2015

I.C.S. ITALIAN COLOR SOLUTIONS

QUICK START GUIDE

Ref.: SO_TPAINT_v2 FIRENZE, April 15th, 2015

INDEX

1. HOW TO PREPARE PAINT/PLASTIC COLORANT DATABASE

In order to correctly train the Top-Paint software for processing a new ColorFile (colorant database), we recommend you to act in conformity with the rules that are hereinafter detailed. **Let us remind you these rules deeply affect the overall performance of our color-matching system and, hence, their observation should be considered as the initial point for successfully exploiting the color imitation and correction algorithms of the Top-Paint software**.

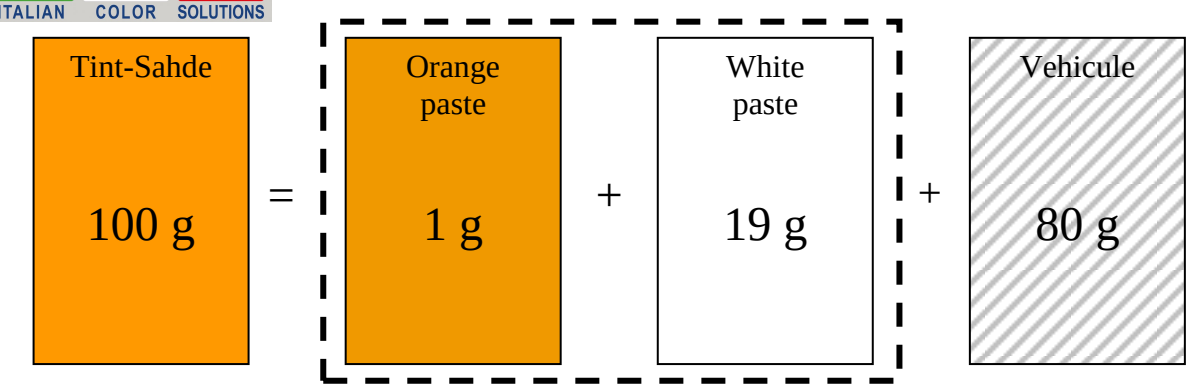
For sake of clarity a few definitions are given:

- the commonly called "paint" is a liquid mixture, usually a solid pigment into a liquid vehicle. The pigment represents the real color of the paint that may be measured while the vehicle affects the coverage properties of the paint itself. The concentration mixture-ratio of these two components is generally well known.
- The basic white pigment is titanium dioxide, selected for its excellent concealing properties;
- The black pigment is commonly made from carbon black.

The recommended rules are:

- **Total and uniform coverage**: select a consistent set of Morest cardboards. Over these supports the final product will be smeared until shaping an uniform and homogeneous thickness of material. **This is a very important issue: it is absolutely necessary to make a layer of the final product that completely obscures the underlying surface**. If necessary, it can be repeated the smearing of the final product above the same Morest cardboard.
- **Test Tint-Shade**: it is necessary to prepare for each pigment (included the black pigment) a single Test Tint-Shade. Its reflectance spectrum will be measured with the spectrophotometer and it will train the Top-Paint software to compute the optimal concentrations of the final Tint-Shade samples.

  Let us suppose realize the Test Tint-Shade of 100g and the concentrations mixture-ratio is given by 20% of the colored mass and 80 % of the vehicle mass. The colored mass of the Test-Shade must be composed with 5% of the selected pigment, and with the remaining 95% of the white paste pigment. This causes to mix together a pigment mass of 1g, a white paste of 19g and a vehicle mass of 80g:

