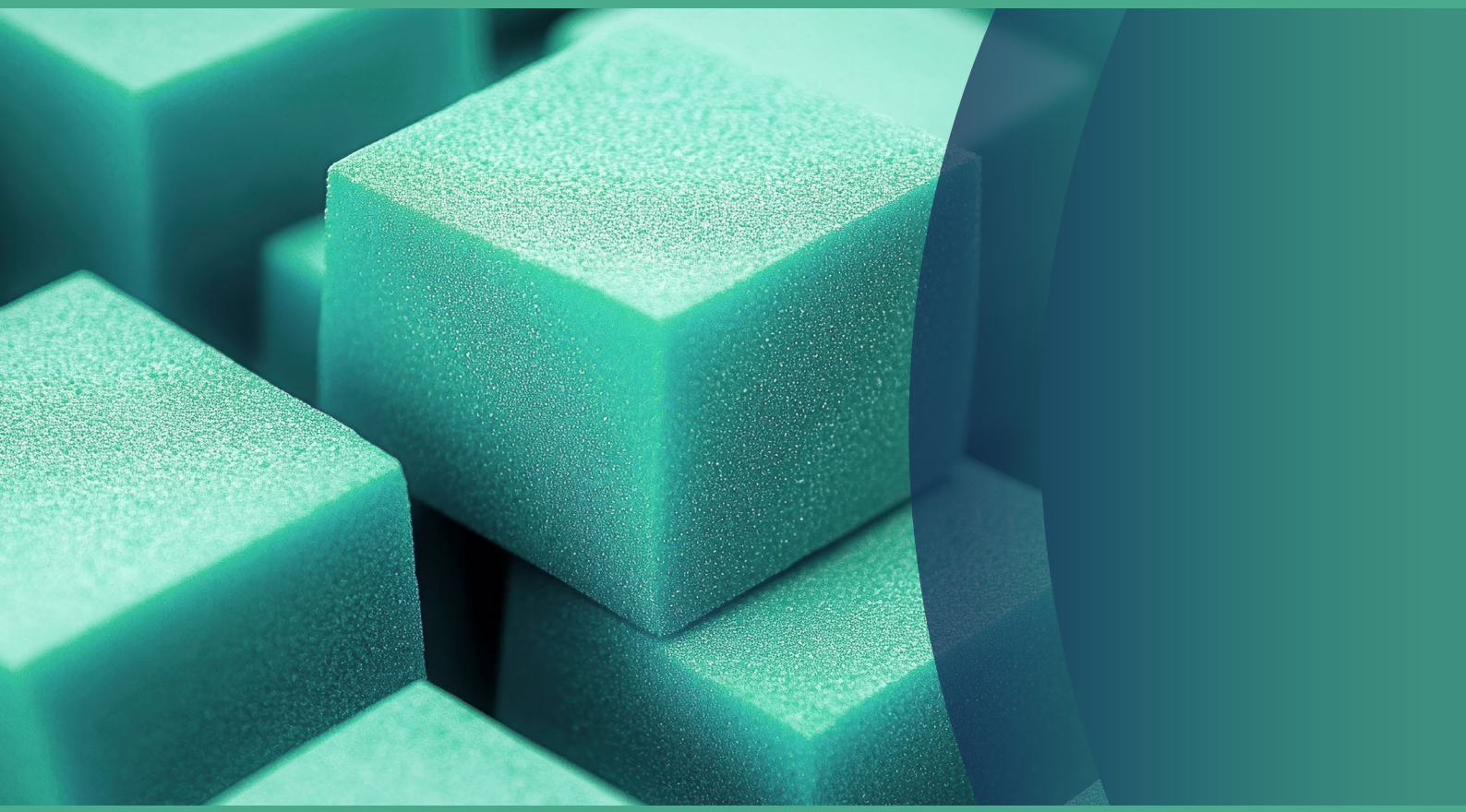
greenchemicals

THE PARTNER FOR YOUR GROWTH



PLASTIC ADDITIVES
TAILOR MADE FORMULATIONS
FOR FOAMS

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

Index

greenchemicals
THE PARTNER FOR YOUR GROWTH

Who We Are

Greenchemicals S.r.l. is an Italian company highly specialized in flame retardant additives, with a particular focus on the development of halogen-free formulations and those with low environmental impact. Greenchemicals S.r.l. has always been considered a reliable global partner in the field of plastic additives.

Greenchemicals' products comply with REACH, CLP, SVHC, Food contact, ROHS requirements, if applicable.

ABOUT GREENCHEMICALS

- Founded in 2010 by Micaela Lorenzi
- **Headquarters in Desio – Italy**; fully owned companies: **Polichem S.r.l.** (Garlasco, ITALY) and **Greenchemicals SA** (Lugano, SWITZERLAND)

greenchemicals
THE PARTNER FOR YOUR GROWTH

- Specialized in flame retardant formulations, it represents a reliable partner for **plastic additives** worldwide

MAIN FIELDS OF APPLICATION:

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

OTHER PRODUCTS:

- Antioxidants
- Uv
- Processing aids
- Color masterbatches

GC - VISION
Develop and promote performing solutions:

- Fire performance and thermal stability
- Superior Environmental and health profile (more sustainable with halogen free solutions)
- Compatibility with polymeric matrix
- Cost / Performance

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.

