|  |
| --- |
| **STANDARD OPERATING PROCEDURE**  **NEW PRODUCT DEVELOPMENT** |

|  |  |  |
| --- | --- | --- |
| **Author** | | |
| Name | Munazza Ali | **Signature** |
| Designation | ManagerR&D |
| Date | April 22,2021 |
| **Approval** | | |
| Name | Shahid Sultan Butt | **Signature** |
| Designation | General Manager |
| Date | April 22,2021 |

## Purpose

To ensure the quality of the product

## Scope

This procedure is applicable to all the staff of liquid master batch division responsible for the quality control.

## Responsible

## Deputy Manager R&D

## Procedure

**Shade Matching in DPM:**

Standard provided for shade matching in DPM could be either in three forms mentioned below;

**DRY PIGMNET**

1. Samples are received from sales team for new development.
2. By using Pantone color guide idea about colors which are to be mixed is picked up.
3. Make a trial mix by using the available pigments of the possible component colors.
4. By using dry pigment and dosing provided by customer, sheet on two roll mill is made in direct shade and in reduction in following composition:

* Direct shade at 2% dosage: PVC-30g + DOP-30g + DPM- 0.6g
* Composition in reduction : PVC: 30g + DOP: 30g + DPM : 0.6g + TiO2 : (4-5)g

1. Using spectrophotometer values are checked.
2. After finalizing the formulation, recipe is again prepared on 2 roll mill and compared with standard if OK then approved if not then adjustments are made until shades are perfectly matched.

**PANTONE NUMBER**

1. By using Pantone color guide idea about colors which are to be mixed is picked up.
2. Using hit and trial attempts are made to match with standard.

**SHOE SOLE**

1. Sole is directly matched with pantone color guide and idea about colors is extracted.
2. Mark the closest shades and obtain an idea about the colors to be mixed.
3. Make a trial mix by using the available pigments of the possible component colors.
4. By using dry pigment and dosing provided by customer, sheet on two roll mill is made in direct shade and in reduction in following composition:

* Direct shade at 2% dosage: PVC-30g + DOP-30g + DPM- 0.6g
* Composition in reduction : PVC: 30g + DOP: 30g + DPM : 0.6g + TiO2 : (4-5)g

1. Using spectrophotometer values are checked.
2. After finalizing the formulation, recipe is again prepared on 2 roll mill and compared with standard if OK then approved if not then adjustments are made until shades are perfectly matched.

**Note**

* Repeat steps until a reasonable match is obtained.
* Note down the formulation of the matched mix and use it to make a sample for customer trail

**SHADE MATCHING IN LIQUID MEDIA:**

**PASTE AND POLYOL:**

1. Using standard paste provided by customer full shade and tint shade of paste is drawn on paper.
2. Using standard paste and Polyol provide by customer diluted shade is also drawn on paper at 5%.

* Full shade
* Tint at 5% : Paste 5% + Polyol 95%

1. Using spectrophotometer values are checked.
2. Using our data bank we try to match shade with our standards.
3. If shade is not present in library then by using Pantone color guide idea about colors which are to be mixed is picked up.
4. Make a trial mix by using the available pastes of the possible component colors.

**DRY PIGMENT:**

1. Using dry pigment provided by customer dispersion of that pigment is prepared in our base Plasticizers at 2%.
2. Then using this paste draw downs of full shade and tint (as per dosing provided by customer) are drawn on shade cards.
3. Above mentioned steps from 3 to 7 are repeated. Then using this paste draw downs of full shade and tint (as per dosing provided by customer) are drawn on paper.
4. Above mentioned steps from 3 to 7 are repeated.

**SHOE SOLE:**

1. In case of shoe sole provided as a standard using color data software guide line about pigment selection is obtained.
2. According to the specs provided by customer through sales team in the product, we select raw material for the development. For example substrate, product properties, end application etc
3. Make a trial mix by using the available pastes of the possible component colors suggested by color data.
4. After mixing direct draw down are drawn on paper.
5. Adjustments are made if shade varies from standard and this continues until exact matched shade is obtained.
6. After finalizing the recipe which is the closest one sheet on two roll mill is manufactured to compare it with standard.

**Shade Matching in MaxFlow Series:**

1. In case of MaxFlow series, standard colorant to be matched is provided by customer
2. First compare standard in comparison with sample in white paint base.
3. Make tint of colorants in white base

White paint base: 99%

Colorant: 1%

1. Take drawdown of tints on card panels using 50-100 micron rod.
2. Dry those draw downs in oven @ 50®C.
3. Check spectrophotometer values. If shade varies from customer standard, adjustments are made until exact matched shade is obtained.
4. Check viscosity @25®C at viscometer.
5. Check PH
6. After finalizing the formulation, recipe is again prepared on bead mill and compared with standard if OK then approved if not then adjustments are made until shades are perfectly matched.

**Shade Matching in Micro Fix Series:**

1. In case of Micro fix series, standard colorant to be matched is provided by customer
2. First compare standard in comparison with sample in binder based stock paste.
3. Make reduction of colorants in stock paste

* 99.9% stock paste with 0.1% colorant
* 99% stock paste with 1% colorant

1. Take drawdown of tints on fabric using screen of fine mesh.
2. Dry in oven @ 60®C.
3. Check spectrophotometer values. If shade varies from customer standard, adjustments are made until exact matched shade is obtained.
4. Check viscosity @25®C at viscometer.
5. Check PH.
6. After finalizing the formulation, recipe is again prepared on bead mill and compared with standard if OK then approved if not then adjustments are made until shades are perfectly matched.

**PANTONE NUMBER:**

1. In case of pantone number provided by customer steps are all same as for shoe sole as a standard.

\*Repeat trial step until required shade is obtained.

\*Note down the formulation of the matched mix and use it to make a sample for customer trial.

## Associated Documents and Records

QC and shade matching sheet records.

.