

MELAGARD . PHOSLITE . MASTERET

FLAME RETARDANTS

red & white flame retardant solutions

MELAGARD . PHOSLITE

MELAGARD™

Melamine Based Flame Retardants

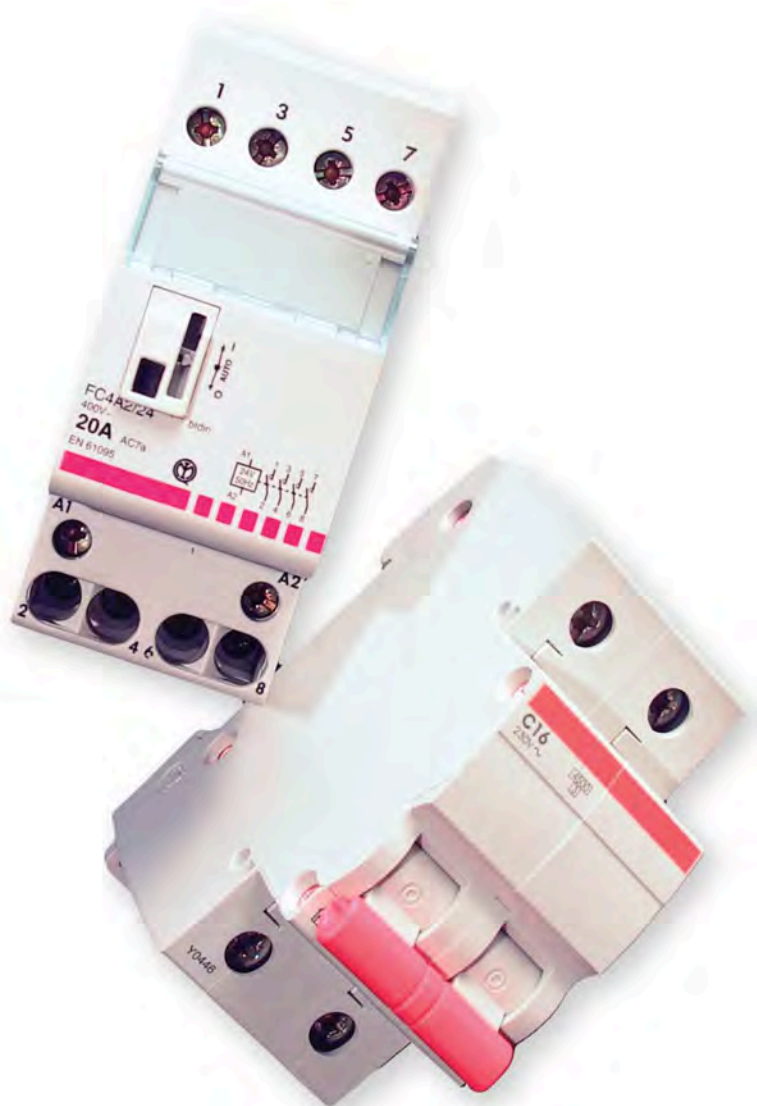
Melagard™ is a family of non toxic and environmentally friendly, melamine based products, widely used thanks to their high efficiency, low corrosivity, high compatibility with many resins and good colorability. This allows the production of compounds requiring also good combination of electrical and mechanical properties, low density and low smokes density. The safety in using these chemicals, their proven balance with environmental issues adds further advantages. The FR mechanism is very interesting in its variety, all modes of action occur at the various stages of the flame exposure and all contribute to the FR performance:

- Melamine salt degradation: $T > 300^{\circ}\text{C}$
- Heat Sink via Endothermic decomposition
- Inert Gas Source: (Melamine): dilution of oxygen and fuel gases
- Non-burning dripping (in case of MC): decrease of exposure to flame
- Char forming (in case of MP): intumescent

PHOSLITE™

Light Phosphorus

Phoslite™ is the newest family of Flame Retardant additives developed and introduced by Italmatch Chemicals. Phoslite™ are halogen free additives, highly effective FR due to the high phosphorus content, characterized by high thermal stability, compatible with most organic polymers, non toxic and fully colorable (white powders), to be used in polyolefins and engineering thermoplastics, in particular in PBT, PC and PC Alloys, PU and polyamides.





