

Declaration

24 April 2013

We know that several factors including the geographical location, the additive package, the quality of pigment, and the moulding conditions can influence the UV stability of a rotomoulded article. Some of my thoughts are so described.

Additive package

In terms of UV stability the addition level and the type of additives to protect the polymers from the harmful action of UV is the major aspect we look at. Our standard rotational moulding grades are UV stabilised by adding HALS (hindered amine light stabilizer). They are extremely efficient against the degradation of the polymer caused by sunlight. HALS additives can reduce the formation of free radicals which destroy the PE chemical bonds. UV attacks are the major responsible for UV degradation which can be seen as a lot of physical and mechanical properties. UV15 classified PE material in accordance to ASTM G155 means that after 15000 hours the material retains at least 50% of the original elongation performance.

Location

Geographic location, along with changes in climate and elevation, can affect actual UV performance. Sunshine variations remain the key variable when correlating accelerated and outdoor exposure data. For example, UV15 PE material can last up to 12 years in Northern Europe, but it only last 7 years in Florida or in very harsh environment (desert, ocean Pacific). This means that after 12 years in the Northern regions, 50% of the original mechanical properties is left.

1/2

Consistently **Delivering Value**

Unit 2, Spindus Road Speke Hall Industrial Estate, Liverpool L24 1YA UK

Tel: +44(0)1514487000 Fax: +44(0)1514860251, Email: info@matrixpolymers.com

Website: www.matrixpolymers.com

Pigment

The quality of pigment has a big influence on the entire life of the product: heat stability, light-fastness and weather ability need to be looked at. The choice of pigments is also important. And we understand that dark colours like black can enhance the overall UV protection of a material. For the best material performance we advise a compounding colouring process. Black pigments offer a very good UV protection because the pigments absorb the sunlight and transform it in heat. Hence the black pigments enhance the UV protection.

Moulding conditions

The moulding conditions have an important role since the material performance can be affected by them. Overcooking the material will reduce drastically additive protection and hence the UV stabilisers. The Revolve grade performance is based on the fact that the grade is processed at the optimum cure.

Yours sincerely,

Lei Wang

Technical Engineer

Disclaimer

This document is intended for the use of the individual or the entity to which it is addressed. This document is confidential and may contain privileged or copyright information. You may not disclose this document to another party or copy its contents in whole or in part without consent from Matrix.

If you are not the intended recipient please notify Matrix and destroy this document. You are hereby notified that disclosing, copying, distributing or taking any action in reliance on the content of this document is strictly prohibited.

Any views or opinions presented in this document are solely those of the author and do not necessarily represent those of Matrix. Any actions taken on the basis of this document are at the recipient's own risk. Neither Matrix nor any of its subsidiaries, affiliates, officers, directors, employees or other representatives accepts liability for any loss suffered as a result of your use of or reliance on any opinion expressed in this document or any attachment or enclosure. Notwithstanding the foregoing, nothing in this disclaimer is intended to limit any rights you may have as a consumer under English law or other statutory rights which may not be excluded nor in any way exclude or limit our liability to you for death or personal injury resulting from our negligence or that of our employees or agents.

The author of this document is expressly required not make any defamatory statements. Any such statement is contrary to Company policy and outside the scope of the employment of the individual concerned. Matrix will not accept any liability in respect of such a statement, and the employee responsible will be personally liable for any damages or other liability arising.

2/2

Consistently **Delivering Value**

Unit 2, Spindus Road Speke Hall Industrial Estate, Liverpool L24 1YA UK

Tel: +44(0)1514487000 Fax: +44(0)1514860251, Email: info@matrixpolymers.com

Website: www.matrixpolymers.com