQUID	Blowing agent for XPS.	
GC HFC 152/A Difluoroethane CAS n. 75-37-6 PHYSICAL FORM: LIQUID	Blowing agent for XPS, XPU.	

TALC & ENDOTHERMIC NUCLEATING MASTERBATCHES

STARCELL PS 60 PHYSICAL FORM: MB	Talc masterbatch for XPS, also pigmented.	60% active masterbatch, carried in high MFI LDPE, of talc with particle size: d50 2-4 µm.
STARCELL PS 60 U PHYSICAL FORM: MB	Talc masterbatch for XPS, also pigmented.	60% active masterbatch, carried in high MFI LDPE, of talc with particle size: d50 2-4 µm. We can offer laminar and very active spherycal talc.
STARCELL PS 60 O PHYSICAL FORM: MB	Talc masterbatch for XPS, also pigmented.	Nucleating talc masterbatch, based on PS carrier.
STARCELL PO 70 PHYSICAL FORM: MB	Talc masterbatch for XPS, also pigmented.	70% active masterbatch, carried in high MFI LDPE, of talc with particle size: d50 2-4 µm.
STARCELL PO 70 U PHYSICAL FORM: MB	Talc masterbatch for XPS, also pigmented.	70% active masterbatch, carried in high MFI LDPE, of talc with particle size: d50 2-4 µm. We can offer laminar and very active spherical talc.
STARCELL PSR 60 U PHYSICAL FORM: MB	Talc masterbatch for XPS, also pigmented.	Nucleating masterbatch, based on spherical talc and PS carrier.
MB HYDRO NUC 35 PHYSICAL FORM: MB	Nucelating masterbatch for XPS.	35% active masterbatch, carried in EVA, of chemicals endothermic blowing agent mixture.

PRODUCTS FOR XPS

PRODUCT NAME	APPLICATION	DESCRIPTION
MB HYDRO NUC 35T PHYSICAL FORM: MB	Nucleting masterbatch for XPS.	45% active masterbatch, carried in EVA of chemical and physical endothermic blowing agent mixture.

COLOR MASTERBATCHES

STARCOLOR PS series PHYSICAL FORM: MB	Color masterbatch for XPS.	Color masterbatch for XPS, filler free formulation.
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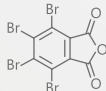
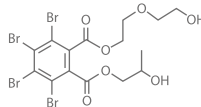
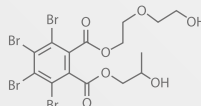
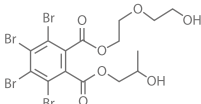
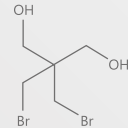
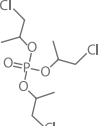
PROCESS AIDS

STARAID EV G 30 PHYSICAL FORM: MB	Processing aid MB for XPS based on fat organic acid ester on EVA.	Processing aid masterbatch, based on GMS and carried on EVA.
STARAID PE OL 20 PHYSICAL FORM: MB	Processing aid MB for XPS based on fat organic acid amide on PE.	Processing aid masterbatch, based on OLEAMIDE or EUROCAMMIDE and carried on EVA.
STARAID SAB 40 PHYSICAL FORM: MB	Antistatic masterbatch for Polystyrene.	Masterbatch based on sulfonate antistatic.
STARAID SAB 50 PHYSICAL FORM: MB	Antistatic masterbatch for Polystyrene.	Masterbatch based on sulfonate antistatic.

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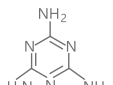
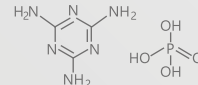
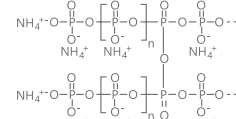