Greenchemicals has always supported agile working methods such as smart working, part time and flexible work schedules in order to allow for a better family management.

GC - PHYSICAL FORMS

- **Masterbatches**
- **Powder Blends**
- **Compacted Blends**
- **Cold Extruded Pellets**
- **Liquid Dispersions**

In 2024 Greenchemicals acquires

polichem
POWERED BY GREENCHEMICALS

MEMBERSHIP:

pinfa
Phosphorus, Inorganic & Nitrogen Flame Retardants Association

Flame retardants in polystyrene

FLAME RETARDANT MECHANISM

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.

HBCD free formulations

HBCD-free FR must be thermal stabilized → **Organic or Inorganic heat stabilizers**

HBCD-free FR can be synergized → **Dicumene S-stabilizers**

HBCD-free FR must be stabilized against aggressive agents and stressfull working conditions → **Antioxidants Processing aids**

Chain-scission Mechanism in polystyrene degradation:

In In·

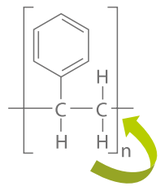
In· + —[—CHØ—CH2—]n—CHØ—CH2—CHØ—[—CH2—CHØ—]n—

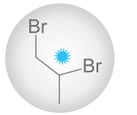
↓ Radical attack and extraction of hydrogen

In + —[—CHØ—CH2—]n—CØ·—CH2—CHØ—[—CH2—CHØ—]n—

↓ **ß** scission

—[—CHØ—CH2—]n—CØ=CH2 + CHØ·—[—CH2—CHØ—]n—

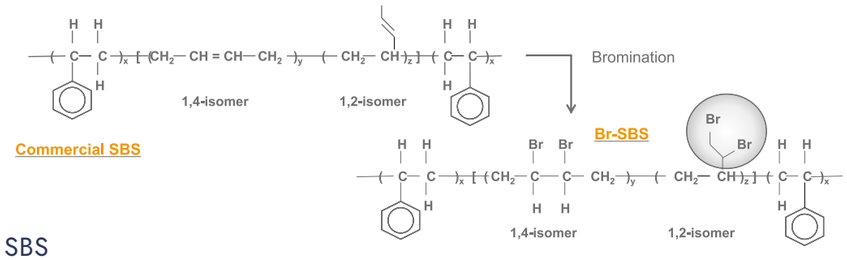




Bis(2,3-dibromopropyl) group

Ø = fenile *In = Radical Initiator*

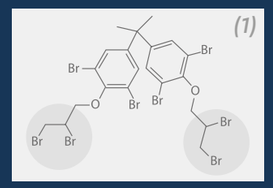
POLYMERIC FLAME RETARDANTS IN POLYSTYRENE: HBCD FREE SOLUTIONS



- 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

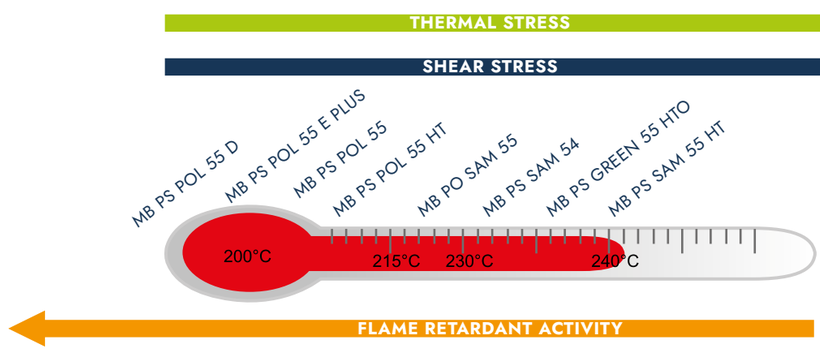
Tetrabromodisphenol A bis (2,3-dibromo-propyl ether), BDDP 68 *(1)*



- 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.

