

DMS-8391, Materials for Motor Vehicle License Plate Validation Stickers

Overview

(Formerly D-9-8391, Motor Vehicle License Plate Validation Stickers).

Effective Date: August 1998 – May 2003.

This specification shall govern for the materials, composition, quality, services, sampling, and testing of materials necessary for production of license plate validation stickers.

Bidders' and/or Suppliers' Requirements

All prospective bidders and/or suppliers are notified that, before any bid is considered, the materials proposed for submission shall be on the list of approved manufacturers of materials covered by this specification and maintained by the Vehicle Titles and Registration Division (VTR) of Texas Department of Transportation.

Payment

Payment for all materials and services under this specification shall be in accordance with the conditions prescribed in the contract awarded by the State.

Prequalification and Performance History

Establishment of Performance History

Prospective bidders and/or suppliers who desire to establish a performance history for materials governed by this specification must contact Texas Department of Transportation, Motor Vehicles Division, 125 E. 11th Street, Austin, TX 78701-2483.

At the time of contact the prospective bidder and/or supplier shall submit technical data exhibiting characteristics of all materials proposed.

Information submitted shall include time and temperature required for curing of any inks, clear coats and/or other materials proposed for use in the production of completed license plate validation stickers.

Prospective bidders and/or suppliers will be notified, after their material has been evaluated, as to conformance with requirements of this specification.

Prequalification testing for validation sticker material will include, but is not limited to, 1200 hours exposure for five year reflective materials and 280 hours for one year reflective materials in an Atlas Type E Weather-Ometer.

Prequalification will not be granted until successful completion of all durability requirements.

Re-evaluation

When, in the opinion of the Director of CST/M&P, changes have been made in the composition and/or manufacturing process of a prequalified material, a re-evaluation of the performance may be required.

TxDOT may conduct additional tests to identify changes in the material. Changes that are detected in composition and/or manufacturing process, which have not been reported by the manufacturer, may be cause for removal of that material from the list of prequalified materials.

Periodic Evaluation

TxDOT reserves the right to periodically evaluate the performance of materials.

Samples for periodic evaluation of performance will be selected at random from materials submitted on state purchase orders.

Failure of materials to comply with the requirements of this specification as a result of periodic evaluation, may be cause for removal of those materials from the list of prequalified materials.

Technical Services

The successful bidder will provide the license plate validation sticker manufacturing plant with all technical services that the Texas Department of Criminal Justice (TDCJ) deems necessary and specifically requests during the procurement and installation of equipment, the training of personnel, and the production of license plate validation stickers.

The technical service provided at locations other than the license plate validation sticker manufacturing plant is not considered a part of this specification.

Fifteen (15) man-days of technical service and five (5) man-trips to the plant will be provided at no extra cost by the successful bidder.

Each additional man-day of technical service specifically requested by TDCJ and each trip necessitated by such request shall be compensated at the same rate and subject to the same regulations, where applicable, as provided for State employees and in effect at the time technical services are performed.

This technical service will be provided when requested by TDCJ, and will be available within 48 hours after such request is made.

Sampling and Testing

Sampling and testing shall be in accordance with CST/M&P *Manual of Testing Procedures*.

Costs of sampling and testing are normally borne by TxDOT; however, the costs of sampling and testing of materials failing to conform to the requirements of this specification shall be borne by the supplier.

Costs of sampling and testing of failing materials shall be assessed at the rate established by the Director of CST/M&P and in effect at the time of testing.

Amounts due TxDOT for conducting such tests will be deducted from partial or final payments on direct purchases by the State.

Sampling

Sampling of reflective materials shall be in accordance with Test Method "Tex-720-I, Sampling Reflective Sheeting."

All liquid materials shall be sampled at the rate of a 0.9 liters (one [1] quart) sample per batch.

Testing

Testing for acceptance of materials submitted on a purchase order will only be considered on those materials that are identifiable as being a material prequalified by the criteria established by this specification and on the list of prequalified materials maintained by TxDOT.

General Requirements

Materials Supplied

All materials supplied under this specification shall be compatible for use with the equipment currently used by the TDCJ's validation sticker plant.