FLAME RETARDANT ADDITIVES

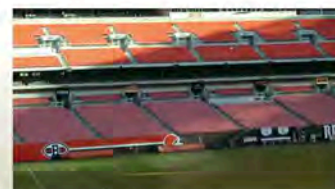
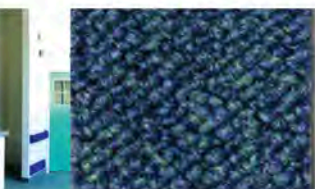
HALOGEN FREE SOLUTIONS FOR SELF EXTINGUISHING ORGANIC POLYMERS

POLYMER APPLICATIONS	MASTERET	MELAGARD	PHOSLITE
POLYAMIDE	20450, 10170	MC	B85AX, B65AM
POLYETHYLENE, EVA	10460 B2XF, 40460 B2XF	MC, MP	EXP PP/35, EXP PP/36, EXP PP/37
POLYPROPYLENE	10460 B2XF, 15460 B2XF		B631C, B712A, B404A, EXP PP/35, EXP PP/36, EXP PP/37
PBT, PET-G, UPR		MC	B85AX, B65AM
POLYCARBONATE, PC/ABS			B85CX, MB9645
EPOXY RESIN	70450	MC	B85AX
TPU		MC	B85AX, B65AM
POLYURETHANES	63460 B2XF		B85AX
TEXTILE/FIBERS	80450	MC	B630CF
LATEX, COATINGS, ADHESIVES, PAINTS	80450	MP	

EXP: experimental grades



red & white flame retardant solutions



MASTERET 10170

Preparation of stabilised red-phosphorus (70%) in Low Density polyethylene (LDPE) carrier. Masteret 10170 is an halogen free FR additive that can often be used in polyolefin applications, rubbers, bitumen and PWC.

MASTERET 10460 B2XF

Preparation of specially stabilised and microencapsulated red-phosphorus (60%) in Low Density polyethylene (LDPE). Masteret 10460B2XF is a halogen free flame retardant additive particularly suitable for polyolefin articles.

MASTERET 15460 B2XF

Preparation of specially stabilised and microencapsulated red-phosphorus (60%) in polypropylene (PP). Masteret 15460B2XF is a halogen free flame retardant additive particularly suitable for PP articles.

MASTERET 20450

Preparation of stabilised red-phosphorus (50%) in polyamide 6 (PA 6). Masteret 20450 is an halogen free flame retardant additive particularly suitable for polyamide articles, glass reinforced.

MASTERET 40460 B2XF

Preparation of specially stabilised and microencapsulated red-phosphorus (60%) in ethylene vinyl acetate copolymer (PE/EVA). Masteret 40460B2XF is a halogen free flame retardant additive particularly suitable for extruded polyolefin articles, like Wire and Cables, hoses, rubber seals.

MASTERET 63460 B2XF

Thixotropic dispersion of specially stabilised and microencapsulated red-phosphorus (60%) in TCPP. Masteret 63460 B2XF is an highly efficient flame retardant additive based on red-phosphorus particularly suitable for fire proofing PU polymers articles intended for high demanding applications.

MASTERET 70450

Thixotropic dispersion of stabilised red-phosphorus (50%) in bisphenol A epoxy resin. Masteret 70450 is an halogen free flame retardant particularly suitable for fire proofing epoxy resins. The dispersion is safe to handle and easy to process.

MASTERET 80450

Thixotropic water dispersion of specially stabilised and microencapsulated red-phosphorus (50%). Masteret 80450 is a halogen free flame retardant additive suitable for fire proofing organic polymers articles intended for high demanding applications. Masteret 80450 is in liquid physical form.

MELAGARD MC

Melagard MC (Melamine Cyanurate) is the elective product for flameproofing clear unfilled PA articles with halogen free additive in position to achieve high demanding applications (UL 94 V0) in nylons (PA66 and PA6) showing also good retention of tensile strength properties and significant increase of tensile modulus. It is also effective in polyesters, PU foams, epoxy resins, styrenics, polyolefins and back side coatings, in combination with suitable coagents. Other applications: lubricants and adhesion agents.

MELAGARD MP

Melagard MP (Melamine Phosphate) halogen free flame retardant/smoke suppressant agent for thermoplastics, polyolefins, elastomers, engineering resins, paints and intumescent fire retardant coatings; it can partly replace Ammonium Polyphosphate (APP).

PHOSLITE IN PP SYSTEMS

Phoslite product family consist in a range of proprietary flame retardant systems based on Phosphorus salts and other further synergic ingredients for use in Polyolefins, especially Polypropylene homo and copolymer.

They are exempt from antimony trioxide or any other heavy metal, not blooming and containing very low halogen or halogen free.