PRODUCTS FOR XPU

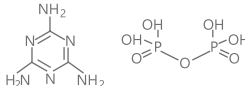

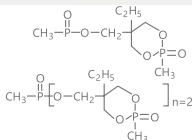
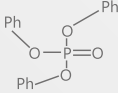
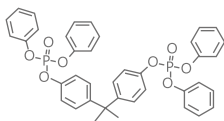
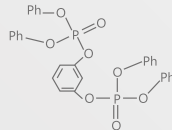
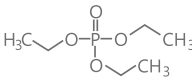
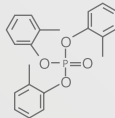
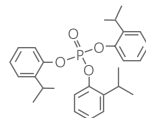
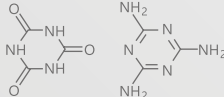
	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
PRODUCT NAME				
HALOGENATED FLAME RETARDANTS				
GC PHT Tetrabromophthalic Anhydride CAS n. 632-79-1 PHYSICAL FORM: GR, PW		Polyurethanes-Engineering thermoplastics. Rigid PU, Epoxy, PS, PHE, high fr efficiency.	280°C	1% @ 202 °C 5% @ 228°C 10% @ 240°C
GC PHT Diol LV Diol of tetrabromophthalic Anhydride CAS n. 20566-35-2 PHYSICAL FORM: LIQ		Rigid Polyurethane Foam, Urethane Elastomers and Coatings with high bromine content (Viscosity 25°C, CP 15,000-30,000).	15000 30000 cps	
GC PHT Diol MV Diol of tetrabromophthalic Anhydride CAS n. 20566-35-2 PHYSICAL FORM: LIQ		Rigid Polyurethane Foam, Urethane Elastomers and Coatings with high bromine content (Viscosity 25°C, CP 30,000-70,000).	30000 70000 cps	
GC PHT Diol HV Diol of tetrabromophthalic Anhydride CAS n. 20566-35-2 PHYSICAL FORM: LIQ		Rigid Polyurethane Foam, Urethane Elastomers and Coatings with high bromine content (Viscosity 25°C, CP 70000-120000).	70000 120000 cps	
GC DNPG 60 Dibromoneopentyl glycol CAS n. 3296-90-0 PHYSICAL FORM: PW		Polyurethanes. Rigid PU foam.	109,5°C	1% @ 196°C 5% @ 225°C 10% @ 245°C
GC TCPP Tris(2-chloropropyl)phosphate PHYSICAL FORM: LIQ		Polyurethanes. Cost efficient Flame Retardant used in PU foam, PVC, EVA and phenolics and epoxy Resin.	60-70 mPa·s	



HALOGEN FREE FLAME RETARDANTS


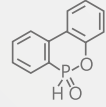
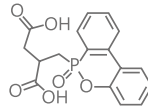
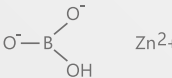
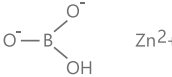
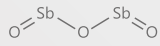
<p>GC MELAMMINA Melamine CAS n. 108-78-1 PHYSICAL FORM: GR, PW</p>		<p>Polyolefins - Polyurethanes. PP, PE, PU, Textile, Coating.</p>	<p>354°C</p>	
<p>GC MP Melamine Phosphate CAS n. 41583-09-9 PHYSICAL FORM: GR, PW</p>		<p>Polyolefins- Polyurethanes - Engineering thermoplastics. PA, Epoxy, PU, PP, Polyesters.</p>	<p>Decomposition T. > 300°C</p>	<p>1% @ 215°C 2% @ 235°C 5% @ 260°C</p>
<p>GC APP II Ammonium Polyphosphate CAS n. 68333-79-9 PHYSICAL FORM: GR, PW</p>		<p>Polyolefins- Polyurethanes - Engineering thermoplastics. PA, PP, PU, Polyesters.</p>	<p>Decomposition T. > 275°C</p>	

PRODUCTS FOR XPU

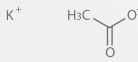
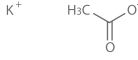
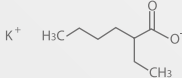
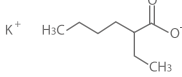


PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
GC MPF Melamine Pyrophosphate CAS n. 15541-60-3 PHYSICAL FORM: GR, PW		Polyolefins- Polyurethanes - Engineering thermoplastics. PA, Epoxy Resins, PU, Polyesters, PP.	Decomposition T. > 300°C	0,5% @ 300°C 5% @ 350°C
GC PENTAERITRIT Pentaerytritol CAS n. 115-77-5 PHYSICAL FORM: PW		Polyolefines - Polyurethanes. PP, PE, PU, Textile, Coating.	> 250°C	
GC FRP 30 Cyclic Phosphonate CAS n. 41203-81-O - CAS n. 42595-45-9 PHYSICAL FORM: LIQ		Polyurethanes - Engineering thermoplastics. Polyesters, Coating, Textile.		
GC TPP Triphenyl Phosphate CAS n. 115-86-6 PHYSICAL FORM: FLAKES, PW		Engineering thermoplastics. PC/ABS, PPO/HIPS, PVC, RUBBER, Epoxy Resin, Phenolic Resin, Acetalic Resin.	47,5-49,5°C	1% @ 198°C 5% @ 231°C 10% @ 247°C
GC BDP Bisphenol A bis(diphenylphosphate) CAS n. 5945-33-5 PHYSICAL FORM: LIQ		Polyurethanes - Engineering thermoplastics. PC, PC/ABS, ABS, SAN, Polyesters, PPO, PU.	120 cps a 80°C	1% @ 255°C 5% @ 372°C 10% @ 398°C
GC RDP Tetraphenyl Resorcinol Diphosphate CAS n. 57583-54-7 PHYSICAL FORM: LIQ		Polyurethanes - Engineering thermoplastics. PC/ABS, PPO/HIPS, TPU, PU.	500-800 cps a 80°C	2% @ 290°C 5% @ 325°C 10% @ 360°C
GC TEP Triethyl Phosphate CAS n. 78-40-0 PHYSICAL FORM: LIQ		Polyurethanes. PU.	5 mPa·s 5 mPa·s	
GC TCP Tricresyl Phosphate CAS n. 1330-78-5 PHYSICAL FORM: LIQ		PU - Polyolefins. PE, PVC, Rubber, Wire&cables.	55-70 mPa·s	
GC FOS 65 Triarylphosphate Isopropylated CAS n. 68937-41-7 PHYSICAL FORM: LIQ		Polyurethanes - Engineering thermoplastics. PVC, Phenolic, PU, Epoxy resins.	64-76 cps	1% @ 197°C 5% @ 217°C 10% @ 235°C
GC MC series Melamine Cyanurate CAS n. 37640-57-6		PU - Engineering thermoplastics. PA, Polyesters.	Decomposition T. > 350°C	1% @ 305°C 2% @ 320°C 5% @ 340°C

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We supply material in powder, granular, masterbatch physical form and liquid dispersions.*

PRODUCTS FOR XPU

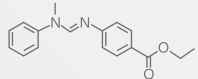
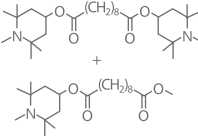
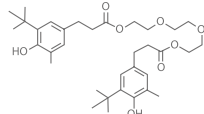
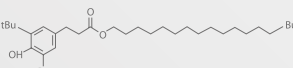
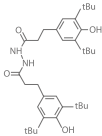
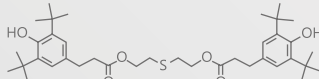
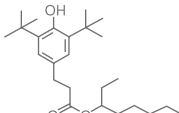
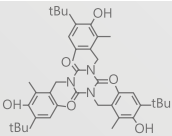
PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
<div> HALOGEN FREE FLAME RETARDANTS</div>				
GC DOPO 9,10-Dihydro-9-oxa-10-phosphaphe- nanthrene 10-oxide CAS n. 35948-25-5 PHYSICAL FORM: PW		Engineering thermoplastics. Epoxy, PU, PA, Polyesters.	117-120°C	
GC RE DDP 2-(6-Oxido-6H-diben- z,c-e, 1,2 oxaphosphorin-6-y) methyl - Butandioic acid CAS n. 63562-33-4 PHYSICAL FORM: PW		PU - PA - Polyesters. Reactive phosphorous flame retardant for PU, PA, Polyesters.	197°C	
GC Zn BO3 - 4 Zinc Borate CAS n. 12767-90-7/138265-88-0 PHYSICAL FORM: PW, COMPACTED		Polyolefins - Polyurethanes- Engineering thermoplastics. Synergist suitable for PVC, Polyolefines, PA, Rubber.	890°C	1% @ 282°C 5% @ 388°C 10% @ 425°C
GC Zn BO3 - 8 Zinc Borate CAS n. 12767-90-7/138265-88-0 PHYSICAL FORM: PW, COMPACTED		Polyolefins - Polyurethanes- Engineering thermoplastics. Synergist suitable for PVC, Polyolefines, PA, Rubber. Specially suitable for Film.	890°C	1% @ 282°C 5% @ 388°C 10% @ 425°C
GC TRIOSSIDO DI ANTIMONIO Antimony Trioxide CAS n. 1309-64-4 PHYSICAL FORM: GR, PW		Polyolefins - Polyurethanes - Engineering thermoplastics. Synergist for brominated flame retardant suitable for plastics and textiles.	656°C	

