



ASSEMBLY PERFORMANCE, INSTRUMENT PANEL AND SOFT INTERIOR COMPONENTS, FLEXIBLE COVER SKIN MATERIAL

WSS-M15P45-C

1. SCOPE

The material defined by this specification is an instrument panel assembly, instrument panel component, floor console armrest, valence panel, steering wheel airbag cover, hush panel, door panel or wrapped pillar, which utilizes a flexible (soft) cover skin material over a hard substrate with or without foam or spacer fabric, and with or without a topcoat.

2. APPLICATION

This specification was released originally for material used for all soft interior components, not including seat trim covers, molded/foam-in-place armrests and headrests. This specification includes top-coated (added for gloss control, haptics and/or cleanability) and in-mold coated (IMC) skins. Instrument panels containing an integrated airbag system must also meet any additional specifications on the Engineering Document. All painted flexible cover skins (through a secondary process) shall meet the requirements of WSS-M2P188-B1/latest. All soft skins or fabrics for armrests and door panels must also meet the requirements of WSS-M8P3-E1/E2/E3/latest (flexible polymeric films), WSS-M99P43-C/latest (leather) or WSS-M8P18-B1/B2/B3/B4/latest (fabrics).

EXCLUDED – The following applications are excluded from this specification.

- hard instrument panels, hard door panels, finish panels (WSS-M15P4-Glatest)
- package trays (WSS-M15P6-E/latest)
- steering wheels (WSS-M98P12-B/latest)
- headliners (WSS-M15P27-F/latest)
- carpeting substrate (WSS-M8P16-B/latest)
- appliqués (WSS-M15P34-E/latest)
- sun visors (WSS-M98P3-B/latest)
- molded headrest (WSS-M15P39-B/latest)
- molded armrests (WSS-M15P26-D/latest) and
- interior elastomers (WSS-M9P8-B/latest)

Testing must be conducted on parts at DV and PV unless specified otherwise by Ford Engineering. See Tables 1 & 2 for sample sizes and required testing.

2.1 LIMITATIONS

Leather/spacer knit systems take a permanent set when compressed. These systems are not recommended in areas that may be subject to the application of any sort of localized load.

3. REQUIREMENTS

3.1 APPROVED SOURCES

This specification is performance based and does not have approved sources.

Date	Action	Revisions	Rev. 02
2018 03 02	Editorial	Corrected reference suffixes	S. Gatzek, NA
2017 06 27	Editorial	Corrected footer	A. Collins, NA
2016 05 19	Released		S. Gatzek, NA



3.2 CONDITIONING AND TEST CONDITIONS

All test values are based on material conditioned for not less than 24 h prior to testing in a controlled environment of 23 +/- 2 °C and 50 +/- 5% relative humidity. Testing of the material should occur in the conditioning environment or soon after removal.

3.3 APPEARANCE

The color, grain, gloss and hand shall match the approved Corporate Design master sample as approved by Color and Materials.

Gloss: As released by Engineering,

Gloss A:	20° Glossmeter	min 92
B:	60° Glossmeter	76-84
C:	60° Glossmeter	66-74
D:	60° Glossmeter	58-66
E:	60° Glossmeter	47-53
F:	60° Glossmeter	33-38
G:	60° Glossmeter	17-23
H:	60° Glossmeter	7-13
J:	60° Glossmeter	4-6
K:	60° Glossmeter	2-4
L:	60° Glossmeter	0.5-2.0
N:	60° Glossmeter	1.8-2.4
R:	60° Glossmeter	1.2-1.6

3.4 ENVIRONMENTAL TESTING

SAMPLE PREPARATION

All parts shall be fully trimmed including all components packaged in the environment (eg. speakers, hardware, wiring, etc.) and assembled onto actual or representative production support foundations that include not only all attaching points but also any boundary conditions that may restrict movement, unless otherwise specified by the responsible Product Design and Release Engineer. The retention methods, attachments and supporting garnish moldings (if any), shall be the same as proposed for production.

MEASUREMENT LOCATIONS

- Every 20 cm and at the points of greatest movement between the 20 cm marks along the part's outside edges and internal openings or as defined by Core Engineering. Some parts may have specific measurement locations required by Core Engineering, which will override the 20 cm required. Part specific measurement locations are to be signed off by Core Engineering prior to test.
- The "significant characteristics locations" specified by Core Engineering.