They are a very effective solution for flame proofing Polyolefins and other polymers, extrusion and injection grades, filled and glass, and properly formulated allow to match for instance the following international FR standards:

- UL 94 V2 (3,2 mm - 0,8 mm)
- UL-94 V0 (3,2 mm - 0,8 mm)
- UL-94 VTM V0 and V2 (0,2 mm – 0,5 mm)
- DIN 4102 B1 and B2



VERY LOW HALOGEN V2 PP : PHOSLITE B631C/B630C/ B630CF

These products contain very low halogen (around 10%). Final loading range is normally 1%-3%, corresponding to Bromine percentage in the final article between 0.1 and 0.3%

- Phoslite B631C is a very effective solution for flame proofing Polypropylene homo and co-polymer
- Phoslite B630C should be used in conjunction with proper synergist.
- Phoslite B630CF is a finely grinded version for use in PP fibers applications.

The above Phoslite based articles properly formulated offer excellent UV and thermal stable compounds based on PP homo and copolymer, glass and filled.

HALOGEN FREE V2 PP ACCORDING TO IEC 61249-2-21: PHOSLITE B712A, B844A, EXP PP/16

These products contain very low halogen (2,8%). Loading at 3% results in 840 ppm bromine in the final article, so safely below 900 ppm (IEC 61249-2-21). Phoslite B712A offers an outstanding thermal stability not influencing rheological characteristics even for extrusion at temperatures around 250-260°C. Phoslite B844A is a grade developed especially for high glow wire applications (GWIT).

HALOGEN FREE V2 PP PHOSLITE B404A

Phoslite B404A is a unique, proprietary flame retardant systems based on inorganic Phosphorus and special organic synergist and do not contains any halogen (0,00%), and it is normally used at 6,5% - 7,5% loading, depending on polymer type and specific formulation. Proper formulations offer unmatched UV and thermal stable compounds, and excellent GWIT values.

HALOGEN FREE VO POLYOLEFINS : EXP PP/35, EXP PP/36, EXP PP/37

These new generation intumescent systems based on salts containing phosphorus and nitrogen offer different grade of thermal stability, efficiency and water solubility. Loading performances of EXP PP/35 and EXP PP/36 without antidripping:

PP homo:	25% (UL-94 V0 1,6mm)
	20% (UL-94 V0 3,2mm)
PP copo and HDPE	30% (UL-94 V0 1,6mm)
	25% (UL-94 V0 3,2mm)
EVA and LLDPE:	35% (UL-94 V0 1,6mm)
	30% (UL-94 V0 1,6mm)

Antidripping at 0,1% loading can reduce total FR loading around -25%. Fiberglass are synergic. Other polymeric substrates not polyolefin based, like TPU or PLA may have similar performances

PHOSLITE B85CX

Proprietary inorganic phosphorus-based halogen free flame retardant system for use in PC (also glass filled), PC/ABS and PC alloys. Phoslite B85CX is a solid powder solution to match UL 94 V0 at different thickness, depending on specific formulation. Phoslite B85CX offers superior thermal performances when compared to existing phosphates plasticized FR compounds, with particularly high Vicat and HDT values (around + 30°C). Phoslite MB9645 is the concentrated, pellet form on polymer carrier.

PHOSLITE B85AX

Proprietary inorganic phosphorus-based halogen free flame retardant system for PBT, Copolyesters, TPU, PP, ABS, PLA, PA6 reinforced or natural. Properly formulated allow to match different FR standards and to reach UL-94 V0 and V2 on low thicknesses.

PHOSLITE B65AM

Proprietary inorganic phosphorus-nitrogen system based halogen free flame retardant system for PBT, Copolyesters, TPU, PA6 reinforced or natural. Properly formulated allow to match different FR standards and to reach UL-94 V0 and V2 on low thicknesses.



Flame Retardants for Engineering Thermoplastics

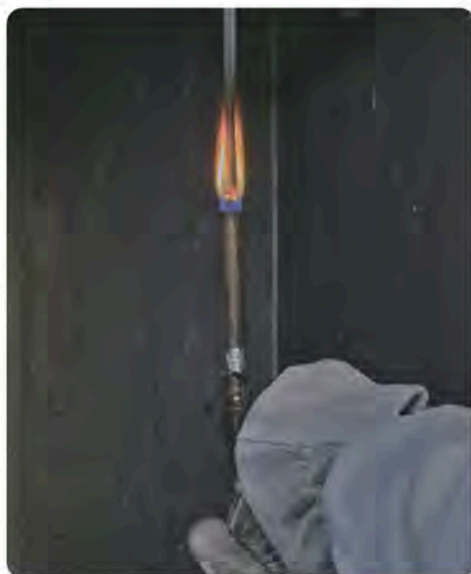
Italmatch Chemicals entered the halogen free flame retardant additives in the mid 90's, developing a unique technology to improve handling and application of Red Phosphorus (stabilized, microencapsulated) as flame retardant for thermoplastics in a polymeric matrix:

MASTERET™; following the significant growth of MASTERET™ market and application in Europe, Italmatch as continuously invested to increase its presence and broaden its FR product portfolio, starting from phosphorus synergistic technologies.

