

PLASTIC ADDITIVES

FR

UV

AOX

GAS

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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)



- 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



MEMBERSHIP:

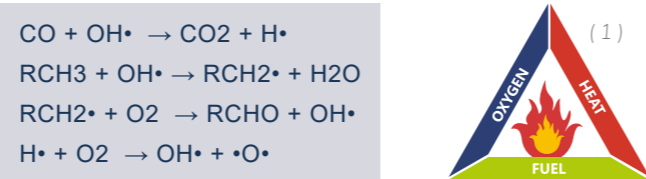


Flame Retardant Mechanism

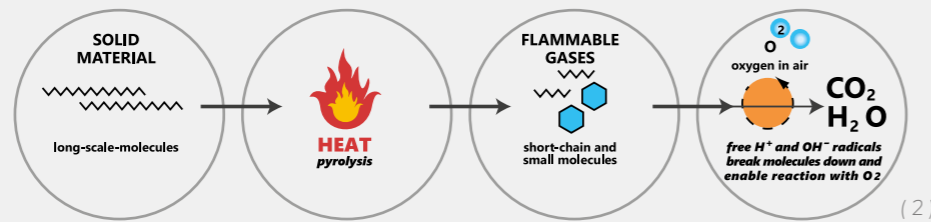
Flame retardants are substances which may reduce flammability of materials by interaction with the fire cycle (FIGURE 1) in order to prevent, delay or stop it. Flame retardants act at different stages, depending on their chemical basis.

COMBUSTION

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



The fire starts with an ignition source put on a combustible item. Solid materials do not burn directly, they are degraded 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.



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 |

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

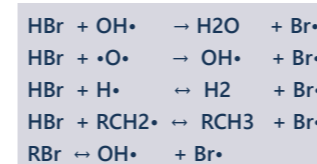
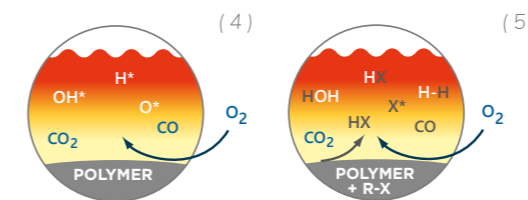
PHYSICAL ACTION CAN TAKE PLACE BY:

- 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-combustible gas

Mechanism:

1. GAS PHASE

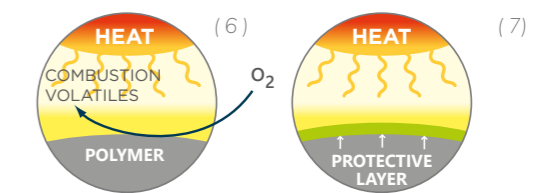
Brominated flame retardants interrupt the radical chain mechanism of the combustion process in the gas phase thanks to generation of lower energy halogen radicals and dilution of flammable gases.



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

2. CHAR

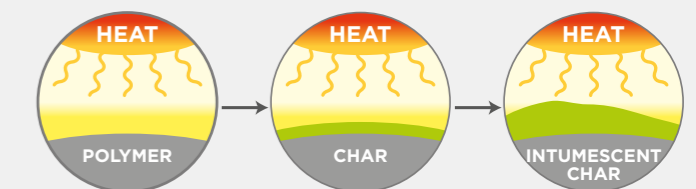
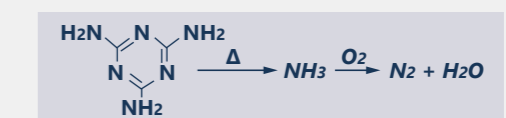
Flame retardancy is obtained by formation of a solid charred surface layer of phosphorus compounds. The flame retardant is transformed into phosphoric acid by thermal degradation in the condensed phase, and water is released from the substrate in the solid phase developing protective layer: char.



3. INTUMESCENT

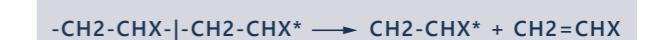
Intumescent mechanism provides efficient flame retardancy to polymers who do not contain heteroatoms in the chain. Char layer is not sufficient and a foaming agent is required to obtain a voluminous protective layer. Intumescent flame retardant systems consist of:

- Carbon agent
- Acid based on phosphorous
- Compound containing nitrogen



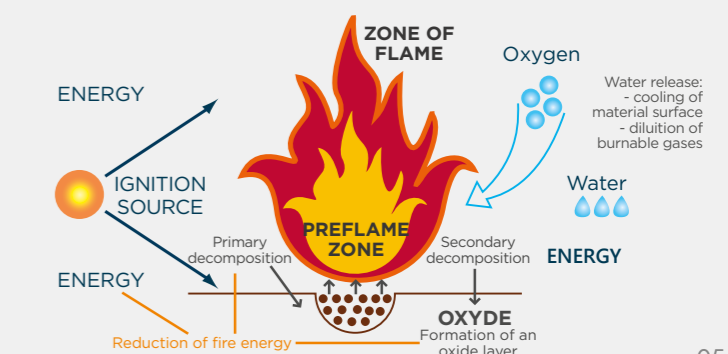
4. DRIPPING

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



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.



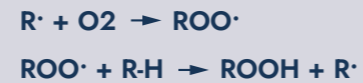
Antioxidants

UV Absorbers / Light Stabilizers

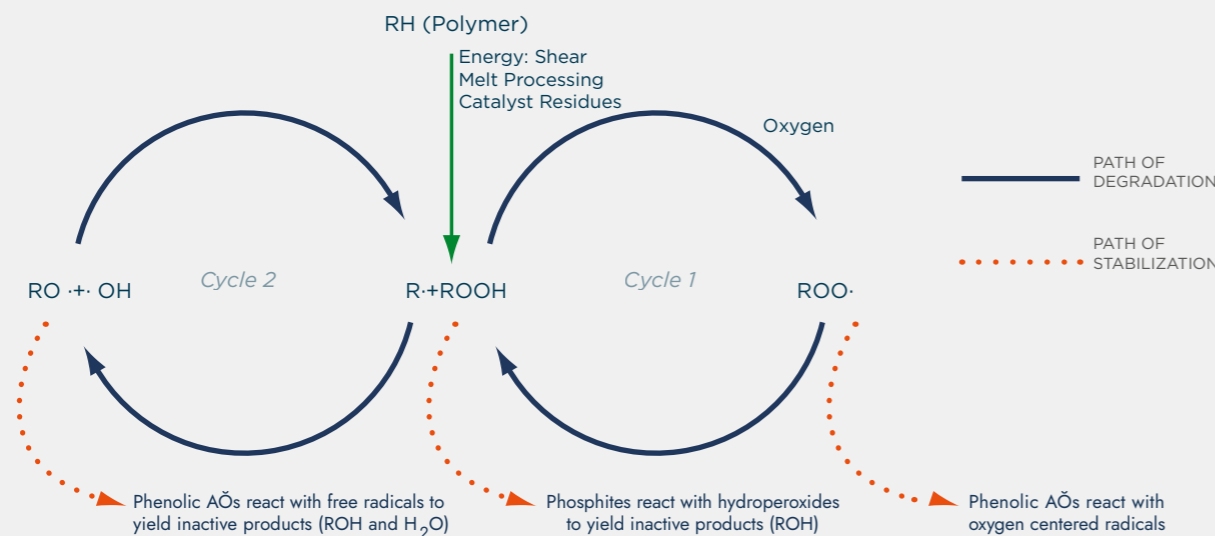
ANTIOXIDANTS CYCLE

Weathering of polymers is caused by absorption of UV lights, which results in radical initiated auto-oxidation by contact with atmospheric oxygen and generation of free radicals such as R^\cdot , RO^\cdot , ROO^\cdot , HO^\cdot .

These free radicals further react with atmospheric oxygen to produce more and more free radicals.

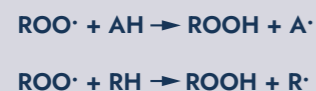


Antioxidants inhibit the formation of free radicals, enhancing the stability of polymers against light and heat, by termination of the oxidation reactions that involve polymers:



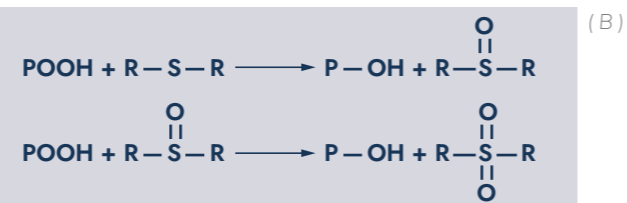
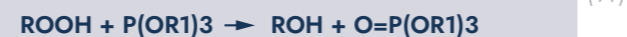
PRIMARY

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.



