GC

GreenChemicals

IMPROVE YOUR PERFORMANCE

PLASTIC ADDITIVES TAILOR MADE FORMULATIONS

GreenChemicals

IMPROVE YOUR PERFORMANCE

CONTENTS

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

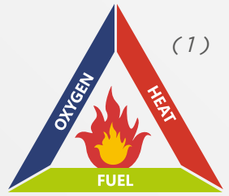
FLAME RETARDANT MECHANISM

Flame retardants are substances which may reduce flammability of materials by interaction with the fire cycle (FIGURE 1) in order to prevent, delay or stop it. Flame retardants act at different stages, depending on their chemical basis.

COMBUSTION

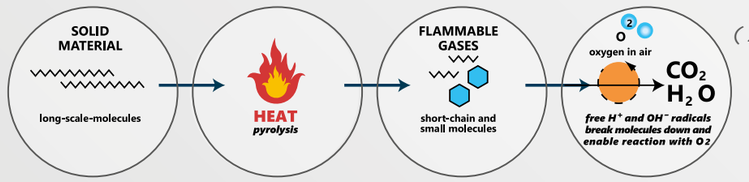
Combustion is a chemical reaction of oxidation that involves heat, flames and smoke/gases with generation of high energy radicals.

$$CO + OH\bullet \rightarrow CO2 + H\bullet$$
$$RCH3 + OH\bullet \rightarrow RCH2\bullet + H2O$$
$$RCH2\bullet + O2 \rightarrow RCHO + OH\bullet$$
$$H\bullet + O2 \rightarrow OH\bullet + \bullet O\bullet$$



(1)

The fire starts with an ignition source put on combustible item. Solid materials do not burn directly, they are degradated by heat due to **Pyrolysis**: polymer's long-chain molecules are decomposed into smaller ones, with the emission of flammable gases in the **Gas Phase** and the formation of inert carbonised material in the **Condensed Phase**, char. (FIGURE 2) In the gas phase visible flames are generated by reaction of flammable gases with oxygen. High energy exothermic chemical reactions take place and generate heat energy that supports combustion.



(2)

FLAME RETARDANTS

Flame retardants prevent or even suppress the process of combustion during a particular phase of the fire cycle: **heating, decomposition, ignition, flame spread**.
Flame retardant action can be physical or chemical (FIGURE 3).

MECHANISM	WAY	EFFECT
WATER VAPOR	PHYSICAL	Cooling Release of water vapor
GAS PHASE	CHEMICAL	Release of inert gases
CHAR	CHEMICAL / PHYSICAL	Cooling Char Layer
INTUMESCENT	CHEMICAL / PHYSICAL	Cooling Expanded Char Layer
DRIPPING	CHEMICAL	Polymer Chain Scission

(3)

Chemical reaction can occur:
· In the **gas phase** by cooling the system and reducing flammable gases.
· In the **condensed phase** by generation of a char layer providing a barrier against the heat source

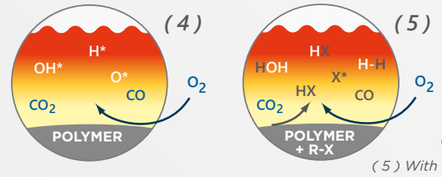
Physical action can take place by :
· **Cooling** : release of water that cools the underlying substance
· **Coating :** formation of solid or gaseous layer that protects material
· **Dilution :** dilution of the fuel by formation of non-combustibile gas

MECHANISM:

1· GAS PHASE

Brominated flame retardants interrupt the radical chain mechanism of the combustion process in the gas phase thanks to generation of lower energy halogen radicals and dilution of flammable gases.

$$HBr + OH\bullet \rightarrow H2O + Br\bullet$$
$$HBr + \bullet O\bullet \rightarrow OH\bullet + Br\bullet$$
$$HBr + H\bullet \leftrightarrow H2 + Br\bullet$$
$$HBr + RCH2\bullet \leftrightarrow RCH3 + Br\bullet$$
$$RBr \leftrightarrow OH\bullet + Br\bullet$$



(4) (5)

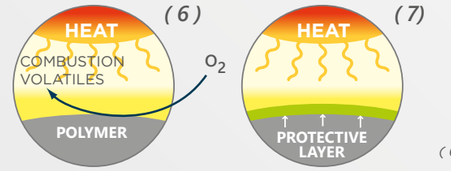
(4) Without Flame Retardant
(5) With Halogenated Flame Retardant

2· CHAR

Flame retardancy is obtained by formation of a solid charred surface layer of phosphorus compounds. The flame retardant is transformed into phosphoric acid by thermal degradation in the condensed phase, and water is released from the substrate in the solid phase developing protective layer: char.

$$(NH4PO3)n \xrightarrow[-n\ NH3]{>250°C} (HPO3)n$$

$$(HPO3)n + Cx(H2O)m \longrightarrow (\text{“}C\text{”})x + (HPO3)n \times mH2O$$

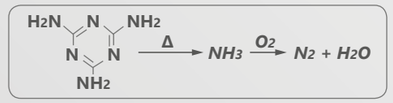


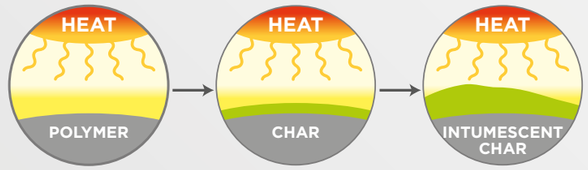
(6) (7)

(6) Without Flame Retardant
(7) With Flame Retardant

3· INTUMESCENT

Intumescent mechanism provides efficient flame retardancy to polymers who do not contain heteroatoms in the chain. Char layer is not sufficient and a foaming agent is required to obtain a voluminous protective layer.
Intumescent flame retardant systems consist of:
· Carbon agent
· Acid based on phosphorous
· Compound containing nitrogen





4· DRIPPING

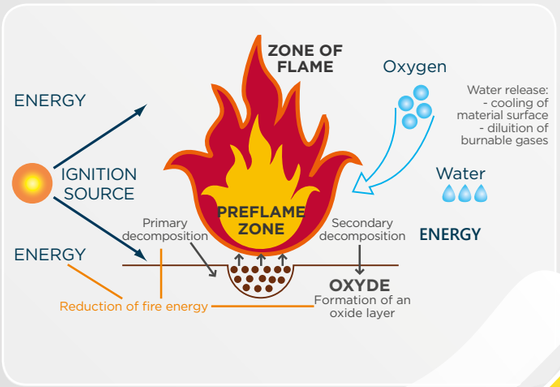
Flame retardant decomposes into radical species that cut polymers chain and cause dripping of the polymer. The reaction is endothermic.

$$\text{-CH2-CHX-|-CH2-CHX*} \longrightarrow \text{CH2-CHX*} + \text{CH2=CHX}$$

5· WATER VAPOUR

Flame retardancy is provided by water release. Endothermic reaction cools material surface and dilute burnable gases with formation of a charred layer.

$$2Al(OH)_3 \longrightarrow Al_2O_3 + 3\ H_2O$$
$$Mg(OH)_2 \longrightarrow MgO + H_2O$$
$$2\ AlOOH \longrightarrow Al_2O_3 + H_2O$$



ANTIOXIDANTS

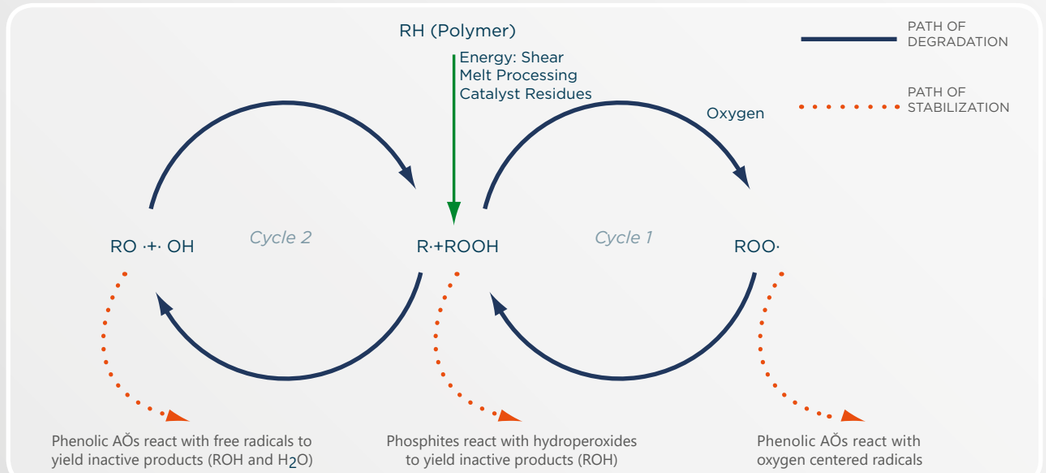
ANTIOXIDANTS CYCLE

Weathering of polymers is caused by absorption of UV lights, which results in radical initiated auto-oxidation by contact with athmospheric oxygen and generation of **free radicals** such as **R•, RO•, ROO•, HO•**. These free radicals further react with atmospheric oxygen to produce more and more free radicals.

