



GLASS RUN WEATHER-STRIP, BELT LINE (INNER/OUTER) WEATHERSTRIPS, SUN ROOF SEALS, AND STATIC FIXED GLASS WEATHERSTRIP PERFORMANCE SPECIFICATION

WSS-M9P10-B

1. SCOPE

This specification defines the minimum durability and performance requirements of belt (inner/outer) weather strips, glass run mounted glass sealing components, and/or static weather strips for glazing that are included in 01.08.04, 01.11.19, and 01.11.20 (CPSC).

2. APPLICATION

This performance specification was released originally for coated and/or uncoated static glass sealing components used in belts and/ or glass run, glass mounted end items.

Material selection must be reviewed and approved by Ford Materials Engineering.

In addition to the requirement listed in this specification, requirements listed in the Moveable Glass (MG) SDS, Fixed Glass (FG) SDS must be met, unless otherwise agreed to by Ford Engineering, including, but not limited to:

- RQT-011104-013695 (Legacy MG-0013): Appearance Aging
- RQT-011104-013697 (Legacy MG-0016): Freezing – Window Sealing
- RQT-011104-013728 (Legacy MG-0185): Heat Soak
- RQT-011104-013729 (Legacy MG-0186): Glass to Seal Breakaway
- RQT-011104-013734 (Legacy MG-0191): Seal Drag
- RQT-011104-013746 (Legacy MG-0203): Inside Belt Weatherstrips
- RQT-011104-013753 (Legacy MG-0210): Belt Weather Strip Retention
- RQT-011104-013754 (Legacy MG-0211): Glass Run Weather Strip Cross Section
- RQT-011104-013760 (Legacy MG-0217): Weather Strip Squeak and Rattle Prevention
- RQT-011104-013766 (Legacy MG-0224): Dents and Dings Robustness
- RQT-011104-013767 (Legacy MG-0225): Insertion/Extraction Efforts – Flange Mounted
- RQT-011104-013768 (Legacy MG-0226): Compression Load Deflection (CLD)
- RQT-011104-013771 (Legacy MG-0230): Molded Corner Joint Strength
- RQT-011104-013774 (Legacy MG-0234): Insertion Efforts – Flange and Channel Mounted
- RQT-011101-012077 (Legacy FX-0117): Glazing/Seal Joint Temperature Stress Test

2.1 LIMITATIONS

This performance specification excludes closure, trim and body flange mounted dynamic Weatherstrips included in WSS-M9P9-B.

2.2 APPLICATION TESTING

Static seal test requirements depend on their type, location and unique properties. Table 1.0 outlines the test requirements necessary for approval.

All static seal types listed in Table 1.0 must also meet the requirements per paragraphs 3.1, 3.2, 3.3, 3.4, 3.15, 3.16, 3.17.

Date	Action	Revisions	Rev 02
2015 02 17	Editorial	See Summary of Revisions	G, Eaton, NA
2015 02 13	Editorial	See Summary of Revisions	G. Eaton, NA
2014 10 27	Released		G. Eaton, FNA



TABLE 1.0
TEST REQUIREMENTS FOR SPECIFIC GLASS SEAL TYPES

Static Glass Seal Type	Location	Tests Required
Belt Weather Strip Seal (Inner and Outer), Uncoated	Closure Mounted	3.6.1 - 3.6.9, 3.7, 3.12 – 3.19 (3.6.4 for metal carrier only),
Belt Weather Strip Seal (Inner and Outer), Coated or Flocked	Closure Mounted	All tests required. (3.6.4 for metal carrier only),
Glass Run Weather Strip, Uncoated	Closure Mounted	3.6.1 - 3.6.9, 3.7, 3.12 – 3.19 (3.6.4 for metal carrier only),
Glass Run Weather Strip, Coated or Flocked	Closure Mounted	All tests required. (3.6.4 for metal carrier only),
Encapsulation, Weather Strip Uncoated	Windshield, Backlite, Sun Roof and Quarter glass	3.6.1 - 3.6.9, 3.7, 3.12 – 3.19 (3.6.4 for metal carrier only),
Encapsulation, Weather Strip Coated	Windshield, Backlite, Sun Roof and Quarter glass	All tests required. (3.6.4 for metal carrier only),
Margin Seals	Co-Extruded	All tests required. (3.6.4 for metal carrier only),

3. REQUIREMENTS

3.1 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

For thermoplastic materials, this specification is based on virgin material only. The use of regrind is permitted, for economic/environmental reasons, with compliance as indicated in WSS-M99P1111-A.

