

ENGINEERING MATERIAL SPECIFICATION

Material Name

Specification Number

LABEL PERFORMANCE, INTERIOR

WSS-M99P34-A

LABEL PERFORMANCE, INTERIOR/EXTERIOR

WSS-M99P34-A2

LABEL PERFORMANCE, EXTERIOR

WSS-M99P34-A3

LABEL PERFORMANCE, UNDER HOOD

WSS-M99P34-A4

1. SCOPE

This specification defines the performance requirements for all labels. The base materials and adhesive types that make up the particular label are selected by the supplier to meet the intended application.

2. APPLICATION

This specification was released originally for labeling requirements of various automotive components. Applications include (but are not limited to) warning labels, bar code labels, instructional labels, anti-theft labels, and "patches" having no printing. Types of labels include, but are not limited to, pressure sensitive adhesives labels and hot stamped labels.

3. REQUIREMENTS

3.1 QUALITY SYSTEM REQUIREMENTS

Material suppliers and part producers must conform to the Company's Quality System Requirements.

3.2 INFRARED SPECTROPHOTOMETRY AND/OR THERMAL ANALYSIS

IR spectra and thermograms established for initial approval shall constitute the reference standard and shall be kept on file at the designated material laboratory. All samples shall produce IR spectra and thermograms that correspond to the reference standard when tested under the same conditions.

3.3 CONDITIONING AND TEST CONDITIONS

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Date	Action	Revisions
2001 10 10	Revised	Revised Titles B. Xu
2001 09 27	Revised	Added Line Callout L. Koth, L. Hess, S. Laskoski
2000 10 25	Activated	L. Koth, Y. Bankowski

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Unless otherwise noted, the test specimen consists of a label affixed to the production substrate material. The labels must be applied to the production representative substrate using a production representative process. The substrate material may be taken from the actual part or may be a production-representative plaque (having grain if appropriate.)

3.4 REPORTING REQUIREMENTS – All Labels

Requirements apply for each suffix (-A through -A4)

3.4.1 Thickness

Report label thickness on Supplement A.

Report release liner thickness on Supplement A.

3.4.2 Base film / Adhesive / Release Liner / Print Method

Report basic material type for each layer of the label on Supplement A.

3.4.3 Label Print Color

Report ink color(s) used on the label on Supplement A.

3.4.4 Application Substrate

Report the material the label was affixed to for testing. Unless prior authorization is obtained from Materials Engineering, the label must be tested on the substrate(s) it will be adhered to in production. The substrate and substrate color(s) must be recorded on the Ford Approved Source List and on Supplement A.

3.4.5 Application Process

Any label application parameters that must be set during production must be documented on Supplement A. (e.g. Hot stamp labels must have a record of process temperature, time, recommendations, etc.)

3.5 APPEARANCE

The labels shall be free of streaks, blisters, wrinkles, ragged edges, and any other surface imperfections that will make them unsuitable for the intended usage. The design, color, and gloss shall be as specified on the engineering drawing. Any release liner must be removable without soaking in water or any other solvent.

3.6 SETTING TIME FOR NORMAL HANDLING

The label shall set sufficiently to permit normal handling immediately after application.

3.7 LABEL STRENGTH

During installation, the label must not break, tear, or deface. The release backing shall not tear or delaminate while being removed from the label.

3.8 PRINT ADHESION

Place a strip of 25 mm wide 3M #898 tape on the printed side of the label. Apply the tape with moderate thumb pressure to the label and substrate. Remove the tape by pulling one end at a 90° angle with a quick snap. There shall be no effect on legibility and no graphic delamination from the substrate.

3.9 GENERAL ACCEPTANCE CRITERIA:

After each of the exposure conditions described for all label types (Sections 3.11 – 3.14), the film or label must not show visual evidence of delamination, loss of printing or legibility, loss of adhesion, curling of edges, staining, blistering, checking, cracking, excessive shrinkage, or any other effect which would detract from its proper function or appearance.

