

Vamp Tech has developed a product range which complies with the new directive IEC 60335-1 ed. 4.0, according to which the flame retardant additives have to match specific GWIT (Glow Wire Ignition Temperature) values. All Vamp Tech compounds also comply with the RoHS directive concerning the hazardous substances and with WEEE for an environmental friendly waste disposal.

THE APPROACH OF A PRODUCER TO THE IEC, ROHS AND WEEE DIRECTIVES

Leading compounder of flame retarded products for a wide range of polymers, both amorphous and semi-crystalline, Vamp Tech has developed a variety of compounds complying with the IEC 60335-1 Ed. 4.0 directive.

It is well known to all producers of electric devices for household appliance, carrying insulating parts with connections having a current higher than 0,2 A or with parts having a distance lower than 3 mm from the connections, how strict the directive is towards the fire resistance evaluation.

This evaluation is carried out on the product through the GWIT test (Glow Wire Ignition Temperature): a glow wire at a temperature of 750°C is applied to the moulded part for 30".

If, during the application, no flame rises or if the flame lasts less than 2", then the product is approved.

Because of this strict rule, a number of compounds, once considered excellent Flame Retarded on the basis of their classification V0 according to UL 94 also at a thickness of 0,8 mm or less, are now no longer suitable for the above mentioned applications.

Moreover the modification of Flame Retardant products to reach the GWIT values established by the IEC 60335-1 ED. 4.0 directive, needs to take into consideration the thermal properties requested from the Directive itself (ball penetration test IEC 60695-10-2 at a temperature of 40°C +/- 2 from the maximum temperature detected on the part with a minimum of 125°C for the active parts). Finally the mechanical performance of the moulded part, as well as the preservation of rheologic properties needed for the injection moulding processes undergone by those compounds have to be considered.

In case the GWIT test is not passed, it is necessary to use flame retarded compounds (UL94 V0 or adequate for the needle flame test) also for the production of those components located near the connections (50 mm) increasing the costs for the electrical device producer.

To optimize the above described properties, Vamp Tech, thanks to R&D activity and advanced production lines, has industrialized following products:


- Polyamide 66 and 6 with halogenated additives PBB and PBDE free and (some of them also Sb203 free), unfilled, filled and reinforced;
- Polyamide 66 with red phosphorus and glass fibre, with medium/high CTI (600 volts);
- Polyamide 66 halogen and red phosphorus free, unfilled and glass filled, with excellent CTI values and good colourability.
- Polyesters (PBT and PET) with halogens PBB and PBDE free (some of them also Sb203 free), unfilled, glass fibre filled and mixed mineral filled and glass fibre;
- Halogen free PBT, 30% glass fibre filled
- Bromine and chlorine free PC-ABS blends with different levels of thermal resistance and fluidity;
- Bromine and chlorine free PC, unfilled and glass fibre filled;
- Polypropylene with halogenated additives, PBB and PBDE free, both unfilled and unfilled or reinforced;
- Halogen free polypropylene, both unfilled and glass/mineral filled;
- Polyphenylenesulfide, glass fibre filled and mixed mineral and glass fibre filled;
- Glass fibre filled Polysulfone.

Moreover, the whole market of electronics and electronic components is aware that, from July 1st 2006, the Directive 2002/95/CE known as RoHS (Restriction of Hazardous Substances) has to be applied in the whole European Community with all its restrictions.

Those substances are lead, silver, cadmium, hexavalent chromium, polybrominated diphenyl and polybrominated diphenyl ethers/oxides.

Note that all above mentioned Vamp Tech compounds comply with Directive 2002/95/CE: moreover, as underlined in the chart, the company is constantly committed to develop halogen free products, demonstrating an environmental friendly approach.

In this field, the Directive 2002/96/CE (WEEE) aims at the human and environmental safety through a correct and environmental friendly waste disposal of

the electric and electronic devices, introducing the marking  for those thermoplastic particles containing bromoderivates which have to be disposed of separately.

Therefore, the increasing number of halogen free flame retarded compounds among Vamp Tech product range is an additional opportunity for the users and producers of electric and electronic devices, since, at the end of the product lifetime, the waste of the components does not need to be managed selectively.