Materials used in interior applications must meet the requirements outlined in WSS-M99P2222-D1/Latest, Performance, Vehicle Interior Environment Quality Material/Component Requirements. Data must be included in material submission package. For odor testing, all weatherstrips should only be tested at 23°C, 45°C, and 65°C.

3.2 STATIC SEAL PERFORMANCE MANAGEMENT

All seals evaluated under this performance specification must have Supplement A completely filled out and signed by Ford materials engineering, the material/coatings supplier, and the Tier One supplier. Compatibility of the seal coating with seal base material is the responsibility of the Tier One supplier. The Tier One shall have the seal tested against the applicable performance specification requirements, and must keep all tested samples for review by Ford Materials Engineering. If the requirements are met, a new Supplement A shall be signed and documented with the addition/change in material.

Table 3.0 describes the construction of the moveable glass or static seal, and must be submitted with Supplement A. (Reference Supplement A). The Tier One supplier is responsible for including Table 3.0 and this performance specification on the part drawing.

All stainless steel bright trim material callouts are limited to the following, unless receiving written approval from Ford Materials Engineering Activity. These callouts (choose one) should be included on the part drawing.



SAE J405 S43600 with 1.2% Mo min
ASTM A240 436 with 1.2% Mo min
ISO 15510 X6CrMoNb17-1 with 1.2% Mo min

3.3 FINISHED PARTS

Testing must be conducted at Design Verification (DV) and Process Validation (PV) per Table 2 unless otherwise agreed to by Materials Engineering, and on actual production parts or a section of the part whenever possible. Where part dimensions limit equipment access, representative test samples may be substituted. PV Testing must be conducted on actual production processed parts. No change in material, facility, or processing is permitted without written approval from Ford Materials Engineering Activity via SREA.

3.4 APPEARANCE: COLOR, FINISH, SURFACE (FLTM BI 109-01)

The part shall be generic black (GAXA) in color and have, at most, a "G" level (17-23 on a 60° gloss meter) gloss, unless otherwise specified on the engineering drawing or PDL. The color shall be uniform (no change in color less than Rating 5 of the Gray Scale, AATCC Evaluation Procedure 1/ISO 105-A02) along the entire length of the seal assembly, including molded or mitered corners and splices.

The surface shall be free of blisters, voids and any bloom unless otherwise specified on the engineering drawing.

Interfacing end items shall be harmonized by the responsible design and release engineer. Color mastering approval shall be evaluated by Ford Color and Harmony. Color durability and performance shall be evaluated by Ford Materials Engineering

3.5 PROCESS WINDOW DEFINITION

The supplier shall perform a DOE for development of new materials and for continuous improvement of current materials, utilizing response surface analysis to determine the Process Window of the system. The variables to be included in the design are **cure temperature (material and coating), conveyor speed, and coating flow**. An initial screening experiment should be run to determine what level will generate a window which includes testing to failure. This screening experiment should be reviewed with the Materials Engineer to set up the final DOE. Response attributes to the DOE should be based on the materials tested and should include, but not be limited to:

- Coefficient of Friction
- Film Thickness
- Resistance to Cleaning Agents
- Resistance to Crocking Abrasion
- Naptha Solvent Rub (if coating is present only)
- Compression Load Deflection (per DY-0036)

3.6 RESISTANCE PROPERTIES

The following requirements shall be assessed on whole parts or sections of seal assemblies and must include all materials and constructions found within the parts (molded corners, bright inserts, extrusions with adhesive, spray-on or co-extruded, tape on polyester (flock tape) low friction coating or wear strips etc).

Separate specimens are required for each test, unless otherwise specified.





The parts as received and after being subjected to the requirements listed below shall conform to the following requirements, unless otherwise specified:

- (a) No evidence of color change less than Rating 4 of the Gray Scale (AATCC Evaluation Procedure 1/ISO 105-A02).
- (b) No cracking, chalking, wrinkling, crazing, iridescence, bloom, milkiness, separation, loss of adhesion (coating), or loss of embossment allowed (as defined in ASTM D1566).
- (c) No evidence of shrinkage or incompatibility between materials of construction. (Examples: coating to substrate, co-extruded materials, etc.)
- (d) Any successful attempt to separate the components of coated and/or composite parts must result in cohesive failure only. Any adhesive failure will be cause for rejection.
- (e) For seals with metal carriers, no visible corrosion or blistering is permitted.