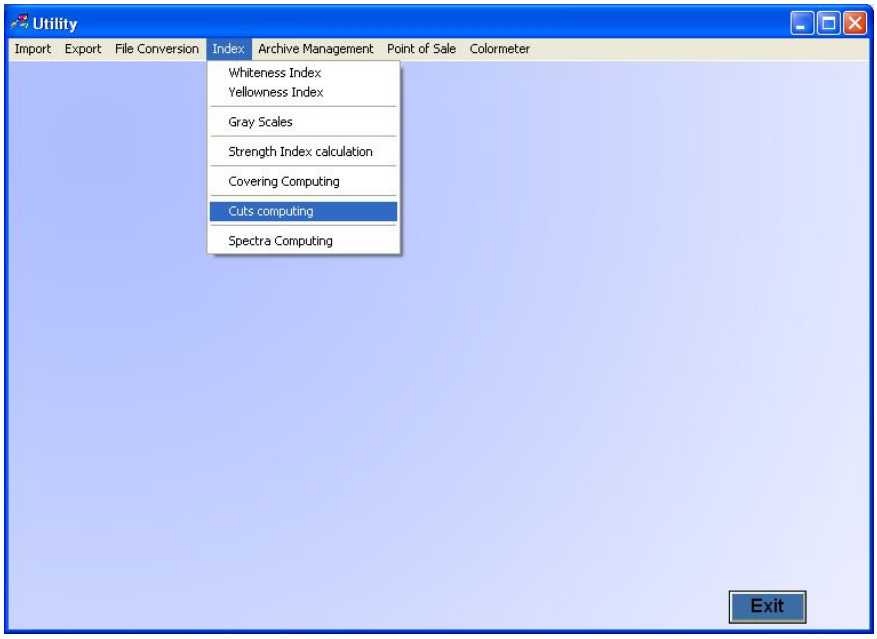


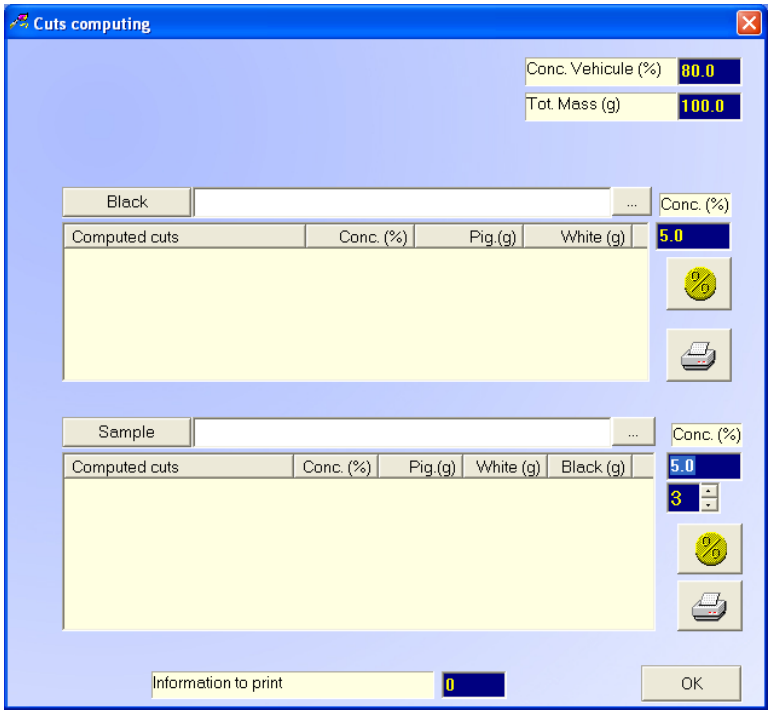
A photo of the obtained Morest samples is sketched below.

ALL THESE SAMPLES MUST BE DELIVERED TO I.C.S. TECHNICAL SERVICE. THESE SAMPLES MUST BE MEASURED BY TOP-PAINT SOFTWEARE

- **Reflectance measurement**: after preparing the Test Tint-Shade for each pigment its reflectance spectrum is measured with the spectrophotometer.

