

Compounding

VS.

Dry Blending

Powder the way you want it™

ICO  **Polymers™**

To dry blend or to compound ?

The case for compounded color for rotational molding

In certain parts of the world, compounding has eclipsed dry blending and turbo blending for rotational molding powders in colors, as rotational molders and end users alike require higher standards for their products. Yet in other regions, the change has been slow in coming.

Why is that ?

Large lot sizes:

Rotomolders have not been able to purchase color compounds economically in lots smaller than 10 metric tons (22,000 lbs.). Such a minimum lot size increases their inventory commitment and reduces the flexibility of that inventory. With dry blending, rotomolders stock only natural grades in pellet or powder form and dry pigments. They control color in house, and can produce small lots on demand.

Cost:

The perception among certain rotomolders is that color compounds represent a significant price premium to dry blended color powders, even when the cost of dry pigment, machinery, plant commitment and labor are taken into account.

Market demand:

Rotomolders' customers have not indicated dissatisfaction with products made from dry blended materials that they have been purchasing for many years, because such products have been "good enough," and because products available from their competition are also made using dry blended materials.



Rotomolders do acknowledge the variety of shortcomings of dry blending...

Color consistency and uniformity are difficult to achieve - swirling and other evidences of inferior dispersion are common.

Color intensity is poor-products tend to look washed out.

Environmental stress crack resistance (ESCR) is lower.

UV resistance is lower.

Opacity is relatively low.

Pigments are inefficiently used through poor dispersion and high agglomeration.

Parts made from dry blended material have a greater tendency to exhibit **warpage** than those made with color compounds.

Cold temperature impact resistance and other impact properties are inferior.

There are dedicated **capital and labor costs** associated with dry blending, as well as the dilution of the time and focus of plant management and quality control.

"Plate-out": dry pigment is not encapsulated in a polymer matrix. Therefore, pigment is deposited on interior mold surfaces, and becomes "bait" for natural powder adhesion as well. Plate-out is a contaminant, and makes necessary the routine cleaning of interior surfaces by sandblasting or solvent wipe. Such cleaning implies additional expense and downtime. Solvent wipe is often ineffective as it does not reach into the pores of the mold surface. Solvents are an additional safety risk and a health hazard. Sandblasting is messy, expensive, and introduces an additional potential contaminant into the plant.

Returns are more frequent, and the rotomolder has no recourse to the supplier if the return is related to improper blending or contamination.

Employee health risks: work with dry pigments, except in the most rigorously controlled environment, results in inhalation of fine, airborne pigment particles which are of an unknown toxic nature.

Agglomeration of pigment may lead to mechanical failures.

Tensile elongation is inferior due to improper dispersion.

Contamination and general plant messiness are common, even difficult to avoid.

Reruns due to improper blending or grinding are common.

and the advantages of color compounds...



The **aesthetic appearance** of end products is comparable to injection molded or blow molded products.

Color dispersion is uniform through the resin.

Pigment **agglomerates** are eliminated.

Opacity and brightness are better.

Physical properties, including impact resistance, ESCR, warpage control and UV resistance are enhanced.

Processing characteristics are superior.

Plate-out is eliminated.

Contingent liability related to end product failures is reduced.

Higher quality, better performing products imply a reduction in reruns and returns and an increase in **customer satisfaction** and **market share**.

What if a color compound supplier could offer:

- Economical small lot production
- Supplier inventory of your main colors based on established buying patterns and a min/max system
- The largest range available of density/MFI combinations developed for specific end use applications
- A stabilization package designed to reduce processing time and pinholing
- Specialty additive packages for UV15, optical brightness, color protection, faster processing and anti-stat, among others
- Sales assistance from ICO to show your customers the advantages of products made with color compounds
- Regional technical assistance to determine the best grade for your applications and assist you on-site with development of optimal processing guidelines

How do the two color solutions really stack up in terms of cost?

The rotational molding industry is under immense pressure to increase the quality of its products and to exceed customer expectations. New colors, new effects, an enlarged selection of density/MFI combinations and specialty additive packages developed for specific applications will help, but the most dramatic path to improved product quality is the move from dry blending to color compounds. **Take a few minutes with your ICO account manager to go through our "compounding vs. dry blending" worksheet to see how the real costs compare for your business.**