Radglo® fluorescent pigments for the plastic industry

Because of their outstanding brilliance and luminosity, properties that are inherent to fluorescent pigments, RADGLO® colours are particulary useful where an intense and long distance visibility is needed. **These characteristics make them especially applicable for publicity and advertising as well as safety and warning signals**.

Typical examples in the plastic field are toys, sport articles, packaging materials, safety helmets, traffic cones etc...

Recommended pigment types per polymer

	EA	RPC	P-09/PS/ PC	GM
LDPE	**R**	**R**		**R**
HDPE/PP/TPU	**R**	**R**		**R**
Polystyrene	**R**	**R**		**R**
ABS	**T**	**T**		**T**
PC/PMMA/PA/SAN/ PET/PES/PU	**T**	**T**		**T**
Rigid PVC	**T**	**T**	**T**	**T**
Plasticized PVC			**R**	**R**
Synthetic rubbers			**R**	**R**

R = Recommended, T = To be tested

Properties

RADGLO® fluorescent pigments and pigment dispersions offer the industry a broad compatibility with many plastics, brilliant colours and easy dispersion at elevated process temperatures. Series like EA and RPC are formaldehyde free.

RADGLO® fluorescent RPC and GM have been especially developed to bring the processor an optimised level of non-plating and non-sticking.

RADGLO® fluorescent products can be used in a.o. extrusion, injection moulding, blow moulding, rotational moulding etc…

To improve processing it is recommendable to predisperse the pigments over masterbatching. The pigment concentration in the masterbatch may go up to 40%. Pigment load in the final product varies with the thickness of the plastic endproduct to be coloured. The polymers used should be as clear as possible to avoid quenching, which may lead to colour shifting.

Special attention has to be given to additives.

Additives containing metal-ions and additives based on nucleated polymers may lead to colour change and loss of brightness/ fluorescence.

Effects of metal ions on fluorescent colorants in plastic

Metal ions can be integrated into plastics systems either as components in processing additives or as a part of the resin, e.g. ionomers. Some of these ions cause brightness and color intensity changes in fluorescent colorants. This is due to the formation of complexes between the ions and the fluorescent components of the pigment.

Fatty acid salts of zinc and calcium were found to be the most commonly used metallic lubricants.

Both zinc and calcium containing additives have been tested thoroughly and are found to change the hue of the fluorescent pigment.

- The intensity of hue change is directly proportional to the amount of metal compound added.

- In pink and magenta formulations, the zinc and calcium have different hue effects. In general, zinc causes a blue shift with reduced UV response, whilst calcium shifts the color towards a yellower shade without affecting the UV- brightness.

- Yellow shades in general are less sensitive for changes.

- Effects are more pronounciated at higher temperatures.

- Effects may be substantially different in equivalent formulations made up in other plastic types.

- Effects also may be different with various pigment types.

Metal free lubricants such as polyethylene homopolymers and modified waxes, do not appreciably change the brightness and UV-intensity hue of the fluorescent pigment. They are rather inert.

Fluorescent plastic colorants, based on resin carriers, containing residual unreacted acid groups, also may react with certain fillerpigments, such as calcite and dolomite. The free carboxylic acid may react at elevated temperature with the filler, releasing hereby Ca++ or Mg++, which on their turn will form a non-fluorescent complex with the fluorescent components.

Ionic iron reacts with fluorescent pigments, with as a result quenching of the fluorescence.

It is recommended to examine thoroughly any additive to a fluorescent plastic system to determine if it will adversely affect the brightness and hue, especially if it is metal based material.

Radglo® Specialities

* *Dye programme*
* *Polymeric colorants: Gem-Tone series*

® = registered trademark
Disclaimer: This technical information is just an advice. No warranty of fitness for a particular purpose is made.

RADIANT COLOR N.V.
Europark 1046 - B-3530 HOUTHALEN

Telephone sales department: + 32 11 52 07 60
Fax: + 32 11 52 66 79
E-mail: sales@radiantcolor .be
Website: www.radiantcolor.be