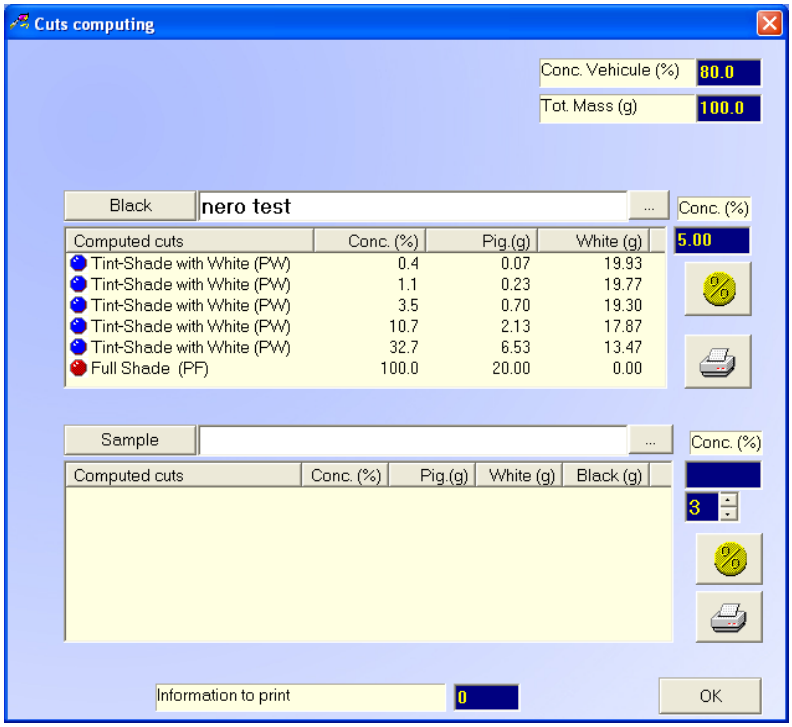
- **Tint-Shade computation**: from the "Additional Functions" button of the Top-Paint main menu the user can access to the "Cuts Computing" window. The procedure to correctly insert all the information is given in the following:
  - ☐ Fill the "Conc.Vehicule (%)" field with the concentration of the vehicle. It is expressed as percentage (%) and by default is 80 %.
  - ☐ Fill the "Tot.Mass (g)" field with the mass of the final product. It is expressed as grams (g) and by default is 100 g.





- **Tint-Shade of the Black pigment**: the procedure to compute the Tint-Shade sample for the Black pigment is given in the following:

☐ Load the Test Tint-Shade of the **Carbon-Black** pigment. If there also is the **Black-Oxide** pigment, its Test Tint-Shade will be loaded later and it will be treated as a common colored pigment. Press the "Black" button to insert the reflectance of the concerning Tint-Shade.