$$R\bullet + O_2 \rightarrow ROO\bullet$$

$$ROO\bullet + R\text{-}H \rightarrow ROOH + R\bullet$$

Antioxidants inhibit the formation of free radicals, enhancing the stability of polymers against light and heat, by termination of the oxidation reactions that involve polymers:



• PRIMARY

Hydrogen-donating antioxidants (AH), such as hindered phenols, quinone based compounds, piperidinoxyl based compounds and secondary aromatic amines, inhibit oxidation by competing with organic substrate (RH) for peroxy radicals, thereby interfering with the chain propagation step.

$$ROO\bullet + AH \rightarrow ROOH + A\bullet$$

$$ROO\bullet + RH \rightarrow ROOH + R\bullet$$

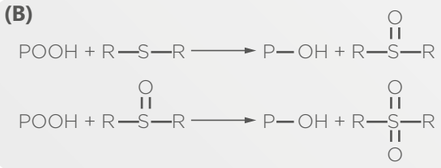
• SECONDARY

Secondary antioxidants based on phosphites **(A)** or sulphides like dialkyldithiocarbamates, dialkyldithiophosphates and thiobisphenolates **(B)** prevent peroxide radicals formation as they decompose hydroperoxides.

(A)

$$ROOH + P(OR1)3 \rightarrow ROH + O{=}P(OR1)3$$

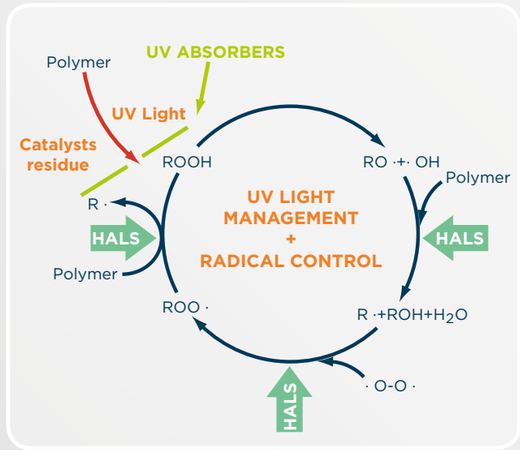
(B)



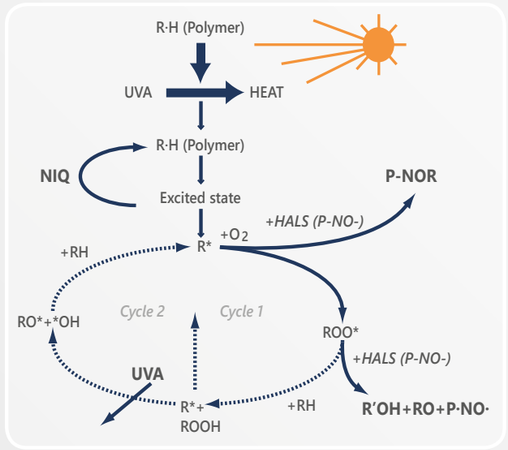
UV ABSORBERS / LIGHT STABILIZERS

UV STABILIZERS

UV stabilizers are chemical compounds capable of interfering with the physical and chemical processes of light-induced degradation. They prevent the formation of free radicals that can be generated by interaction of UV radiation with tertiary carbon bonds in polymer chain structures or with aromatic rings. They can act in different ways:

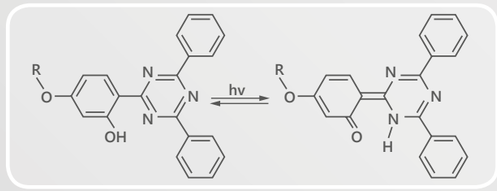


(1) Photo-oxidation



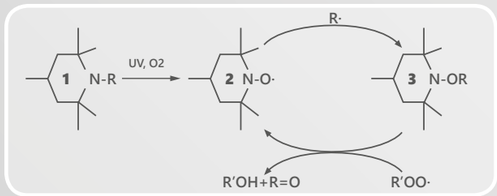
(2) Light stabilizer mechanism

• **UV ABSORBERS,** usually dihydroxybenzophenones and hydroxyphenyl benzotriazoles, act by absorbing the UV radiation and dissipating the energy as low-level heat by reversible intramolecular proton transfer during which a quinone structure is formed.

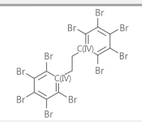
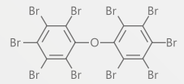
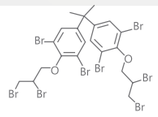
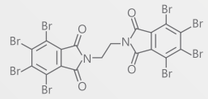
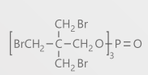
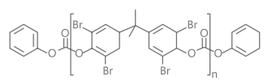
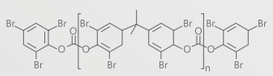
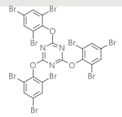
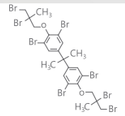
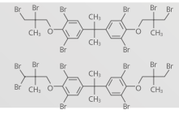


• **QUENCHERS** are energy tranfer agents, they deactivate excited states of chromophoric groups in polymers before bond scission can occur, by energy transfer process or chemical and/or physical deactivation.

• **HINDERED AMINES** are derivatives of 2,2,6,6-tetramethyl piperidine and they slow down the photochemically initiated degradation reaction through a cyclic process. They scavenge radicals by the formation of nitroxyl radicals (R-O•) that combine with free radicals in polymers generating aminoether molecules. These will then react with peroxides regenerating the nitroxyl radicals.

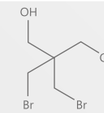
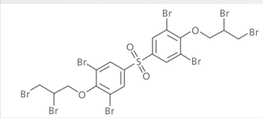
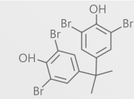
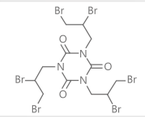
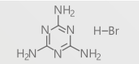


