

Using the Concentrate Scaling Function in Match Pigment

In the coloration of plastics in industrial processes, it is common to use a material that contains a very high percentage of coloring material to be mixed with uncolored plastic resin in order to achieve the correct color, opacity and appearance of the finished product. This is commonly done in the molding, extrusion, etc. processes of making plastic parts.

This is done for economy and ease of handling. These highly loaded materials are called color concentrates and come in various forms. The colorants they contain are dispersed in a carrier (resins, liquids, waxes, etc.) and this insures the colorants themselves are fully developed to achieve maximum effect. It also allows the colorants to mix quickly and thoroughly with the uncolored resin to create the final product.

While the colorant level in the final plastic product is generally very low, concentrate colorant levels are by design very high. For example, the final plastic product may contain only a total of 0.7% mixed colorants (e.g., a red, yellow, black and white pigment mix to make a tan final color), the concentrate may have a target colorant loading that will allow it to be mixed with uncolored resin at a ratio of 25 part uncolored resin to 1 part color concentrate by weight.

While working in a laboratory, the color matcher may achieve the desired color for the color match using pure pigments and determine the final colorant loading to be that 0.7%. However, he also needs to scale up that loading to create the same formula for the concentrate which will be used at that 25:1 let down ratio.

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View (100 %) Measure Match Quality Maintenance