SECONDARY

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

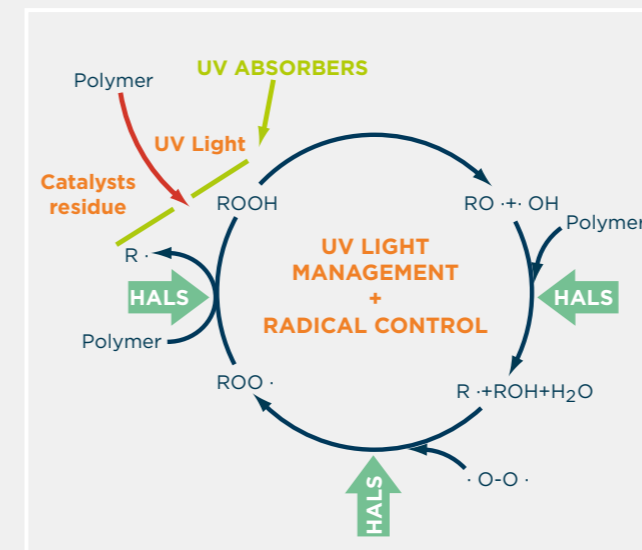


UV STABILIZERS

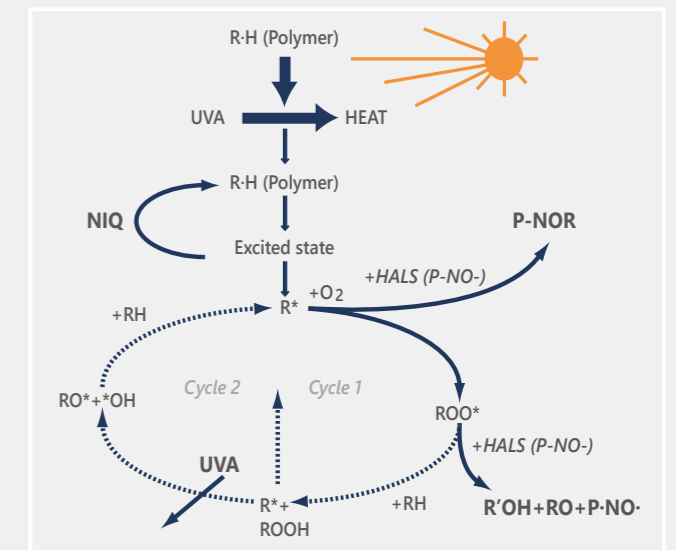
UV stabilizers are chemical compounds capable of interfering with the physical and chemical processes of light-induced degradation.

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:



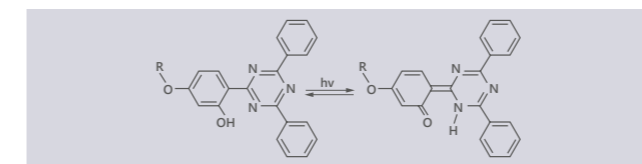
(1) Photo-oxidation



(2) Light stabilizer mechanism

UV ABSORBERS

UV absorbers act by absorbing the UV radiation and dissipating the resulting energy in a non-photosensitizing way, such as heat, by intramolecular proton transfer.

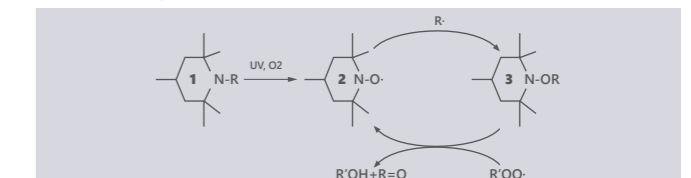


QUENCHERS

They are energy transfer 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

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



Plastic Additives

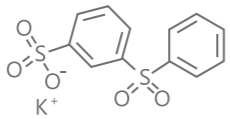
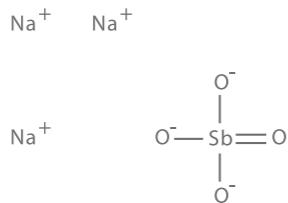
THE RANGE

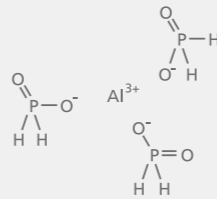
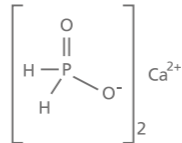


| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|---|------------------|---|--|
| GC MELAMMINA Melamine CAS n. 108-78-1 PHYSICAL FORM: GR, PW | | Polyolefins - Polyurethanes. PP, PE, PU, Textile, Coatings. | M.P./S.R Viscosity 354°C |
| GC MC series & GC MCA granular Melamine Cyanurate CAS n. 37640-57-6 PHYSICAL FORM: GR, PW | | Engineering Thermoplastics. PA, Polyesters. | M.P./S.R Viscosity Decomposition T. > 350°C ----- TGA: 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. | M.P./S.R Viscosity Decomposition T. > 275°C |
| GC MPP Melamine Polyphosphate CAS n. 218768-84-4 PHYSICAL FORM: GR,PW | | Polyurethanes - Engineering Thermoplastics. PA, Epoxy, PU, Polyesters. | M.P./S.R Viscosity Decomposition T. > 300°C ----- TGA: 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. | 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 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 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 RDP Reaction mass of 3-[[diphenoxyphosphoryl]oxy]phenyl triphenyl 1,3-phenylene bis (phosphate) and tetraphenyl 1,3-phenylene bis(phosphate) EC n. 701-337-2 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 DICUMENE 90 Dicumene CAS n. 1889-67-4 PHYSICAL FORM: PW | | Polyolefins - Engineering Thermoplastics. FR synergist. | M.P./S.R Viscosity 100-110°C |
| GC FOS 65 Isopropylated Triaryl phosphate CAS n. 68937-41-7 PHYSICAL FORM: LIQ | | Polyolefins - 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 FOS 35 Isopropylated Triaryl phosphate CAS n. 68937-41-7 PHYSICAL FORM: LIQ | | Polyurethanes - PVC - Epoxy resins - Vinyl polymers. | M.P./S.R Viscosity 42-50 cps |
| GC FOS 95 Isopropylated Triaryl phosphate CAS n. 68937-41-7 PHYSICAL FORM: LIQ | | Polyurethanes - PVC - Epoxy resins - Vinyl polymers. | M.P./S.R Viscosity 95-114 cps |
| GC TEP Triethyl Phosphate CAS n. 78-40-0 PHYSICAL FORM: LIQ | | Polyurethanes. PU. | M.P./S.R Viscosity 5 mPa·s-5 mPa·s |
| GC TCP Tricresyl Phosphate CAS n. 1330-78-5 PHYSICAL FORM: LIQ | | Polyolefins. PE, PVC, Rubber, Wire&cables. | M.P./S.R Viscosity 55-70 mPa·s |

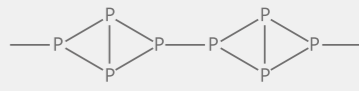
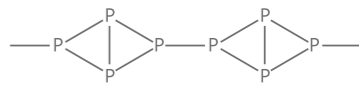
| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity TGA |
|--|------------------|--|--|
| NOFIA HM1100, HM9000, HM7000 & HM5000 Polyphosphonate CAS n. 68664-06-02 PHYSICAL FORM: GR, PW | | PET - PTT - PBT - PLA - PC - TPU - TPEE. | M.P./S.R Viscosity Decomposition T. > 350°C |
| NOFIA CO6000 Polyphosphonate-co-carbonate CAS n. 77226-90-5 PHYSICAL FORM: GR | | PC - PC blends. | |
| NOFIA OL1000 Phosphonate Oligomer CAS n. 68664-06-02 PHYSICAL FORM: GR | | UP - Epoxy - Polyurethane and Polyurea. | |
| GC DOPO 9,10-Dihydro-9-oxa-10-phosphaphenanthrene 10-oxide CAS n. 35948-25-5 PHYSICAL FORM: PW, FLAKES | | Engineering Thermoplastics. Epoxy, PU, PA, Polyesters. Reactive Flame Retardant. | M.P./S.R Viscosity 117-120°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, Engineering polymers. Reactive Flame Retardant. | M.P./S.R Viscosity 245°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. | M.P./S.R Viscosity 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. | M.P./S.R Viscosity 158-162°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. | M.P./S.R Viscosity 110-117°C |

| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | 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. | M.P./S.R Viscosity 350°C ----- TGA: 1% @ 362°C 5% @ 388°C 10% @ 404°C |
| GC ZnBO3 - 4 Zinc Borate CAS n. 138265-88-0 PHYSICAL FORM: PW, COMPACTED |  | Polyolefins - Polyurethanes - Engineering Thermoplastics. Synergist suitable for PVC, Polyolefins, PA, Rubber. | M.P./S.R Viscosity 890°C ----- TGA: 1% @ 282°C 5% @ 388°C 10% @ 425°C |
| GC ZnBO3 - 8 Zinc Borate CAS n. 138265-88-0 PHYSICAL FORM: PW, COMPACTED |  | Polyolefins - Polyurethanes - Engineering Thermoplastics. Synergist suitable for PVC, Polyolefins, PA, Rubber. Specially suitable for Film. | M.P./S.R Viscosity 890°C ----- TGA: 1% @ 282°C 5% @ 388°C 10% @ 425°C |
| GC KSS Reaction mass of dipotassium 3,3'-sulphonyl-bis(benzenesulphonate) and potassium 3-(phenylsulphonyl) benzene sulphonate EC n. 915-932-1 PHYSICAL FORM: PW |  | Engineering Thermoplastics. Flame retardant suitable for transparent PC at very low dosage. | TGA: 1% @ 425°C 5% @ 452°C 10% @ 468°C |
| GC TRIOSSIDO DI ANTIMONIO Antimony Trioxide CAS n. 1309-64-4 PHYSICAL FORM: PW |  | Polyolefins - Polyurethanes - Engineering Thermoplastics. Synergist for brominated flame retardant suitable for plastics and textiles. | M.P./S.R Viscosity 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. | M.P./S.R Viscosity Melting point: 600°C 100 kPa |

| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|---|---|--|------------------------------------|
| GC FOS AL Aluminium phosphinate CAS n. 7784-22-7 PHYSICAL FORM: PW |  | Engineering polymers - TPU - PU - PBT - PET - TPE - PA + GF - 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. | |

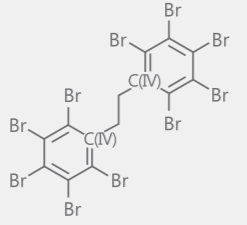
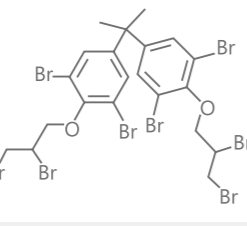
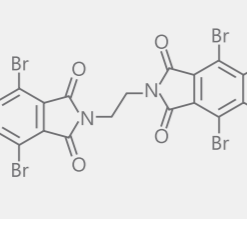
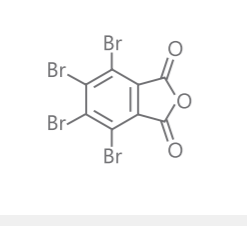
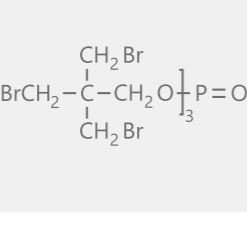
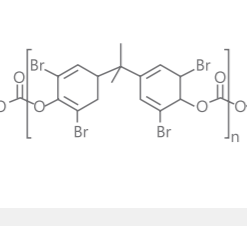
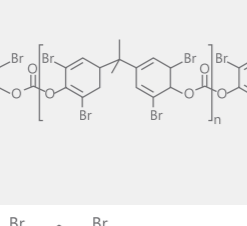
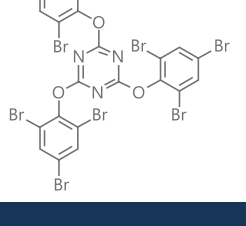
Please feel free to contact us for any other substance not mentioned in this list.
We supply material in powder, granular, masterbatch physical form and liquid dispersions.

| PRODUCT NAME | APPLICATIONS | DESCRIPTION |
|--|---|--|
| GC DRIPP HF 70 Low Halogen Content PHYSICAL FORM: PW, MB | 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 HFT PC 90 HALOGEN FREE PHYSICAL FORM: PW | 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, application ABS. |
| GC PBT FLAM V0 HALOGEN FREE PHYSICAL FORM: PW | PBT, PBT V0.  | Halogen free blend for polyesters. It keeps mechanical 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 PP HF 200 Intumescent System HALOGEN FREE PHYSICAL FORM: PW, MB | PP V0 - PE - TPR - TPU.  | Efficient halogen free intumescent blend. Reduced loading level, good dispersion. |
| GC PP HF 1000 Intumescent System HALOGEN FREE PHYSICAL FORM: PW | PP V0 - PE - TRP - TPU.  | Efficient intumescent blend based on phosphorus and nitrogen. |
| MB PA P RED 50 Red phosphorous masterbatch PHYSICAL FORM: MB | Engineering Thermoplastics. PA, Polyesters. Red phosphorous masterbatch for PA. | CHEMICAL FORMULA:  |

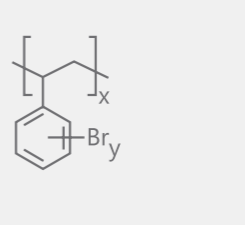
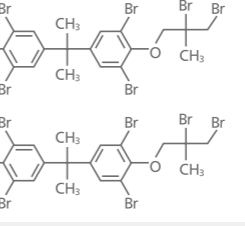
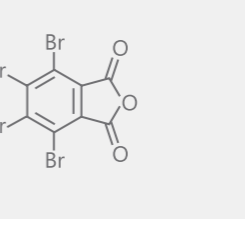
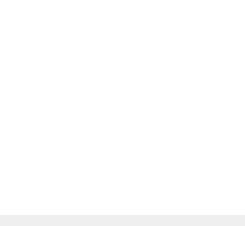
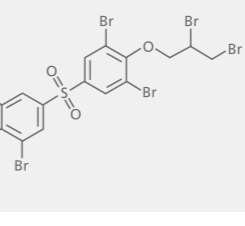
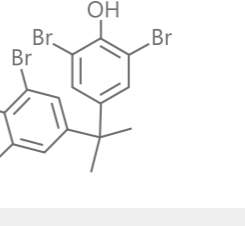
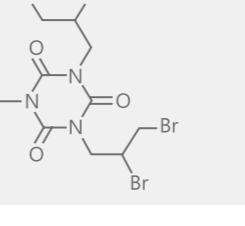
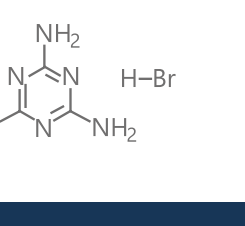
| PRODUCT NAME | APPLICATIONS | DESCRIPTION |
|---|---|--|
| MB PP P RED 60 Red phosphorous masterbatch PHYSICAL FORM: MB | Polyolefins. PP, PE. Red phosphorous masterbatch for PP. | CHEMICAL FORMULA:  |
| MB PE P RED 70 Red phosphorous masterbatch PHYSICAL FORM: MB | Polyolefins. PP, PE. Red phosphorous masterbatch for PE. | CHEMICAL FORMULA:  |
| MB PE TRIX 80 / 90 PHYSICAL FORM: MB | Polyolefins. | Masterbatch containing antimony trioxide, also on EVA base. |