BROMINATED FLAME RETARDANTS

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
GC DPE 81 Decabromodiphenyl ethane **CAS n. 84852-53-9** PHYSICAL FORM: GR, PW		**Polyolefins - Engineering thermoplastics.** High efficiency, dioxime free, multi-function for PE, PP, HIPS, PA, PBT, EPOXY, PHE.	350°C	1% @ 332°C 5% @ 365°C 10% @ 378°C
GC DECA 83 Decabromodiphenyl oxide **CAS n. 1163-19-5** PHYSICAL FORM: GR, PW		**Polyolefins - Engineering thermoplastics.** High efficiency, multi-function for PE, PP, HIPS, PA, PBT, EPOXY, PHE.	305°C	1% @ 320°C 5% @ 365°C 10% @ 387°C
GC BDDP 68 Tetrabromobisphenol A bis (2,3-dibromopropyl ether) **CAS n. 21850-44-2** PHYSICAL FORM: GR, PW		**Polyolefins - Engineering thermoplastics.** Good thermal stability, high efficiency PP, HIPS, ABS.	113-117°C	1% @ 299°C 5% @ 312°C 10% @ 321°C
GC BT 67 Ethylenbistetrabromo Phthalimide **CAS n. 32588-76-4** PHYSICAL FORM: GR, PW		**Polyolefins - Engineering thermoplastics.** HIPS, PBT, PET, TPR, good thermal stability, UV stability, no blooming, excellent wet electrical properties.	460°C	1% @ 336 °C 5% @ 417°C 10% @ 430°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.	280°C	1% @ 202 °C 5% @ 228°C 10% @ 240°C
GC FR TRI 70 Tris(tribromoneopentyl)phosphate **CAS n. 19186-97-1** PHYSICAL FORM: GR, PW		**Polyolefins - Engineering thermoplastics.** PP, HIPS, ABS, XPS, alloy, UV and light stability, non blooming.	181°C	1% @ 332°C 5% @ 365°C 10% @ 378°C
GC B 52 Phenoxy terminated carbonate oligomer of tetrabromobisphenol A **CAS n. 94334-64-2** PHYSICAL FORM: PW		**Engineering thermoplastics.** PET, PBT, PC, ABS, PC/ABS, thermal and UV stability, excellent electrical properties.	190-210°C	1% @ 376°C 5% @ 412°C 10% @ 426°C
GC B 58 Tribromylphenyl terminated carbonate oligomer of tetrabromobisphenol A **CAS n. 71342-77-3** PHYSICAL FORM: PW		**Engineering thermoplastics.** PET, PBT, PC, ABS, PC/ABS, thermal and UV stability, excellent electrical properties.	210-230°C	1% @ 356°C 5% @ 407°C 10% @ 425°C
GC FR245 66 2,4,6-tris(2,4,6-tribromophenoxy) -1,3,5-triazine **CAS n. 25713-60-4** PHYSICAL FORM: PW		**Engineering thermoplastics.** HIPS, ABS, good flow, good impact, good UV and thermal stability, non-blooming.	230°C	1% @ 351°C 5% @ 385°C 10% @ 400°C
GC BPS 67, GC BPS 310 Brominated polystyrene **CAS n. 88497-56-7** PHYSICAL FORM: GR		**Engineering thermoplastics.** PA, PBT, PET, good CTI, good thermal stability, non-blooming.	265-320°C	2% @ 340°C 5% @ 375°C 10% @ 384°C
GC MFR 66 Tetrabromobisphenol A bis (2,3-di-bromo -2-methylpropyl ether) **CAS n. 97416-84-7** PHYSICAL FORM: GR, PW		**EPS, XPS.** Good FR efficiency.	100-110°C	1% @ 263°C 5% @ 280°C 10% @ 286°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.	113°C	

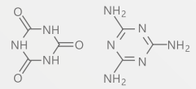
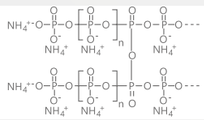
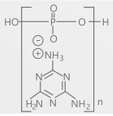
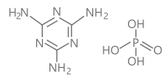
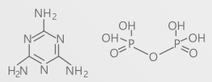
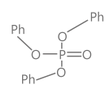
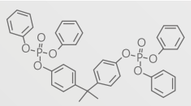
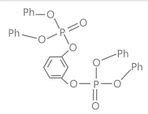
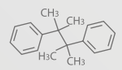
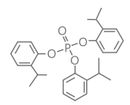
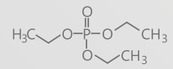
BROMINATED FLAME RETARDANTS

BROMINATED FLAME RETARDANTS

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
GC PHT DIOLO HV Reaction products of tetrabromophthalic anhydride with 2,2'-oxydiethanol and methyloxirane **CAS n. 77098-07-8** 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 DIOLO MV Reaction products of tetrabromophthalic anhydride with 2,2'-oxydiethanol and methyloxirane **CAS n. 77098-07-8** 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 DIOLO HV Reaction products of tetrabromophthalic anhydride with 2,2'-oxydiethanol and methyloxirane **CAS n. 77098-07-8** 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: LIQ		**Polyurethanes.** Rigid PU foam.	109,5°C	1% @ 196°C 5% @ 225°C 10% @ 245°C
GC BDDP 65 S Bis[3,5-dibromo-4-(2,3-dibro-mopropoxy)phenyl] sulphone **CAS n. 42757-55-1** PHYSICAL FORM: PW		**PP, PE, PS, ABS and rubber.** Flame retardant with white color, outstanding thermal and UV stability, non blooming, excellent wet electrical properties.	110°C	2% @ 262°C 5% @ 295°C 10% @ 306°C
GC TBBPA 59 Tetrabromobisphenol A **CAS n. 79-94-7** PHYSICAL FORM: PW		**Engineering thermoplastics.** Epoxy resin, good flow and compatibility, no blooming.	180°C	1% @ 227°C 5% @ 254°C 10% @ 270°C
GC D3BO 65 Tris (2,3-dibromopropyl) isocyanurate **CAS n. 52434-90-9** PHYSICAL FORM: PW		**Polyolefins - Engineering thermoplastics.** PP, HIPS, ABS. Good thermal stability, high efficiency.	105-115°C	1% @ 110°C 5% @ 172°C 10% @ 208°C
GC MHBR Melamine Hydrobromide **CAS n. 29305-12-2** PHYSICAL FORM: PW		Effective flame retardant for PP V2 with low halogen content requirements.		

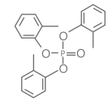
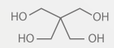
Please feel free to contact us for any other substance not mentioned in this list.
We supply material in powder, granular, masterbatch physical form and liquid dispersions.

HALOGEN FREE FLAME RETARDANTS

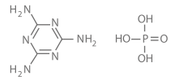
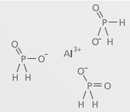
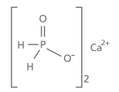
PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
GC MELAMMINA Melamine **CAS n. 108-78-1** PHYSICAL FORM: GR, PW		**Polyolefins - Polyurethanes.** PP, PE, PU, Textile, Coating.	354°C	
GC MC series & GC MCA granular Melamine Cyanurate **CAS n. 37640-57-6**		**Engineering thermoplastics.** PA, Polyesters.	Decomposition T. > 350°C	1% @ 305°C 2% @ 320°C 5% @ 340°C
GC APP II Ammonium Polyphosphate **CAS n. 68333-79-9** PHYSICAL FORM: GR, PW		**Polyolefins- Polyurethanes - Engineering thermoplastics.** PA, PP, PU, Polyesters.	Decomposition T. > 275°C	
GC MPP Melamine Polyphosphate **CAS n. 218768-84-4** PHYSICAL FORM: GR, PW		**Polyurethanes - Engineering thermoplastics.** PA, Epoxy, PU, Polyesters.	Decomposition T. > 300°C	1% @ 355°C 2% @ 370°C 5% @ 385°C
GC MP Melamine Phosphate **CAS n. 41583-09-9** PHYSICAL FORM: GR, PW		**Polyolefins- Polyurethanes - Engineering thermoplastics.** PA, Epoxy, PU, PP, Polyesters.	Decomposition T. > 300°C	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.	Decomposition T. > 300°C	0,5% @ 300°C 5% @ 350°C
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 Reaction mass of 3-[(diphenoxyphosphoryl)oxy] phenyl triphenyl 1,3-phenylene bis(phosphate) and tetraphenyl 1,3-phenylene bis(phosphate) **CAS n. 701-337-2** 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 DICUMENE 90 Dicumene **CAS n. 1889-67-4** PHYSICAL FORM: PW		**Polyolefins - Engineering thermoplastics.** FR synergist.	100-110°C	
GC FOS 65 Isopropylphenyl phosphate **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 TEP Triethyl Phosphate **CAS n. 78-40-0** PHYSICAL FORM: LIQ		**Polyurethanes.** PU.	5 mPa·s5 mPa·s	

HALOGEN FREE FLAME RETARDANTS

HALOGEN FREE FLAME RETARDANTS

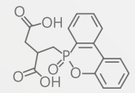
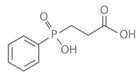
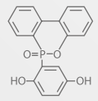
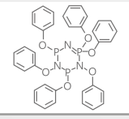
PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
GC TCP Tricresyl Phosphate **CAS n. 1330-78-5** PHYSICAL FORM: LIQ		**Polyolefins.** PE, PVC, Rubber, Wire&cables.	55-70 mPa·s	
GC PENTAERITRITE Pentaerytritol **CAS n. 115-77-5** PHYSICAL FORM: PW		**Polyolefines - Polyurethanes.** PP, PE, PU, Textile, Coating.	> 250°C	
GC NPO Series Cyclic Phosphonates PHYSICAL FORM: LIQ, PW		**Polyurethanes -Engineering thermoplastics.** Polyesters, Coating, Textile, Synergist.		