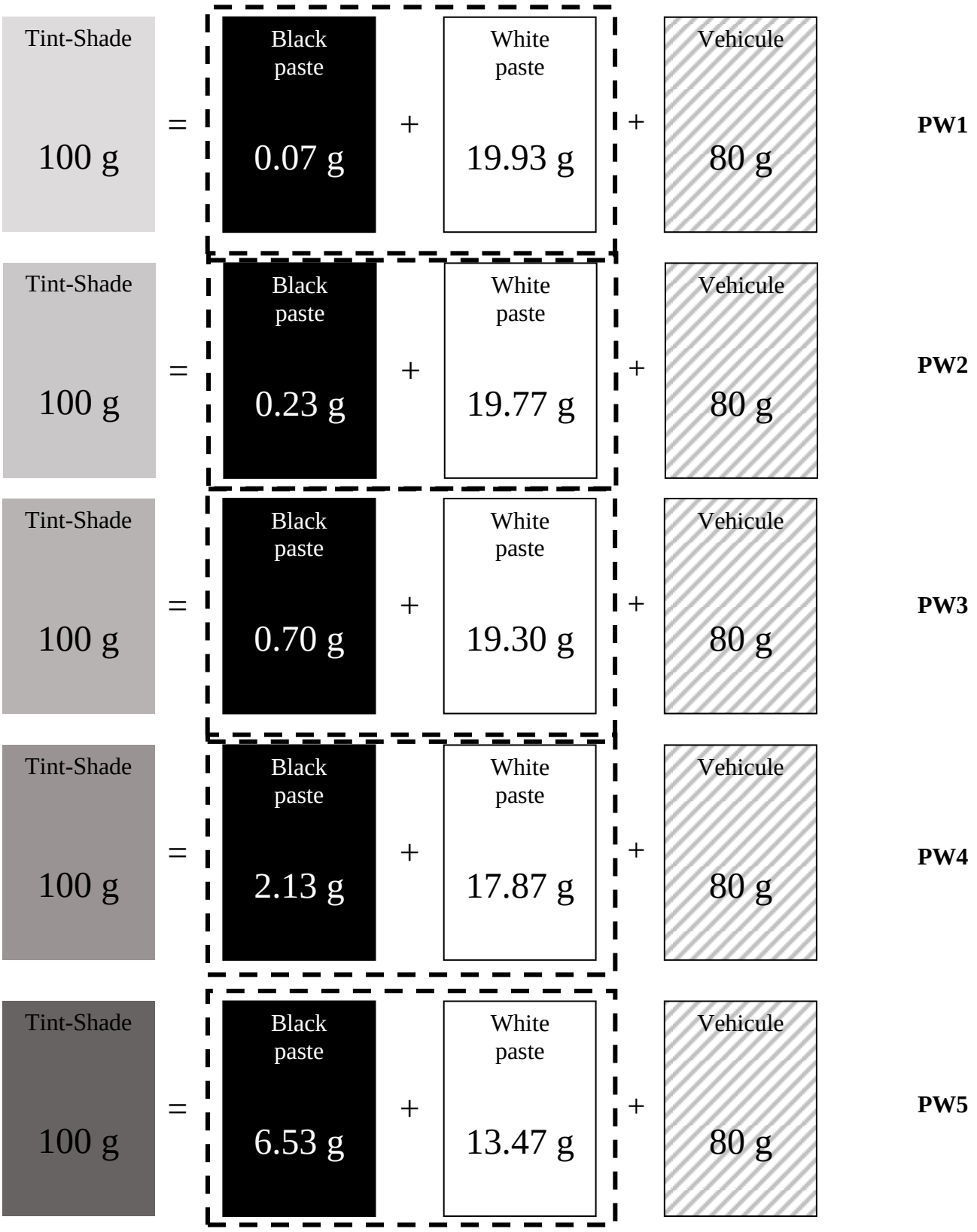


☐ After selecting the **Black** Test Tint-Shade, fill the "Conc.(%)" field with the concentration of the Black pigment (with respect to the colored mass). In our example it was at 5 %.

☐ Press the yellow button  to compute the optimal concentrations of the final Tint-Shade samples. The obtained concentrations are computed with reference to the colored mass only. In the above example the software has computed a set of 6 concentrations as detailed in the following:

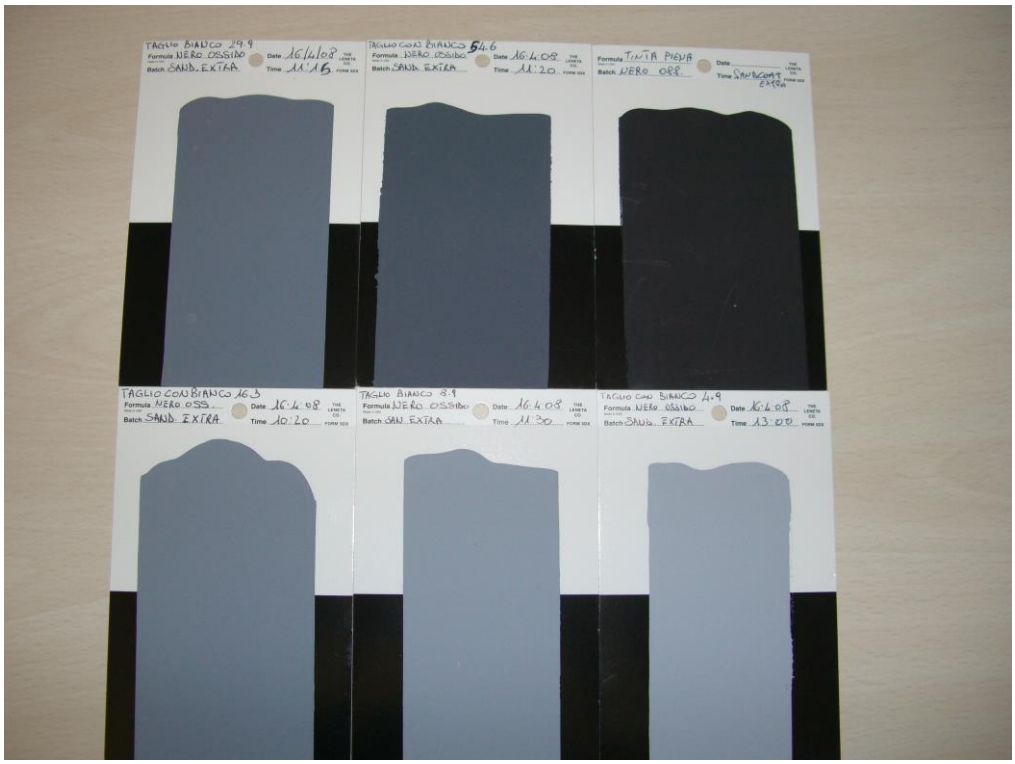
	Conc.(%)	**Pig.(g)**	**White (g)**
Tint-Shade with White (PW)	0.4	0.07	19.93
Tint-Shade with White (PW)	1.1	0.23	19.77
Tint-Shade with White (PW)	3.5	0.70	19.30
Tint-Shade with White (PW)	10.7	2.13	17.87
Tint-Shade with White (PW)	32.7	6.53	13.47
Full Shade (PF)	100.0	20.00	0.00