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

Brominated Flame Retardants

| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|---|---|--|---|
| GC DPE 81 Decabromodiphenyl ethane1 CAS n. 84852-53-9 PHYSICAL FORM: GR, PW |  | Polyolefins - Engineering Thermoplastics. High efficiency, dioxine free, multi-function for PE, PP, HIPS, PA, PBT, EPOXY, PHE. | M.P./S.R Viscosity 350°C ----- TGA: 1% @ 332°C 5% @ 365°C 10% @ 378°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. | M.P./S.R Viscosity 113-117°C ----- TGA: 1% @ 299°C 5% @ 312°C 10% @ 321°C |
| GC BT 67 Ethylenebistetra bromo 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. | M.P./S.R Viscosity 460°C ----- TGA: 1% @ 336 °C 5% @ 417°C 10% @ 430°C |
| GC PHT Tetrabromophthalic Anhydride CAS n. 632-79-1 PHYSICAL FORM: 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 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. | M.P./S.R Viscosity 181°C ----- TGA: 1% @ 332°C 5% @ 365°C 10% @ 378°C |
| GC B 52 Phenoxy-terminated carbonate oligomer of tetrabromophenol A CAS n. 94334-64-2 PHYSICAL FORM: PW |  | Engineering Thermoplastics. PET, PBT, PC, ABS, PC / ABS, thermal and UV stability, excellent electrical properties. | M.P./S.R Viscosity 190-210°C ----- TGA: 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. | M.P./S.R Viscosity 210-230°C ----- TGA: 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: GR, PW |  | Engineering Thermoplastics. HIPS, ABS, good flow, good impact, good UV and thermal stability, non-blooming. | M.P./S.R Viscosity 230°C ----- TGA: 1% @ 351°C 5% @ 385°C 10% @ 400°C |

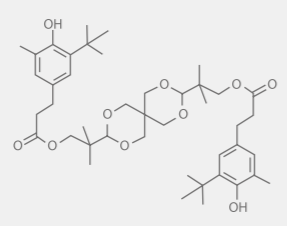
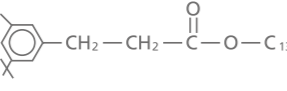
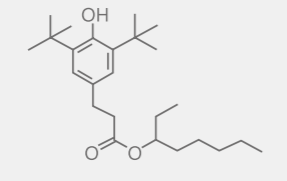
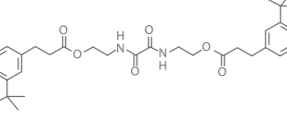
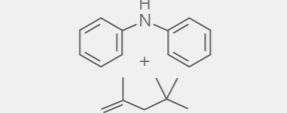
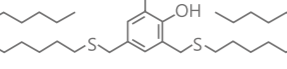
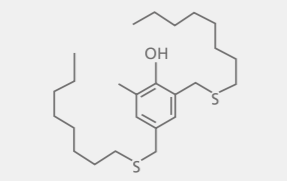
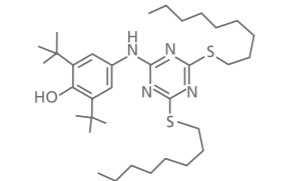
Brominated Flame Retardants

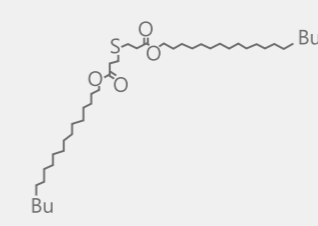
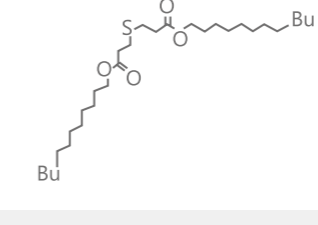
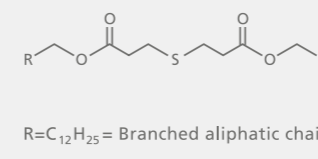
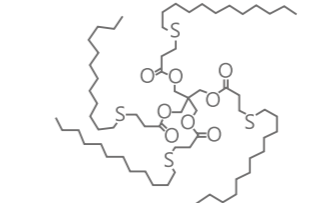
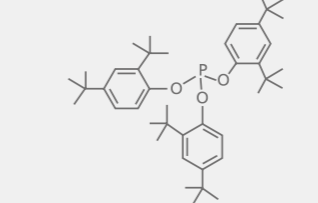
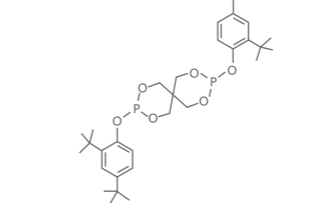
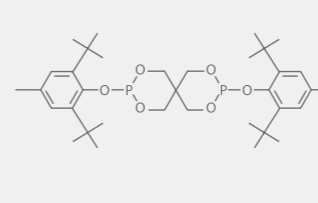
| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|---|---|---|--|
| GC BPS 67, GC BPS 310 Brominated polystyrene CAS n. 88497-56-7 PHYSICAL FORM: GR |  | Engineering Thermoplastics. PA, PBT, PET, good CTI, good thermal stability, non-blooming. | M.P./S.R Viscosity 265-320°C ----- TGA: 2% @ 340°C 5% @ 375°C 10% @ 384°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 n. 944-461-4 PHYSICAL FORM: PW |  | EPS - XPS. Good FR efficiency. | M.P./S.R Viscosity 113°C ----- TGA: 1% @ 299°C 5% @ 312°C 10% @ 321°C |
| GC PHT Tetrabromophthalic 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 DILO 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 30,000-70,000). | M.P./S.R Viscosity 70000 120000 cps ----- TGA: 1% @ 202 °C 5% @ 228°C 10% @ 240°C |
| GC BDDP 65 S Bis[3,5-dibromo-4-(2,3-dibromopropoxy)phenyl] sulphone CAS n. 42757-55-1 PHYSICAL FORM: PW |  | PP - PE - PS - ABS - Rubber. Flame retardant with white color, outstanding thermal and UV stability, non blooming, excellent wet electrical properties. | M.P./S.R Viscosity 110°C ----- TGA: 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. | M.P./S.R Viscosity 180°C ----- TGA: 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. | M.P./S.R Viscosity 105-115°C ----- TGA: 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. | M.P./S.R Viscosity 230°C ----- TGA: 1% @ 351°C 5% @ 385°C 10% @ 400°C |

| PRODUCT NAME | APPLICATIONS | DESCRIPTION |
|-----------------------------|-------------------------------|--|
| MB SAN / EVA DETO 41 | 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. |
| PHYSICAL FORM: MB | | |
| MB PE DPE 90 | Polyolefins. | 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. |
| PHYSICAL FORM: MB | | |

| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|---|------------------|--|--|
| GC AOX 1010 Tetrakis(methylen(3,5-di- <i>t</i> -butyl-4-hydroxycinnamate) methane CAS n. 6683-19-8 PHYSICAL FORM: GR, PW | | 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 AOX 1024 1,2-bis (3,5-di- <i>t</i> -butyl-4-hydroxyhydrocinnamoyl) hydrazine CAS n. 32687-78-8 PHYSICAL FORM: GR, PW | | 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 AOX 1076 Octadecyl 3-(3',5'-di- <i>t</i> -butyl-4'-hydroxyphenyl)propionate CAS n. 2082-79-3 PHYSICAL FORM: GR, PW | | PVC - Engineering Thermoplastics. Excellent stabilizer for polyolefins, impact modified styrenics, block co-polymers, elastomers, adhesives, PVC and polyurethanes. | M.P./S.R Viscosity 50-55°C ----- TGA: 5% @ 260°C 10% @ 278°C 25% @ 302°C |
| GC AOX 3114 1,3,5-tris(3,5-di- <i>t</i> -butyl-4-hydroxybenzyl)-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione CAS n. 27676-62-6 PHYSICAL FORM: GR, PW | | Styrenics and Polyolefins (Fibers). Phenolic antioxidant with low extraction properties. Suitable for fibers and PO. | M.P./S.R Viscosity 218-223°C ----- TGA: 5% @ 305°C 10% @ 319°C 25% @ 337°C |
| GC AOX 330 1,3,5-Trimethyl-2,4,6-tris-(3,5-di- <i>t</i> -butyl-4-hydroxybenzyl)benzene CAS n. 1709-70-2 PHYSICAL FORM: PW, FLAKES | | Adhesives - Elastomers - PA - Polyolefins - Polyesters - PS - PUR. Phenolic antioxidant with low extraction properties. | M.P./S.R Viscosity 240-250°C ----- TGA: 5% @ 316°C 10% @ 350°C 25% @ 385°C |
| GC AOX 245 Triethyleneglycol-bis[3-(3- <i>t</i> -butyl-4-hydroxy-5-methylphenyl)propionate] CAS n. 36443-68-2 PHYSICAL FORM: PW | | PVC - Polyurethanes - Engineering Thermoplastics. Effective in styrene polymers, particularly impact-modified polystyrenes, ABS, MBS, SB as well as in POM homo- and co-polymers. It is also very useful for the stabilization of polyurethanes, polyamides, thermoplastic polyesters, PVC and other polymers. | M.P./S.R Viscosity 76-80°C ----- TGA: 5% @ 297°C 10% @ 312°C 25% @ 332°C |
| GC AOX 1098 N,N'-hexamethylenebis[3-(3,5-di- <i>t</i> -butyl-4-hydroxyphenyl)propionamide] CAS n. 23128-74-7 PHYSICAL FORM: GR, PW | | PA - PU - Elastomers. Excellent antioxidant for polyamide fibers, molded articles and films. It can be added prior to polymerization, to protect polymer color properties during manufacturing, shipping or thermal fixation. | M.P./S.R Viscosity 156-162°C ----- TGA: 5% @ 330°C 10% @ 342°C 25% @ 375°C |
| GC AOX 1790 1,3,5-tris(4- <i>t</i> -butyl-3-hydroxy-2,6-dimethylbenzyl)-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione CAS n. 40601-76-1 PHYSICAL FORM: PW | | 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 |