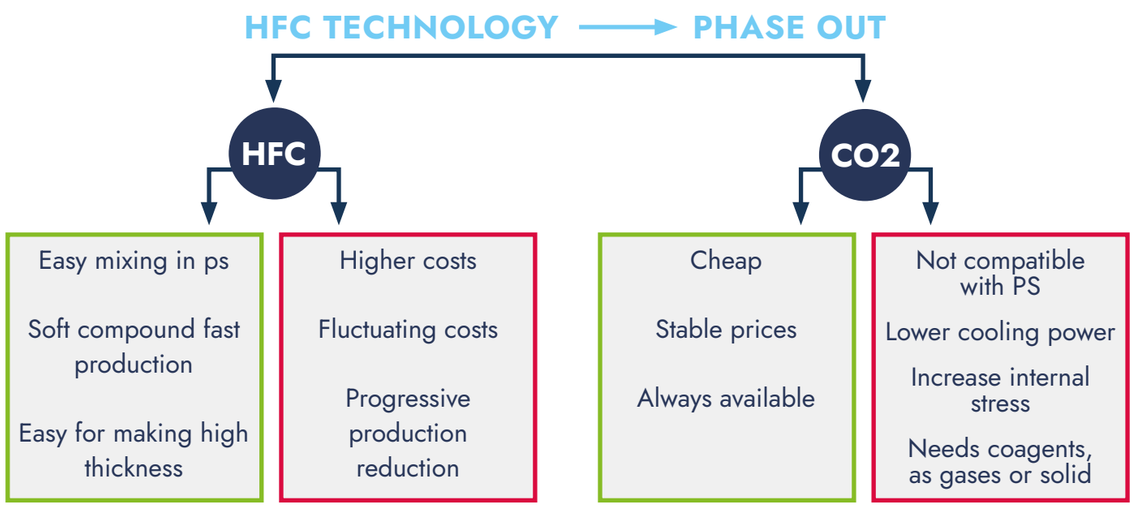
Extrusion Thermometer



Additives physical forms

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

Blowing Agents



Processing Aids

NECESSARY WHEN CO2 USED
They create a better enviroment for CO2 to stay

THEY MAKE A SOFTER COMPOUND
They allow to produce at higher speed

THEY MAKE EASIER WORKING WITH Polimeric-FR

THEY ALLOW TO HAVE BETTER SKIN

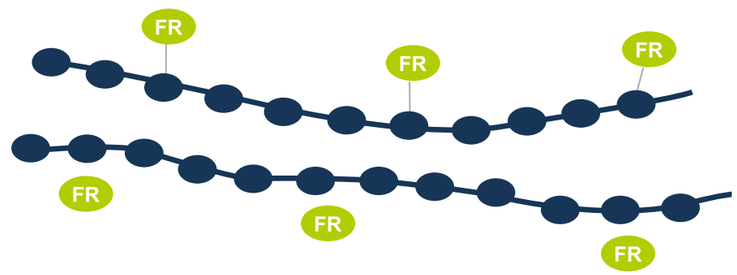
Nucleating masterbatch based on talc

Talc particle is like a small sponge, which absorb blowing agent unders 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 purspose.
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;

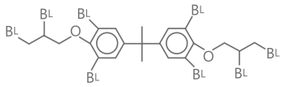
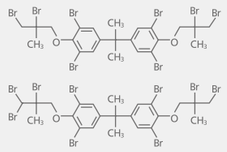
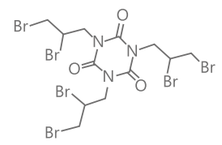
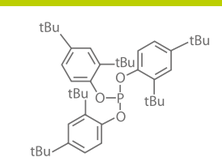
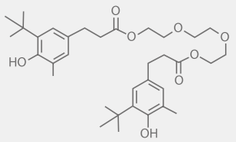
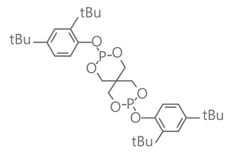
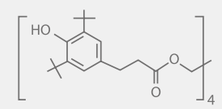
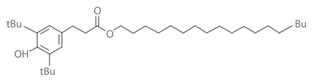
Thermal resistance increased, compared to mixing, because od additional strong bonds to the polymer;

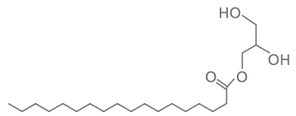
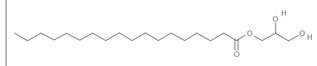
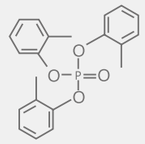
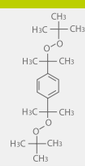
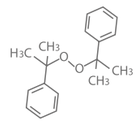
It solves dosing problems of P based molecules;

It solves compatibility problems, between polymer and PFR

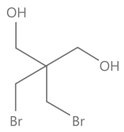
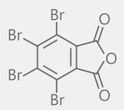
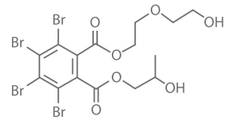
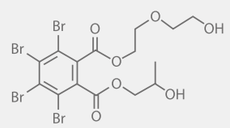
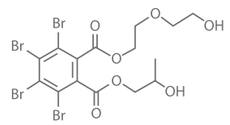
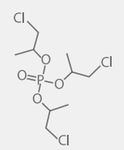
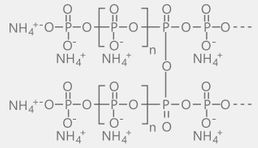
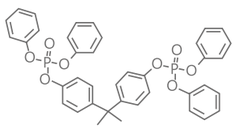
PROJECTS:

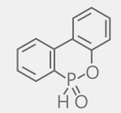
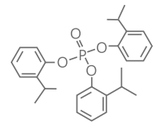
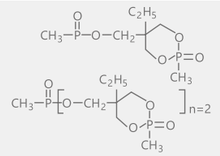
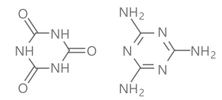
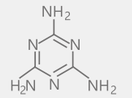
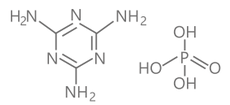
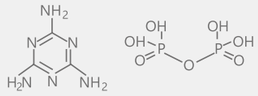
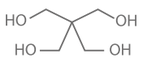
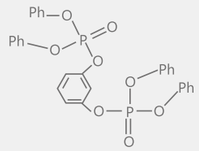
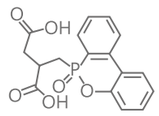
XPU	→	Reactive PET Polyol
PA	→	Polymer with FR copolymerized
PET	→	Reactive PET Polyol
XPS/EPS	→	Link reaction on modified PS