- ◆ Scallop Score Sheeting
 - The supplier shall make available reflective sheeting material with a scallop score at the request of the purchaser or his agent at no additional charge.
- ◆ Supplied Reflective Sheeting
 - The supplier shall supply white and/or colored reflective sheeting as may be required for Texas validation stickers.
 - Colored sheeting material shall have an effective performance life comparable to white sheeting.

- To avoid serious wastage, colored sheeting shall be provided that has shade tolerances uniform and consistent with colors of existing inventories.

Supplier Responsibility

The supplier shall be responsible to the State of Texas for losses incurred from any consistent malfunction of the sheeting, its adhesives, protective finish coating, or any product inability to withstand outside environmental exposure and cleansing agents, during the validation sticker's respective service life period covered by this specification after the material's placement on vehicle license plates.

Material Requirements

This specification covers the general and specific requirements for all materials necessary for the production of motor vehicle license plate validation stickers

General Requirements

All materials shall meet all requirements of this specification except when specific requirements are shown for a particular material.

Materials shall include, but not be limited to, reflective sheeting, inks, protective finish clear coats, solvents, thinners and similar products necessary to process the sheeting order into validation stickers meeting the requirements of this specification.

All materials necessary to produce license plate validation stickers meeting all requirements of this specification shall be supplied by the same supplier.

All reflective sheeting shall be received free from ragged edges, cracks and blisters; and be free from foreign materials such as sawdust, or flakes and chips of sheeting.

Retroreflective Materials

◆ General

- The material used to produce retroreflection shall consist of flexible sheeting containing embedded spherical lens elements plus any other coatings required to produce license plate validation stickers that will meet all requirements of this specification.
- The reflective sheeting shall be similar in day color and reflected night color.
- The finished or unfinished sheeting surface shall be readily letterpress printed and compatible with transparent and opaque color inks furnished and recommended by the sheeting manufacturer.

◆ Thickness

- Variance in sheeting thickness (sheeting, less adhesive) shall not exceed plus 0.0381 millimeters (0.0015 inches) or minus 0.0127 millimeters (0.0005 inches)

from the thickness of the sheeting submitted and prequalified under this specification.

- Total thickness of sheeting, adhesive, and protective liner shall not exceed 0.305 millimeters (0.012 inches).

◆ Weight

- Base weight of protective liner paper shall be 36 kilograms (80 pounds), plus or minus five (5) percent.

◆ Color

- The diffuse (daytime) and reflected (nighttime) color of the sheeting surface shall conform to a standard color sample acceptable to the purchaser or his agent prior to the start of production.
- When required and properly covered with a single coat of protective finish clear, the color fastness of the inks being used shall be warranted by the supplier for the prescribed service life of the respective sticker.
- After printing with transparent ink, the sheeting shall have similar diffused and reflected color.
- Color shall be determined according to Test Method "Tex-839-B, Determining Color in Reflective Materials."

◆ Photometrics

- The unprinted reflective sheeting shall have the following minimum brightness values expressed as candlepower per foot-candle per square foot of material.
- Measurements shall be conducted in accordance with Test Method "Tex-842-B, Measuring Retroreflectivity."

Minimum Brightness Values								
Divergence Angle	White				Yellow			
	.2	.5	.2	.5	.2	.5	.2	.5
Incidence Angle	Specific Intensity lm/lx/m ² (cp/ftc/ft ²)							
- 4 degrees	628	(50.0)	377	(30.0)	439	(35.0)	188	(15.0)
30 degrees	314	(25)	138	(11)	188	(15)	113	(9.0)
50 degrees	44	(3.5)	25	(2.0)	38	(3.0)	31	(2.5)

◆ Security Marks

- The sheeting shall be provided with integral security marks, approved by the State, which would make unauthorized sticker reproduction unlikely and/or extremely difficult if attempted.
- For ease in discernability, the security marks shall be spaced no farther than 19 millimeters (3/4 inch) center to center from each other.
- The marks shall have an area of at least 129 millimeter square (0.2 square inch) and shall be reverse printed containing at least 60 percent reverse printed area