In 2004 Italmatch introduced a new family of Melamine Based FR (MELAGARD™), to add and expand its presence in the Flame Retardant Market.

In 2005 Italmatch R&D capabilities, allowed the development of a new product family, based on fully colourable inorganic phosphorus products (PHOSLITE™), completing the range for fully colourable engineering thermoplastics.

Italmatch Chemicals supported also from its investors, is still committed to further grow in the market of other halogen free solutions, providing flexibility, competence and cost competitive solutions.



Italmatch Chemicals

Italmatch Chemicals majors in the production of phosphorus derivatives, giving it a unique strength and leading position in the international market, also thanks to global manufacturing presence (EU and Asia) and backward raw material integration.

italmatch Chemicals has earned the respect and trust, over a period of years, of such Multinationals leaders in their sectors, with particular regard to lubricant oil additives (L.O.A.), plastic & polymers flame retardant additives (F.R.) and other various industrial applications.

The wide sector already encompassed by Italmatch Chemicals is destined to expand even larger thanks to its historical ambition of growth.

The ability to combine its historical competence in phosphorus with the opportunities offered by advanced technology and continuous development, implemented by an expert and dynamic management, results in Italmatch Chemical's unparalleled creativity, competence and Customers satisfaction.

By focusing on today's dynamic world of specialty chemicals and its expanding horizons, with manufacturing plants in Italy and China, Italmatch Chemicals offers advanced and effective solutions based largely, but not exclusively, on phosphorus derivatives.

Careful environmental concern through ISO 14000 standards stands to witness the Company long term commitment to the market and its customers, as the technologically advanced systems adopted in its manufacturing plants stand to prove, with particular respect to the optimisation of environmental impact and increased safety.

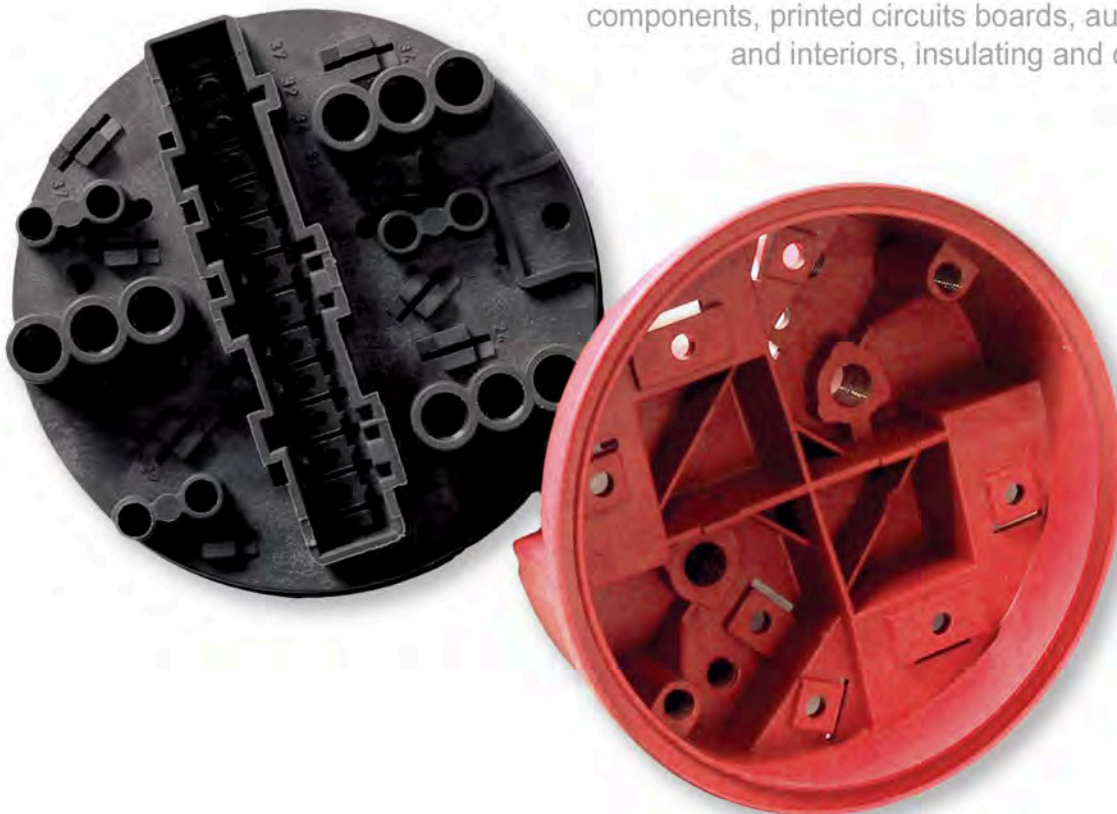
ITALMATCH CHEMICALS has global manufacturing and global sales with strong direct operation in Europe and China, where local staff and dedicated organizations support the export operations outside Europe and China.