- the Tint-Shade labeled as “Tint-Shade with White (PW)” represents as in the first raw of the table, a mixture of 0.07 g of the black pigment, 19.93 g of the white paste. This mass of 20 g is always added to 80 g of vehicle.
- The Tint-Shade labeled as “Full Shade (PF)” represents a mass of 20 g of the black pigment. This mass of 20 g is always added to 80 g of vehicle.

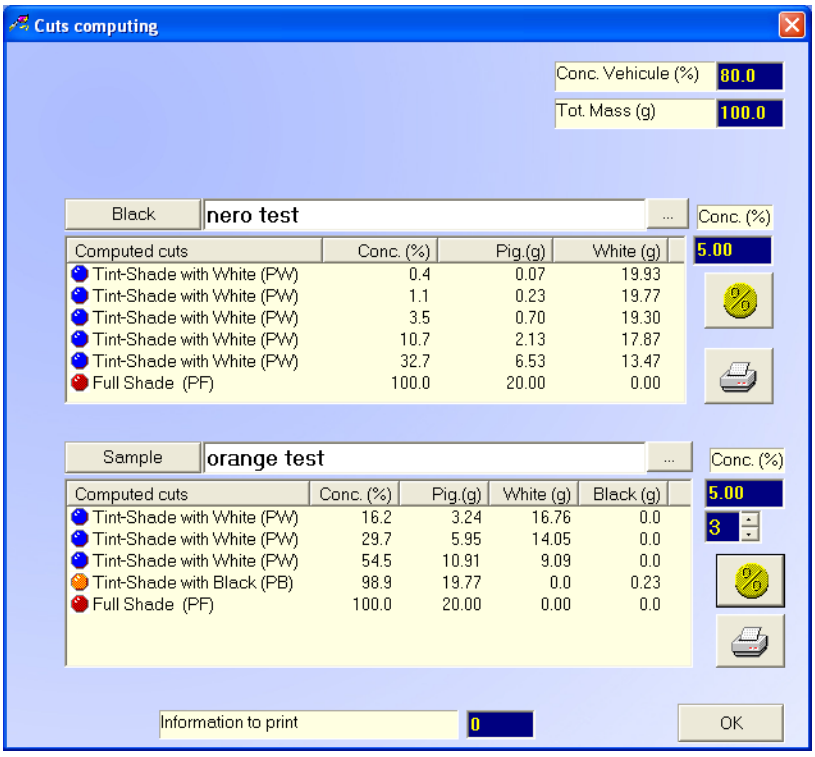

Tint-Shade
100 g
=
Black paste
0.07 g
+
White paste
19.93 g
+
Vehicule
80 g
PW1
Tint-Shade
100 g
=
Black paste
0.23 g
+
White paste
19.77 g
+
Vehicule
80 g
PW2
Tint-Shade
100 g
=
Black paste
0.70 g
+
White paste
19.30 g
+
Vehicule
80 g
PW3
Tint-Shade
100 g
=
Black paste
2.13 g
+
White paste
17.87 g
+
Vehicule
80 g
PW4
Tint-Shade
100 g
=
Black paste
6.53 g
+
White paste
13.47 g
+
Vehicule
80 g
PW5


Tint-Shade
l
100 g
=
Black
paste
20 g
+
White
paste
0 g
+
Vehicule
80 g

PF



- **Tint-Shade of the colored pigment**:
  - ☐ Load the Test Tint-Shade of the concerned pigment. Press the "Sample" button to insert the reflectance of the concerning Tint-Shade.