PRODUCT NAME	CHEMICAL FORMULA	APPLICATIONS	M.P./S.R Viscosity ------- TGA
Flame Retardants			
GC BDDP 68 Tetrabromobisphenol A bis(2,3 dibrompropyl ether) **PHYSICAL FORM:** GR, PW		**HIPS, ABS, PP.** Good thermal stability, high efficiency.	**M.P./S.R Viscosity** 113-117°C ------- **TGA:** 1% @ 299°C 5% @ 312°C 10% @ 321°C
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.	**M.P./S.R Viscosity** 113°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.	**M.P./S.R Viscosity** 105-115°C ------- **TGA:** 1% @ 110°C 5% @ 172°C 10% @ 208°C
Antioxidants			
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.	**M.P./S.R Viscosity** 183-187°C ------- **TGA:** 5% @ 239°C 10% @ 250°C 25% @ 272°C
GC RIANOX 245 Triethylenglycol-bis[3-(3-t-butyl-4-hydroxy-5-methylpheyl)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.	**M.P./S.R Viscosity** 76-80°C ------- **TGA:** 5% @ 297°C 10% @ 312°C 25% @ 332°C
GC RIANOX 626 Bis(2,4-di-t-butylphenyl)pentaerytrhritol diphosphite **CAS n.** 26741-53-7 **PHYSICAL FORM:** GR, PW, MB		**Polyolefins - Engineering thermoplastics.** ABS, HDPE, LDPE, LLDPE, PC, PP, PVC.	**M.P./S.R Viscosity** 160-175°C ------- **TGA:** 5% @ 159°C 10% @ 215°C 25% @ 267°C
GC RIANOX 1010 Tetrabimethylen(3,5-di-t-butyl-4-hydroxycinnammate)methane **CAS n.** 6683-19-8 **PHYSICAL FORM:** GR, PW, MB		**Polyolefins - Engineering thermoplastics.** Phenolic antioxidant, suitable for PA, PO and ABS.	**M.P./S.R Viscosity** 110-125°C ------- **TGA:** 5% @ 350°C 10% @ 365°C 25% @ 387°C
GC RIANOX 1076 Octadecyl 3-(3,5-di-tert-butyl-4-hydroxyphenyl)proprionate **CAS n.** 2082-79-3 **PHYSICAL FORM:** GR, PW, MB		**Engineering thermoplastics.** Phenolic antioxidant, suitable for PS.	**M.P./S.R Viscosity** 50-55°C ------- **TGA:** 5% @ 260°C 10% @ 278°C 25% @ 302°C

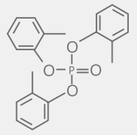
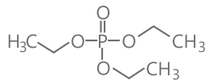
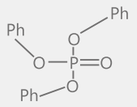
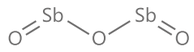
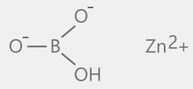
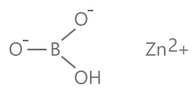
PRODUCT NAME	CHEMICAL FORMULA	APPLICATIONS	M.P./S.R Viscosity ------- TGA
Process Aids & Stabilizers			
GC DGM 95 Dystilled Glycerol Monostearate **CAS n.** 123-94-4 **PHYSICAL FORM:** PASTILLES		It can be used in plastic sector as anti-static, anti-fog or lubricant. It's a good emulsifier, dispersant, 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.**	**M.P./S.R Viscosity** 58-62°C
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
GC TCP Tricresyl Phosphate **CAS n.** 1330-78-5 **PHYSICAL FORM:** LIQ		**Polyolefins.** PE, PVC, Rubber, Wires & cables.	**M.P./S.R Viscosity** 55-70 mPa·s
Synergists			
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
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).	**M.P./S.R Viscosity** >39°C

* Other Peroxides are available upon request.

PRODUCT NAME	CHEMICAL FORMULA	APPLICATIONS	M.P./S.R Viscosity --- TGA
Halogenated Flame Retardants			
GC DNPG 60 Dibromoneopentyl glycol **CAS n.** 3296-90-0 **PHYSICAL FORM:** PW		**Polyurethanes.** Rigid PU foam.	**M.P./S.R Viscosity** 109,5°C --- **TGA:** 1% @ 196°C 5% @ 225°C 10% @ 245°C
GC PHT Tetrabromophtalic Anhydride **CAS n.** 632-79-1 **PHYSICAL FORM:** GR, PW		**Polyurethanes-** **Engineering thermoplastics.** Rigid PU, Epoxy, PS, PHE, high fr efficiency.	**M.P./S.R Viscosity** 280°C --- **TGA:** 1% @ 202 °C 5% @ 228°C 10% @ 240°C
GC PHT Diol HV Diol of tetrabromophathalic 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).	**M.P./S.R Viscosity** 70000 120000 cps
GC PHT Diol LV Diol of tetrabromophathalic 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).	**M.P./S.R Viscosity** 15000 30000 cps
GC PHT Diol MV Diol of tetrabromophathalic 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).	**M.P./S.R Viscosity** 30000 70000 cps
GC TCPP Tris(2-chloroptopyl)phosphate **PHYSICAL FORM:** LIQ		**Polyurethanes.** Cost efficient Flame Retardant used in PU foam, PVC, EVA and phenolics and epoxy Resin.	**M.P./S.R Viscosity** 60-70 mPa·s
Halogen free Flame Retardants			
GC APP II Ammonium Polyphosphate **CAS n.** 68333-79-9 **PHYSICAL FORM:** GR, PW		**Polyolefins - Polyurethanes -** **Engineering thermoplastics.** PA, PP, PU, Polyesters.	**M.P./S.R Viscosity** Decomposition T. > 275°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.	**M.P./S.R Viscosity** 120 cps a 80°C --- **TGA:** 1% @ 255°C 5% @ 372°C 10% @ 398°C