PHOSPHINATES

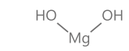
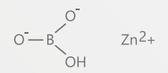
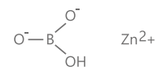
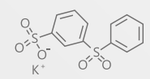
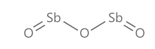
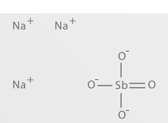
GC MIPO Melamine hypophosphIte PHYSICAL FORM: PW		**Polyolefins - Polyurethanes - Engineering thermoplastics.** PA, Epoxy, PU, Polyesters.		
GC FOS AL Aluminium phosphinate **CAS n. 7784-22-7** PHYSICAL FORM: PW		**Engineering polymers, TPU, PU, PBT, PET, TPE, PA + GF and Polyolefins.** Non-halogenated flame retardant based on inorganic hypophosphite.		
GC FOSCA Calcium phosphinate **CAS n. 7789-79-9** PHYSICAL FORM: PW		**Polyolefins - Engineering polymers.** Active phosphorous flame retardants.		

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.

HALOGEN FREE FLAME RETARDANTS

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
GC DOPO NEW 9,10-Dihydro-9-oxa-10-phosphaphenanthrene 10-oxide **CAS n. 35948-25-5** PHYSICAL FORM: PW		**Engineering thermoplastics.** Epoxy, PU, PA, Polyesters. Reactive Flame Retardant.	117-120°C	
GC RE DDP 2-(10-oxo-10H-9-oxa-10-phosphaphenanthren-10-ylmethyl)succinic acid **CAS n. 63562-33-4** PHYSICAL FORM: PW		**PU - PA - Polyesters.** Reactive phosphorous flame retardant for PU, PA, Polyesters.	197°C	
GC CEPPA 3-(hydroxyphenylphosphinyl)propanoic acid **CAS n. 14657-64-8** PHYSICAL FORM: PW		**PE/PA.** Reactive phosphorous flame retardants for PE, PA and Polyesters polymerization.	158-162°C	
GC DOPO HQ 10-(2,5-Dihydroxyphenyl)-10H-9-oxa-10-phospha-phenantbrene-10-oxide **CAS n. 99208-50-1** PHYSICAL FORM: PW		**Epoxy resins and Engineering polymers.** Reactive Flame Retardant.	245°C	
GC HFR 693 Hexaphenoxycyclotriphosphazene **CAS n. 1184-10-7** PHYSICAL FORM: PW		**PC - PC/ABS - Polyesters.** HF polymeric system for PC, PC/ABS and Polyesters.	110-117°C	

INORGANIC FLAME RETARDANTS

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
GC MgOH2 Magnesium Hydroxide **CAS n. 1309-42-8** PHYSICAL FORM: GR, PW, MB		**PP - PE - PS - PA - PET.**	350°C	1% @ 362°C 5% @ 388°C 10% @ 404°C
GC ZnBO3 - 4 Zinc Borate **CAS n. 1332-07-6** 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 ZnBO3 - 8 NEW Zinc Borate **CAS n. 1332-07-6** 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 KSS Potassium 3-(phenylsulphonyl) benzene sulfonate **CAS n. 63316-43-8** PHYSICAL FORM: GR, PW, MB		**Engineering thermoplastics.** Flame retardant suitable for transparent PC at very low dosage.		1% @ 425°C 5% @ 452°C 10% @ 468°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	
GC NATO Sodium Antimonate **CAS n. 15432-85-6** PHYSICAL FORM: PW		Synergist for brominated flame retardant, low acidity, indicated for PC and Polyesters.	Melting point: 600°C 100 kPa	

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.

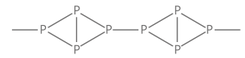
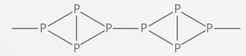
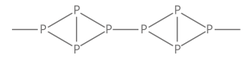
FLAME RETARDANT FORMULATIONS

HALOGEN FREE FLAME RETARDANT FORMULATIONS

PRODUCT NAME	APPLICATION	DESCRIPTION
GC DRIPP HF 70 Low Halogen Content NEW PHYSICAL FORM: GR, PW, MB, COMPACTED	PP V2.	GC DRIPP HF 70 is very low halogen formulation for PP V2. Very low dosage, Br content in the compound can respect 900ppm limit. Also in masterbatch.
GC FR 1012 HALOGEN FREE NEW PHYSICAL FORM: GR, PW, MB, COMPACTED	PA.	Mixture of halogen free flame retardants based on aluminium phenylphosphinates.
GC HFT PC 90 HALOGEN FREE NEW PHYSICAL FORM: GR, PW, MB, COMPACTED	PC V0 Transparent.	Halogen free blend based on new P3 products for low thickness PC, keeping transparency below in 1,6 mm.
GC ABS FLAM V0 HALOGEN FREE PHYSICAL FORM: GR, PW, MB, COMPACTED	ABS V0.	Halogen Free blend for ABS, appication ABS.
GC PA FLAM V0 HALOGEN FREE PHYSICAL FORM: GR, PW, MB, COMPACTED	PA, V0.	Halogen free blend for PAVO. Very competitive in price, very interesting dosage level.
GC PET FLAM V0 HALOGEN FREE PHYSICAL FORM: GR, PW, MB, COMPACTED	PET, PET V0.	Halogen free blend for polyesters. it keeps mechnical properties for a long time.
ISODRIPP PA MC25 45 HALOGEN FREE PHYSICAL FORM: GR, PW, MB, COMPACTED	PA.	Concentrated masterbatch of melamine cyanurate on PA base.
GC FR 1001 HALOGEN FREE PHYSICAL FORM: GR, PW, MB, COMPACTED	PA.	Mixture of halogen free flame retardants based on alluminium phenylphosphinates cost effective.
GC PP FLAM V0 Intumescent System HALOGEN FREE PHYSICAL FORM: GR, PW, MB, COMPACTED	PP V0, PE, TPR, TPU.	GC FLAM V0 is a halogen free blend working with intumescent mechanism. It has good thermal stabilization and processability. Coste effective.
GC PP HF 200 Intumescent System HALOGEN FREE NEW PHYSICAL FORM: GR, PW, MB, COMPACTED	PP V0, PE, TPR, TPU.	Efficient halogen free intumescent blend. Reduced loading level, good dispersion.
GC PP HF 1000 Intumescent System HALOGEN FREE NEW PHYSICAL FORM: WHITE POWDER	PP VO, PE, TRP, TPU.	Efficient intumescen blend based on phosphorus and nitrogen.
GC PP HF 2000 Intumescent System HALOGEN FREE NEW PHYSICAL FORM: GR, PW, MB, COMPACTED	PP V0, PE, TPR, TPU.	Efficient halogen free intumescent blend. Reduced loading level, good dispersion.

FLAME RETARDANT FORMULATIONS

FLAME RETARDANT FORMULATIONS

PRODUCT NAME	APPLICATION	DESCRIPTION
MB PA P RED 50 Red phosphorous masterbatch PHYSICAL FORM: MB	**Engineering thermoplastics.** PA, Polyesters. Red phosphorous masterbatch for PA.	*CHEMICAL FORUMLA:* 
MB PP P RED 60 Red phosphorous masterbatch PHYSICAL FORM: MB	**Polyolefins.** PP, PE. Red phosphorous masterbatch for PP.	*CHEMICAL FORUMLA:* 
MB PE P RED 70 Red phosphorous masterbatch PHYSICAL FORM: MB	**Polyolefins.** PP, PE. Red phosphorous masterbatch for PE.	*CHEMICAL FORUMLA:* 
MB PE TRIX 80 / 90 PHYSICAL FORM: GR, PW, MB, COMPACTED	POLYOLEFINES.	Masterbatch containing antimony trioxide, also on EVA base.