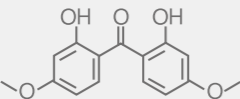
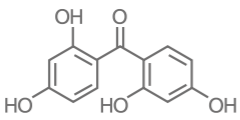
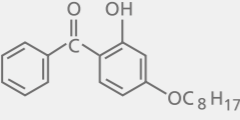
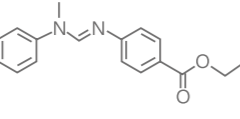
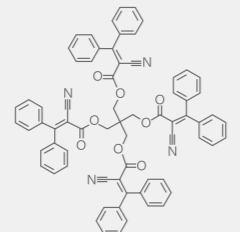
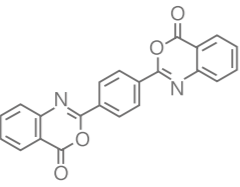
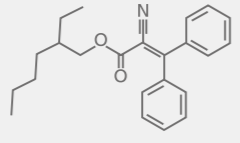
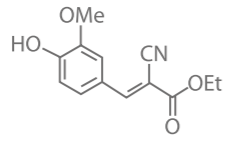
Please feel free to contact us for any other substance not mentioned in this list.

| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|--|---|--|---|
| GC AOX 80 3,9-Bis[1,1-dimethyl-2-[(3-tert-butyl-4-hydroxy-5-methylphenyl)propionyloxy]ethyl]-2,4,8,10-tetraoxaspiro[5.5]undecane |  | Polyolefins - HIPS - ABS - Engineering plastics - TPU - Unsaturated elastomers. | M.P./S.R Viscosity ----- 115-125°C |
| CAS n. 90498-90-1 PHYSICAL FORM: GR, PW | | | |
| GC AOX 1315 Benzenepropanoic acid, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-,C13,15- branched and linear alkyl esters |  | PU foam. | M.P./S.R Viscosity ----- 56°C |
| CAS n. 171090-93-0 PHYSICAL FORM: LIQ | | | |
| GC AOX 1135 Reaction mass of isomers of: C7-9-alkyl 3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionate |  | Polyurethanes. PUR, Polyol. | TGA: 1% @ 160°C 10% @ 200°C |
| CAS n. 144429-84-5 PHYSICAL FORM: LIQ | | | |
| GC AOX 697 2,2'-Oxalyldiamidobis[ethyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate] |  | Polyurethanes - Polyolefins- Engineering Thermoplastics. Phenolic chelating antioxidant, suitable for PO, PU, PA, ABS. | M.P./S.R Viscosity ----- 174-180°C TGA: 10% @ 326°C 20% @ 338°C 30% @ 345°C |
| CAS n. 70331-94-1 PHYSICAL FORM: GR, PW | | | |
| GC AOX 5057 Benzenamine, N-phenyl-, reaction products with 2, 4, 4-trymethylpentene |  | Polyolefins - Polyurethanes. EVA, PUR, Polyol. | |
| CAS n. 68411-46-1 PHYSICAL FORM: PW | | | |
| GC AOX 1726 4,6-Bis(Dodecylthiomethyl)-o-cresol |  | Polyolefins - Polyurethanes. SBS, SIS, PUR. | M.P./S.R Viscosity ----- 28°C |
| CAS n. 110675-26-8 PHYSICAL FORM: PW | | | |
| GC AOX 1520 4,6-Bis[(Octylthio)methyl]-o-cresol |  | Elastomers - Silant Adhesives - Lubricants - Polyolefins -Polyurethanes. BR, NBR, SBR, SBS. | M.P./S.R Viscosity ----- About 14°C |
| CAS n. 110553-27-0 PHYSICAL FORM: LIQ | | | |
| GC AOX 565 2,6-Di-tert-butyl-4-(4,6-bis(octylthio)-1,3,5-triazin-2-ylamino)phenol |  | Adhesives and Elastomers. Elastomers and styrenic block co-polymers such as SBS and SIS. It also used in adhesives, EPDM, ABS, HIPS, PA and Polyolefins. | M.P./S.R Viscosity ----- 91-96°C TGA: 1% @ 268°C 10% @ 28°C |
| CAS n. 991-84-4 PHYSICAL FORM: GR, PW | | | |

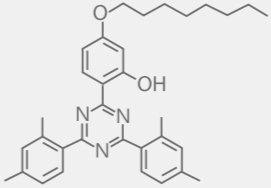
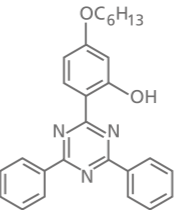
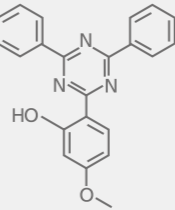
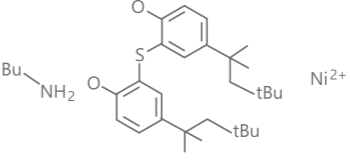
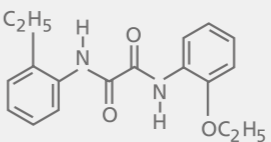
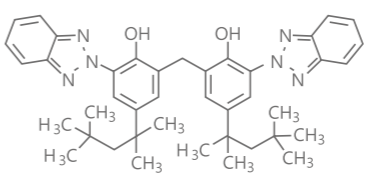
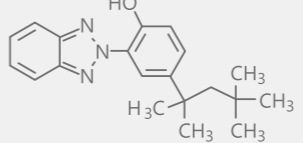
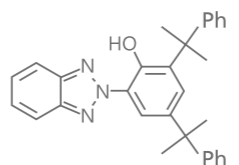
| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|--|---|---|------------------------------------|
| GC AOX DSTP Dioctadecyl 3,3'-thiodipropionate |  | Polyolefins - Engineering Thermoplastics. Thiosynergist antioxidant, suitable for PA, PO, PET and ABS. | |
| CAS n. 693-36-7 PHYSICAL FORM: GR, PW | | | |
| GC AOX DLTP Di-lauryl-3,3'-thiodipropionate |  | Polyolefins - Engineering Thermoplastics. Thiosynergist antioxidant, suitable for PA, PO, Polyester and ABS. | |
| CAS n. 123-28-4 PHYSICAL FORM: GR, PW | | | |
| GC AOX DTDTP Esterification products of 3,3'-thiodipropionic acid and C13- (branched) alcohols |  | ABS PP PE and PVC, excellent compatibility with resin. Liquid secondary stabilizer and antioxidant. GC AOX DTDTP is very efficient used in combination with phenolic antioxidant. GC AOX DTDTP is soluble in most common aprotic organic solvents but it is insoluble in water. | |
| EC n. 955-320-1 PHYSICAL FORM: LIQ | R=C ₁₂ H ₂₅ = Branched aliphatic chain | | |
| GC AOX 412S Pentaerythrityl tetrakis (3-laurylthiopropionate) |  | Polyolefins - Engineering Thermoplastics. Thiosynergist antioxidant suitable for ABS, BR, PC, PE, PP, PS. | |
| CAS n. 29598-76-3 PHYSICAL FORM: GR, PW | | | |
| GC AOX 168 Tris(2,4-di-tert-butylphenyl)phosphite |  | PVC - Polyolefins - Engineering Thermoplastics. Organophosphite antioxidant suitable for use in numerous polymers such as polyolefins, polycarbonate, ABS and polyesters. | |
| CAS n. 31570-04-4 PHYSICAL FORM: GR, PW | | | |
| GC AOX 626 Bis (2,4-Di-T-Butylphenyl) Pentaerythritol Diphosphite |  | PVC - Polyolefins - Engineering Thermoplastics. Phosphite ester antioxidant suitable for PE, PP, PS, PA, PC and ABS. | |
| CAS n. 26741-53-7 PHYSICAL FORM: GR, PW | | | |
| GC AOX P PEP-36 Bis(2,6-di-ter-butyl-4-methylphenyl)-pentaerythritol diphosphite |  | ABS - Engineering plastics Polyolefins - PS. Organophosphite antioxidant with excellent process stability and colour protection at high temperatures. | |
| CAS n. 80693-00-1 PHYSICAL FORM: PW | | | |

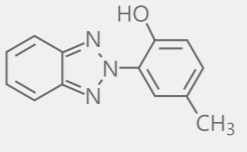
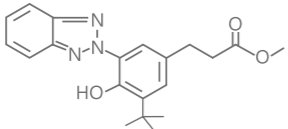
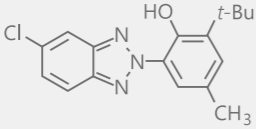
Please feel free to contact us for any other substance not mentioned in this list.

