CONVENTUS
BEYOND POLYMERS

COLOR MATCHING

THERMOPLASTIC COLOR MATCHING

Choosing the right color is an important step in the application development process. Color can impact branding, the ability to catch a consumer's eye, and an opportunity to offer the market a differentiated aesthetic solution. The repeatability and reproducibility of consistently meeting that color is critical to quality.

Most thermoplastic resins and compounds can be colored to satisfy application requirements. Conventus can assist in understanding any limitations that exist.

THERE ARE FOUR COMMON WAYS TO COLOR PLASTICS:

Pre-compounded
Gold-standard for lot-to-lot consistency and easy processing.

Color Concentrates
Cost effective, but compromises color consistency and ease of processing.

Salt and Pepper
Pre-mixed concentrate and resin to avoid additional mixing step during processing.

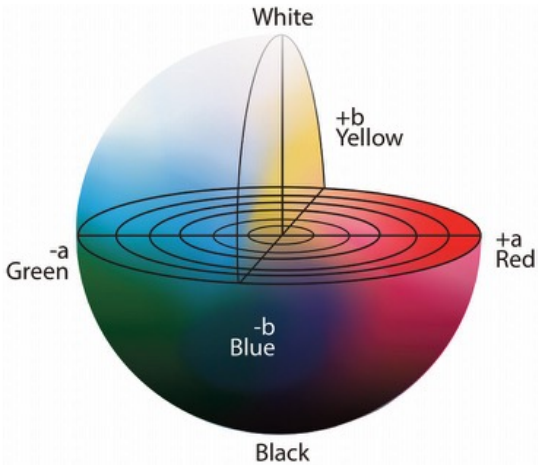
Liquid Colorant
Accepted way to color plastic but can get messy.

COLOR MATCHING CHALLENGES

Color matching in thermoplastics is challenging because many variables influence the final appearance of a molded part. These variables affect how color is perceived and measured. Even when matching to a Pantone, molded part, or color chip, slight differences are inevitable due to ΔE tolerances and varying viewing conditions.

KEY CHALLENGES INCLUDE:

Processing effects:	Color can shift with changes in melt temperature, residence time, or overall heat exposure.
Reference variation:	Matches to Pantone, parts, or chips can differ slightly depending on target and ΔE tolerance.
Lighting conditions	Colors may appear different under daylight, LED, or fluorescent light (metamerism).
Base resin impact	The natural tint, gloss, or transparency of the resin influences color perception.
Additive interactions	Stabilizers, fillers, and flame retardants can alter brightness, hue, or yellowing behavior.
Regulatory limits	Some pigments or dyes are restricted, reducing formulation flexibility for exact matches.



CONVENTUS
BEYOND POLYMERS

COLOR MATCHING

COLOR MATCHING PROCESS

1

DETERMINE BASE THERMOPLASTIC

a. Resin and fillers impact colorant compatibility.
b. Regulatory approvals needed for application also impact colorant type.

2

DEFINE LIGHT SOURCE

a. Light sources include daylight, fluorescent, cool white, etc.
b. Colors that appear to match in one light source may not match in another.

3

SELECT COLOR MATCH TARGET

a. Match target can be a part, color chip, Pantone number, FED STD number, etc.
b. Transparency and surface finish will also impact the color match.

4

CONFIRM MATCH CRITERIA (ΔE)

a. ΔE is a circular representation of the color space using L* a* b* values.
b. This helps quantify how close a color match is to the original color

5

COLOR CHIP APPROVAL

a. Customers will receive color chips once color match is completed to approve them.
b. Approved chips become standard for production quality assurance.

INTERPRETING ΔE VALUES

ΔE VALUE	MEANING
0 - 1	No visible difference
1 - 2	Small difference only visible to a trained eye
2 - 4	Noticeable difference visible to untrained eye
> 4	Obvious difference

The color matching process typically takes 2 to 4 weeks once a color standard has been defined.

USA – 1719 Route 10 | Parsippany, NJ 07054 | Tel: +1-973-343-7669
Mexico – Av. 18 de Marzo, #704 | Guadalajara, Jal 44470 Mexico | Tel: +52-33-36789134
China – 6F, The 21st Building | No. 210 Century Ave. | Pudong New District | Shanghai 200120 China | Tel: +86-21-31185068

Email: info@conventuspolymers.com
www.conventuspolymers.com

ALTHOUGH ANY INFORMATION, RECOMMENDATIONS, OR ADVICE CONTAINED HEREIN IS GIVEN IN GOOD FAITH, CONVENTUS POLYMERS MAKES NO WARRANTY OR GUARANTEE,EXPRESS OR IMPLIED, (I) THAT THE RESULTS DESCRIBED HEREIN WIL BE OBTAINED UNDER END-USE CONDITIONS, OR (II) AS TO THE EFFECTIVENESS OR SAFETY OF ANY DESIGN INCORPORATING CONVENTUS POLYMERS MATERIALS, PRODUCTS, RECOMMENDATIONS OR ADVICE, CONVENTUS POLYMERS AND ITS REPRESENTATIVES SHALL IN NO EVENT BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF ITS MATERIALS OR PRODUCTS DESCRIBED HEREIN. Each user bears full responsibility for making its own determination as to the suitability of Conventus Polymers materials,products, recommendations, or advice for its own particular use. Each user must identify and perform all tests and analyses necessary to assure that its finished parts incorporating Conventus Polymers materials or products will be safe and suitable for use under end-use conditions. Nothing in this or any other document, nor any oral recommendation or advice, shall be deemed to alter, vary, supersede, or waive any provision of Conventus Polymers Standard Conditions of Sale or this Disclaimer, unless any such modification is specifically agreed to in writing signed by Conventus Polymers.