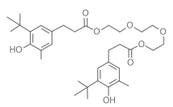
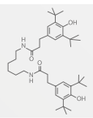
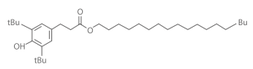
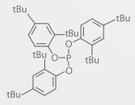
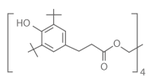
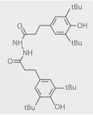
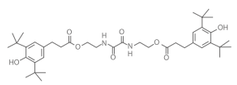
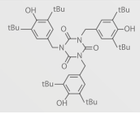
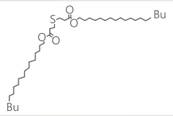
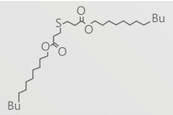
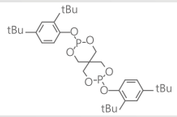
HALOGENATED FLAME RETARDANT FORMULATIONS

GC BZ 75 ANTIMONY FREE PHYSICAL FORM: GR, PW, MB, COMPACTED	POLYOLEFINS.	Brominated blend without antimony trioxide for XPE application.
GC BR DETO Series PHYSICAL FORM: GR, PW, MB, COMPACTED	POLYOLEFINS, ENGINEERING THERMOPLASTICS.	Classic Brominated compound/Sb2O3 blend.
MB SAN / EVA DETO 41 PHYSICAL FORM: GR, PW, MB, COMPACTED	SAN, ABS, PC/ABS V0.	MB SAN DETO 41 is a masterbatch in a matrix of SAN or EVA that is heat-stable and synergized with a high content of bromine, making it the perfect candidate for processing at high temperature and stress conditions.
GC DRIPP BR 79 PHYSICAL FORM: GR, PW, MB, COMPACTED	RECYCLED PP V2.	GC DRIPP BR 79 is a brominated blend for PPV2. It allows low halogen concentration with recycled PP or copolymers.
MB PE DPE 90 PHYSICAL FORM: GR, PW, MB, COMPACTED	POLYOLEFINES.	MB PE DPE 90 is an extremely thermal stable, halogenated and synergized masterbatch, with high bromine content, which makes it the perfect candidate for high temperature and stressfull processes.
GC D 80 PHYSICAL FORM: GR, PW, MB, COMPACTED	POLYOLEFINS, ENGINEERING THERMOPLASTICS.	Classic Brominated compound/Sb2O3 and zinc borate blend.
GC F 80 PHYSICAL FORM: GR, PW, MB, COMPACTED	ABS.	Classic Brominated compound/Sb2O3 and zinc borate blend for ABS.

Please feel free to contact us for any other substance not mentioned in this list.

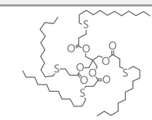
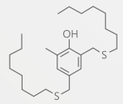
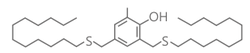
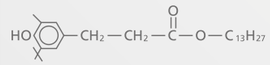
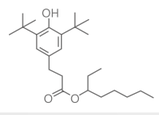
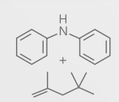
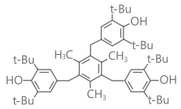
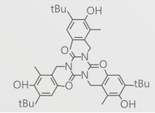
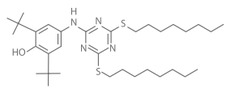
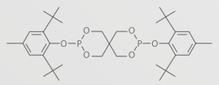
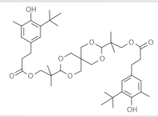
GC GreenChemicals

ANTIOXIDANTS

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
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.	76-80°C	5% @ 297°C 10% @ 312°C 25% @ 332°C
GC RIANOX 1098 N,N'-hexamethylenebis[3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionamide] **CAS n. 23128-74-7** PHYSICAL FORM: GR, PW, MB		**Polyurethanes - Engineering thermoplastics.** Phenolic antioxidant, suitable for PA, PU and Elastomers.	156-162°C	5% @ 330°C 10% @ 342°C 25% @ 375°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.	50-55°C	5% @ 260°C 10% @ 278°C 25% @ 302°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 1010 Tetrakismethylen(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.	110-125°C	5% @ 350°C 10% @ 365°C 25% @ 387°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 697 2,2'-Oxalyldiamidobis[ethyl-3-(3,5-di-t-butyl-4-hydroxyphenyl)propionate] **CAS n. 70331-94-1** PHYSICAL FORM: GR, PW, MB		**Polyurethanes - Polyolefins-Engineering thermoplastics.** Phenolic chelating antioxidant, suitable for PO, PU, PA, ABS.	174-180°C	10% @ 326°C 20% @ 338°C 30% @ 345°C
GC RIANOX 3114 1,3,5-tris(3,5-di-t-butyl-4-hdroxybenzyl) -1,3,5-triazine-2, 4,6 (1H,3H,5H)-trione **CAS n. 27676-62-6** PHYSICAL FORM: GR, PW, MB		**Polyolefins.** Phenolic antioxidant with low extraction properties. Suitable for fibers and PO.	218-223°C	5% @ 305°C 10% @ 319°C 25% @ 337°C
GC RIANOX DSTP Dioctadecyl 3-3'-thiodipropionate **CAS n. 693-36-7** PHYSICAL FORM: GR, PW, MB		**Polyolefins - Engineering thermoplastics.** Thiosynergist antioxidant, suitaple for PA, PO, PET and ABS.	63,5-68,5°C	5% @ 270°C 10% @ 310°C 25% @ 342°C
GC RIANOX DLTP Di-lauryl-3,3'-thiodipropionate **CAS n. 123-28-4** PHYSICAL FORM: GR, PW, MB		**Polyolefins - Engineering thermoplastics.** Thiosynergist antioxidant, suitaple for PA, PO, Polyester and ABS.	38-41°C	5% @ 251°C 10% @ 270°C 25% @ 296°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.	160-175°C	5% @ 159°C 10% @ 215°C 25% @ 267°C

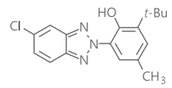
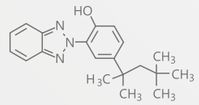
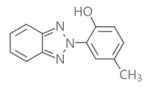
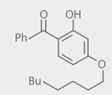
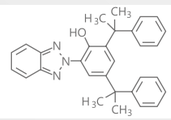
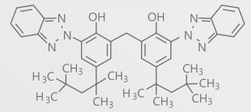
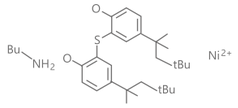
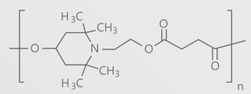
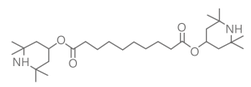
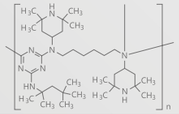
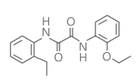
ANTIOXIDANTS

ANTIOXIDANTS

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
GC RIANOX 412S Pentaerythrityl tetrakis (3-laurylthio-propionate) **CAS n. 29598-76-3** PHYSICAL FORM: GR, PW, MB		**Polyolefins - Engineering thermoplastics.** Suitable for ABS, BR, PC, PE, PP, PS.	48-54°C	5% @ 284°C 10% @ 295°C 25% @ 330°C
GC RIANOX 1520 4,6-Bis[(Octylthio)methyl)]-o-cresol **CAS n. 110553-27-0** PHYSICAL FORM: LIQ		**Polyolefins - Polyurethanes.** BR, NBR, SBR, SBS.	About 14°C	
GC RIANOX 1726 4,6-Bis(Dodecylthiomethyl)-o-cresol **CAS n. 110675-26-8**		**Polyolefins - Polyurethanes.** SBS, SIS, PUR.	28°C	
GC THANOX 1315 Benzenepropanoic acid, 3,5-bis(1,1-dimethylethyl)- 4-hydroxy-, C13,15-branched and linear alkyl esters **CAS n. 171090-93-0** PHYSICAL FORM: TRASPARENT LIQ		**PU FOAM.**	56°C	
GC RIANOX 1135/1135R 2-ethylhexyl 3,5-bis(di-tert-butyl) -4-hydroxybenzopropionate **CAS n. 144429-84-5** PHYSICAL FORM: LIQ		**Polyurethanes.** PUR, Polyol.		1% @ 160°C 10% @ 200°C
GC RIANOX 5057 Benzenamine, N-phenyl-, reaction products with 2, 4, 4-trymethylpentene **CAS n. 68411-46-1**		**Polyolefins - Polyurethanes.** EVA, PUR, Polyol.		
GC RIANOX 330 1,3,5-Trimethyl-2,4,6-tris-(3,5-di-tert-butyl-4-hydroxybenzyl)benzene **CAS n. 1709-70-2** PHYSICAL FORM: GR, PW, MB		**Polyurethanes- Polyolefins - Engineering thermoplastics.** Adhesives, Elastomers, PA, Polyolefins, Polyesters, PS, PUR.	240-250°C	5% @ 316°C 10% @ 350°C 25% @ 385°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
GC RIANOX 565 2,6-Di-tert-butyl-4-(4,6-bis(octylthio)-1,3,5-triazin-2-ylamino)phenol **CAS n. 991-84-4** NEW		Elastomers and styrenic block co-polymers such as SBS and SIS. It also used in adhesives, EPDM, ABS, HIPS, PA and Polyolefins.	91-96°C	1% @ 268°C 10% @ 28°C
GC RIANOX PEP-36 Bis(2,6-di-ter-butyl-4-methylphenyl)-pentaerythritol diphosphite **CAS n. 80693-00-1** PHYSICAL FORM: GR, PW, MB		**ABS, Engeneering plastics, Polyolefins, PS.**	135-240°C	
GC GREENOX 80 3,9-Bis[1,1-dimethyl-2-[(3-tert-butyl-4-hydroxy-5-methyl-phenyl)propionyloxy]ethyl]-2,4, 8,10-tetraoxaspiro[5.5]undecane NEW **CAS n. 90498-90-1**		**Polyolefins, HIPS, ABS, Engeneering plastics, TPU, Unsaturated elastomers.**	115-125°C	