Global Settings

Help

All Systems All Users Dispenser

ODBC Data Source Name
CC2000_DB

Folder for Datacolor MATCH PIGM
C:\ProgramData\Datacolor\Matc

License

Auto Store Jobs

Enable Keywords

View System Details

Edit Units

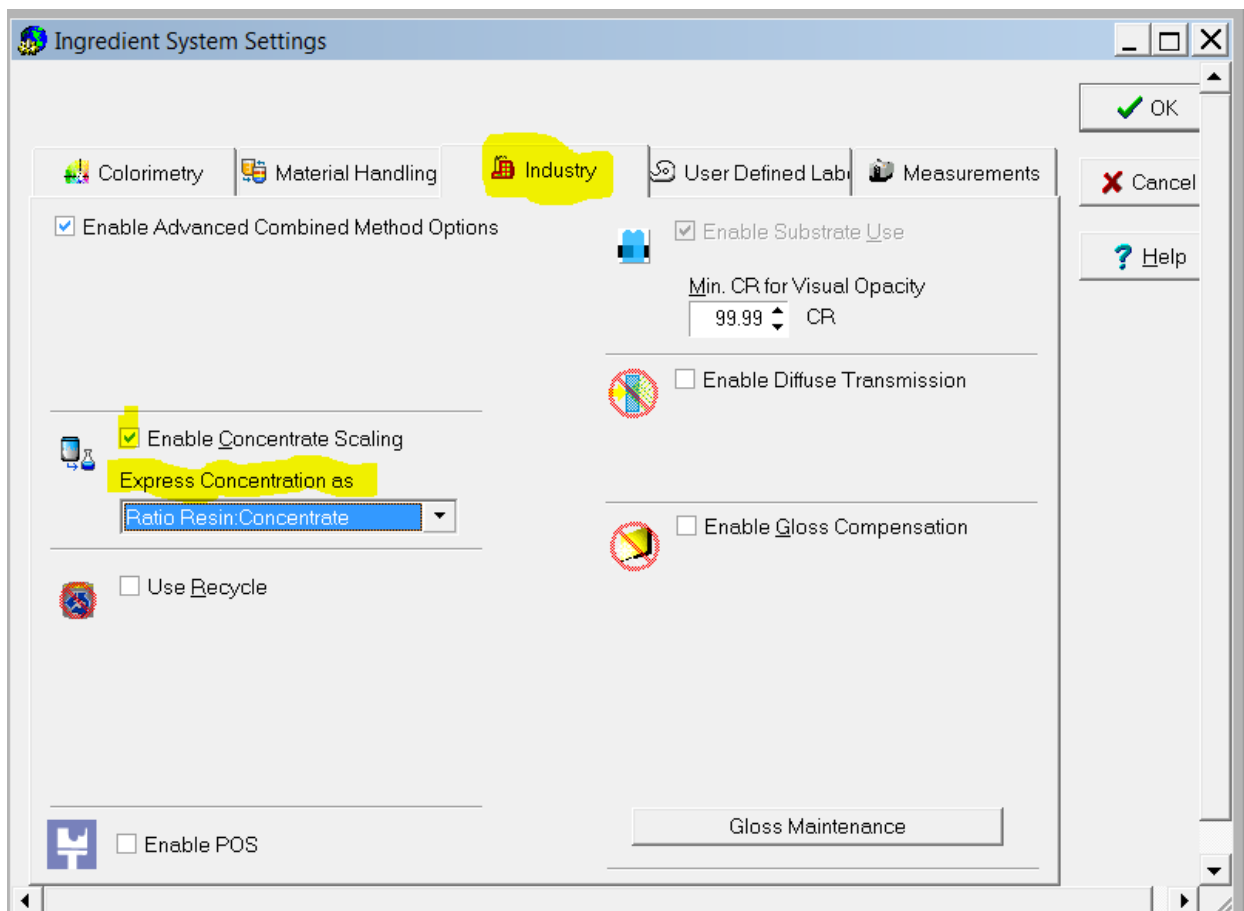
Edit Formula Modes

Business Info Setup

System Name	Modified	Modified by	Created	Created by
▶ ChromaCalc	12/9/2014 3:39:10 PM	dci	1/10/2014 11:57:51 AM	dci

Initial 1st Shot Sample Regular User 2/9/2015 8:28:27 AM User 2/10/2015 1

There, click on the Industry tab:



Here you will place a check mark in the box next to Enable Concentrate Scaling. For the box labeled Express Concentration as: you will have 3 choices. Within the industry and across nations, which of these three expressions is used varies so all three are offered here. All 3 are normally expressions determined by weight.

Ratio Resin: Concentrate This is the ratio of uncolored resin to be mixed with the color concentrate, so if you express this as 25:1, you are saying you intend to mix 25 parts of uncolored resin with 1 part of color concentrate.

Percent of Resin (Concentrate/Resin) Here the above example would be 1 part concentrate divided by 25 parts uncolored resin, or 4%

Percent to Total (Concentrate/Resin + Concentrate) Again, using the same example, it would be 1 part concentrate divided by 25 parts uncolored resin plus the 1 part concentrate, 1 divided by 26, which would be 3.85%.

Once you have set these items up, you would exit Admin, exit Match Pigment and then restart Match Pigment in order to make this now active in Formula Central.

Formula Central - Job 16 From Opaque - Auto Reformulate

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Target
Blue Panel #24

Trial
Blue Panel #24 1st Shot

Formula
Correction For Blue Panel #24 1st Shot 1

CIELAB		L*	a*	b*	C*	h	CF
Target		55.25	-6.94	-14.16	15.77	243.91	
Trial As Is		55.28	-6.99	-14.64	16.23	244.48	1.10
Trial Corrected		55.24	-6.94	-14.18	15.79	243.94	1.11

Trial As Is		DE*	DL*	Da*	Db*	DC*	DH*	MI
D65/10		0.48	0.03	-0.05	-0.48	0.46	0.16	1.92
A/10		0.96	-0.02	0.43	-0.86	0.49	0.82	
F11/10		2.06	-0.70	1.34	-1.40	0.71	1.80	

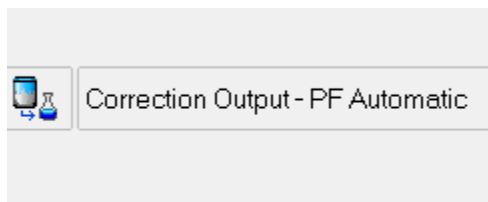
Trial Corrected		DE*	DL*	Da*	Db*	DC*	DH*	MI
D65/10		0.02	-0.01	0.00	-0.02	0.01	0.01	1.87
A/10		0.69	-0.02	0.61	-0.32	-0.06	0.68	
F11/10		1.76	-0.70	1.37	-0.85	0.19	1.60	