Chart 1 - semicrystalline compounds

POLYMERS	COMPOUND NAME	COMPOUND DESCRIPTION	UL94 (1,6 mm)	UL94 (0,8 mm)	CTI (Volt)	BALL PENETRATION TEST (°C)
PA6	Vampamid 6 0023 V0 GW	unfilled, with halogens, PBDF and PBDE free	V0	V0	300	>125
PA6	Vampamid 6 0023 V0 GW SBF	unfilled, with halogens, PBDF/PBDE and Sb203 free	V0	V0	300	>125
PA6	Vampamid 6 3026 V0 DF	30% glass fibre with halogens, PBDF/PBDE free	V0	V0	400	125
PA66	Vampamid 66 0023 V2 GW	unfilled, with halogens, PBDF and PBDE free	V2	V2	300	125
PA66	Vampamid 66 0023 V0 GW	unfilled, with halogens, PBDF and PBDE free	V2	V0	225	125
PA66	Vampamid 66 0023 V0 GW SBF	unfilled, with halogens, PBDF/PBDE and Sb203 free	V0	V0	275	125
PA66	Vampamid 66 0024 V0 GW	unfilled, halogen and red phosphorus free	V0	V0	600	125
PA66	Vampamid 66 0024 V2 GW	unfilled, halogen and red phosphorus free - hinge effect	V2	V0	600	125
PA66	Vampamid 66 XX26 V0 40	XX = glass fibre from 10 to 40%, with halogens, PBDF and PBDE free	V0	V0	425	125
PA66	Vampamid 66 2530 V0 P GW	25% glass fibre with red phosphorus	V0	V0	475	125
PA66	Vampamid 66 2530 V0 P60 GW	25% glass fibre with red phosphorus	V0	V1	550	125
PA66	Vampamid 66 3028 V0 GW	30% glass fibre, halogen and red phosphorus free	V0	V0	525	125
PBT	Vampter 3026 V0 GW	30% glass fibre, with halogens, PBDF/PBDE free	V0	V0	275	125
PBT	Vampter 3026 V0 GW SBF	30% glass fibre, with halogens, PBDF/PBDE and Sb203 free	V0	V2	325	125
PBT	Vampter 0023 V0 GW	unfilled, with halogens, PBDF/PBDE free	V0	V0	325	125
PBT	Vampter 4554 V0 GW	45% glass fibre and mineral filled, with halogens, PBDF/PBDE free	V0	V0	325	125
PBT	Vampter 4554 V0 GW SBF	45% glass fibre, with halogens, PBDF/PBDE and Sb203 free	V0	V1	325	125
PBT	Vampter 3028 V0 GW	30% glass fibre, halogen and red phosphorus free	V0	V0	-	125
PET	Vampdur 3026 V0	30% glass fibre, with halogens, PBDF/PBDE free	V0	V2	225	125
PPS	Vampson 4010	40% glass fibre	V0	V0	175	125
PPS	Vampson 6031	60% glass fibre and mineral filled	V0	V0	225	125
PP	Vamplen 0023 O V2 NF	unfilled, with halogens, PBDF and PBDE free	V2	-	>600	>125
PP	Vamplen 3026 V0 CB DF	30% glass fibre, with halogens, PBDF/PBDE free	V0	-	-	>125
PP	Vamplen 0024 V2 LBC	unfilled, halogen free	V2	V2	>600	>125
PP	Vamplen 0024 V2 EC 01	unfilled, halogen free, for extrusion	V2	V2	>600	>125
PP	Vamplen 0024 V0 A	unfilled, halogen free	V0	V0	>600	>125
PP	Vamplen 0024 V0 C	unfilled, halogen free	V0	V2	>600	>125
PP	Vamplen 1028 V0	10% glass fibre, halogen free	V0	-	>600	>125
PP	Vamplen 2528 V0 CB	25% glass fibre, halogen free	V0	V2	>600	>125
PP	Vamplen M 2025 V0 GW	20% mineral filled, with halogens	V0	-	>600	>125

Chart 2 - amorphous compounds

POLYMERS	COMPOUND NAME	COMPOUND DESCRIPTION	UL94 (1,6 mm)	UL94 (0,8 mm)	CTI (Volt)	BALL PENETRATION TEST (°C)
PC/ABS	Vampalloy 0024 V0 8	unfilled, Br and Cr free, high fluidity	V1	-	325	80
PC/ABS	Vampalloy 0024 V0 9	unfilled, Br and Cr free, medium fluidity	V0	-	275	85
PC/ABS	Vampalloy 0024 V0 11	unfilled, Br and Cr free, general application	V0	V2	275	90
PC/ABS	Vampalloy 0024 V0 12	unfilled, Br and Cr free, medium thermal properties	V0	V2	275	95
PC/ABS	Vampalloy 0024 V0 13	unfilled, Br and Cr free, high thermal properties	V0	-	300	100
PC	Vampcarb 0024 V0	unfilled, halogen free	V0	-	225	-
PC	Vampcarb 1026 V0	10% glass fibre, with halogens	V0	-	175	>125
PC	Vampcarb 1028 V0	10% glass fibre, halogen free	V0	-	200	-
PC	Vampcarb 1028 V1	10% glass fibre, halogen free	V1	-	175	>125
PSU	Vampsulf 2028 V0	20% glass fibre, halogen free	V0	V0	-	>125