UV Absorbers / Light Stabilizers

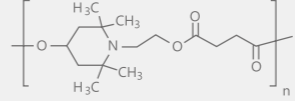
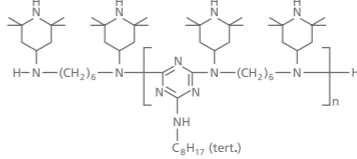
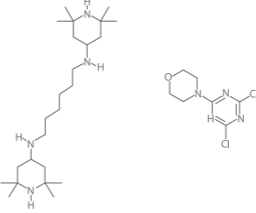
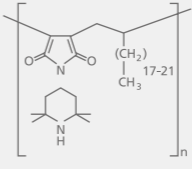
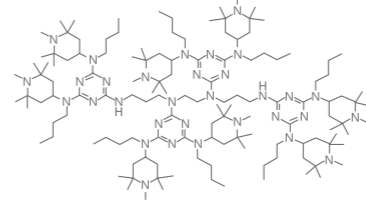
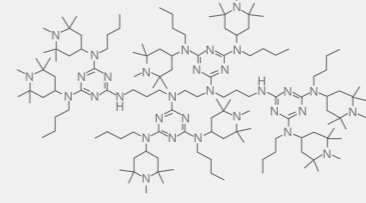
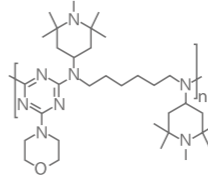
| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|---|---|--|--|
| GC UV-3049 2,2-Dihydroxy-4,4-dimethoxy benzophenone |  | Engineering Thermoplastics - Coatings. Efficient UV absorber for polyester film, which it protects from premature damage, particularly under severe exposure conditions. | |
| CAS n. 131-54-4 PHYSICAL FORM: PW | | | |
| GC UV-3050 2,2',4,4'-Tetrahydroxybenzophenone |  | 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 systems and Alkyd resins. | |
| CAS n. 131-55-5 PHYSICAL FORM: PW | | | |
| GC CHIM 81 Octabenzene |  | Polyolefines – PVC - Styrenics. Benzophenone based UVA, suitable for PO, PS, PVC, elastomers. Particularly efficient in combination with HALS. | M.P./S.R Viscosity 47-50°C ----- TGA: 5% @ 220°C 10% @ 233°C 25% @ 255°C |
| CAS n. 1843-05-6 PHYSICAL FORM: PW, FLAKES | | | |
| GC UV-1 Ethyl 4-[[[(methylphenylamino)methylene]amino]benzoate |  | Polyurethanes. UV absorber especially applicable in PU system such as microcellular and integral skin foam, rigid, semirigid and flexible PU foam. Also applicable in some adhesives, elastomers and sealants. | M.P./S.R Viscosity 2000 – 3000 cps at 25°C |
| CAS n. 57834-33-0 PHYSICAL FORM: LIQ | | | |
| 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 |  | 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. | M.P./S.R Viscosity 175-178°C ----- TGA: 1% @ 250°C 2% @ 350°C |
| CAS n. 178671-58-4 PHYSICAL FORM: PW, FLAKES | | | |
| GC UV-3638 2,2-(1,4-phenylene)bis[(4H-3,1-benzoxazine-4-one) |  | Engineering Thermoplastics. UV absorber for engineering plastics, especially for PET, PBT. | M.P./S.R Viscosity 310°C |
| CAS n. 18600-59-4 PHYSICAL FORM: PW | | | |
| GC UV-3039 2-Ethylhexyl 2-cyano-3,3-diphenylpropenoate |  | Engineering Thermoplastics. Liquid cyanoacrylate UV absorber particularly suitable for the stabilization of PVC-p and PVC plastisols. It can also be used in PUR, polyesters and PMMA. | |
| CAS n. 6197-30-4 PHYSICAL FORM: LIQ | | | |
| GC UV-80 Ethyl 2-cyano-3-(4-hydroxy-3-methoxyphenyl)prop-2-enoate |  | Polyolefins - Coatings - Engineering thermoplastics. UV absorber with UV absorption at 380-400nm, especially used in sunglasses lenses resins of TAC, PC, PMMA, also used in adhesives, paint and solvent-based systems. | M.P./S.R Viscosity 110-113°C |
| CAS n. 13373-29-0 PHYSICAL FORM: GR, PW | | | |

UV Absorbers / Light Stabilizers

| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|--|---|---|--|
| GC UV-1164 2-[4,6-Bis(2,4-dimethylphenyl)-1,3,5-triazin-2-yl]-5-(octyloxy)phenol |  | Polyolefins Engineering Thermoplastics. Triazine based UVA particularly suitable for olefin polymers in thin and thick applications. Applicable in PA, PET, PBT, ABS, PMMA and other engineering thermoplastics. | M.P./S.R Viscosity 88-92°C |
| CAS n. 2725-22-6 PHYSICAL FORM: GR, PW | | | |
| GC UV-1577 2-[4,6-Diphenyl-1,3,5-triazin-2-yl]-5-[(hexyl)oxy]-phenol |  | Engineering Thermoplastics. Triazine based UVA particularly suitable for PC and PET. 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. | M.P./S.R Viscosity 147-151°C |
| CAS n. 147315-50-2 PHYSICAL FORM: GR, PW | | | |
| GC UV-1579 2-(2-Hydroxy-4-methoxyphenyl)-4,6-diphenyl-1,3,5-triazine |  | Engineering Thermoplastics. UV absorber mainly 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. | |
| CAS n. 106556-36-9 PHYSICAL FORM: GR, PW | | | |
| GC NIQ 84 A 2,2'-Thiobis(4-tert-octylphenolato)-n-butylamine nickel(II) |  | Polyolefins. Nickel Quencher, UV stabilizer developed for outdoor applications in polyolefins. | M.P./S.R Viscosity 245-280°C |
| CAS n. 14516-71-3 PHYSICAL FORM: PW | | | |
| GC UV-312 N-(2-ethoxyphenyl)-N'-(2-ethylphenyl) oxamide |  | Polyamides - PVC - PU. Oxanilide UV absorber. Particularly resistant to discoloration induced by metal ions, e.g. from polymerisation catalyst residues, fillers and other ingredients in plastics. Highly effective light stabilizer for a variety of plastics and other organic substrates including Polyamides, PVC and PVC plastisol, unsaturated polyesters. | M.P./S.R Viscosity 125-130°C |
| CAS n. 23949-66-8 PHYSICAL FORM: GR, PW | | | |
| GC UV-360 2,2'-Methylenebis(6-(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol) |  | Polyolefins - Polyurethanes - Engineering Thermoplastics. UV absorber containing benzotriazole, suitable for POM, PMMA, PC, PA, PBT, PET, Elastomers. | M.P./S.R Viscosity 195°C ----- TGA: 1% @ 333°C 2% @ 350°C |
| CAS n. 103597-45-1 PHYSICAL FORM: PW | | | |
| GC UV-329 2-(2H-benzotriazole-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol |  | Engineering Thermoplastics. UV absorber belonging to the benzotriazole class suitable for a variety of plastics and other organic substrates. | M.P./S.R Viscosity 102-108°C |
| CAS n. 3147-75-9 PHYSICAL FORM: GR, PW | | | |
| GC UV-234 2-[2-hydroxy-3,5-di(1,1-dimethylbenzyl)phenyl]-2H-benzotriazole |  | Polyolefins - Engineering Thermoplastics. UV absorber containing benzotriazole, suitable for PS, PET, TPE, PA, POM, PC. | M.P./S.R Viscosity 137-141°C ----- TGA: 1% @ 264°C 2% @ 280°C 5% @ 302°C |
| CAS n. 70321-86-7 PHYSICAL FORM: PW | | | |

| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|---|---|---|--|
| GC UV-P 2-(2H-benzotriazol-2-yl)-p-cresol |  | UV absorber of the benzotriazole class suitable for styrene homopolymers and copolymers, engineering plastics such as polyesters and acrylic resins, polyvinyl chloride and other polymers containing halogens and copolymers (such as vinylidene), acetals and cellulose esters. | M.P./S.R Viscosity 128-132°C ----- TGA: 5% @ 163°C 10% @ 178°C 50% @ 197°C |
| CAS n. 2440-22-4 PHYSICAL FORM: PW | | | |
| 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)propionyloxy(oxyethylene) |  | 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. | M.P./S.R Viscosity 7400 (+/-2%) mPa.s |
| PHYSICAL FORM: LIQ | | | |
| GC UV-326 2-(5-Chloro-2H-benzotriazol-2-yl)-6-(1,1-dimethylethyl)-4-methylphenol |  | Suitable for polymers processed at high temperatures such as polycarbonates, polyalkylene terephthalates, polyacetals, polyamides, polyphenylene sulfide, polyphenylene oxide, aromatic copolymers, thermoplastic polyurethane and polyurethane fibers, as well as for polyvinylchloride, styrene homo- and copolymers. | M.P./S.R Viscosity 137-142°C ----- TGA: 5% @ 202°C 10% @ 205°C 25% @ 236°C |
| CAS n. 3896-11-5 PHYSICAL FORM: GR, PW | | | |

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

| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|---|---|---|--|
| GC UV LS 622 Butanedioic acid, dimethyl ester, polymer with 4-hydroxy-2,2,6,6-tetramethyl-1-piperidine ethanol |  | Polyolefins - Engineering Thermoplastics. Polymeric hindered amine light stabilizer. Suitable for Polyolefins, unsaturated Polyesters, Acrylics, Styrene, vinyl Polymers and Polyurethanes, including Plastisol, Elastomers, Adhesives and Sealants. | M.P./S.R Viscosity 50-70°C ----- TGA: 0,1% @ 200°C 0,4% @ 250°C 1,1% @ 275°C |
| CAS n. 65447-77-0 PHYSICAL FORM: GR, PW | | | |
| GC UV LS 944 Poly [[6-[(1,1,3,3-tetramethylbutyl)amino]-s-triazine-2,4-diy]]-[[2,2,6,6-tetramethyl-4-piperidyl]imino]-hexamethylene-[[2,2,6,6-tetramethyl-4-piperidyl]imino]] |  | Polyolefins - Polyurethanes - Engineering Thermoplastics. Oligomeric, sterically hindered amine light stabilizer, particularly suitable for the protection of polyolefins, including co-polymers and blends of polypropylene with elastomers. Excellent performance in the stabilization of thin articles such as fibers, tapes and films. Suitable for EVA, POM, PU, PVC, XPE. | M.P./S.R Viscosity 100-135°C ----- TGA: 0,2% @ 275°C 1,0% @ 300°C 3,7% @ 325°C |
| CAS n. 71878-19-8 PHYSICAL FORM: GR, PW | | | |
| GC UV HALS 9449 Poly[[6-[(1,1,3,3-tetramethylbutyl)amino]-1,3,5-triazine-2,4-diy]]-[[2,2,6,6-tetramethyl-4-piperidyl]imino]-1,6-hexandiyl-[[2,2,6,6-tetramethyl-4-piperidyl]imino]] | | Polyolefins. Oligomeric, sterically hindered amine light stabilizer particularly suitable for the protection of polyolefins. It withstand well manufacturing processes at high temperatures. | M.P./S.R Viscosity 275-300°C |
| CAS n. 86168-95-8 PHYSICAL FORM: PW | | | |
| GC UV LS 3346 1,6-Hexanediamine, N,N'-bis(2,2,6,6-tetramethyl-4-piperidinyl)-, polymer with 2,4-dichloro-6-(4-morpholinyl)-1,3,5-triazine |  | Polyolefins - Polyurethanes - Engineering Thermoplastics. Hindered amine light stabilizer with broad compatibility. With both HALS and triazine function group, especially 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, ASA, PBT, ABS, HIPS, PMMA and PU. | M.P./S.R Viscosity 100-125°C ----- TGA: 10% @ 340°C |
| CAS n. 82451-48-7 PHYSICAL FORM: GR | | | |
| GC UV-5050H Alkenes, C20-24 -, polymers with maleic anhydride, reaction products with 2,2,6,6-tetramethyl-4-piperidinamine |  | Polyolefins - Polyurethanes - Engineering Thermoplastics. Oligomeric sterically hindered amine light stabilizer. It can be used in all Polyolefins. 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. | |
| CAS n. 152261-33-1 PHYSICAL FORM: GR, PW | | | |
| GC UV LS 119 HALS 119-88% CAS n. 106990-43-6 HALS 622-12% CAS n. 65447-77-0 |  | PP - PE - blends with EVA - PE - EEA - Polyolefins - Elastomers. | |
| PHYSICAL FORM: GR | | | |
| GC UV LS 119 P N,N',N'',N'''-tetrakis(4,6-bis(butyl-(N-methyl-2,2,6,6-tetramethylpiperidin-4-yl)amino)triazin-2-yl)-4,7-diazadecane-1,10-diamine |  | Elastomers - Polyolefins. Oligomeric sterically hindered amine light stabilizer. It can be used in all Polyolefins. particularly effective in Polypropylene, Polyethylene, -olefin copolymers, and blends with EPR, ERR, PE, EVA, EAA, EVOH and filled PP. | M.P./S.R Viscosity 115-150°C |
| CAS n. 106990-43-6 PHYSICAL FORM: GR | | | |
| 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 |  | Polyolefins - Engineering Thermoplastics. HALS used in PE and PP agricultural films, artificial turf, injection&rotational molding. PP fiber, POM, PA, PBT, ASA, ABS, HIPS, Rigid & flexible PVC, PMMA and PUR. | M.P./S.R Viscosity 95-120°C ----- TGA: 10% @ 350°C |
| CAS n. 193098-40-7 PHYSICAL FORM: GR | | | |

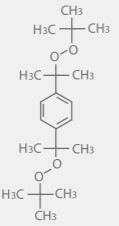
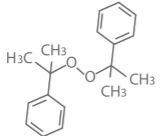
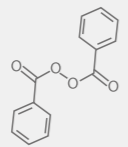
| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|--|------------------|---|---|
| GC UV LS 2020 1,6-Hexanediamine, N,N'-bis(2,2,6,6-tetramethyl-4-piperidinyl)-polymer with 2,4,6-trichloro-1,3,5-triazine, reaction products with N-butyl-1-butanamine and N-butyl-2,2,6,6-tetramethyl-4-piperidinamine | | Polyolefins - cross-linked Polyethylene Olefin copolymers such EVA. Oligomeric sterically hindered amine light stabilizer. Highly effective light stabilizer for Polyolefins, olefin copolymers such as EVA as well as blends of Polypropylene with elastomers. Suitable for in Polyacetals, Polyamides, flexible and rigid PVC, PVC blends, Polyurethanes. | M.P./S.R Viscosity 120-150°C |
| GC UV LS 770 Bis(2,2,6,6-tetramethyl-4-piperidyl) sebacate | | Polyolefins - Engineering Thermoplastics. Low Molecular weight hindered amine light stabilizer. Suitable for Polyolefins, Polystyrene and styrenic based copolymers, PVC, Polyurethane but also engineering Plastics. | M.P./S.R Viscosity 81-85°C ----- TGA: 1% @ 203°C 5% @ 221°C 10% @ 242°C |
| GC UV-4050H N,N'-Bis(2,2,6,6-tetramethyl-4-piperidyl)-N,N'-diformylhexamethylenediamine | | Polyolefins - Engineering Thermoplastics. Light stabilizer used in polyolefins, ABS and nylons. It is highly compatible with pigments. | M.P./S.R Viscosity 155-158°C |
| GC UV LS 292 Reaction mass of bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate and methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate | | Elastomers - Sealant/Adhesives - Coatings. Low Molecular weight hindered amine light stabilizer. Applicable in wide range of polymers and applications : Polyurethanes, Sealants, Adhesives, Elastomers, unsaturated Polyesters, Acrylics, vinyl polymers (PVB,PVC), Styrene homo and copolymers, liquid color concentrates, and other organic substrates. | |
| GC UV LS 123 Bis-(1-octyloxy-2,2,6,6-tetramethyl-4-piperidinyl) sebacate | | Coatings. HALS, especially used in automotive, industrial coatings/decorative paints and wood stains or varnishes. | |