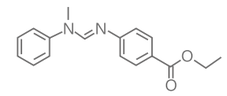
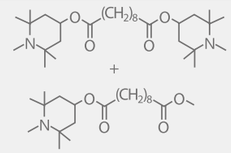
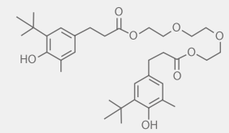
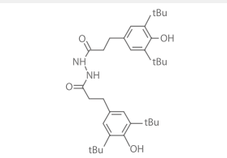
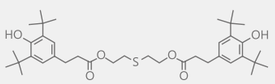
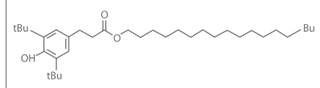
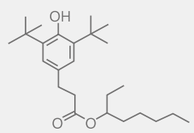
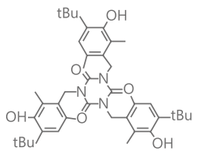
PRODUCT NAME	CHEMICAL FORMULA	APPLICATIONS	M.P./S.R Viscosity --- TGA
GC DOPO 9,10-Dihydro-9-oxa-10-phosphaphenanthrene 10-oxide **CAS n.** 35948-25-5 **PHYSICAL FORM:** PW		**Engineering thermoplastics.** Epoxy, PU, PA, Polyesters.	**M.P./S.R Viscosity** 117-120°C
GC FOS 65 Triarylphosphate Isopropylated **CAS n.** 68937-41-7 **PHYSICAL FORM:** LIQ		**Polyurethanes -** **Engineering thermoplastics.** PVC, Phenolic, PU, Epoxy resins.	**M.P./S.R Viscosity** 64-76 cps --- **TGA:** 1% @ 197°C 5% @ 217°C 10% @ 235°C
GC FRP 30 Cyclic Phosphonate **CAS n.** 41203-81-0 _ 42595-45-9 **PHYSICAL FORM:** LIQ		**Polyurethanes -** **Engineering thermoplastics.** Polyesters, Coating, Textile.	
GC MC series Melamine Cyanurate **CAS n.** 37640-57-6		**PU - Engineering thermoplastics.** PA, Polyesters.	**M.P./S.R Viscosity** Decomposition T. > 350°C --- **TGA:** 1% @ 305°C 2% @ 320°C 5% @ 340°C
GC MELAMMINA Melamine **CAS n.** 108-78-1 **PHYSICAL FORM:** GR, PW		**Polyolefins - Polyurethanes.** PP, PE, PU, Textile, Coating.	**M.P./S.R Viscosity** 354°C
GC MP Melamine Phosphate **CAS n.** 41583-09-9 **PHYSICAL FORM:** GR, PW		**Polyolefins - Polyurethanes -** **Engineering thermoplastics.** PA, Epoxy, PU, PP, Polyesters.	**M.P./S.R Viscosity** Decomposition T. > 300°C --- **TGA:** 1% @ 215°C 2% @ 235°C 5% @ 260°C
GC MPF Melamine Pyrophosphate **CAS n.** 15541-60-3 **PHYSICAL FORM:** GR, PW		**Polyolefins - Polyurethanes -** **Engineering thermoplastics.** PA, Epoxy Resins, PU, Polyesters, PP.	**M.P./S.R Viscosity** Decomposition T. > 300°C --- **TGA:** 0,5% @ 300°C 5% @ 350°C
GC PENTAERITRITE Pentaerytritol **CAS n.** 115-77-5 **PHYSICAL FORM:** PW		**Polyolefins - Polyurethanes.** PP, PE, PU, Textile, Coating.	**M.P./S.R Viscosity** > 250°C
GC RDP Tetrapheyl Resorcinol Diphosphate **CAS n.** 57583-54-7 **PHYSICAL FORM:** LIQ		**Polyurethanes -** **Engineering thermoplastics.** PC/ABS, PPO/HIPS, TPU, PU.	**M.P./S.R Viscosity** 500-800 cps a 80°C --- **TGA:** 2% @ 290°C 5% @ 325°C 10% @ 360°C
GC RE DDP 2-(6-Oxido-6H-dibenz,c-e, 1,2 oxapho-sphorin-6-y) methyl – Butandioic acid **CAS n.** 63562-33-4 **PHYSICAL FORM:** PW		**PU - PA - Polyesters.** Reactive phosphorous flame retardant for PU, PA, Polyesters.	**M.P./S.R Viscosity** 197°C