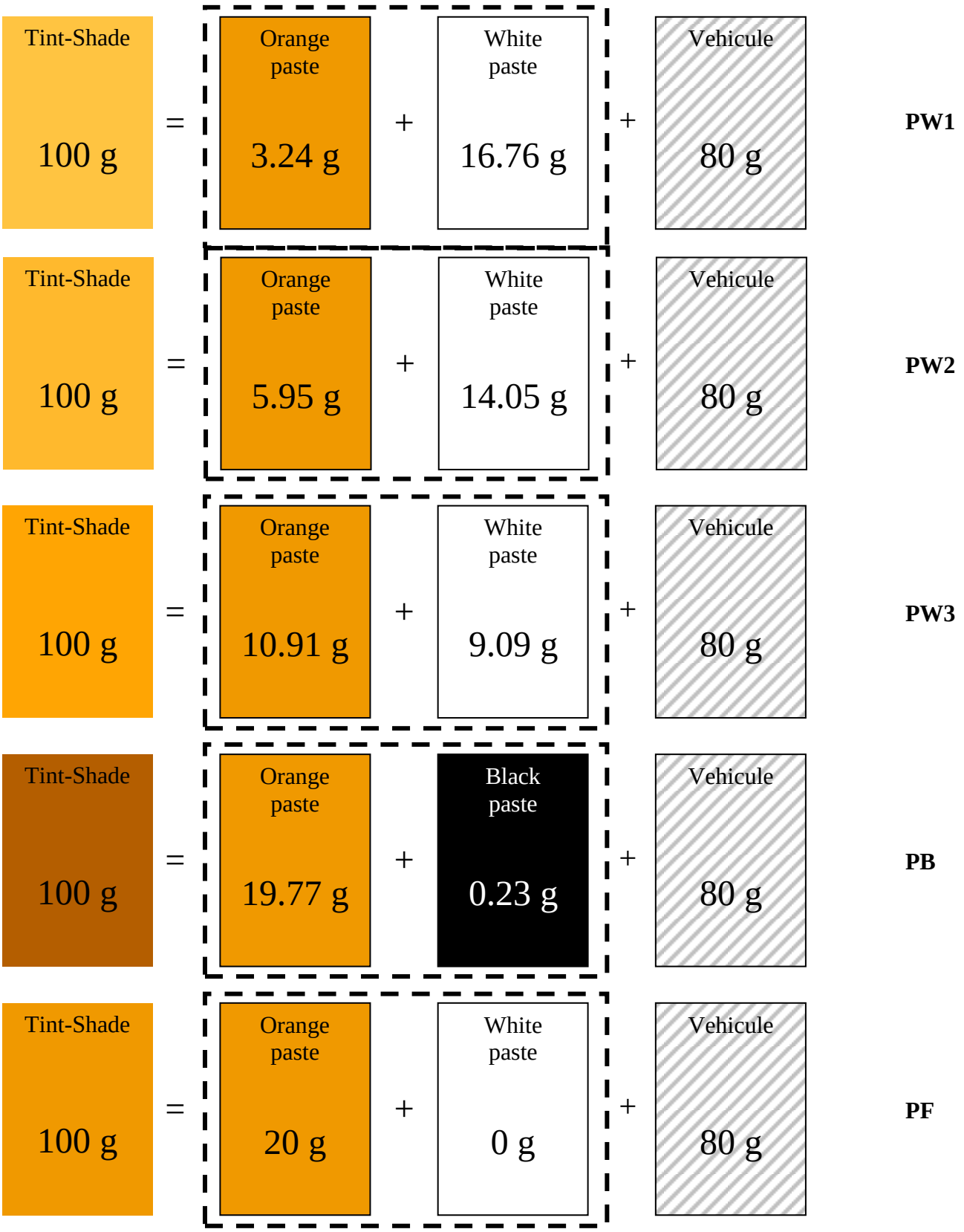


- After selecting the pigment Test Tint-Shade, fill the "Conc.(%)" field with the concentration of the pigment (with respect to the colored mass). In our example it was at 5 %.