PRODUCTS FOR XPU

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
CATALYSTS				
GC K ACE 60 D Potassium acetate in DEG PHYSICAL FORM: PW		PU Catalyst.	292 °C	
GC K ACE 60 M Potassium acetate in MEG PHYSICAL FORM: PW		PU Catalyst.	292 °C	
GC K OCTO 25 D Potassium octoate PHYSICAL FORM: PW		PU rigid foam.		
GC K OCTO 25 M Potassium octoate PHYSICAL FORM: PW		PU rigid foam.		
GC TEDA 33 D 1,4-diazabicyclooctane PHYSICAL FORM: LIQ		PU Catalyst.		
GC TEDA 33 M 1,4-diazabicyclooctane PHYSICAL FORM: LIQ		PU Catalyst.		

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We supply material in powder, granular, masterbatch physical form and liquid dispersions.

PRODUCTS FOR XPU

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
UV ABSORBERS - LIGHT STABILIZERS				
GC UV-1 Ethyl 4-[[[(methylphenylamino) methylene]amino]benzoate CAS n. 57834-33-0 PHYSICAL FORM: LIQ		Polyurethanes. UV absorber especially applicable in PU system such as microcellular and integral skin foam, rigid, semirigid and flexible PU foam. Also applicable in some adhesives, elastomers and sealants.	2000 - 3000 cps at 25C°	
GC UV LS 292 2-(2H-benzotriazol-2-yl)-4,6-bis (1-methyl-1-phenylethyl)phenol CAS n. 1065336-91-5 PHYSICAL FORM: LIQ		Elastomers - Engineering thermoplastics. UV absorber applicable in wide range of polymers and applications including sealants, polyurethanes, adhesives, elastomers, unsaturated polyesters, acrylics, vinyl polymers (PVB, PVC), styrene homo and copolymers, polyolefins, liquid color concentrates, and other organic substrates.		
ANTIOXIDANTS				
GC RIANOX 245 Triethylenglycol-bis[3-(3-t-butyl-4-hydroxy-5-methylphenyl)propionate] CAS n. 36443-68-2 PHYSICAL FORM: GR, PW, MB		Polyurethanes - Engineering thermoplastics. Phenolic antioxidant, suitable for PA, PU, PC/ABS and SB/SBR.	76-80°C	5% @ 297°C 10% @ 312°C 25% @ 332°C
GC RIANOX 1076 Octadecyl 3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate CAS n. 2082-79-3 PHYSICAL FORM: GR, PW, MB		Engineering thermoplastics. Phenolic antioxidant, suitable for PS.	50-55°C	5% @ 260°C 10% @ 278°C 25% @ 302°C
GC RIANOX 1024 1,2-bis (3,5-di-t-butyl-4-hydroxyhydro-cinnamoyl) hydrazine CAS n. 32687-78-8 PHYSICAL FORM: GR, PW, MB		Polyolefins - Engineering thermoplastics. Phenolic chelating antioxidant and metal deactivator, suitable for PO, PA, Elastomers.	221-232°C	5% @ 284°C 10% @ 295°C 50% @ 330°C
GC RIANOX 1035 Thiodiethylene bis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate] CAS n. 41484-35-9 PHYSICAL FORM: GR, PW, MB		Polyurethanes - Polyolefins - Engineering thermoplastics. ABS, Elastomers, PE, PP, PUR, PVA, XLPE.	63-82°C	5% @ 291°C 10% @ 309°C 25% @ 335°C
GC RIANOX 1135 2-ethylhexyl 3,5-bis(di-tert-butyl)-4-hydroxybenzopropionate CAS n. 125643-61-0 PHYSICAL FORM: LIQ		Polyurethanes. PUR, Polyol.		1% @ 160°C 10% @ 200°C
GC RIANOX 1790 1,3,5-tris(4-tert-butyl-3-hydroxy-2,6-dimethylbenzyl)-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione CAS n. 40601-76-1 PHYSICAL FORM: GR, PW, MB		Polyurethanes- Polyolefins - Engineering thermoplastics. PU, PA, PET, ABS, Polyolefins.	159-163°C	1% @ 202°C 5% @ 333°C 10% @ 349°C