Products for **XPU**

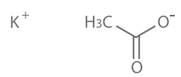
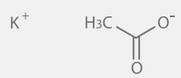
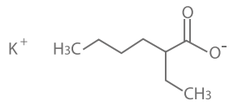
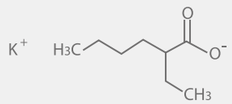
PRODUCT NAME	CHEMICAL FORMULA	APPLICATIONS	M.P./S.R Viscosity ------- TGA
GC TCP Tricresyl Phosphate **CAS n.** 1330-78-5 **PHYSICAL FORM:** LIQ		**PU - Polyolefins.** PE, PVC, Rubber, Wire & cables.	**M.P./S.R Viscosity** 55-70 mPa·s
GC TEP Triethyl Phosphate **CAS n.** 78-40-0 **PHYSICAL FORM:** LIQ		**Polyurethanes.**	**M.P./S.R Viscosity** 55 mPa·s
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.	**M.P./S.R Viscosity** 47,5-49,5°C ------- **TGA:** 1% @ 198°C 5% @ 231°C 10% @ 247°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.	**M.P./S.R Viscosity** 656°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.	**M.P./S.R Viscosity** 890°C ------- **TGA:** 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.	**M.P./S.R Viscosity** 890°C ------- **TGA:** 1% @ 282°C 5% @ 388°C 10% @ 425°C

*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 **XPU**

PRODUCT NAME	CHEMICAL FORMULA	APPLICATIONS	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 appliable in some adhesives, elastomers and sealants.	**M.P./S.R Viscosity** 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-methylpheyl)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.	**M.P./S.R Viscosity** 76-80°C ------- **TGA:** 5% @ 297°C 10% @ 312°C 25% @ 332°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.	**M.P./S.R Viscosity** 221-232°C ------- **TGA:** 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.	**M.P./S.R Viscosity** 63-82°C ------- **TGA:** 5% @ 291°C 10% @ 309°C 25% @ 335°C
GC RIANOX 1076 Octadecyl 3-(3,5-di-tert-butyl-4-hydroxyphenyl)proprionate **CAS n.** 2082-79-3 **PHYSICAL FORM:** GR, PW, MB		**Engineering thermoplastics.** Phenolic antioxidant, suitable for PS.	**M.P./S.R Viscosity** 50-55°C ------- **TGA:** 5% @ 260°C 10% @ 278°C 25% @ 302°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.	**TGA:** 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.	**M.P./S.R Viscosity** 159-163°C ------- **TGA:** 1% @ 202°C 5% @ 333°C 10% @ 349°C

Products for **XPU**

PRODUCT NAME	CHEMICAL FORMULA	APPLICATIONS	M.P./S.R Viscosity ------- TGA
Catalysts			
GC K ACE 60 D Potassium acetate in DEG **PHYSICAL FORM:** PW		**PU Catalyst.**	**M.P./S.R Viscosity** 292°C
GC K ACE 60 M Potassium acetate in MEG **PHYSICAL FORM:** PW		**PU Catalyst.**	**M.P./S.R Viscosity** 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.**	

Products for **XPU & XPS**

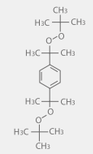
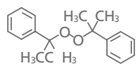
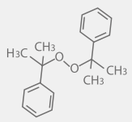
Foaming Agents	
R1234ze	This product is perfect for extruded polystyrene and pressurized one-and two-component polyurethane foams.

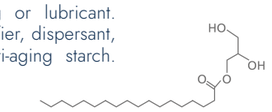
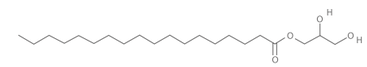
Products for **XPE-XPP – XPE Cross linked**

PRODUCT NAME	APPLICATIONS	DESCRIPTION
Flame Retardant Masterbatches		
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.
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.
MB PE BATO 21 **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.
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 BIT 60 **PHYSICAL FORM:** MB	**Masterbatch for XPE.**	Flame retardant masterbatch for XPE, CPO, DBDPE free. Easy meltable and enviromental friendly.
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.
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.

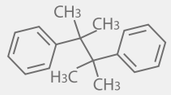
Color Masterbatches

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

PRODUCT NAME	APPLICATIONS	DESCRIPTION
Talc & Endothermic Nucleating Masterbatches		
GC HYDRONUC 35 **PHYSICAL FORM:** GR, NDB	**Nucleating for XPE.**	45% active masterbatch, carried in high MFI LDPE, of chemical and physical endothermic blowing agent mixture.
GC HYDRONUC 35 T **PHYSICAL FORM:** GR, NDB	**Nucleating additive for XPE.**	35% active masterbatch, carried in high MFI LDPE, of chemical endothermic blowing agent mixture.
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.
Peroxides		
GC BIPB 40 Bis (t-butilperossi isopropil) benzene **PHYSICAL FORM:** PELLETS	**Thermoplastic Polyolefins / natural and synthetic Rubber.**	40% active compacted pellets of di-(tertbutyl peroxiisopropyl) benzene, mainly known as bis-peroxide, supported by calcium carbonate and silica. M.P./S.R. Viscosity: 37-54°C 
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 DICUMYL PEROXIDE Dycumil Peroxide **CAS n.** 80-43-3 **PHYSICAL FORM:** FLAKES	**Polyolefins / Elastomers** (tubes, wires, tires, rubber seals).	98% pure dicumyl peroxide in flakes. M.P./S.R. Viscosity: >39°C 