- The marks shall be readily discernible when viewed under diffuse daylight conditions at a distance of 1.8 meters (six [6] feet).
- When a sample is held at 0.6 meters (two [2] feet) from the eyes and viewed by the retroreflected light of a standard "D" cell flashlight held between the eyes at nose level, the security marks shall be discernible by retroreflected light.
- Security markings shall not be reproducible in other finished reflective sheeting without destruction of their reflective properties.
- Security markings shall not be removable by chemical or physical means from the face of the retroreflective sheeting, or a finished validation sticker, applied or unapplied, without causing irreparable damage of the reflective properties.
- The reflective sheeting shall be precoated with a pressure sensitive, permanent bond adhesive on its back with a protective liner attached to the adhesive.
- The liner shall be of a material consistent in quality with thickness not to exceed 0.127 millimeters (0.005 inches) and shall not cause distortion of the sheeting face during printing, drying, die-cutting, or shear-cutting operations.
- The liner shall be detachable from the adhesive by peeling without the necessity for soaking in water or solvents.
- The liner shall remain easily removable from the adhesive after accelerated storage of four hours at 66 °C (150 °F) under a weighted pressure of 17 kilopascals (2.5 pounds per square inch).
- The sheeting and liner combination shall be required to maintain integrity at drying temperature up to 182 °C (360 °F) without curling, peeling at the corners, blistering, shrinking, or exuding adhesive; and shall readily accept die-cutting and shearing cutting without chipping, flaking, cracking, or exuding adhesive after having been processed with protective finish coating materials.
- The adhesive shall be of such quality that the validation stickers may be easily applied while the license plates are attached to the vehicles.
- The sticker shall become adhered by placing it upon the surface of a license plate or upon the surface of a previously applied license plate validation sticker and rubbing with moderate pressure.
- A validation sticker applied to any clean Texas license plate surface or to any previously applied Texas validation sticker shall remain in place, complete and intact for the life of the license plate issue.
- After aging for 48 hours at 24 °C (75 °F), the applied sticker shall resist shocking off when struck with a spatula at a temperature of -23 °C (-10 °F).
- The adhesive shall have no staining effects on the reflective material and shall permit application to the prescribed surfaces at temperatures of 0.6 °C (33 °F) and above.
- The adhesive must withstand oven-drying temperatures up to a maximum of 182 °C (360 °F) without melting, running, or exuding from the edges of the sheeting material.

- The adhesive shall not react in such a manner so as to cause sheets to stick together during shear cutting, die cutting, or after being packaged for shipping and distribution.
 - If the adhesive should be found to run, melt, or exude from the sheeting edge at any time during the manufacturing process, or within a period of 18 months after the sheeting purchase, the supplier shall be liable for all losses with replacement sheeting being furnished for defective sheets.
- ◆ Physical Characteristics
- The sheeting shall be furnished precut to the desired size with maximum size tolerances in length and/or width not to exceed zero (0) to + 0.7938 millimeters (0.03125 inch).
 - The distance between diagonal corners of each sheet shall be equal with an acceptable tolerance of 1.579 millimeters (0.0625 inch).
 - Each sheet shall be consecutively numbered in the upper left hand corner on the liner back to assure that inventory records can be accurately maintained.
 - Each printed number shall be 4.763 millimeters (3/16 inch) minimum height and shall be printed in a light color other than black which shall provide good legibility and contrast yet shall not interfere with any validation sticker instructions that may be printed over it.
 - Due diligence shall be taken to assure that each sheet is packaged for delivery in its proper numerical sequence.
 - In the event of count discrepancies, supplier's liability shall be limited to correction of counts and/or replacement for misnumbered or skip numbered sheets.
- ◆ Packaging and Delivery
- The consecutively numbered sheets shall be packaged in individual lots of 150, 200, or 250 sheets per package.
 - The top and bottom of each lot shall be covered with a heavy cardboard or masonite type material to prevent the sheets from curling during shipment and storage.
 - Each individual lot shall be wrapped in polyethylene plastic or other suitable wrap and packed, side-by-side, four (4) lots to a box in wooden boxes size.

Interior Box Dimensions			
	Length	Width	Height
Yearly Boxes	0.753 meters (29.625 inches)	0.62 meters (24.5 inches)	88.9 millimeters (3.5 inches)
Monthly Boxes	0.830 meters (32.5 inches)	0.57 meters (22.25 inches)	88.9 millimeters (3.5 inches)

- Each wooden box shall have an exterior label on the side identifying the beginning and ending sheet numbers contained within and shall have nailed down wooden tops to retard thermal expansion of the materials during shipment and storage.