PRODUCTS FOR XPE

PRODUCT NAME	APPLICATION	DESCRIPTION
FLAME RETARDANT MASTERBATCHES		
MB PE DETO 31 PHYSICAL FORM: MB	Masterbatch for XPE.	80% active flame retardant masterbatch, carried on high MFI LDPE. Flame retardant package is a really active combination of brominate FR and antimony trioxide as synergist.
MB PE CPO 31 PHYSICAL FORM: MB	Masterbatch for XPE.	60% active flame retardant masterbatch, carried on high MFI LDPE. Flame retardant package is a combination of clorinated paraffin FR and antimony trioxide as synergist.
GC D HF 41 CE PHYSICAL FORM: MB	Masterbatch for XPE.	90% active halogen free flame retardant, carried on PE WAX. Flame retardant package is a combination of P1 base flame retardant with its antimony free synergist.
MB PE BDDP 50 PHYSICAL FORM: MB	Masterbatch for XPE.	50% active flame retardant masterbatch, carried on high MFI LDPE. It Contains an aliphatic-aromatic brominate flame retardant, antimony free.
MB PE BATO 31 PHYSICAL FORM: MB	Masterbatch for XPE.	60% active flame retardant masterbatch, carried on high MFI LDPE. Flame retardant package is a really active combination of easy melting and highly thermal stable brominate FR and antimony trioxide as synergist.
GC HF 1000 CE HALOGEN FREE PHYSICAL FORM: MB	Masterbatch for XPE.	90% active halogen free flame retardant, carried on PE WAX. Flame retardant package is a combination of P/N base flame retardant with its antimony free synergist. It works with intumescent mechanism.

COLOR MASTERBATCHES

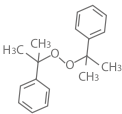
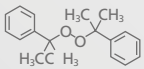
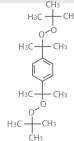
* We can offer a full range of color masterbatches, carried on GPPS and PETG.

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We supply material in powder, granular, masterbatch physical form and liquid dispersions.

PRODUCTS FOR XPE

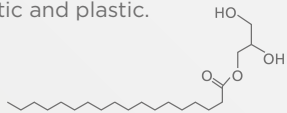
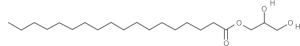
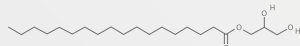
PRODUCT NAME	APPLICATION	DESCRIPTION
TALC & ENDOTHERMIC NUCLEATING MASTERBATCHES		
STARCELL PS 60 PHYSICAL FORM: MB	Talc masterbatch for XPE, also pigmented.	60% active masterbatch, carried in high MFI LDPE, of talc with particle size: d50 2-4 µm.
STARCELL PS 60 U PHYSICAL FORM: MB	Talc masterbatch for XPE, also pigmented.	60% active masterbatch, carried in high MFI LDPE, of talc with particle size: d50 2-4 µm. We can offer laminar and very active spherycal talc.
STARCELL PO 70 PHYSICAL FORM: MB	Talc masterbatch for XPE, also pigmented.	70% active masterbatch, carried in high MFI LDPE, of talc with particle size: d50 2-4 µm.
STARCELL PO 70 U PHYSICAL FORM: MB	Talc masterbatch for XPE, also pigmented.	70% active masterbatch, carried in high MFI LDPE, of talc with particle size: d50 2-4 µm. We can offer laminar and very active spherical talc.
MB HYDRO NUC 35 PHYSICAL FORM: MB	Nucleating masterbatch for XPE.	35% active masterbatch, carried in high MFI LDPE, of chemical endothermic blowing agent mixture.
MB HYDRO NUC 35 T PHYSICAL FORM: MB	Nucleating masterbatch for XPE.	45% active masterbatch, carried in high MFI LDPE, of chemical and physical endothermic blowing agent mixture.

