COLOR PROCEDURES

Nordstrom Product Group has established color procedures that identify our requirements, processes, standards and tolerances for lab dips, bulk swatches, strike-offs, handlooms and knit downs. The goal is to reduce the color development cycle, improve the consistency and accuracy of color comments and decrease the volume of unsatisfactory submits.

NPG brands evaluate colors “Visually” using a light box and/or “Digitally” using the spectrophotometer. All visual evaluations are made by the Brands. The digital evaluation of color is conducted by the NPG QA Colorist.

VISUAL COLOR EVALUATION PROCESS

ILLUMINANTS

At NPG, all samples are evaluated in the Nordstrom Light Box.

NPG uses Fluorescent Daylight 6500K, 90 CRI (D65) as its primary illuminant for color matching.

Store light is the second illuminant utilized to view and evaluate samples for flaring. Store light is a combination of two light sources (Fluorescent Daylight 3000K, 82CRI (D30) and Halogen lights) that must be turned on at the same time during evaluation. Industry standard TL84 may be used as an alternative to the Nordstrom store light.

Nordstrom Light Boxes can be purchased from SDL ATLAS.
SDL Atlas
1813A Associates Lane
Charlotte, NC 28217-2956
Phone: 704-329-0911
Fax: 704-329-0914

GretagMacbeth or Verivide light boxes are acceptable alternatives to the Nordstrom Light Box. D65 and TL84 are the light sources used with the alternative light boxes.

NORDSTROM VISUAL COLOR EVALUATION TECHNIQUE

- Center the sample in the light box with face side up and with the horizontal/vertical direction based on how the fabric will be used in the final product.
- View the sample at a 45 degree angle.
- Place the sample and color standard so their edges touch, making visual differences easily detected. Do not overlap the sample and color standard.
- Fold the samples to be viewed to sufficient thickness to make them opaque, typically two to four layers. The sample is opaque if it does not allow light to pass through.
- Evaluate the submitted sample color against the color standard under the light source D65.
- To communicate color differences effectively, use a common and consistent color language. Evaluate the “value”, “chroma” and “hue” of the sample against the color standard swatch for color matching.
  - Value: Light/Dark
  - Chroma: Bright/Dull
  - Hue: Blue, Green, Yellow and Red
- Evaluate the sample for flare. Flaring or metamerism is the effect when the same color appears to match under one light source but does not when observed in another. View the sample under store light: Turn on both the Fluorescent D30, 82CRI and Halogen lights or TL84 if using an alternative light box.
  - If the color is flaring, the formula should be adjusted before sending for approval.

*Note*: Light exposure, high temperatures, high humidity, dust, dirt can degrade the color of specimens. Prior to handling the sample, wash hands with soap and water to remove dirt and oils. Do not use lotions. Avoid eating, drinking around your colors and light boxes.

### DIGITAL COLOR EVALUATION

#### INSTRUMENTAL COLOR MEASUREMENT

The purpose of instrumental color measurement is to provide objective, reproducible, quantifiable data for color communication through the use of the spectrophotometer. The spectrophotometer helps improve the accuracy of submitts, reduce the volume of unsatisfactory submittals, improve communication and decrease time and expense associated with color approvals.

*Note*: Pile fabric such as corduroy and velour will not be evaluated by spectrophotometer due to its three dimensional structure.

- **DATACOLOR SPECTRAFLASH SF600 PLUS**
  - Viewing condition: Aperture size varies from 30mm to 3mm LAV=30mm MAV=20mm SAV=9mm USAV=6.6mm XUSAV=3mm
  - Color space: CMC
  - Illuminant/Observer: D65/10
  - Calibration: Calibration is performed prior to measurement, after 8 hour of use and after changing aperture size.
  - Conditioning: *Temperature*: 70 Fahrenheit *Humidity*: 65%

### NORDSTROM MEASUREMENT TECHNIQUE

- Before beginning the measurement, please be sure that your hands are clean. Wash them with soap and water, do not use skin lotions. Avoid eating, drinking around spectrophotometer and your samples. Do not over handle the samples.
- Calibrate the instrument before use.
  - The instrument should be calibrated every 8 hours or when the aperture size is changed.
- Condition the samples before measurement for a minimum of 30 minutes.
- Fold the samples to be viewed to sufficient thickness to make them opaque, typically two to four layers. The sample is opaque if it does not allow light to pass through. Make sure to measure the face side of the fabric.
- Be sure to choose the right aperture size according to your sample. Try to use the largest possible view aperture for maximum accuracy. NPG has specific measurement protocols by fabrication. Please refer to those protocols.(See following “Measurement Protocol” chart)
the fabrication you want to measure is not listed, please contact NPG Color Data Mailbox (npgcolordata@nordstrom.com) to develop a protocol. NPG’s requirement is to make 4 measurements for each sample.