- Wooden boxes shipped on pallets shall be banded with a minimum of one band on each side.
- All deliveries of sheeting and accompanying supplies shall be made within 30 days from the request of such an order by the purchaser or his agent with the initial order being up to 100,000 sheets each and all subsequent orders being up to 75,000 sheets each.
- The purchaser, through his agent, reserves the right to order elsewhere if supplier is unable to furnish quantities of sheeting and supplies in compliance with the thirty-day shipment requirements.

Protective Finish Coating and Attendant Supplies

Protective finish coating and attendant supplies required shall meet the following requirements:

- ◆ Inks
 - The ink, opaque or transparent, after coating with the finish coating, when required, shall exhibit no significant color change or other deterioration when exposed for 1200 hours in an Atlas Weather-Ometer utilizing an 18-102 cyclic gear according to Test Method ASTM G 23, Method I, Type EH.
 - Opaque and/or transparent inks furnished with the sheeting material shall be compatible for use with the sheeting supplied and shall be of a type recommended for use with letterpress printing equipment.
 - Color selection of inks shall be determined by the purchaser or his agent.
- ◆ Protective Finish Coating
 - The finish coating shall be clear and formulated such that when prepared and thinned as recommended by the supplier, equipment utilized by the TDCJ, shall deposit, on the printed reflective sheet, a film with a minimum dry film thickness of 0.0102 millimeters (0.0004 inch) in one (1) coat.
 - The dry film shall be uniform in thickness and exhibit a smooth and glossy outer surface.
 - After oven drying at a maximum temperature of 182 °C (360 °F) and aging for 48 hours, the protective finish coating shall not be unduly tacky so as to cause sheets to stick together and shall thereafter be capable of accepting a die-cutting and a shear-cutting operation without chipping, cracking, or flaking.
 - All supplies necessary to produce the correct protective finish coating mixture shall be provided for and warranted by the supplier.
 - Finish coatings for validation stickers that are to normally be exposed in use for one year shall not become brittle, flaky, discolored, or acquire a chalky-powdery exposed surface during 1000 hours Weather-Ometer (Atlas, Sunshine Type) exposure.

- Finish coatings for validation stickers that are to normally be exposed in use for six years or more shall not become brittle, flaky, discolored, or acquire a chalky-powdery exposed surface after 1200 hours Atlas Weather-Ometer exposure.
- ◆ Curing
 - Inks and clear coats shall be completely cured at all temperature and time limit combinations as shown:

Temperature and Time Limits		
Operation	Temperature	Time, Minutes
Face printing	138 ± 6 °C (290 ± 10 °F)	3-1/4
Numbering	157 ± 6 °C (325 ± 10 °F)	4-1/2
	171 ± 6 °C (350 ± 10 °F)	3-1/4
Clear Coating	143 ± 6°C (300 ± 10°F)	5-1/2
	149 ± 6 °C (310 ± 10 °F)	3-1/2

Completed Validation Sticker

Completed validation stickers shall conform to the following requirements:

- ◆ Completed validation stickers applied to the surface of a clean license plate meeting the requirements of TxDOT "DMS-8390, Materials for Motor Vehicle License Plates," shall show no tendency to peel, curl, delaminate, shrink, fade, or surface chalk when exposed for 1200 hours in an Atlas Weather-Ometer utilizing an 18 - 102 cyclic gear.
- ◆ After application to the prescribed license plate surface, the sticker shall be easily cleaned by washing with water and mild detergent for removal of normal dirt and soil accumulation.
- ◆ The protective clear-coated surface of the sticker shall also be sufficiently solvent-resistant to permit cleaning with solvents and other alcohol and oil based products normally used to remove road tars and grit without appreciable change or damage being done to the protective quality of the sticker surface.
- ◆ The sheeting materials shall be warranted by the supplier not to fade, disintegrate, peel back, or fall off the license plate surface for six years after application. They shall be vandal-proof to the extent that any attempt to remove an applied sticker shall cause irreparable damage to the body of the sticker.