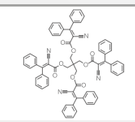
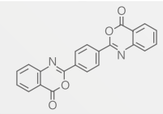
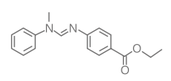
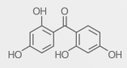
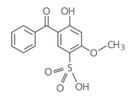
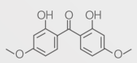
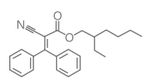
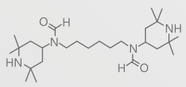
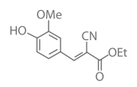
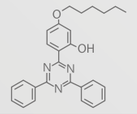
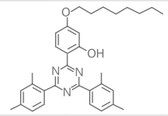
Please feel free to contact us for any other substance not mentioned in this list.
We supply material in powder, granular, masterbatch physical form and liquid dispersions.

UV ABSORBERS – LIGHT STABILIZERS

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
GC UV-326 2-(2'-Hydroxy-3'-t-butyl-5'-methyl-phenyl)-5-chlorobenzotriazole **CAS n. 3896-11-5** PHYSICAL FORM: GR, PW, MB		**Polyolefins - Polyurethanes - Engineering Thermoplastics.** UV absorber containing benzotriazole, suitable for ABS, PS, PO, PUR, PVC, Polyesters.	137-142°C	5% @ 202°C 10% @ 205°C 25% @ 236°C
GC UV-329 2-(2'-Hydroxy-3',5'-di-t-amylphenyl) benzotriazole **CAS n. 3147-75-9** PHYSICAL FORM: GR, PW, MB		**Engineering Thermoplastics.** UV absorber containing benzotriazole, suitable for PS, PET, PAM, PAC, PVC.	102-108°C	5% @ 220°C 10% @ 246°C 50% @ 286°C
GC UV-P 2-(2'-hydroxy-5-methyl-phenyl)-5-benzotriazole **CAS n. 2440-22-4** PHYSICAL FORM: GR, PW, MB		**Polyolefins - Polyurethanes - Engineering Thermoplastics.** UV absorber containg benzotriazole, suitable for ABS, PS, Elastomers, Plyesters, PUR, PVC.	128-132°C	5% @ 163°C 10% @ 178°C 50% @ 197°C
GC CHIM 81 Octabenzone **CAS n. 1843-05-6** PHYSICAL FORM: GR, PW, MB		**Polyolefins - Polyurethanes - Engineering Thermoplastics.** UV absorber containing benzotriazole, suitable for PS, PUR, elastomers, PVC.	47-50°C	5% @ 220°C 10% @ 233°C 25% @ 255°C
GC UV-234 2-[2-hydroxy-3,5-di(1,1-dimethylbenzyl) phenyl]-2H-benzotriazole **CAS n. 70321-86-7** PHYSICAL FORM: GR, PW, MB		**Polyolefins - Engineering Thermoplastics.** UV absorber containing benzotriazole , suitable for PS, PET, TPE, PA, POM, PC.	137-141°C	1% @ 264°C 2% @ 280°C 5% @ 302°C
GC UV-360 2,2'-Methylenebis(6-(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol) **CAS n. 103597-45-1** PHYSICAL FORM: GR, PW, MB		**Polyolefins - Polyurethanes - Engineering Thermoplastics.** UV absorber containing benzotriazole, suitable for POM, PMMA, PC, PA, PBT, PET, Elastomers.	195°C	1% @ 333°C 2% @ 350°C
GC NIQ 84 2,2'-Thiobis(4-tert-octylphenolato) -n-butylamine nickel(II) **CAS n. 14516-71-3** PHYSICAL FORM: GR, PW, MB		**Polyolefins.** Nickel Quencher, UV stabilizer developed for outdoor applications in polyolefins.	245-280°C	
GC UV LS 622 Butanedioic acid, dimethyl ester, polymer with 4-hydroxy -2,2,6,6-tetramethyl-1-piperidine ethanol **CAS n. 65447-77-0** PHYSICAL FORM: GR, PW, MB		**Polyolefins - Engineering Thermoplastics.** UV absorber suitable for Adhesives, Elastomers, PO, PVC, Sealants, Styrenics, Unsatured Polyesters.	50-70°C	0,1% @ 200°C 0,4% @ 250°C 1,1% @ 275°C
GC UV LS 770 Bis(2,2,6,6-tetramethyl-4-piperidyl) sebacate **CAS n. 52829-07-9** PHYSICAL FORM: GR, PW, MB		**Polyolefins - Engineering Thermoplastics.** UV absorber suitable for ABS, ASA, EPDM, IPS, PP, SAN, TPO.	81-85°C	1% @ 203°C 5% @ 221°C 10% @ 242°C
GC UV LS 944 Poly [[6-[(1,1,3,3-tetramethyl-butyl)amino]-s-triazine-2,4-diyl]- [(2,2,6,6-tetramethyl-4-piperidyl)imino]-hexamethylene-[(2,2,6,6-tetramethyl-4-piperidyl)imino]] **CAS n. 71878-19-8** PHYSICAL FORM: GR, PW, MB		**Polyolefins-Polyurethanes - Engineering Thermoplastics.** UV absorber suitable for EVA, PO, POM, PU, PVC, XPE.	100-135°C	0,2% @ 275°C 1,0% @ 300°C 3,7% @ 325°C
GC UV-312 N-(2-ethoxyphenyl)-N'-(2-ethylphenyl) oxamide **CAS n. 23949-66-8** PHYSICAL FORM: GR, PW, MB		**PVC-Polyurethanes- Engineering Thermoplastics.** UV absorber used in a variety of plastics and other organic substrates including unsaturated polyesters, PVC and PVC plastisol, PUR, PC, PBT.		