- Position sample at the instrument port and measure it.
- Remove the sample from the instrument, re-fold, re-position and measure it. Shift the location 90 degrees and/or direction of the sample at each measurement to optimize surface reading. Do not read the same location.
- Take a total of 4 measurements.
- After all are measurements completed, the instrument will provide DELTA E (DE) reading for comparison.
### MEASUREMENT PROTOCOLS

<table>
<thead>
<tr>
<th>Fabric</th>
<th>Aperture Size</th>
<th># of Folds</th>
<th># of Readings for a Measurement</th>
<th>Fabric Content</th>
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</thead>
<tbody>
<tr>
<td>Flat Knits</td>
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<td></td>
<td></td>
<td>cotton, cotton / spandex, cotton / polyester / spandex, cotton / modal, rayon / spandex, modal / spandex,</td>
</tr>
<tr>
<td>Rib / jersey / pique / interlock / French terry</td>
<td>LAV</td>
<td>1</td>
<td>4</td>
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<tr>
<td>Rib/Jersey Weight &gt;160 g/m2</td>
<td>LAV</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Sweater</td>
<td></td>
<td></td>
<td></td>
<td>cotton, cotton / spandex</td>
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<tr>
<td>Fine Gauge Jersey Knit-down (&gt;12 gauge)</td>
<td>LAV</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Flat Woven</td>
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<td></td>
<td></td>
<td>cotton, cotton / spandex, cotton / nylon/ spandex polyester / rayon / spandex</td>
</tr>
<tr>
<td>Plain Weave/Twill</td>
<td>LAV</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

NPG established the following acceptability ranges (Tolerances):
- **Acceptable**: DE≤ 0.8. All submits below or equal to this value
- **May Be Acceptable**: DE= 0.8-1.2 The submits that fall into this range after reviewing visually.
- ** Unsatisfactory**: DE≥1.2: The submits greater than 1.2 although other factors may be taken into consideration before rejecting a color.
LAB DIP PROCESS

The purpose of lab dip matching is to determine the best color match to a Nordstrom specified color standard which will meet NPG colorfastness requirements.

- NPG Brands will submit color standards on the NPG Color Standard Submit Form.

LAB DIP SUBMITTAL FOR APPROVAL

- The physical lab dip submits must be an accurate color match to the specified color standard when viewed under the designated light sources D65 and store light.
- All Lab Dip Submissions must be attached to the NPG Lab Dip Submittal Form.
- To ensure accurate analysis, minimum lab dip size must be:
  - Fabric: 2”x2” swatch, commercial front in the vertical direction
  - Threads: 2” long x 1/2” thick bundle
- Mount swatch with double-sided tape showing the correct side of the fabric. Do not use staples, single sided tape or glue.

LAB DIP COLOR SHADE MATCHING EVALUATION METHOD

NPG’s goal is to approve the lab dip within the first lab dip submittal, so please limit submissions only to those that have been determined to be an accurate color match. Please submit at least 3 options. Timing of lab dip submittal and approval is critical.

*Note:* In the event the submitted lab dip is rejected, the mill or supplier must resubmit corrected lab dips within five working days of the notice of rejection.

- Color evaluation
  - All submitted lab dips are compared to Nordstrom specified color standards.
  - Please follow the procedures described in Nordstrom Visual Color Evaluation Technique.

PRODUCTION SWATCH EVALUATION

After a lab dip is approved, the same formula must be maintained for the approved color and fabric to ensure reproducibility in bulk production and re-orders.

A 6x6 swatch from the first dye lot must be submitted to ensure that the bulk production swatch accurately match the approved lab dip under the required light sources.

All bulk swatch submissions need to be attached to Nordstrom Production Swatch Submittal Form.

- Color Evaluation
  - All bulk swatches are compared to the approved lab dips.
  - Please follow the procedures described in Nordstrom Visual Color Evaluation Technique.
STRIKE-OFF / HANDLOOM / KNITDOWNS PROCESS

The purpose of strike off/handloom and knit down is to determine the best color match to the Nordstrom specified pattern design and colorways that will meet NPG’s colorfastness requirements.

The NPG print pattern design and colorways are submitted by NPG.

STRIKE-OFF/HANDLOOM/KNITDOWN PATTERN DESIGN AND COLOR SUBMITTAL FOR APPROVAL

- The strike-off/handloom and knit down must be an accurate match to the provided print pattern design and colorways when viewed under the designated light sources D65 and storelight.
- To ensure an accurate analysis, the minimum size should be 5”x5” and one pattern repeat
- Mount swatch with double-sided tape showing the correct side of the fabric. Do not use staples, single sided tape or glue.

STRIKE-OFF/HANDLOOM/KNIT DOWN PATTERN DESIGN AND COLOR EVALUATION METHOD

The goal is to approve the strike-off/handloom/knit down within the first submittal, please limit submissions only to those that have been determined to be an accurate color match.

- Color evaluation
  - All submitted strike-off/handloom/knit down compared to Nordstrom specified colorways.
  - Please follow the procedures described in Nordstrom Visual Color Evaluation Technique.
- Pattern Evaluation
  - Please evaluate the strike off/handloom/knit down for pattern design, pattern size, color placement against the Nordstrom specified pattern design.

If you have any questions, please contact with NPG Color Data Mailbox at (npgcolordata@nordstrom.com)