PRODUCT NAME	APPLICATIONS	DESCRIPTION
Process Aid & Antistatics		
GC DGM 95 Distilled glycerol monosterate **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	**Processing aid MB for XPE-XPP.**	Glycerol mono stearate tri-substituted, 90% pure, in micro-pearls or in powder form. M.P./S.R. Viscosity: 66,7°C 
GC GMS 40 Stearic acid, monester with glycerol (gms conc. ≥40) **CAS n.** 31566-31-1 **PHYSICAL FORM:** FLAKES	**Processing aid MB for XPE-XPP.**	Glycerol mono stearate mono-substituted, 40% pure, in flakes. M.P./S.R. Viscosity: 66,7°C 
STARAID EV G 30 **PHYSICAL FORM:** MB	**Processing aid MB for XPE-XPP** based on fat organic acid ester on EVA.	Processing aid masterbatch, based on GMS and carried on EVA.
MB PE MOX RANGE		Increases by 10% AZO activity, allowing to reduce its dosage, with high cost saving. It's also a processing aid, because it increases the reaction time windows. It allows the use of Bis-peroxide, in stead of Dicumyl, reducing dramatically the smell.
MB PE IDRO 60 R1		It's a halogen free flame retardant masterbatch, which is necessary to reduce the heat, during the flame. It's normally used in combination with MB PE DETO31.

Products for **XEPS**

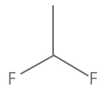
PRODUCT NAME	APPLICATIONS	DESCRIPTION
Flame Retardant Masterbatches		
MB PS POL 55 **PHYSICAL FORM:** MB	**Polymeric HBCD free solution for XPS.**	Polymeric FR masterbatch on PS carrier with heat stabilization and synergist.
MB PS SHARP 45 **PHYSICAL FORM:** MB	**HBCD free solution for XPS,** thermal 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.**	
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 
Process Aids & 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	APPLICATIONS	DESCRIPTION
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 GREEN 55 **PHYSICAL FORM:** MB	Polymeric **HBCD free** solution for XPS, cost effective.	Thermal stable Polymeric FR masterbatch on PS carrier, synergized.
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 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 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 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 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 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 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.

PRODUCT NAME	APPLICATIONS	DESCRIPTION
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 polystirene matrix.
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 152/A Difluoroethane **CAS n.** 75-37-6 **PHYSICAL FORM:** LIQ	Blowing agent for XPS, XPU.	
GC HFC 152A/DME Difluoroethane / dimethylether **CAS n.** 75-37-6 & 115-10-6 **PHYSICAL FORM:** LIQ	Blowing agent for XPS.	

Talc & Endothermic Nucleating Masterbatches

MB HYDRO NUC 35 **PHYSICAL FORM:** MB	Nucelating masterbatch for XPS.	35% active masterbatch, carried in EVA, of chemicals endothermic blowing agent mixture.
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.
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.

PRODUCT NAME	APPLICATIONS	DESCRIPTION
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 O **PHYSICAL FORM:** MB	Talc masterbatch for XPS, also pigmented.	Nucleating talc masterbatch, based on PS carrier.
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 PSR 60 U **PHYSICAL FORM:** MB	Talc masterbatch for XPS, also pigmented.	Nucleating masterbatch, based on spherical talc and PS carrier.
STARCOLOR PS series **PHYSICAL FORM:** MB	**COLOR MASTERBATCH FOR XPS.**	Color masterbatch for XPS, filler free formulation.

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 Polystirene.	Masterbatch based on sulfonate antistatic.