- Press the yellow button  to compute the optimal concentrations of the final Tint-Shade samples. The obtained concentrations are computed with reference to the colored mass only. In the above example the software has computed a set of 6 concentrations as detailed in the following:

	Conc.(%)	**Pig.(g)**	**White (g)**	**Black (g)**
Tint-Shade with White (PW)	16.2	3.24	16.76	0.0
Tint-Shade with White (PW)	29.7	5.95	14.05	0.0
Tint-Shade with White (PW)	54.5	10.91	9.09	0.0
Tint-Shade with Black (PB)	98.9	19.77	0.0	0.23
Full Shade (PF)	100.0	20.00	0.00	0.0

  - the Tint-Shade labeled as "Tint-Shade with White (PW)" represents as in the first raw of the table, a mixture of 3.24 g of the pigment, 16.76 g of the white paste. This mass of 20 g is always added to 80 g of vehicle.
  - the Tint-Shade labeled as "Tint-Shade with Black (PB)" represents as in the first raw of the table, a mixture of 19.77 g of the pigment, 0.23 g of the black paste. This mass of 20 g is always added to 80 g of vehicle.
  - The Tint-Shade labeled as "Full Shade (PF)" represents a mass of 20 g of the pigment. This mass of 20 g is always added to 80 g of vehicle.