For molded corner joint applications only:

After exposure, the loss of pull-off effort shall not exceed 25% of the original requirement stated in the movable glass SDS, MG-0230. Record original and after exposure pull-off efforts.

For hot melt sealant applications only:

After exposure, the loss of pull-off effort shall not exceed 25% of the original requirement stated in the movable glass SDS MG-0225. Record original and after exposure pull-off efforts.

When a seal assembly includes windlace/pinch weld retention systems additional samples shall be assembled to metal panels simulating production installation.

All samples must be conditioned for 1 h +/- 5 minutes at 23 +/- 2 °C and 50% R.H. prior to all assessments, unless otherwise specified.

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| 3.6.1 Humidity Exposure
(ASTM D 2247, 14 d,
38 +/- 2 °C, 95% to 100% R.H.
100 mm long specimen
Horizontal exposure) | Acceptance criteria
(a), (b), (c), (d), (e),
Must meet pull-off
effort for the hot melt
sealant application
only. |
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Note: Component shall be evaluated at the sealing lip and the non-functional surface.
Note: Requirement 3.8 requires adhesion testing after humidity exposure (3.6.1).

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| 3.6.2 Environmental Cycling Test
(FLTM BQ 104-07, method 1,
except CASS cabinet,
100 mm specimen,
horizontal exposure) | Acceptance criteria
(a), (b), (c), (d), (e),
Must meet pull-off
effort for the hot melt
sealant application
only. |
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4 cycles. Each cycle shall consist of the following:

4 h at 100 +/- 2 °C
4 h at 38 +/- 2 °C, 95% to 100% R.H.
16 h at -40 +/- 2 °C
4 h at 38 +/- 2 °C, 95% to 100% R.H.
4 h at 100 +/- 2 °C
16 h at -40 +/- 2 °C

Note: Component shall be evaluated at the sealing lip and the non-functional surface.
Note: Requirement 3.8 requires adhesion testing after humidity exposure (3.6.2).

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| 3.6.3 Cold Flexibility
(FLTM BP 106-03,
4 h at -40 +/- 2 °C,
except carrier material, | No evidence of cracks
or breaks as examined
with the unaided eye. |
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reference ASTM D380
for apparatus)

Note: Component shall be evaluated at the sealing lip and the non-functional surface.

3.6.4 Corrosion
(CETP 00.00-L-467, 9 weeks)

Applicable to parts containing metal carriers.

Must meet (e)

3.6.5 Ozone Resistance
(FLTM BP 101-01, Procedure B)

Rating 0 max

No chalking or cracking visible at 2X magnification.

3.6.6 Heat Aging
(ISO 188/ASTM D 573)

3.6.6.1 22 h at 80 +/- 2 °C

3.6.6.1.1 Change in length
(Seals with and without metal
carrier), 300 mm long specimen,
horizontal exposure sealant

Acceptance criteria
Max +/- 0.5%, (a),
(b) (Must meet pull
off effort for the hot
melt only application

For stand-alone glass seals that don't meet the above requirements, it is recommended that the glass seal(s) be tested simulating the production environment (Examples: sheet metal flange, etc.).

Note: Requirement 3.8 requires adhesion testing after short term heat aging (3.6.6.1).

3.6.6.2 1000 h at 80 +/- 2 °C
(Test must follow 3.6.6.1, on new specimens)

3.6.6.2.1 Change in length
(Seals with and without metal
carrier), 300 mm long specimen,
horizontal exposure sealant

Acceptance criteria
Max +/- 0.5%, (a),
(b) (Must meet pull
off effort for the hot
melt only application

For molded corner joint applications only (use 100mm size specimen):

For stand-alone glass seals that don't meet the above requirements, it is recommended that the glass seal(s) be tested simulating the production environment (Examples: sheetmetal flange, etc.).

Note: Requirement 3.8 requires adhesion testing after short term heat aging (3.6.6.2).

3.6.7 Fluid Resistance
(FLTM (BI 168-01, Method B)

Rating 4 min

Additional fluids to include: Rubber Lubricant (ESE-M99B144-B), and soap and water referenced in FLTM BI 113-01.

FNA Build Only: McLube 1725 (or equivalent), Tribolube F219/223/30FL (or equivalent)

3.6.8 Resistance to Cleaning Agents
(FLTM BN 107-01, Procedure C, 9N load)

Rating 4 min

Cover the abrasion head with a double thickness of cloth with the fill direction parallel to the direction of rubbing.

Note: A fresh sample of cloth must be used for each test.