5	Relative Black	0.0298	0.0310	0.0012	G	0.9547
4	Relative Blue	0.0325	0.0314	-0.0011	G	1.0289
2	Relative Magenta	0.0250	0.0230	-0.0020	G	1.0801
10	Relative White	3.1131	3.1077	-0.0054	G	0.9944
9	Relative Clear	454.0000	454.0000	0.0000	G	1.0000
	Total Color	3.2004	3.1930	-0.0074	G	
	Total Resin	454.0000	454.0000	0.0000	G	
	Total Batch	457.2004	457.1930	-0.0074	G	

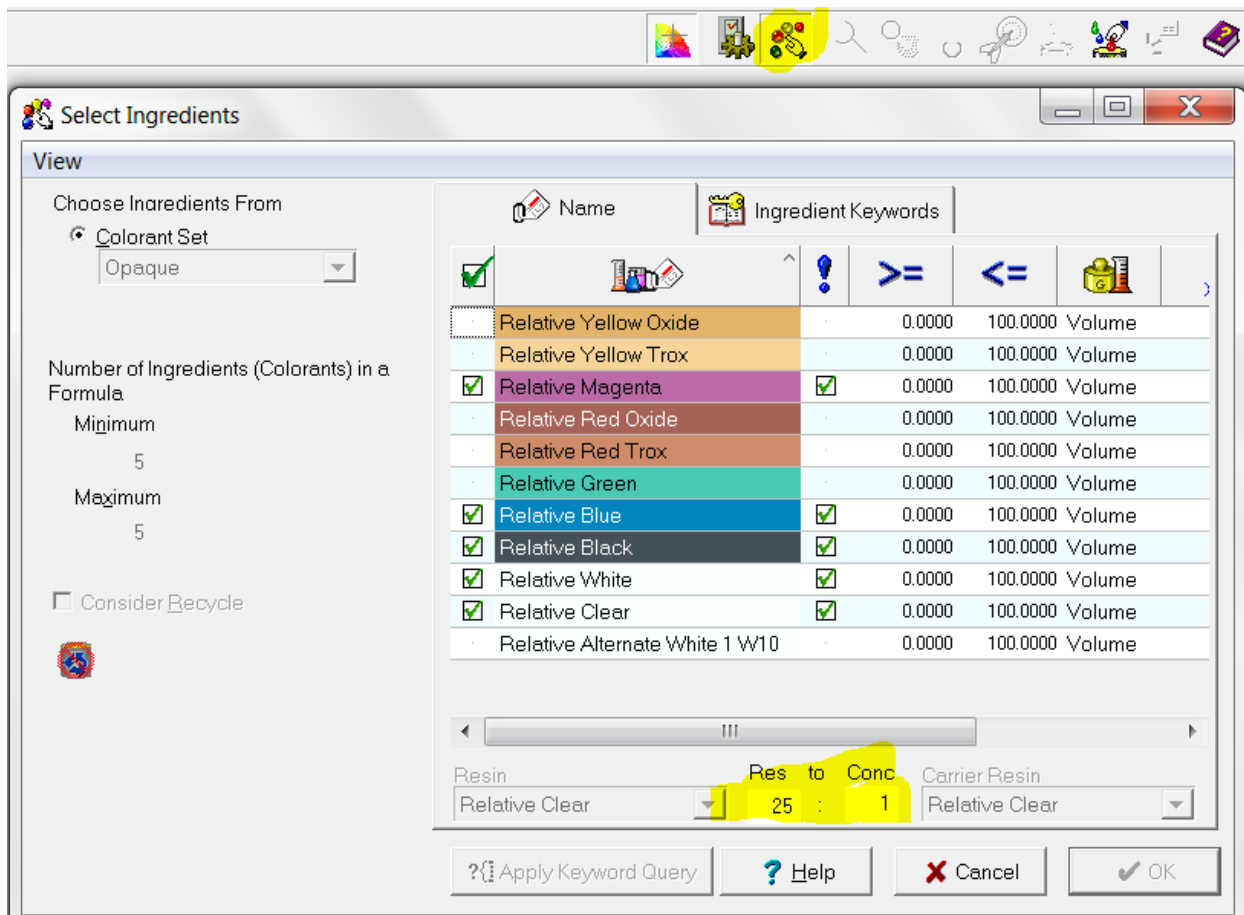
Correction Output - PF Automatic 5 - 5 of 5 Formulas Found:1