MEASUREMENT TECHNIQUE

The movement at each measurement point shall be recorded in two directions: (1) in the x/y plane from the observers view, and (2) in the z-dimension direction into or out of the x/y plane from the observers view. The observer's view shall remain consistent always viewing from the front side of the part.



TEST PROCEDURE

Visually evaluate the part before, during, and after the test. Measure the part and record data at all specified locations at room temperature before and after cycling on the production support foundation or test fixture. Any visual defects/imperfections must be noted in the test report, and signed off by PD Engineering for compliance.

Subject the number of assemblies specified to each of the cycles that follow in paragraphs 3.4.1 and 3.4.2.

Use test chambers with automated programmable test cycles for the listed test conditions below. Ramp speed 1 to 5 °C per minute. Typical ramp time between stages is 30 minutes unless otherwise agreed upon by Materials Engineering. Record the actual ramp speed on data sheet. Recalculation of all the ramp times will be necessary to enable equilibrium of each test cycle.

EVALUATION AND REQUIREMENTS

The trimmed assemblies shall remain relatively unaffected by the exposure cycles during and after the tests as demonstrated:

- 1) Tactually/visually - no excessive tackiness, loss in surface-grain, or surface-color change (ISO 105-A-02/AATCC Procedure 1, Rating 4, min); no spewing, wrinkling, distortion, blistering, warping, delamination, blushing, hazing, milking, waviness, or other objectionable visual appearance. Any spotty or non-uniform staining or discoloration shall be cause for rejection. For topcoated polymeric cover skin materials, a color shift that reverses after 16 h Xenon weathering, per 3.8.1 is acceptable
- 2) Functionally - no excessive expansion, shrinking, or warping that will interfere with normal functional operations.
- 3) Dimensionally - no movement exceeding what is required on the Engineering drawing from the original installed position during or after the test. Dimensional exceptions to these requirements may be allowed by Core Engineering.

3.4.1 Short Term Heat, Humidity and Cold Cycle

For leather wrapped parts, ensure the component is positioned in the test chamber so no condensation from the test equipment can drip and pool on the part surface during the test cycle. Note that stages do not include ramp times to transition from level to level. Each specimen can have different size, geometry, etc. which impacts ramp times; therefore, each transition period will vary in length of time. Total test time should exceed 38 h due to time required to transition from level to level.

3.4.1.1 Horizontal or vertical parts AT OR ABOVE THE BELT-LINE (e.g. wrapped pillars, soft instrument panels)

- 5 h at -30 +/- 2 °C
- 30 min at 23 +/- 2 °C and 50% R.H.
- 5 h at 100 +/- 2 °C
- 30 min at 23 +/- 2 °C and 50% R.H.
- 2 h at 50 +/- 2 °C and 95 +/- 5% R.H.
- 30 min at 23 +/- 2 °C and 50% R.H.
- 5 h at -30 +/- 2 °C
- 30 min at 23 +/- 2 °C and 50% R.H.
- 5 h at 100 +/- 2 °C



3.4.1.2 Horizontal or vertical parts BELOW THE BELT-LINE (e.g., door panels, soft consoles, wrapped glove box doors and other non-sun loaded parts)

- 5 h at -30 +/- 2 °C
- 30 min at 23 +/- 2 °C and 50% R.H.
- 5 h at 90 +/- 2 °C
- 30 min at 23 +/- 2 °C and 50% R.H.
- 2 h at 50 +/- 2 °C and 95 +/- 5% R.H.
- 30 min at 23 +/- 2 °C and 50% R.H.
- 5 h at -30 +/- 2 °C
- 30 min at 23 +/- 2 °C and 50% R.H.
- 5 h at 90 +/- 2 °C

3.4.1.3 Other non-sun loaded floor level parts that don't meet the dimensional or functional requirements when tested at 90 °C (e.g., scuff plates, kick panels, map pocket opening of door trim and below)