PEROXIDES

GC DICUMYL PEROXIDE Dycumil Peroxide CAS n. 80-43-3 PHYSICAL FORM: FLAKES	Polyolefins / elastomers (tubes, wires, tires, rubber seals). M.P./S.R. Viscosity: >39°C	 98% pure dicumyl peroxide in flakes.
GC C DC 40 PHYSICAL FORM: PELLETS	Thermoplastic polyolefins / natural and synthetic rubber.	 40% active compacted pellets of dicumyl peroxide, supported by calcium carbonate and silica.
GC BIPB 40 Bis (t-butilperossi isopropil) benzene PHYSICAL FORM: PELLETS	Thermoplastic polyolefins / natural and synthetic rubber. M.P./S.R. Viscosity: 37-54°C	 40% active compacted pellets of di-(tertbutyl peroxyisopropyl) benzene, mainly known as bis-peroxide, supported by calcium carbonate and silica.

* We can offer a full range of Peroxides, pure or in diluted compacted form.

PRODUCTS FOR XPE

PRODUCT NAME	APPLICATION	DESCRIPTION
PROCESS AID AND ANTISTATICS		
GC DGM 95 Distilled glycerol monostearate PHYSICAL FORM: PASTILLES	Food, cosmetic and plastic.	 It can be used in plastic sector as anti-static, anti-fog or lubricant. It's a good emulsifier, dispersant, stabilizer and anti-aging starch.
GC GMS 90 Stearic acid, monester with glycerol (gms conc. ≥90) CAS n. 123-94-4 PHYSICAL FORM: PW	Plasticizer. M.P./S.R. Viscosity: 66,7°C	 Glycerol mono stearate tri-substituted, 90% pure, in micro-pearls or in powder form.
GC GMS 40 Stearic acid, monester with glycerol (gms conc. ≥40) CAS n. 31566-31-1 PHYSICAL FORM: FLAKES	Plasticizer. M.P./S.R. Viscosity: 66,7°C	 Glycerol mono stearate mono-substituted, 40% pure, in flakes.
STARAID EV G 30 PHYSICAL FORM: MB	Processing aid MB for XPS based on fat organic acid ester on EVA.	Processing aid masterbatch, based on GMS and carried on EVA.
STARAID PE OL 20 PHYSICAL FORM: MB	Processing aid MB for XPS based on fat organic acid amide on PE.	Processing aid masterbatch, based on OLEAMIDE or EUROCAMMIDE and carried on EVA.

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We supply material in powder, granular, masterbatch physical form and liquid dispersions.

PRODUCTS FOR XPS FOOD

PRODUCT NAME	APPLICATION	DESCRIPTION
TALC MASTERBATCHES		
MB PET GRAD PHYSICAL FORM: MB	Talc masterbatch for XPS Food.	Chain extenders series masterbatches, carried in PBT.
STARCELL PS 60 STARCELL PS 60 U PHYSICAL FORM: MB	Talc masterbatch for XPS Food.	60% active masterbatch, carried in high MFI GPPS, of talc with particle size: d50 2-4 µm. We can offer laminar and very active spherical talc (U version).
STARCELL PO 60 STARCELL PO 60 U PHYSICAL FORM: MB	Talc masterbatch for XPS Food.	60% active masterbatch, carried in high MFI LDPE, of talc with particle size: d50 2-4 µm. We can offer laminar and very active spherical talc (U version).
STARCELL PO 70 STARCELL PO 70 U PHYSICAL FORM: MB	Talc masterbatch for XPS Food.	70% active masterbatch, carried in high MFI LDPE, of talc with particle size: d50 2-4 µm. We can offer laminar and very active spherical talc (U version).
STARCELL PET 60 STARCELL PET 60 U PHYSICAL FORM: MB	Talc masterbatch for XPS Food.	60% active masterbatch, carried in high MFI PETG, of talc with particle size : d50 2-4 µm. We can offer laminar and very active spherical talc (U version).

DRAINING ANTICOLLAPSE MASTERBATCHES

STARAID SAB 50 PHYSICAL FORM: MB	Masterbatch for XPS Food.	50% active masterbatch, carried in high MFI GPPS, of sodium alkyl benzene sulphonate.
STARAID SAB 40 PHYSICAL FORM: MB	Masterbatch for XPS Food.	40% active masterbatch, carried in high MFI GPPS, of sodium alkyl benzene sulphonate.
STARAID SAB 40 MA PHYSICAL FORM: MB	Masterbatch for XPS Food.	40% active masterbatch, carried in high MFI GPPS, of sodium alkyl benzene sulphonate and synergists to create higher hydrophilic behaviour of polystyrene.
STARAID PET SAB 30 PHYSICAL FORM: MB	Masterbatch for XPS Food.	30% active masterbatch, carried in high MFI PETG, of sodium alkyl benzene sulphonate.