Where required, the designed destruct mechanism, tell-tail, or UV footprint must be evaluated by general visual examination and after each test condition using the 180° peel test (per ASTM D 1000, Para 3.10.3, 304.8 mm/min, 25.4 mm width). Labels shall exhibit the required characteristics as received and after being subjected to ALL test conditions. **"Tamper-evident" and/or "destruct" must be noted on the engineering drawing, the Ford Approved Source List, and Supplement A.** The particular type of "tamper evident" and/or "destruct" mechanism must be recorded on the Line Callout.

3.10 LINE CALLOUT REQUIREMENTS

All callout digits shall be specified on the engineering drawing and approved source list.

Create a 7-digit line callout to further characterize the label using the classification system below.

*All "As specified" (Z) digits must be defined in the supplier submission, on the engineering drawing and Approved Source List.

Example: An interior label that is heat applied, has high performance adhesion and medium abrasion, is applied below the beltline to leather and has a UV footprint feature is classified as follows.

Material Specification with the Callout:
WSS-M99P34-A1 P1Q4R4S4T5U2

3.10.1 First Digit

<u>Label Type</u>	<u>Code Letter</u>
Heat Applied	P1
Pressure Sensitive Application	P2
Printed, No adhesive	P3
Sewn In	P4
In Mold	P5
As Specified	PZ

3.10.2 Second Digit

<u>Adhesion Resistance</u>	<u>Code Letter</u>
REMOVABLE	Q1
LOW Performance	Q2
MEDIUM Performance	Q3
HIGH Performance	Q4
EXTERIOR non-REMOVABLE	Q5
Underhood (A4) Labels	Q6
None	Q7

3.10.2 Third Digit

<u>Abrasion Resistance</u>	<u>Code Letter</u>
No Abrasion	R1
Virtually No Abrasion (40 cycles)	R2
LOW Abrasion (100 cycles)	R3
MEDIUM Abrasion and Underhood (600 cycles)	R4
HIGH Abrasion (3500 cycles)	R5

3.10.3 Fourth Digit

<u>Heat Age Condition</u>	<u>Code Letter</u>
Engine Under Hood (125 °C)	S1
General Under Hood (100 °C)	S2
Interior: At or Above Beltline (100 °C)	S3
Interior: Below Beltline (90 °C)	S4
Interior: Scuff Plate / Floor Area (80 °C)	S5
Interior / Exterior (A2) Labels (80 °C)	S6
Exterior (70 °C)	S7
As Specified	SZ

3.10.4 Fifth Digit

<u>Assembly Substrate</u>	<u>Code Letter</u>
ABS	T1
Acrylic	T2
Aluminum	T3
Carpet	T4
Cloth	T5
EVA	T6
Glass	T7
Leather	T8
Fiberboard	T9
Painted Metal	T10
Polyamide	T11
Polyester	T12
Polyethylene	T13
Polyethylene Film	T14
Polyethylene Foam	T15
Polycarbonate	T16
Polycarbonate / ABS	T17
Polypropylene	T18
PPE	T19
PPS	T20
PU foam	T21
PVC Flexible	T22
PVC Rigid	T23
Reclaim Fiber	T24
Stainless Steel	T25
TPE	T26
TPO	T27
Woodstock	T28
As specified, including PCR and PIR Plastics	TZ

3.10.4 Sixth Digit

<u>Tamper-Evident Label Features</u>	<u>Code Letter</u>
None	U1
Adhesive UV Footprint	U2
Adhesive Word or Pattern	U3
Erase Detection	U4
UV Topcoat-Face Material	U5
Security Print Feature-Face Material	U6
Window -Face Material	U7
Combination, list all that apply in parenthesis	UX
As specified	UZ

3.10.5 Seventh Digit

Scannability

Code Letter

N/A – No Barcode

V1

Scannable for vehicle life

V2

Scannable – As Specified

VZ

3.11 LABEL PERFORMANCE, INTERIOR (A):

All label systems are subject to the acceptance requirements of Section 3.9.

The following testing applies to labels affixed to areas of the vehicle in the passenger compartment and also the trunk area.

