|  |
| --- |
| **STANDARD OPERATING PROCEDURE**  **RAW MATERIAL EVALUATION** |

|  |  |  |  |
| --- | --- | --- | --- |
| **Author** | | | |
| Name: Ahmad Raza | |  | **Signature** |
| Designation: Sr. Manager Operations | |  |
| Date: 09-11-2021 | |  |
| **Review** | | | |
| Name: Ali Raza Gohar | |  | **Signature** |
| Designation: QHSE Team Lead | |  |
| Date: 09-11-2021 | |  |
| **Approval** | | | |
| Name: Shahid Sultan Butt | Designation: GM  Date: 09-11-2021 |  |  |
|  |  |  |

## Purpose

To test a raw material (New grade or new lot of standard material) against standard raw material

## Scope

This procedure is applicable to all the staff of PCC responsible for RM evaluation

## Responsible

Assistant Manager-LAB

## Procedure

## Pre evaluation checklist

## New RM sample

* Ensure lot number of sample is available.
* Ensure proper literature is provided along with the sample in which material is clearly mentioned to be “Recommended” in the intended system by the supplier.
* Ensure that price comparison is provided and the price is competitive.
* Ensure proper quantity of material is provided for testing as per below table:

|  |  |  |  |
| --- | --- | --- | --- |
| **Material** | **Quantity (kg)** | | |
| **Polyamide system** | **NC system** | **Water based system** |
| Base resin | 0.50 | 0.50 | 0.50 |
| Supporting resin | 0.30 | 0.30 | 0.30 |
| Pigment | 0.30 | 0.15 | 0.25 |
| TiO2 | 0.30 | 0.25 | 0.25 |
| Extenders | 0.30 | 0.30 | 0.30 |
| Wax | 0.15 | 0.15 | 0.15 |
| Additives | 0.15 | 0.15 | 0.15 |
| Solvents/carriers | 1 | 1 | 1 |

## If something is missing, report to R&DC on the same day otherwise proceed to testing section

## New lot of regular RM/PSS

## Just ensure sample quantity as per above table and proceed to testing section

## Evaluation

* + 1. **Base resin**
       1. **Solid resin**
  + Prepare varnish according to standard formulation of relevant series.
  + Compare the varnish with the standard produced under similar conditions in lab according to SOP of QC
  + Focus on key parameters: Color, Viscosity, gloss, Tape and pH (for water based inks).
  + Test flow stability of varnish. Viscosity of varnish should be within ±10% of original value after 24 hours. Otherwise, observe for another 24 hours.
    - 1. **Liquid resin/Dispersion**
  + Use resin to prepare color concentrate according to standard formulation of relevant series.
  + Compare the concentrate with the standard produced under similar conditions in lab according to SOP of QC.
  + Focus on key parameters: Color, Viscosity, gloss, Tape and pH (for water based inks).
  + Test flow stability of resulting inks. Viscosity of varnish should be within ±10% of original value after 24 hours. Otherwise, observe for another 24 hours.
    1. **Supporting resin**
  + Use resin to produce 04 process color inks according to standard formulation of relevant series.
  + Compare the inks with the standards produced under similar conditions in lab according to SOP of QC.
  + Focus on key parameters: Color, Viscosity, gloss, Tape and pH (for water based inks).
  + Test flow stability of resulting inks. Viscosity of varnish should be within ±10% of original value after 24 hours. Otherwise, observe for another 24 hours.
    1. **Pigment/ TiO2/ Extenders**
  + Use pigment/TiO2/Extender to prepare concentrate/extender according to standard formulation of relevant series.
  + Compare the concentrate/extender with the standard produced under similar conditions in lab according to SOP of QC.
  + Focus on key parameters: Color and tinting strength, Viscosity, gloss, Tape and pH (for water based inks).
  + Test flow stability of resulting inks. Viscosity of varnish should be within ±10% of original value after 24 hours. Otherwise, observe for another 24 hours.
    1. **Waxes**
  + Use wax to prepare wax dispersion according to standard formulation of relevant series.
  + Compare the wax dispersion with the standard produced under similar conditions in lab by ink making according to SOP of QC.
  + Focus on key parameters: Rub and scratch resistance, Tape fastness, gloss,
  + Test flow stability of resulting inks. Viscosity of varnish should be within ±10% of original value after 24 hours. Otherwise, observe for another 24 hours.
    1. **Dispersing agents**
  + Use dispersing agents to prepare concentrate/extender according to standard formulation of relevant series.
  + Compare the concentrate/extender with the standard produced under similar conditions in lab according to SOP of QC.
  + Focus on key parameters: Color and tinting strength, Viscosity, gloss, Tape and pH (for water based inks).
  + Test flow stability of resulting inks. Viscosity of varnish should be within ±10% of original value after 24 hours. Otherwise, observe for another 24 hours.
    1. **Other additives**
  + Use additive to prepare ink according to standard formulation of relevant series.
  + Compare the ink with the standard produced under similar conditions in lab according to SOP of QC.
  + Focus on key parameters: Adhesion for adhesion promoters, viscosity for viscosity stabilizers, pH for pH regulators etc.
    1. **Solvents/carriers**
* Purity of solvents should be tested by GC analysis.
  1. **Testing guidelines**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Properties** | **Water based resin** | **Water based pigment** | **Solvent based resin** | **Solvent based pigment** | **Water based Additives** | **Solvent based additive** |
| **Appearance** | **✓** |  | **✓** |  | **✓** | **✓** |
| **RM viscosity (Cp/sec.) \*** | **✓** |  | **✓** |  | **✓** | **✓** |
| **Concentrate Premix viscosity (cp)** | **✓** | **✓** | **✓** | **✓** |  |  |
| **Concentrate Viscosity (cp /sec.)** | **✓** | **✓** | **✓** | **✓** | **✓** | **✓** |
| **Ink Viscosity (Sec)** | **✓** | **✓** | **✓** | **✓** | **✓** | **✓** |
| **Flow** | **✓** | **✓** | **✓** | **✓** | **✓** | **✓** |
| **Ink Shade** | **✓** | **✓** | **✓** | **✓** | **✓** | **✓** |
| **Opacity** |  | **✓** |  | **✓** |  |  |
| **Ink Strength** | **✓** | **✓** | **✓** | **✓** | **✓** | **✓** |
| **Ink Gloss** | **✓** | **✓** | **✓** | **✓** | **✓** | **✓** |
| **pH** | **✓** | **✓** |  |  | **✓** |  |
| **Tape Test** |  |  | **✓** | **✓** | **✓** | **✓** |
| **Rub resistance** | **✓** |  |  |  | **✓** | **✓** |
| **Nail test** |  |  | **✓** | **✓** |  | **✓** |
| **Heat seal @ 140 ◦C \*\*** |  |  | **✓** |  |  | **✓** |
| **Sludge** | **✓** | **✓** |  |  | **✓** |  |
| **settling** | **✓** | **✓** | **✓** | **✓** | **✓** | **✓** |

## Additional working

Additional working is recommended in case of rejection if:

* Sample is from a purchased lot
* Sample has considerable price benefit over current standard
* Standard raw material is not available.

In this case, amend the formulation in the light of your experience and guidelines from seniors to resolve the issue where possible.

## Reporting

* Prepare report on specified format.
* Update results in RM testing log.

## Associated Documents and Records

SOP of QC

RM testing log

Raw material testing report

**AMENDMENT HISTORY**

|  |  |  |  |
| --- | --- | --- | --- |
| **REV. #** | **DCR#** | **SECTION** | **AMENDED TEXT** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

\* All changes made in the document are notified in the Amendment History Table.