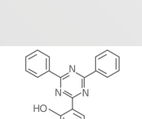
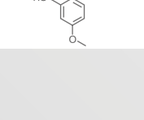
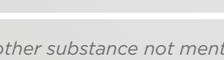
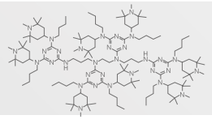
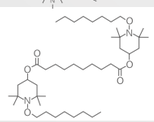
UV ABSORBERS – LIGHT STABILIZERS

UV ABSORBERS – LIGHT STABILIZERS

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
GC UV-3030 2-Propenoic acid, 2-cyano -3,3-diphenyl-, 2,2-bis(2-cyano-1-oxo-3,3-diphenyl-2-propenyl)oxymethyl-1,3-propanediyl ester **CAS n. 178671-58-4** PHYSICAL FORM: GR, PW, MB		**Engineering thermoplastics.** UV absorber provides completely transparent polycarbonate parts with excellent protection from yellowing, while maintaining the clarity and natural colour of PC, ABS, ASA.	175-178°C	1% @ 250°C 2% @ 350°C
GC UV-3638 2,2-(1,4-phenylene)bis((4H-3,1-benzoxazine-4-one) **CAS n. 18600-59-4** PHYSICAL FORM: GR, PW, MB		**Engineering thermoplastics.** UV absorber for engineering plastics, especially for PET, PBT.	310°C	
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.	2000 – 3000 cps at 25C°	
GC UV-3050 2,2',4,4'-Tetrahydroxybenzophenone **CAS n. 131-55-5** PHYSICAL FORM: GR, PW, MB		**Polyurethanes- Engineering Thermoplastics.** UV absorber very suitable for applications in which an optimum filter effect up to the boundary with visible light is desired. It is used in linear polyesters or optical articles, PU sysems and Alkyd resins.		
GC UV-BP4 5-benzoyl-4-hydroxy-2-methoxybenzene -1-sulfonic acid **CAS n. 4065-45-6** PHYSICAL FORM: GR, PW, MB		**Cosmetics.** UV absorber used in a large number of cosmetic products to protect the skin or the hair, and also to protect the formulation.		
GC UV-3049 2,2-Dihydroxy-4,4-dimethoxy benzophenone **CAS n. 131-54-4** PHYSICAL FORM: GR, PW, MB		**Engineering Thermoplastics - Coatings.** Efficient UV absorber for polyester film, which it protests from premature damage, particularly under severe exposure conditions.		
GC UV-3039 2-Ethylhexyl 2-cyano-3,3-diphenylpropenoate **CAS n. 6197-30-4** PHYSICAL FORM: LIQ		**Engineering Thermoplastics.** UV absorber particularly suitable for the stabilization of PVC-p and PVC plastisols. It can also be used in PUR, polyesters and PMMA.		
GC UV-4050H N,N'-Bis(2,2,6,6-tetramethyl-4-piperidyl) -N,N'-diformylhexamethylenediamine **CAS n. 124172-53-8** PHYSICAL FORM: GR, PW, MB		**Polyolefins - Engineering Thermoplastics.** Light stabilizer used in polyolefins, ABS and nylons. It is highly compatible with pigments.	155-158°C	
GC UV-80 ethyl 2-cyano-3-(4-hydroxy-3-methoxyphenyl)prop-2-enoate **CAS n. 13373-29-0** PHYSICAL FORM: GR, PW, MB		**Engineering Thermoplastics - Coatings.** UV absorber with UV absorption at 380-400nm, especially used in sunglasses lenses resins of TAC, PC, PMMA, also used in adhesive, paint and solent-based systems.	110-113°C	
GC UV-1577 2-(4,6-Diphenyl-1,3,5-triazin-2-yl)-5-[(hexyl)oxy]-phenol **CAS n. 147315-50-2** PHYSICAL FORM: GR, PW, MB		**Engineering Thermoplastics.** UV absorber applicable in polyalkene terephthalates and naphthalates, linear and branched PC, modified polyphenylene ether compounds, and various high performance plastics. Can also be used in polymer blends & alloys, such as PC/ABS, PC/PBT, PPE/IPS, PPE/PA.	147-151°C	
GC UV-1164 2-[4,6-Bis(2,4-dimethylphenyl)- 1,3,5-triazin-2-yl]-5-(octyloxy)phenol **CAS n. 2725-22-6** PHYSICAL FORM: GR, PW, MB		**Engineering Thermoplastics.** UV absorber applicable in nylon, PVC, PET, PBT, ABS and PMMA and other high performance plastics.	88-91°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.

UV ABSORBERS - LIGHT STABILIZERS

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
GC UV LS 292 Reaction mass of bis(1,2,2,6,6-penta-methyl-4-piperidyl) sebacate and methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate **CAS n. 1065336-91-5** PHYSICAL FORM: LIQ		**Elastomers - Engineering thermoplastics.** UV absorber applicable in wide range of polymers and applications including polyurethanes, sealants, adhesives, elastomers, unsaturated polyesters, acrylics, vinyl polymers (PVB, PVC), styrene homo and copolymers, polyolefins, liquid color concentrates, and other organic substrates.		
GC UV LS 3529 1,6-Hexanediamine, N,N'-bis(2,2,6,6-tetramethyl-4-piperidinyl)-, polymers with morpholine-2,4,6-trichloro -1,3,5-triazine reaction products, methylated **CAS n. 193098-40-7** PHYSICAL FORM: GR, PW, MB		**Polyolefins - Engineering thermoplastics.** HALS used in PE and PP agricultural films, artificial turf, injection&rotational molding. PP fiber, POM, PA, PET, PBT, ASA, ABS, HIPS, Rigid&flexible PVC, PMMA and PUR.	95-120°C	10% @ 350°C
GC UV LS 3346 1,6-Hexanediamine, N,N'-bis(2,2,6,6-tetramethyl-4-piperidinyl)-, polymer with 2,4-dichloro-6-(4-morpho-linyl)-1,3,5-triazine **CAS n. 82451-48-7** PHYSICAL FORM: GR, PW, MB		**Polyolefins - Engineering thermoplastics - Polyurethanes.** With both HALS and triazine function group, especially applicableespecially applicable in PE and PP agricultural film, PP fiber, molded polyolefin application. It can be also used in PE/PP film and tape, injection & rotational molding, POM, PA, PET, ASA, PBT, ABS, HIPS, PMMA and PU.	100-125°C	10% @ 340°C
GC UV-5050H Alkenes, C20-24 α-, polymers with maleic anhydride, reaction products with 2,2,6,6-tetramethyl-4-piperi-dinamine **CAS n. 152261-33-1** PHYSICAL FORM: GR, PW, MB		**Polyolefins - Engineering thermoplastics - Polyurethanes.** HALS be used in all polyolefins. It is particularly suitable for water-cooled tape production, films containing PPA and TiO2 and agricultural applications. It can also be used in PVC, PA and TPU as well as in ABS and PET.		
GC UV LS 3853 2,2,6,6-Tetramethyl-4-piperidinyl stearate **CAS n. 167078-06-0** PHYSICAL FORM: GR, PW, MB		**Polyolefins.** Low MW HALS concentrate in PP, afford-ing superior surface property. Protection, it has High solubility/compati-bility withpolyolefins and styrenics. It has Performance synergy with otherstabilizers, especially high molecular weight HALS and UV absorbers.		
GC UV LS 119 N,N',N'',N'''-tetrakis(4,6-bis (butyl-(N-methyl-2,2,6,6-tetramethylpiperi-din-4-yl)amino)triazin-2-yl)-4,7-diazadeca-ne-1,10-diamine **CAS n. 106990-43-6** PHYSICAL FORM: GR, PW, MB		**Elastomers, Polyolefins.** Light stabilizers with good migration resistance and low volatility. It is an effective antioxidant which provides significant long-term heat stability for polyolefins and elastomers.		
GC UV LS 123 Bis-(1-octyloxy-2,2,6,6-tetramethyl-4-pipe-ridinyl) sebacate **CAS n. 129757-67-1** PHYSICAL FORM: LIQ		**Coatings.** HALS, especially used in automotive and industrial coatings/decorative paints and wood stains or varnishes.		
GC UV-1130 A mixture of: α-3-(3-(2H-benzotriazol-2-yl)-5-tert-butyl-4-hydroxyphenyl)propionyl-ω-hydroxypoly(oxyethylene); α-3-(3-(2H-benzotriazol-2-yl)-5-tert-butyl-4-hydroxyphenyl)propionyl-ω-3-(3-(2H-benzotriazol-2-yl)-5-tert-butyl-4-hydroxyphenyl)propionyloxypoly (oxyethylene) PHYSICAL FORM: LIQ		**Coatings.** A liquid benzotriazole-based UV absorber for coatings, printing and packaging, adhesives and sealants. It is universally applicable in solvent- and water-based coatings including UV-curable systems.	7400 (+/- 2%) mPa.s	
GC UV-1579 2-(2-Hydroxy-4-methoxyphenyl)-4,6-diphenyl-1,3,5-triazine **CAS n. 106556-36-9** PHYSICAL FORM: GR, PW, MB		**Engineering thermoplastics.** UV absorber mainly used as UV absorber used in PET fiber(Terylene). It can both protect PET fiber itself and dyestuff. It is recommended to be used in dip-dyeing of PET fiber,especially in processing of heat treating.		

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.

