**SEALER, EXPANDING, PUMPABLE, ANTI-FLUTTER, 35 - 55 A HARDNESS** — **WSB-M4G348-A**

**SEALER, EXPANDING, PUMPABLE, ANTI-FLUTTER, 10 - 20 A HARDNESS** — **WSS-M4G348-A3**

**SEALER, NON-EXPANDING, PUMPABLE, ANTI-FLUTTER, 25 – 45 A HARDNESS** — **WSS-M4G348-A4**

**SEALER, LOW EXPANDING, PUMPABLE, ANTI-FLUTTER, 5-10 A HARDNESS, ELONGATION 100-200%** — **WSS-M4G348-A5**

**SEALER, LOW EXPANDING, PUMPABLE, ANTI-FLUTTER, 5-10 A HARDNESS, ELONGATION 50-100%, SPECIFIED DAMPENING PROPERTIES** — **WSS-M4G348-A6**

## 1. SCOPE

The materials defined by these specifications are pumpable, expanding and non-expanding anti-flutter sealers.

## 2. APPLICATION

These specifications were released originally for sealers used to isolate inner from outer closure panels, and body and roof reinforcements from exterior sheet metal areas normally inaccessible after welding operations. The materials can be applied over oily metal surfaces and expand when processed through the electrocoat bake oven.

Anti-flutter materials are required to perform in a number of applications and closure designs. Each design and/or application has unique requirements. Compliance with this materials specification does not guarantee the anti-flutter will function for all potential applications on a vehicle. Selection of the appropriate material should therefore be based on jury evaluations or other NVH test procedures as well as the required functional trial.

Note: Material defined by WSS-M4G348-A3 replaces the former ESB-M4G60-B and ESB-M4G60-B2.

## 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).

| Date | Action | Revisions | Rev. 03 |
|---|---|---|---|
| 2015 04 06 | Revised | Activated -A5/-A6. Revised A, A3, A4 (See Summary of Revisions) | J. Herl EU |
| 2011 09 20 | Revised | See Summary of Revisions | B. Witkowski, NA |
| 1995 05 15 | Activated | A, A3, A4 | N. E. Lindsay, G. A. Molnar |


Copyright Ford Motor Company
Provided by IHS Markit under license with FORD
No reproduction or networking permitted without license from IHS
Full document details: FORD WSS-M4G348-A6 2015
Copyright © 2015, Ford Global Technologies, LLC
Licensee=/, User=,
Not for Resale,
Documents Sharing Hub

**3.2 SYSTEM COMPATIBILITY**

Initial sealer approval was based on a specific material system which included the substrate, stamping lubricants and sealer. Substrate choice, stamping lubricants, stamping plant processing conditions, assembly processing condition may affect sealer performance. If any of these parameters are changed, the sealer performance must be validated using these parameters.

Material Consistency and Process Compatibility

Materials shall be a smooth homogenous mixture, free from entrapped air, foreign materials and properties detrimental to normal production operation. The material shall work with all the plant processes (cleaning operations, phosphating process, welding operations, etc.) and shall not deteriorate the performance of phosphating, electrocoat primer or other materials applications. All bulk mastic, sealer or adhesives packaged in minitotes will be returned to the supplier with some residual material in the bottom of the container from the initial fill. It is understood that the residual materials will be the base of the next refill and will not affect the quality of the refilled certified product and supplier shall demonstrate via testing of retain materials of production lots of materials to support the above, the ratio of old to virgin material should be tested at a ratio of 10 old to 1 part by weight new, and other ratios defined at approval. Supplier shall present data to manufacturing and materials engineering prior to approval, as well as data showing compatibility with process aids used in mini-tote assembly (i.e. seal lubricants.) For mini-tote sytem information, the VO procedure should be reviewed as master for the process, reference(VOPGNN002).

No minitote should be refilled with residual material exceeding the above mentioned amount and should be returned to the plant of origin for follower plate removal and container/residual material disposal. The follower plate will be returned to the supplier after extraction by the plant of origin for insertion into a new drum. (VOPGNN002)

| | | |
|---|---|---|
| **3.3** | **SOLIDS**<br>(ASTM D2834, except heat at 100 +/- 2 °C for 3 h in a mechanical convection oven. Save sample for next test, para 3.4) | 98% min |
| **3.4** | **ASH**<br>(ISO 3491, Method A, 760 +/- 30 °C based on the solids weight) | 70% max |

**3.5 WEIGHT PER VOLUME**
(ASTM D816)

The weight tolerance for any one supplier shall be +/- 0.02 kg/L, based on the recorded weight of his original approval production sample (refer to para 4.1).

**3.6 VISCOSITY**
(SAE J1524, VIS-2, 2.64 mm orifice, 550 kPa)

| | | |
|---|---|---|
| 3.6.1 | As Received<br>(Conditioning Method B) | +/- 10 s |
| 3.6.2 | Aged<br>(Material aged in closed container for 72 h at 40 +/- 1 °C, conditioning Method B) | No more than 50% increase from original approval |

Copyright Ford Motor Company
Provided by IHS Markit under license with FORD
No reproduction or networking permitted without license from IHS
Full document details: FORD WSS-M4G348-A6 2015

Copyright © 2015, Ford Global Technologies, LLC
Licensee=/, User=,
Not for Resale,

AVA Documents
Document Sharing Hub

The viscosity tolerance for any one supplier shall be +/- 10 s, based on the recorded viscosity of the original approved production sample. Reference para 4.2.

3.6.3 90 day Storage Stability at 23 +/- 2 °C and 32 +/- 2 °C

The supplier shall provide a viscosity profile versus time from initial through 90 days storage at 23 +/- 2 °C and 32 +/- 2 °C. Measurements shall be taken at weekly intervals. Curves shall be made available to Materials Engineering prior to addition to the Approved Source List.

Final approval of a specified material viscosity for production shipments shall be made by the affected manufacturing activity. In all cases, the viscosity shall be within specification limits as identified on the material control plan.

**3.7 HARDNESS**
(ISO 868, instantaneous reading, cure material
for 30 min oven time at 182 °C, cool to 23 +/- 2 °C)

| | | |
|---|---|---|
| WSB-M4G348-A | Shore A | 35 – 55 |
| WSS-M4G348-A3 | Shore A | 10 – 25 |
| WSS-M4G348-A4 | Shore A | 25 – 45 |
| WSS-M4G348-A5 | Shore A | 5 – 10 |
| WSS-M4G348-A6 | Shore A | 5 - 10 |

The hardness tolerance for any one supplier shall be +/- 5 based on the recorded hardness of their originally approved production sample.

**3.8 COLOR**

The material color shall meet manufacturing process control requirements. Final approval of material color for production shipments shall be made by the affected manufacturing activity.

The material color for any one supplier shall not visually deviate from the originally approved production sample. Reference para 4.3.

**3.9 FOGGING**
(SAE J1756 use max curing condition
and 10g of material)

Fog Number 60 min

The formation of droplets or coalescence into a clear film is cause for rejection.

**3.10 ELECTROCOAT COMPATIBILITY**
(FLTM BV 119-01) Shall not contaminate electrocoat primer bath or cause electrocoat film irregularities

**3.11 WASH RESISTANCE**
(FLTM BV 116-01, Method A, 1.5 mm material thickness) No wash off

Copyright Ford Motor Company
Provided by IHS Markit under license with FORD
No reproduction or networking permitted without license from IHS
Full document details: FORD WSS-M4G348-A6 2015

Copyright © 2015, Ford Global Technologies, LLC
Licensee=/, User=,
Not for Resale,

Documents
Document Sharing Hub