In this example, the user has just completed asking for a reformulation correction. His trial sample (or “batch”) uncorrected has a CIE DE* of 0.48 and the projected correction would bring that down to a DE* of 0.02. He has been working with a trial size determined by a resin weight of 454 grams and this reformulation correction also contains 454 grams of resin. This was the size determined by what he was working with in the laboratory but now he needs to prepare a 5000 gram sample of color concentrate to send 2270 grams (5 lbs.) to the customer and retain the remaining 160 grams for his use in the lab. He wants to make the let down ratio of the concentrate 25 : 1 so the customer can run a trial making as much as 125 lbs. of parts.

In the bottom left hand corner of that Formula Central screen is an icon that is turned off. Clicking on it will turn on color concentrate scaling and change the screen. So a new page is created which brings him back to point before the correction was calculated without color concentrate scaling.



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Formula Central - Job 16 From Opaque - Auto Reformulate

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Target
Blue Panel #24

Trial
Blue Panel #24 1st Shot

Formula
Correction For Blue Panel #24 1st Shot 1

CIELAB		L*	a*	b*	C*	h	CF
Target		55.25	-6.94	-14.16	15.77	243.91	
Trial As Is		55.28	-6.99	-14.64	16.23	244.48	1.10
Trial Corrected		55.25	-6.94	-14.18	15.79	243.91	1.11

Trial As Is		DE*	DL*	Da*	Db*	DC*	DH*	MI
D65/10		0.48	0.03	-0.05	-0.48	0.46	0.16	1.92
A/10		0.96	-0.02	0.43	-0.86	0.49	0.82	
F11/10		2.06	-0.70	1.34	-1.40	0.71	1.80	

Trial Corrected		DE*	DL*	Da*	Db*	DC*	DH*	MI
D65/10		0.02	0.00	-0.01	-0.02	0.02	0.00	1.87
A/10		0.68	-0.01	0.60	-0.33	-0.05	0.68	
F11/10		1.75	-0.69	1.36	-0.86	0.20	1.59	

5	Relative Black	0.0298	8.8035	8.7737 G			0.9547
4	Relative Blue	0.0325	8.9281	8.8956 G			1.0289
2	Relative Magenta	0.0250	6.5271	6.5021 G			1.0801
10	Relative White	3.1131	883.6564	880.5433 G			0.9944
	Total Color	3.2004	907.9151	904.7147 G			
	Total Resin	0.4540	129.0921	128.6381 KG			
	Carrier Resin	14.3842	4092.0852	4077.7009 G			
	User Supplied Resin	0.4396	125.0000	124.5604 KG			
	Concentrate	17.5846	5000.0005	4982.4155 G			
	Total Batch	0.4572	130.0000	129.5428 KG			

Correction Output - PF Automatic 5 - 5 of 5 Formulas Found:1

To get the concentrate weight that we want, all we need do then is to swipe the Concentrate weight of 17.5843 grams in the correction output column, and replace it with 5000 grams and hit the Enter key:

Please note the rows that were added when concentrate scaling was turned on:

Carrier resin: this is the material that the colorants are going to be dispersed in to make a color concentrate (4092 grams).

User Supplied Resin: this the resin the end user will blend with the concentrate to make the final correctly colored plastics parts (125 kilograms or approx. 275 lbs.).

Concentrate: This of course is the amount of concentrate the formula will yield (5000 grams).