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

| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|---|---|---|--|
| GC STEARATO DI BARIO Fatty acids, C16-18, barium salts | | Drying lubricants and dusting agents for Rubbers. | |
| CAS n. 91002-07-2 PHYSICAL FORM: PW, FLAKES | | | |
| GC STEARATO DI ZINCO Fatty acids, C16-18, zinc salts | | Stabilization and lubricant of PVC compounds, it is used in combination with calcium or other metal stearates to form primary stabilizers. Employed also as an acid acceptor and release and anti-blocking agent. | M.P./S.R Viscosity 120°C |
| CAS n. 91051-01-3 PHYSICAL FORM: PW | | | |
| GC STEARATO DI CALCIO Fatty acids, C16-18, calcium salts | | It is an acid scavenger, release agent and lubricant in plastics industry, water repellent and anti-compacting agent. Compared to waxes, it has a relatively high softening point, and, consequently, do not become greasy at higher temperatures. Stabilization and lubricant of PVC compounds, it is used in combination with other metal stearates to form primary stabilizers. Employed also as an acid acceptor and release and anti-blocking agent. | M.P./S.R Viscosity 140-160°C |
| CAS n. 85251-71-4 PHYSICAL FORM: PW | | | |
| GC STEARATO DI MAGNESIO Stearic acid, magnesium salts | | Very good water repellent properties. The product is characterized by a very high fineness, therefore a lower dosage can be used, and very good free-flowing properties. Stabilization and lubricant of PVC compounds, it is used in combination with other metal stearates to form primary stabilizers. Employed also as an acid acceptor and release and anti-blocking agent. | M.P./S.R Viscosity 130-150°C |
| PHYSICAL FORM: PW | | | |
| GC GMS 40 Stearic acid, monoester with glycerol (Conc. ≥40%) | | Plasticizer. | M.P./S.R Viscosity 60°C |
| PHYSICAL FORM: PEARLS, FLAKES | | | |
| GC GMS 90 Stearic acid, monoester with glycerol (Conc. ≥90%) | | Plasticizer. | M.P./S.R Viscosity 66,7°C |
| CAS n. 123-94-4 PHYSICAL FORM: MICROGRANULES | | | |
| GC DGM 95 Distilled Glycerol Monostearate | | It can be used in plastic sector as anti-static, anti-fog or lubricant. It is a good emulsifier, dispersant, stabilizer and anti-aging starch. | |
| CAS n. 123-94-4 PHYSICAL FORM: PASTILLES | | | |
| GC NA ABS (Sodio Alcan solfonato) Sulfonic acids, C14-17-sec-alkane, sodium salts | $H_3C-(CH_2)_m-CH(CH_2)_n-CH_3$ $ $ SO_3Na | Anionic surfactants for the detergent, chemical-technical and cosmetic industry with excellent wetting behavior. | M.P./S.R Viscosity > 350°C |
| CAS n. 97489-15-1 PHYSICAL FORM: GR | $m + n = 11 - 4$ Average chain length: C15,2 | | |

| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|---|------------------|--|------------------------------------|
| GC ULTRASTAB PHYSICAL FORM: MB | | PO, PE, PP. GC ULTRASTAB is a masterbatch containing a very strong stabilization package, especially studied for use during recycling of post-consume polymers. It can inactivate the decomposition products such as radicals derived for example from flame retardants. It also contains an additive that helps to reduce frictions. | |
| GC ULTRASTAB ETP PHYSICAL FORM: MB | | PBT, PET, PC, Engineering Polymers. GC ULTRASTAB ETP is a masterbatch containing a very strong stabilization package, especially studied for use during recycling of post-consume polymers. It can inactivate the decomposition products such as radicals derived for example from flame retardants. It also contains an additive that helps to reduce frictions. | |
| GC STANNATO DI ZINCO PHYSICAL FORM: PW, MB, COMPACTED | ZnSnO3 | The product is used in a number of plastic, rubber and paint applications and it can completely replace Antimony Trioxide in formulations. It is also capable of improving smoke performance in both halogen and halogen free systems. | TGA: >570°C |

Peroxides

| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|--|---|---|--|
| GC BIPB 40 Peroxide formulation based on Bis(t-butylperoxy isopropyl)benzene |  | Thermoplastic Polyolefins - natural and synthetic Rubber. | M.P./S.R Viscosity 37-54°C |
| GC DICUMYL PEROXIDE Dicumyl Peroxide CAS n. 80-43-3 |  | Polyolefins - Elastomers (tubes, wires, tires, rubber seals). | M.P./S.R Viscosity >39°C |
| GC BEO 25 W Dibenzoyl Peroxide (CAS n. 94-36-0) 75% with water |  | PVC - Styrenics. | M.P./S.R Viscosity 103-108 °C @ 1.013 hPa |

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

| PRODUCT NAME | APPLICATIONS | DESCRIPTION |
|---|--|---|
| CG AOX 1098 50% PHYSICAL FORM: LIQ | Polyolefins - Polyurethanes - Engineering Thermoplastics. | Liquid dispersion 50 % of phenolic antioxidant, suitable for PU, PA and elastomers. |
| CG AOX 1171 PHYSICAL FORM: PW | Engineering Thermoplastics. | Mixture of phenolic antioxidant and phosphite suitable for PA. |
| GC B215, B220, B225, B561 PHYSICAL FORM: PW | Polyolefins - Engineering Thermoplastics. | Mixture of antioxidant 1010/168, suitable for PC, ABS, Polyester and PO. |
| GC B900, B921 PHYSICAL FORM: PW | Polyolefins - Engineering Thermoplastics. | Mixture of antioxidant 1076/168, suitable for PC, ABS, Polyester and PO. |
| GC UV LS 783 PHYSICAL FORM: GR | Polyolefins - Polyurethanes - Engineering Thermoplastics. | Mixture of 622/944 for several polymers. |
| GC UV LS 791 PHYSICAL FORM: PW | Polyolefins - Polyurethanes - Engineering Thermoplastics. | Mixture of 770/944 for several polymers. |

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Optical Brighteners

| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | 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 Acrylics - Thermoplastic Polyurethanes - Polyvinylchloride - Styrene homo and copolymers - Polyolefins - Adhesives, and other organic substrates. | M.P./S.R Viscosity 201-205°C |
| GC OB-1 2,2'-(1,2-Ethenediyl-di-4,1-phenylene)bisbenzoxazole CAS n. 1533-45-5 PHYSICAL FORM: PW | | Polypropylene plastic - hard PVC - ABS EVA - Polystyrene - Polycarbonate. | M.P./S.R Viscosity 355-360°C |

SMA

| PRODUCT NAME | CHEMICAL FORMULA | APPLICATIONS | M.P./S.R Viscosity ----- TGA |
|---|------------------|--|------------------------------------|
| GC SMA 700 Random Copolymer PHYSICAL FORM: GR | | 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: GR | | 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 Copolymer PHYSICAL FORM: GR | | Because of the hyper reactivity of SAN chain and maleic anhydride, it is particularly suitable as compatibilizer for resin alloy like PA/ABS, PC/ABS, PC/ASA, PA/ASA, ABS/PET, etc. | |

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

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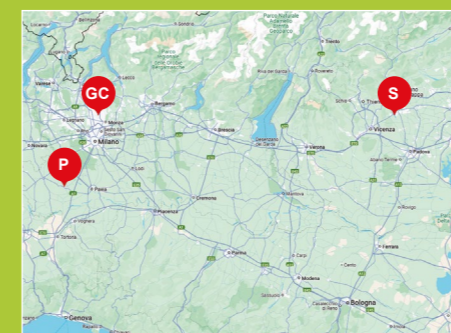
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PLASTIC ADDITIVES

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