PRODUCTS FOR XPS FOOD

PRODUCT NAME	APPLICATION	DESCRIPTION
NUCLEATING ENDOTHERMIC MASTERBATCHES		
MB HYDRO NUC 35 PHYSICAL FORM: MB	Masterbatch for XPS Food.	35% active masterbatch, carried in EVA, of chemical endothermic blowing agent mixture.
MB HYDRO NUC 35T PHYSICAL FORM: MB	Masterbatch for XPS Food.	45% active masterbatch, carried in EVA, of chemical and physical endothermic blowing agent mixture.

COLOR MASTERBATCHES

We can offer a full range of color masterbatches, carried in GPPS and PETG.

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We supply material in powder, granular, masterbatch physical form and liquid dispersions.

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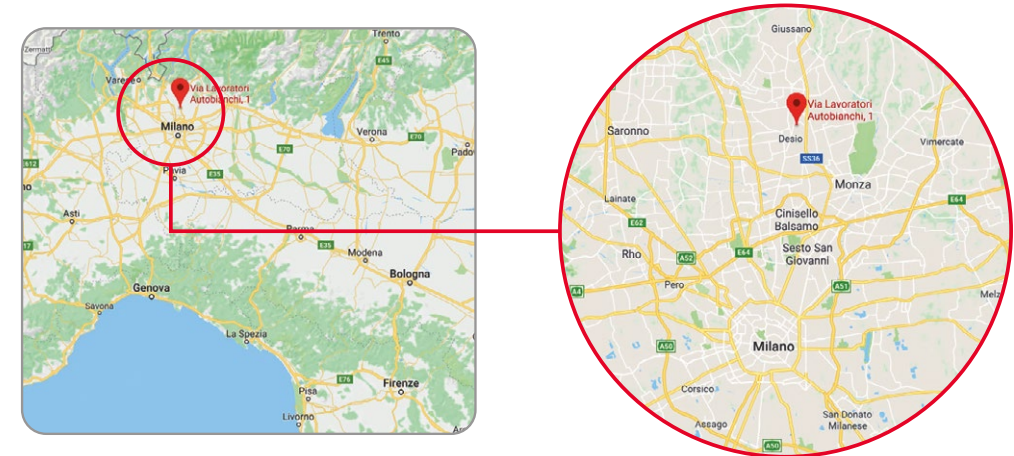
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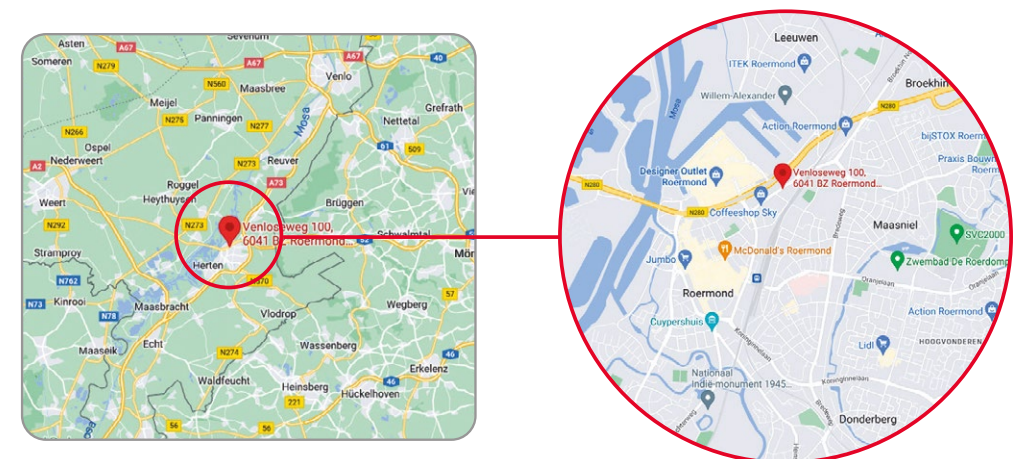
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