3.11.1 Scannability

Note: Only applicable to labels that are intended to be scanned with a barcode reader. The scannability performance level must be documented on the engineering drawing, Supplement A, and on the Approved Source List via the line callout – Seventh Digit.

3.11.1.1 Original

The barcode pattern must be scannable by the type of scanner that will be used in production.

3.11.1.2 After Conditioning

If the label must be "scannable" for the lifetime of the vehicle and/or for service requirements, scan samples following conditioning per Para's. 3.11.3, 3.11.4, 3.11.8, 3.11.9. Otherwise, choose the appropriate paragraphs for the application and record on Supplement A.

3.11.2 Adhesion

Adhesion must be tested per appropriate classification in Para 3.11.2.1-4 "as received" and after conditioning per 3.11.3.1-5.

The adhesion performance level must be documented on the engineering drawing, Supplement A, and on the Approved Source List via the line callout – Second Digit.

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|----------|--|--------------------------------------|
| 3.11.2.1 | Removable, min
(ASTM D 1000, 180° peel,
appropriate substrate(s),
conditioned per Para 3.3) | 5 N/m (and easily
peeled by hand) |
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Removable, non permanent, non-staining, and easily removed by hand. For example, labels that contains information that is intended to be temporary for convenience and/or inventory or process management. Also includes protective films containing no printed information.

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| 3.11.2.2 | Low Performance, min
(ASTM D 1000, 180° peel,
appropriate substrate(s),
conditioned per Para 3.3) | 175 N/m |
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This label classification conveys information that is not safety related nor governmentally mandated.

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| 3.11.2.3 | MEDIUM Performance, min
(ASTM D 1000, 180° peel,
appropriate substrate(s),
conditioned per Para 3.3) | 525 N/m |
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This label classification may convey safety information or governmentally mandated information that is permanent by virtue of the protected environment in which it shall be installed.

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| 3.11.2.4 | HIGH Performance
(FLTM BI 106-01, Part "B",
omit scribe lines) | No label delamination
or loss of legibility |
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Typically, labels containing safety information, governmentally regulated permanent labels, or labels required to be permanent for any reason are "high performance" labels (e.g. Heat transfer labels affixed to fabrics such as Air Bag Warning Labels on the sun visors and child seat warnings on safety restraints).

TEST METHOD:

Place a strip of 3M #898 25 mm wide tape along the entire bottom edge of the label with a 16 +/- 2 mm of the tape width to be on the label. Apply the tape with moderate thumb pressure to the label and substrate. Remove the tape by pulling one end at a 90°angle with a quick snap.

3.11.3 Appearance and Adhesion after environmental conditioning

Requirements for 3.11.3.1 - 3.11.3.5:

Adhesion must be tested per Para 3.11.2, as appropriate, 1 - 4 h after removal from the conditioning environments listed below in Paras 3.11.3.1 - 3.11.3.5.

For REMOVABLE labels, an adverse effect on the substrate (e.g. evidence of staining, discoloration, gloss change, transfer of adhesive residue on the substrate) is not permitted.

For LOW, MEDIUM, and HIGH performance labels, the result must be equal to or better than the result obtained in 3.11.2 with no loss of legibility or delamination.

3.11.3.1 Heat Age (AATCC Evaluation Procedure 1) Rating 4

Place the test specimen in an oven as follows:

At or Above Beltline:	168 hours, 100 +/- 2 °C
Below Beltline:	168 hours, 90 +/- 2 °C
Scuff Plate / Floor Area:	168 hours, 80 +/- 2 °C
Special Area	168 hours, TBD by Materials Engineering

The standard requirement will be assumed to be "At or Above Beltline" unless otherwise noted on Supplement A, the Approved Source List, and the Engineering Drawing. The test condition must be documented via the line callout – Fourth Digit.

If the label will be affixed to various color substrates in production, repeat this test using one substrate color from each of the following color categories:

3.11.3.1.1	Red
3.11.3.1.2	Blue
3.11.3.1.3	Black
3.11.3.1.4	Brown
3.11.3.1.5	Tan

3.11.3.2 Heat Resistance

Place the test specimen in an oven for 1 h at 120 +/- 2 °C.