

FAILURES WITHIN ROTOMOULDING - Part 4

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This is the fourth article in the series describing what we see as the main problems to failures within rotomoulding. In this article we will highlight 2nd reason for failures

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2. Pigmentation.

There are several techniques how to add pigment to a material. The most common are:

- Compounding
- Dry mixing
- Compound mixed with natural

There are mainly two types of pigments – in-organic and organic pigments. Both types have their advantages and disadvantages.

Organic pigments are clean and strong and will give a bright color. These pigments are less toxic than in-organic pigments. They are relatively expensive, difficult to get well dispersed and have a tendency to migrate out from the end product.

In-organic pigments will normally outperform organic pigments. They have good heat and UV stability and easy to distribute. They are also less expensive and will not migrate from the end product. They are more toxic and not as clean and bright as organic pigments. Water and food approval may be a problem when using in-organic pigments.

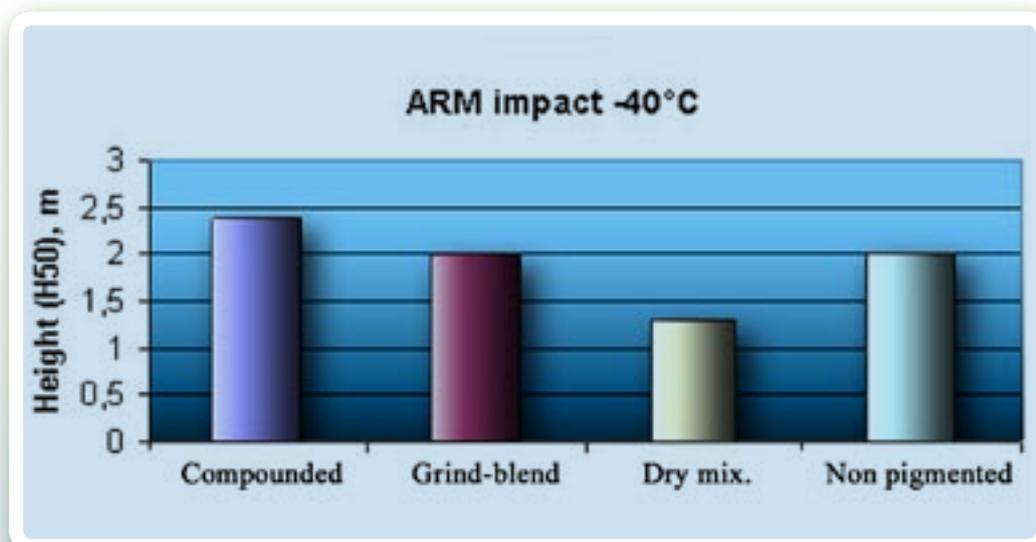


Fig. 1. ARM impact test (-40°C)

When adding pigment to a material, it is important to be aware it will influence both processing parameters and the end properties of the product.

As discussed in previous article, by drymixing pigment we can see concentration of pigments causing problem with the end product.

The choice of pigment can influence on oven time. Studies carried out have shown cases were oven times have to be increased 20% to achieve optimal physical properties.

Bad dispersion will also influence the UV stability. The size of a product will be influenced, because the crystal structure is affected. In addition shrinkage and warpage can vary when pigments are used.

At last, but not least, be aware the change in mechanical properties.

Attached graph shows the result of ARM impact strength of the different pigmentation techniques.

The basics for the test are a natural material processed at optimum processing conditions. Depending of which pigmentation technique used, we see a reduction of mechanical properties of 50%. We have seen even bigger reduction. If fully compounded material is used, we have seen an increase in mechanical properties.

Our recommendation is therefore to use fully compounded material. By using compound you will have improvements on areas as:

- processing
- dispersion of pigment
- aesthetics
- mechanical properties
- UV performance
- better control of warpage / distortion

Then you will secure a high quality product with the best functionality.

Fig. 2. Non pigmented material

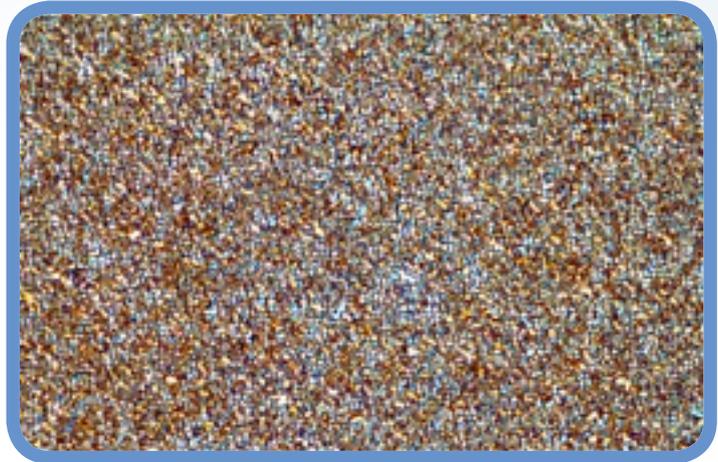


Fig. 3. Fully compounded material

Fig. 4. Pol dry mix

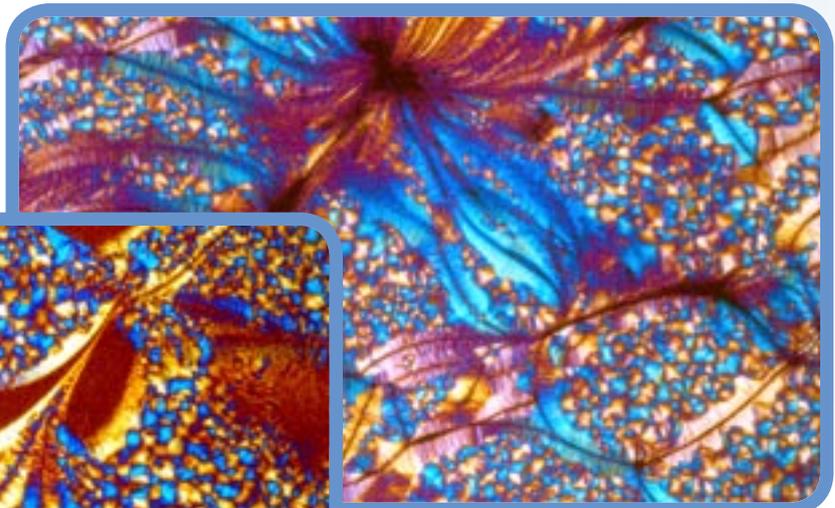


Fig. 5. Pol grind blend