A dynamic team of sales and technical service staff provides prompt assistance world wide to ensure Customer satisfaction in terms of service, technical and application support. ITALMATCH CHEMICALS "hands on", flexible, "trouble shooting", decision making approach enables effective tailor-made solutions and intervention to individual Customer requirements.



MASTERET™ ***Red Phosphorus Based Flame Retardants***

Masteret™, stabilised and polymer-bound Red Phosphorus Masterbatches (NOT flammable and NOT regulated for transportation) were used initially in glass fiber reinforced polyamide applications where molded final fireproof articles with outstanding properties are needed, in particular areas where good mechanical properties together with very high electrical properties are required and where the natural red or gray/black pigmentation is acceptable. Main applications include electric installation systems, industrial switching units, household electrical equipment, automation technology and automotive. The use of Masteret™, the safest, environmentally friendly and most convenient way of handling and processing Red Phosphorus, introduced by Italmatch Chemicals in 1996, gave the engineering plastic industry a boost in the area of high performance flame retardancy technology, due to the highest possible phosphorus additive content. Masteret™ product range has traditionally been geared to improving Red Phosphorus processability, simplifying tasks, reducing costs and improving quality for the final customer. In fact Masteret™ technology allows the completely safe transportation, handling and incorporation of Red Phosphorus. In addition, Italmatch, has recently developed proprietary technology to drastically reduce/eliminate phosphine emissions during processing and in final articles. The physical form - pellets or liquid - presently offer an extremely simple and safe method for introduction of Red Phosphorus into a wide range of polymeric materials, among which EVA, PP, HDPE as well as also latex / rubbers / coatings / epoxy, with applications ranging from electrical and electronic components, printed circuits boards, automotive components and interiors, insulating and construction materials and furniture.





Italmatch Chemicals

Headquarters & Sales Office

Via Pietro Chiesa 7/13 (8th floor)
Torri Piane San Benigno
16149 Genova – ITALY
Phone: +39 010 642081
Telefax: +39 010 4695296
E-Mail: sales.dpt@italmatch.it
Web: www.italmatch.it

Arese Manufacturing Plant & Sales Office

via E.Vismara 114
20020 Arese (MI) – ITALY
Phone: +39 02 935251
Telefax: +39 02 93525496
E-Mail: sales.arese@italmatch.it

Spoleto Manufacturing Plant

Via S. Tommaso 13
06049 Spoleto (PG) – ITALY
Phone: +39 0743 20191
Telefax: +39 0743 45841

Barcelona Office

(ex Union Derivan, S.A.)
Avda. Generalitat 175-179
08840 Viladecans Barcelona – España
Phone: +34 93 6373537
Telefax: +34 93 6591902
E-mail: sales@undesa.com

Zaragoza Manufacturing Plant

Poligono Industrial El Campillo Zuera

Nantong Italmatch Chemicals co. Ltd Manufacturing Plant & Sales Office

Bihne Road,
Rugao Port Economic Development Zone
Nantong, Jiangsu Province, 226532, P.R. CHINA
Phone: +86 513 87688318
Telefax: +86 513 87586888
E-Mail: f.dejong@italmatchgroup.com

Italmatch Chemicals Shanghai Sales Office

Rm 703, Pine City, 8 Dong'an Road,
Xuhui District, Shanghai 200032, P.R. CHINA
Phone: +86 21 3469 1871
Telefax: +86 21 3469 1872
E-Mail: kevin.he@italmatch.com.cn

Italmatch Singapore Pte Ltd

1, Kim Seng Promenade
#17-02 Great World City East Tower
Singapore 237994
Tel: + 65-62356483
Fax: +65-68364534
E-mail: e.koay@italmatchgroup.com

Italmatch USA Corporation

660 White Plains Road, Suite 510,
Tarrytown
NY 10591 USA
Phone: +1 914 333 5604
E-mail: g.padilla@italmatchgroup.com