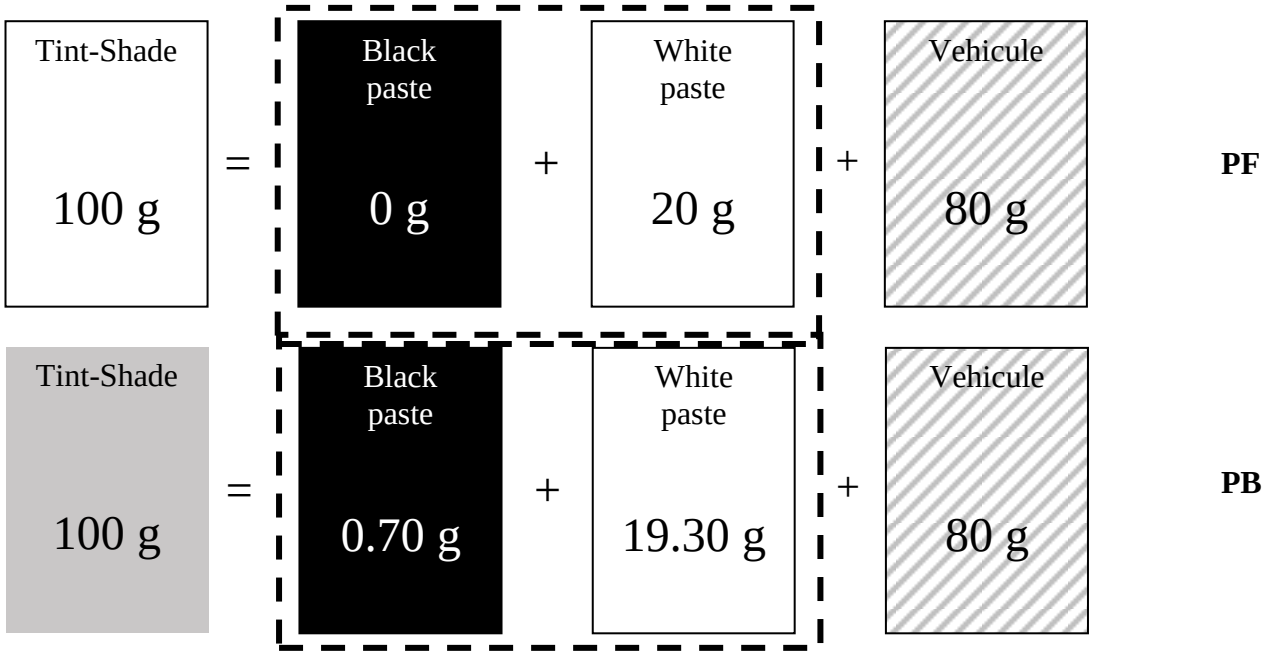

Tint-Shade
100 g
=
Orange paste
3.24 g
+
White paste
16.76 g
+
Vehicule
80 g
PW1
Tint-Shade
100 g
=
Orange paste
5.95 g
+
White paste
14.05 g
+
Vehicule
80 g
PW2
Tint-Shade
100 g
=
Orange paste
10.91 g
+
White paste
9.09 g
+
Vehicule
80 g
PW3
Tint-Shade
100 g
=
Orange paste
19.77 g
+
Black paste
0.23 g
+
Vehicule
80 g
PB
Tint-Shade
100 g
=
Orange paste
20 g
+
White paste
0 g
+
Vehicule
80 g
PF

- **Tint-Shade of the Titanium Dioxide**: after preparing the Tint-Shade of each pigment, it is necessary to prepare also the Tint-Shade of the white-paste (titanium dioxide). The two recommended Tint-Shade samples are:
  - the Full Shade (PF): a mixture of 20 g of the titanium dioxide is added to 80 g of vehicle.
  - the Tint-Shade with Black (PB): in this case of titanium dioxide, the user will select among the Tint-Shade with White (PW) of the Black pigment those which show an **averaged reflectance around 30%.** For sake of simplicity let us report the table of the various Tint-Shade samples with White pertaining to the Black pigment that were previously prepared. Let us suppose that the third Tint-Shade with White has an average reflectance around 30%.

	Conc.(%)	**Pig.(g)**	**White (g)**
Tint-Shade with White (PW)	0.4	0.07	19.93
Tint-Shade with White (PW)	1.1	0.23	19.77
Tint-Shade with White (PW)	3.5	0.70	19.30
Tint-Shade with White (PW)	10.7	2.13	17.87
Tint-Shade with White (PW)	32.7	6.53	13.47
Full Shade (PF)	100.0	20.00	0.00

In this case the user will select this Tint-Shade sample as the second Tint-Shade for fully characterizing the white paste (Titanium Dioxide). The outputted table will be:

	Conc.(%)	Pig.(g)	Black (g)
Full Shade (PF)	100.0	20.00	0.00
Tint-Shade with Black (PB)	3.5	19.30	0.70



- **Tint-Shade of the white-base**: The two recommended Tint-Shade samples are:
  - the Full Shade (PF): an amount of white-base (i.e. 100 g) will be smeared over the Morest cardboard. Be careful to not add any amount of other additives.
  - the Tint-Shade with Black (PB): In order to reduce the number of experimental attempts for correctly preparing the Tint-Shade with Black of the white-base (PB), it is recommended to be complaint with the following rule-of-thumb. To this aim it is necessary to gather some information. The most important one concerns the amount of Titanium Dioxide powder that is present inside the white-paste. Let us suppose that it is around 60%. That means, accordingly to our case, a mass of Titanium Dioxide powder of 12 g, that corresponds to a 12% of powder with respect to the total mass of 100 g. The second information concerns the amount of Black pigment in the second Tint-Shade (PB) that characterizes the white-paste. In our example, this was at 3.5% that means an amount of Black pigment of 0.7 g that corresponds to a 0.7% of Black pigment with respect to the total mass of 100 g. The third information is the amount of Titanium Dioxide powder that is present inside the white-base.

Let us suppose that it is around 15%. This means a relative difference of 25% with respect to the Titanium Dioxide powder of the white-paste. Due to this circumstance the user will add to the white-base an amount of the Black Pigment until reaching the same relative increment of 25%, that means an amount of 0,175 g. The final Tint-Shade will be made with 0,875 g of Black pigment added to 100 g of white-base. The

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Capitale sociale sottoscritto i.v.: 50.000,00 €