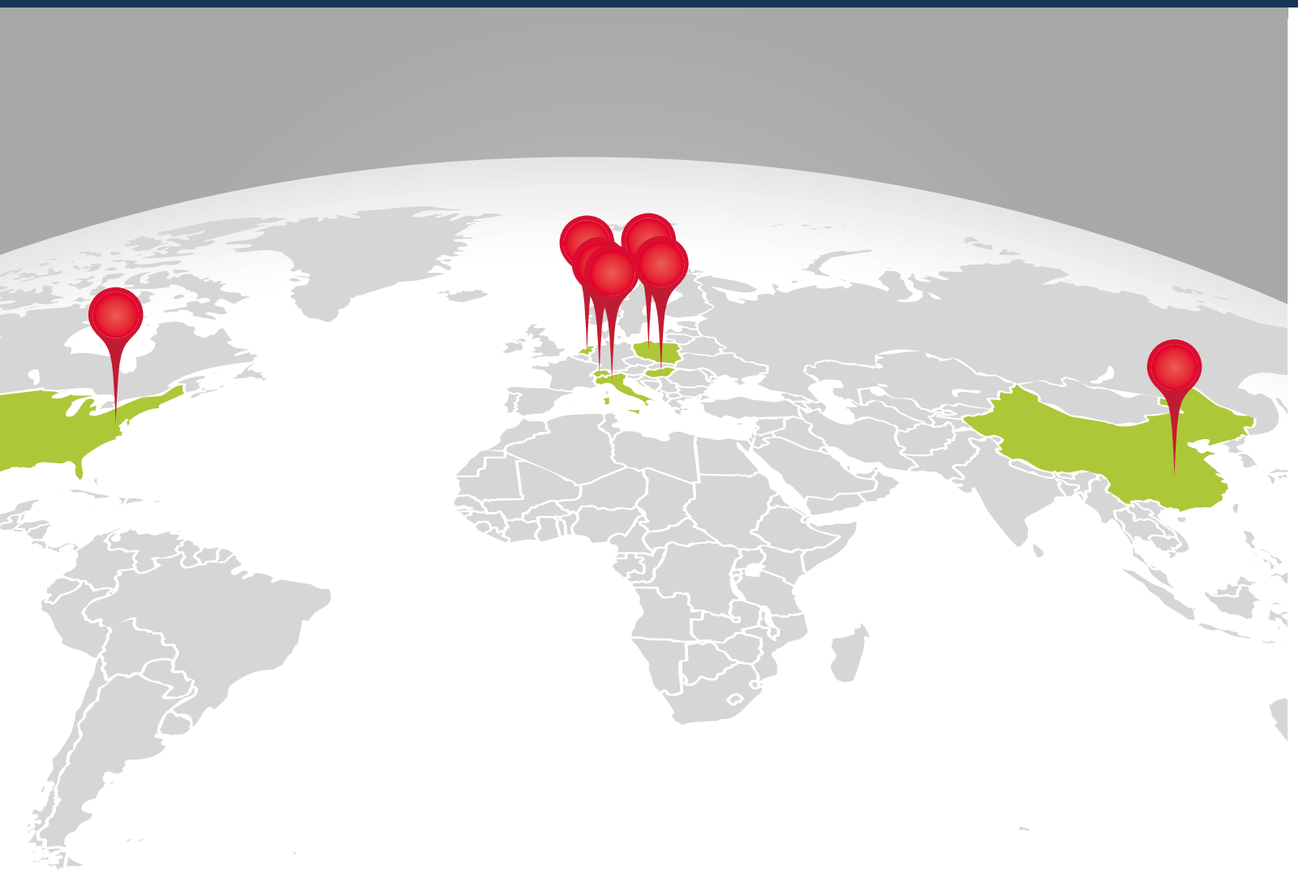
PRODUCT NAME	APPLICATIONS	DESCRIPTION
Talc Masterbatches		
MB HYDRO NUC 35 **PHYSICAL FORM:** MB	**Nucleating masterbatch for XPE.**	35% active masterbatch, carried in high MFI LDPE, of chemical endothermic blowing agent mixture.
MB HYDRO NUC 35 T **PHYSICAL FORM:** MB	**Nucleating masterbatch for XPE.**	45% active masterbatch, carried in high MFI LDPE, of chemical and physical endothermic blowing agent mixture.
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.
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.
Draining Anticollapse Masterbatches		
STARAID PET SAB 30 **PHYSICAL FORM:** MB	**Masterbatch for XPS Food.**	30% active masterbatch, carried in high MFI PETG, of sodium alkyl benzene sulphonate.
STARAID SAB 40 **PHYSICAL FORM:** PELLETS	**Masterbatch for XPS Food.**	40% active masterbatch, carried in high MFI GPPS, of sodium alkyl benzene sulphonate.
STARAID SAB 40 MA **PHYSICAL FORM:** PELLETS	**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.

Products for **XPS FOOD**

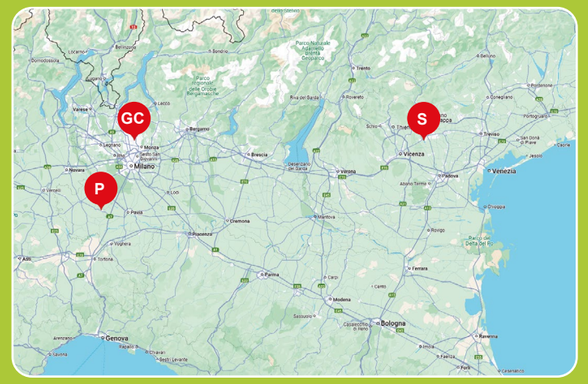
PRODUCT NAME	APPLICATIONS	DESCRIPTION
STARAID SAB 50 **PHYSICAL FORM:** MB	**Masterbatch for XPS Food.**	50% active masterbatch, carried in high MFI GPPS, of sodium alkyl benzene sulphonate.
Nucleating Endothermic Masterbatches		
MB HYDRO NUC 35 **PHYSICAL FORM:** MB	**Masterbatch for XPS Food.**	35% active masterbatch, carried in EVA, of chemical endothemic blowing agent mixture.
MB HYDRO NUC 35T **PHYSICAL FORM:** MB	**Masterbatch for XPS Food.**	45% active masterbatch, carried in EVA, of chemical and physical endothemic blowing agent mixture.
Color Masterbatches		

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

Where We Are in the world



Where We Are in Italy:



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