Thermoplastic Traffic Striping and Pavement Marking Material, Miscellaneous Requirements

1.0 QUALITY ASSURANCE PROVISIONS

1.1 Inspection and Sampling: Each lot of thermoplastic material intended for use by the California Department of Transportation (the Department) must be tested by the manufacturer before shipment. For each lot the Manufacturer will create a certificate of compliance, (COC, see Attachment 1). When the COC is complete the manufacturer may ship the lot to the purchaser, with a copy of the COC. At the same time the manufacturer will ship one 6 kg representative sample of each lot of thermoplastic and a copy of the COC to the Transportation Laboratory for quality assurance testing. The address of the Transportation Laboratory is listed in section 3.4.

A lot shall consist of a batch or consecutive batches of thermoplastic manufactured on the same day using the same formulation. A batch shall be that amount of thermoplastic that was manufactured and packaged in a single operation. Thermoplastic from the same lot shall be palletized, shrink-wrapped, labeled with the manufacturer’s lot and batch numbers (on each pallet) and batch number (on each bag). A lot shall be more than 900 kg and shall be less than 20,000 kg of thermoplastic.

The manufacturer’s COC will include but is not limited to the following information:

- Brookfield Thermosel Viscosity @ 218°C (or at 191°C for Spray-Type)
- Hardness
- Binder Content
- Glass Bead Content
- Daylight Luminous Reflectance
- Yellow Color (for yellow only)
- Yellowness Index (for white only)
- Independent laboratory test results showing the lead and arsenic content of the lot of glass beads used in the thermoplastic formulation (see section 3.4.1 of specifications #PTH-02ALKYD (October 2017) or #PTH-02SPRAY (October 2017) for test methods).

The sample and completed COC shall be sent to the Transportation Laboratory at the address listed in section 3.4.

1.2 Random Sampling: The Department of Transportation reserves the right to take random samples of lots/batches of thermoplastic, destined for use by the Department, at the manufacturer’s facility. Sampling may also be done at the Contractor’s warehouse or jobsite. If requested by the Inspector, batch tickets must also be provided for batches of thermoplastic produced for the Department. The Department of Transportation also reserves the right to retest any batch/lot of thermoplastic after delivery. Results from such retesting shall prevail over all other tests and will be the basis of rejection. Material not meeting the specification shall be removed and replaced by the supplier at their expense, including all costs for handling, retesting and shipping.

1.3 Testing: All tests shall be performed according to the specified test methods (latest revision) mentioned in the material specifications. The manufacturer shall maintain a laboratory sufficiently staffed and equipped so as to maintain the quality of the product as called for in these specifications.

2.0 PREPARATION FOR DELIVERY
2.1 **Packaging:**

2.1.1 **Block Form:**
The thermoplastic material shall be packaged in suitable containers to which it will not adhere nor interact during shipment and storage. The blocks of cast thermoplastic material shall be approximately 900 by 300 by 50 mm and shall weigh approximately 22.7 kg. The containers shall be palletized as specified in the contract or purchase order.

2.1.2 **Granular Form:**
The thermoplastic material shall be packaged in meltable bags which are compatible with the thermoplastic and which weigh approximately 22.7 kg when filled. The containers must have sufficient strength and be properly sealed to prevent breakage and leakage during normal handling. The bags shall be shrink-wrapped to reduce shifting of the bags on the pallet and shall be palletized as specified in the contract or purchase order.

2.2 **Markings:** Each individual unit/container of product shall be labeled. This label shall include: State Specification number (#PTH-02ALKYD or #PTH-02SPRAY), color, type of binder, manufacturer’s name and address, date of manufacture and batch number. Lead-free yellow materials shall be marked “Lead-Free”. Thermoplastic meant for recessed application shall be marked “For Recessed Application”. All markings on containers shall be legible and permanent. Markings shall not smear or rub-off container. Containers failing to meet marking requirements will not be accepted.

The containers and labeling shall meet all applicable US Department of Transportation and Interstate Commerce Commission regulations. Concerning the content, each container shall be labeled with such warnings or precautions as are required by; Local, State and Federal laws and requirements.