- 5 h at -30 +/- 2 °C
- 30 min at 23 +/- 2 °C and 50% R.H.
- 5 h at 80 +/- 2 °C
- 30 min at 23 +/- 2 °C and 50% R.H.
- 2 h at 50 +/- 2 °C and 95 +/- 5% R.H.
- 30 min at 23 +/- 2 °C and 50% R.H.
- 5 h at -30 +/- 2 °C
- 30 min at 23 +/- 2 °C and 50% R.H.
- 5 h at 80 +/- 2 °C

3.4.2 Long Term Heat Exposure / Sun Load

3.4.2.1 Soft Instrument Panels with or without integrated floor consoles

- Sun Load per IP-105: 107 °C surface temperature via heat lamps with a chamber temperature of 90 °C for 242 hours

3.4.2.2 Horizontal or vertical parts AT OR ABOVE THE BELT-LINE (e.g. wrapped pillars; soft upper door trim rollover for aged peel adhesion only):

- 7 days at 100 +/- 2 °C

3.4.2.3 Horizontal or vertical parts BELOW THE BELT-LINE (e.g., door panels and soft consoles that are not integrated with the instrument panel; soft upper door trim panels dimensional and visual):

- 7 days at 90 +/- 2 °C

3.4.2.4 Other non-sun loaded floor level parts (e.g., scuff plates, kick plates, door trim bottom surface).

- 7 days at 80 +/- 2 °C

For Instrument Panels Only (para 3.4.3. 3.4.4):

Test Method: After Long Term Heat Exposure / Sun Load (3.4.2), cut test specimens (remove foam and substrate) and condition them for 24 h at 23 +/- 2 °C and 50 +/- 5% relative humidity prior to performing the following test:



- | | | |
|-------|---|---------------------------------------|
| 3.4.3 | Cold Flexibility
(180° bend at -30 °C for a minimum of 4 hours
over a 20 +/- 1 mm diameter mandrel,
sample size approximately 50 x 150 mm) | No cracks |
| 3.4.4 | Elongation of Flexible Coverskin
(ISO 37, Type 1, 500 mm/minute test speed) | 50% max change from
original value |

Excludes leather which must meet requirements in WSS-M1F25-B/latest.

3.5 180 DEGREE PEEL ADHESION STRENGTH

(FLTM BN 151-05, 300 mm/minute cross head rate, test specimens must be 50 mm wide, report peel adhesion strength using integral method; arithmetic mean of 5 test specimens, cut in any direction).

FLTM BN 152-01 Determination of Bond Strength Using the Wedge Method, may be required for systems with a thick foam layer that breaks when folded back on itself, Use of this test method and acceptance criteria must be agreed upon with Ford Materials Engineering and PD Engineering.

If the layers comprising the interface to be evaluated cannot be separated during test specimen preparation, the peel adhesion bond will be deemed too strong to separate and be judged as meeting the requirement.

Peel adhesion is applicable for systems comprised of layers that are chemically or adhesively bonded together. Examples of specifications for these systems are listed below:

Instrument Panels:

- Foam in Place: WSS-M4D983-A3, WSS-M4D985-A3, WSS-M4D980-A, M4D1059-A, WSS-M4D1060-A
- Vacuum Forming In Mold Graining (IMG) / In Mold Grain Lamination (IMGL): WSS-M98D39-A2, WSB-M98D18-B2
- Leather Wrapped Systems: WSS-M1F25-B
- Polymeric Skin Wrapped Adhesive Systems: WSS-M2F206-A3, WSS-M2F207-A2/A3, WSS-M2F208-A3

All Other Parts:

- Foam in Place: WSS-M4D983-A3, WSS-M4D985-A2, WSS-M4D980-A, M4D1059-A, WSS-M4D1060-A
- Back Injection Molded Systems: WSS-M5H40-B3
- Vacuum Forming In Mold Graining (IMG) / In Mold Grain Lamination (IMGL): WSS-M98D39-A1, WSB-M98D18-B1
- Foam Laminated to Leather: WSS-M1F27-B, WSS-M1F29-B
- Leather or Vinyl Wrapped Systems with Separate Foam Layer: WSS-M1F27-B, WSS-M1F30-B, WSS-M2F212-A, WSS-M2F186-A1/A2
- Tri-Laminate Wrapped Adhesive Systems: WSS-M1HXXXX, M2FXXX material specifications with WSS-M8P3 and M8P18 performance specifications