ONE SHOT FORMULATIONS

PRODUCT NAME	APPLICATION	DESCRIPTION
GC RIANOX 1098 50%	POLYOLEFINS, POLYURETHANES, ENGINEERING THERMOPLASTICS.	Liquid dispersion 50 % of phenolic antioxidant, suitable for PU, PA and elastomers.
GC RIANOX 1171	ENGINEERING THERMOPLASTICS.	Mixture of phenolic antioxidant and phosphite suitable for PA.
GC B215, B220, B225, B561	POLYOLEFINS, ENGINEERING THERMOPLASTICS.	Mixture of antioxidant 1010/168, suitable for PC, ABS, Polyester and PO.
GC B900, B921	POLYOLEFINS, ENGINEERING THERMOPLASTICS.	Mixture of antioxidant 1076/168, suitable for PC, ABS, Polyester and PO.
GC UV LS 783	POLYOLEFINS, POLYURETHANES, ENGINEERING THERMOPLASTICS.	Mixture of 622/944 for several polymers.
GC UV LS 791	POLYOLEFINS, POLYURETHANES, ENGINEERING THERMOPLASTICS.	Mixture of 770/944 for several polymers.
GC NIQ 84 81	POLYOLEFINS.	Uv stabilizer mixture of Nickel quencher and UV531 for outdoor application.

Please feel free to contact us for any other substance not mentioned in this list.

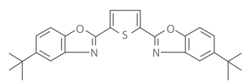
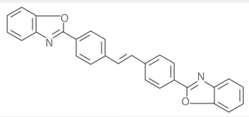
GC GreenChemicals
IMPROVE YOUR PERFORMANCE

OPTICAL BRIGHTENERS

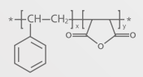
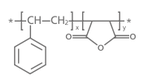
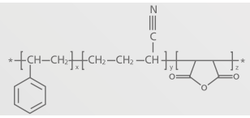
SMA

PROCESS AID & STABILIZERS

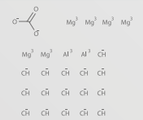
OPTICAL BRIGHTENERS

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
GC OB 2,5-thiophenediylbis (5-tert-butyl-1,3-benzoxazole) **CAS n. 7128-64-5** PHYSICAL FORM: PW		Polyesters, Polycarbonate, Polyamides and acrylics, thermoplastic Polyurethane, Polyvinylchloride, Styrene homo- and copolymers, Polyolefins, Adhesives, and other organic substrates.	201-205°C	
GC OB 1 2,2'-(1,2-Ethenediyldi-4,1-phenylene) bisbenzoxazole **CAS n. 1533-45-5** PHYSICAL FORM: PW		Polypropylene plastic, hard PVC, ABS, EVA, Polystyrene and Polycarbonate.	355-360°C	

SMA

GC SMA 700 Random Copolymer PHYSICAL FORM: COLORLESS OR YELLOWISH TRASPARENT GRANULES		It can be used as modifier of the heat resistance of ABS, PS, AS and ASA improving thermal performance. GC SMA 700 can be used as compatibilizer in PC and PET or as coupling agent for styrene resins and glass fiber.		
GC SMA 725 Random Copolymer PHYSICAL FORM: COLORLESS OR YELLOWISH TRASPARENT GRANULES		It contains maleic anhydride and styrene. It can be used as modifier of the heat resistance of ABS, PS, AS and ASA improving thermal performance. It can be used as compatibilizer in PC and PET or as coupling agent for styrene resins and glass fiber.		
GC SMA 800 Random Termopolymer PHYSICAL FORM: COLORLESS OR YELLOWISH TRASPARENT GRANULES		Because of the hyper reactivity of SAN chain and maleic anhydride, it is particularly suitable as compatilizer for resin alloy like PA/ABS, PC/ABS, PC/ASA,PA/ASA,ABS/ PET, etc.		

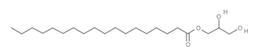
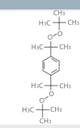
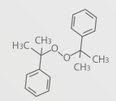
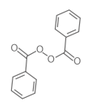
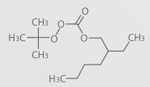
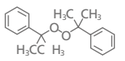
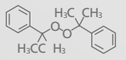
PROCESS AID & STABILIZERS

GC HT4 Hydrotalcite **CAS n. 11097-59-9**		Acid scavenger.		

Please feel free to contact us for any other substance not mentioned in this list.

PROCESS AID & PEROXIDES

PROCESS AID & PEROXIDES

PRODUCT NAME	CHEMICAL FORMULA	APPLICATION	M.P./S.R. Viscosity	TGA
PROCESS AID				
GC GMS 90 Stearic acid, monoester with glycerol (Conc. ≥90%) **CAS n. 123-94-4**		Plasticizer.	66,7°C	
GC GMS 40 Stearic acid, monoester with glycerol (Conc. ≥40%) **CAS n. 123-94-4**		Plasticizer.	60°C	
GC STEARATO DI BARIO Fatty acids, C16-18, barium salts **CAS n. 91002-07-2**		Drying lubricants and dusting agents for rubbers.		
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.		
PEROXIDES				
GC BIPB 40 Peroxide formulation based on Bis(t-butylperoxy isopropyl)benzene		Thermoplastic polyolefins / natural and synthetic rubber.	37-54°C	
GC DYCUMIL PEROXIDE Dicumyl Peroxide **CAS n. 80-43-3**		Polyolefins / elastomers (tubes, wires, tires, rubber seals).	>39°C	
GC BEO 25 W Dibenzoyl Peroxide (CAS n. 94-36-0) 75% with water		PVC, Styrenics.	103-108 °C @ 1.013 hPa	
GC TBEC Tert-Butylperoxy 2-ethylhexyl carbonate **CAS n. 34443-12-4**		Acrylates& methacrylates, Polyesthers, Styrenics.		
GC C DC 40 Compacted blend wit 40% of Dicumyl Peroxide PHYSICAL FORM: PELLETS		Thermoplastic polyolefins and synthetic and natural rubber.		
GC PE DC 40 Compacted blend of Dicumyl Peroxide disperded on LDPE		Polyolefins and synthetic and natural rubber.		

Please feel free to contact us for any other substance not mentioned in this list.

GC GreenChemicals

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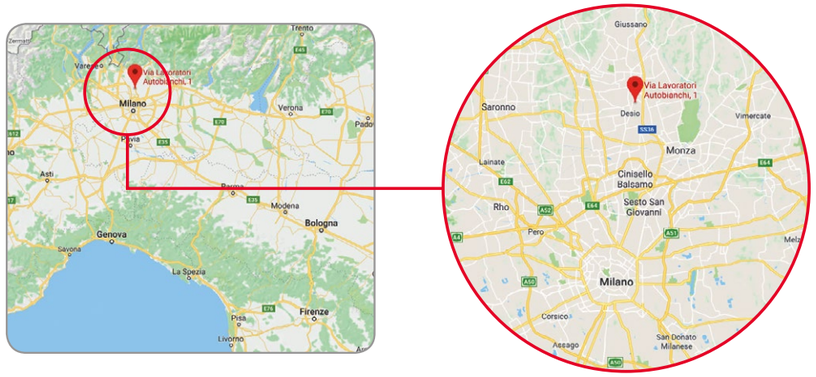

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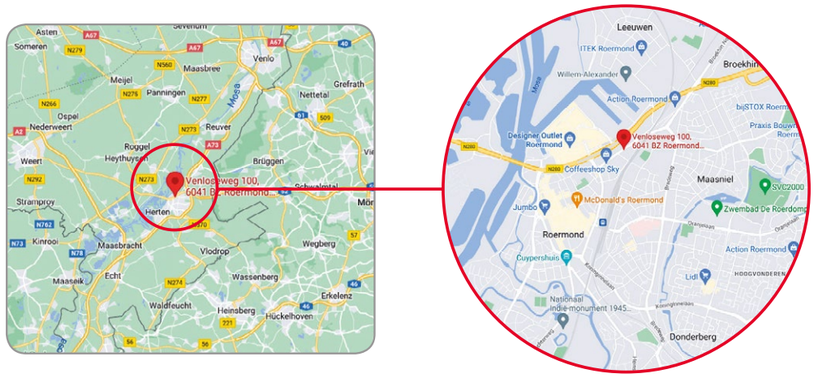

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