3.0 **NOTES**

3.1 **Certificate of Compliance:** The certificate of compliance form in Attachment 1 requires the manufacturer to list their Quality Control testing for each lot. The manufacturer of thermoplastic materials shall furnish the Engineer with the COC in conformance with the provisions of the California Department of Transportation Standard Specifications, 2015, section 6-2.03C, “Certificate of Compliance.” The COC shall be sent along with each delivery of thermoplastic and also with samples sent to the Transportation Laboratory for quality assurance testing.

3.2 **Safety Data Sheets:** The manufacturer shall provide Safety Data Sheets (SDS’s) with each delivery of thermoplastic. These SDS’s shall include health hazard information on the material when it is heated to application temperature.

3.3 **Patents:** The Contractor shall assume all costs arising from the use of patented; materials, equipment, devices or processes used on or incorporated in the work, and further agrees to indemnify and save harmless the State of California and its duly authorized representatives from all suits at law or action of every nature for or on account of the use of any patented; materials, equipment, devices or processes.

3.4 **Contact Information:** Please send samples to the Transportation Laboratory for testing at the address below.

California Department of Transportation
Transportation Laboratory – Chemistry Section
5900 Folsom Blvd.
Sacramento, CA 95819
Attention: Lisa Dobeck
Phone: (916) 227-7291
Thermoplastic – Miscellaneous Requirements

October 2017

Attachment 1

Certificate of Compliance

State Specification Type: ________________________________
Manufacturer’s Product #: ___________________________
ID #s of batches comprising the lot and lot number: ______________________________________
Lot Quantity: __________________________ Date COC Issued: __________________________
Date of Manufacture: _______________ Color: ___________ Viscosity Type ___________

Issued To: {Contractor name here}  CC: California Department of Transportation
{State Project Number here}  ORMT, Chemical Testing Branch
{Dist-County-Route}  5900 Folsom Boulevard
Sacramento, CA  95819

The {Manufacturer} representatives whose signatures are below certify that this lot of thermoplastic meets or exceeds the requirements in Section 84-2 of the 2015 Standard Specifications, and all the specification requirements in the current State Specification listed above.

Attach a certificate of compliance and test results from an independent laboratory for each lot of intermixed glass beads used in the thermoplastic formulations.

<table>
<thead>
<tr>
<th>Quality Characteristic</th>
<th>Test Method</th>
<th>Date Tested</th>
<th>Test Result</th>
<th>Tested By</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brookfield Thermosel Viscosity, 20 rpm, 425°F, Poise</td>
<td>California Test 423</td>
<td></td>
<td></td>
<td></td>
<td>Low viscosity &lt; 4.5 Extrude 4.5-10</td>
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<tr>
<td>Hardness, Shore A-2 Durometer, 115°F</td>
<td>California Test 423</td>
<td></td>
<td></td>
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<tr>
<td>Yellowness Index, white only, max</td>
<td>California Test 423</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Daytime Luminance Factor</td>
<td>California Test 423</td>
<td></td>
<td></td>
<td></td>
<td>White &gt; 80 Yellow 47-60</td>
</tr>
<tr>
<td>Yellow Color, yellow only</td>
<td>California Test 423</td>
<td></td>
<td></td>
<td></td>
<td>Within color box</td>
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<tr>
<td>Glass Bead Content, %</td>
<td>California Test 423</td>
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<td></td>
<td></td>
<td>30-35</td>
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<tr>
<td>Binder Content, %, min</td>
<td>California Test 423</td>
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Intermix Glass Bead Test Results

<table>
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<tr>
<th>Quality Characteristic</th>
<th>Test Method</th>
<th>Test Results</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead content, mg/kg</td>
<td>EPA Test Method 3052 and 6010B or 6020C</td>
<td>&lt; 200</td>
<td></td>
</tr>
<tr>
<td>Arsenic content, mg/kg</td>
<td>EPA Test Method 3052 and 6010B or 6020C</td>
<td>&lt; 200</td>
<td></td>
</tr>
</tbody>
</table>

Certified by: ____________________________  Executed by: ____________________________
(person in responsible charge of testing)  (authorized rep of manufacturer)
Title: ________________________________  Title: ________________________________