SEALER, HEAT CURING, TAPE, SPOT WELDABLE, EXPANDING	**WSK-M4G325-A1**
SEALER, HEAT CURING, PUMPABLE, SPOT WELDABLE, LOW EXPANDING	**WSK-M4G325-A2**
SEALER, HEAT CURING, TAPE, SPOT WELDABLE, LOW EXPANDING, MEDIUM STRENGHT	**WSK-M4G325-A3**
SEALER, HEAT CURING, PUMPABLE, SPOT WELDABLE, HIGH EXPANDING	**WSS-M4G325-A4**
SEALER, HEAT CURING, PUMPABLE, SPOT WELDABLE, MEDIUM EXPANDING	**WSK-M4G325-A5**
SEALER, HEAT CURING, PUMPABLE, SPOT WELDABLE, LOW EXPANDING, LOW VISCOSITY	**WSS-M4G325-A6**

1. SCOPE

The materials defined by these specifications are spot weldable, heat curing, heat expanding sealers.

2. APPLICATION

WSK-M4G325-A1/A3: These specifications were released originally for dimensioned materials used for sealing spot weld joints on the body-in-white. It is applied to oiled surfaces in the form of self adhesive strips.

WSK-M4G325-A2/A6: This specification was released originally for non-dimensioned materials used for sealing spot weld joints on the body-in-white. It is applied to oiled surfaces by an extrusion apparatus.

WSK-M4G325-A4/A5: These specifications were released originally for non-dimensioned materials used for sealing joints in BIW. It is applied to oiled surfaces by an extrusion apparatus.

The materials are applicable on oiled surfaces with acceptable oil film weights (European applications limit the oil/pre-lubricant film weight to max 3 g/m², see para. 3.7).

Note: Care must be taken to ensure that the local oil film weight in the area of the adhesive/sealer application does not exceed the critical limit. Monitoring of the film thickness, adequate storage of the part and/or cleaning of the surface prior to sealer/adhesive application is necessary to avoid critical film thickness values, which would then cause malfunction of the sealer/adhesive.

3. REQUIREMENTS

3.1 APPROVED SOURCES

This specification requires the use of approved sources. Only the sources identified on the Ford Approved Source List (ASL) can be used when this specification is listed on the drawing, CAD file, or other documents. The list of approved sources is located within Ford at www.mats.ford.com or available externally through a Ford Materials Engineer.

Material specification requirements are to be used for initial qualification of materials.

Date	Action	Revisions	Rev. 12
2017 06 27	Editorial	Corrected footer	A. Collins, NA
2016 10 17	Revised	See Summary of Revisions	S. Short, NA
1991 07 01	Released	(A1/A2 1991 07 01) (A3 1992 07 01) (A4 2006 01 23) (A5 2007 01 19) (A6 2010 03 25)	

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3.2	PERFORMANCE REQUIREMENTS	A1/A3	A2/A4/A5/A6
3.2.1	Color	Black	Black
3.2.2	Solids, %, min (FLTM BV 150-10)	99	85
3.2.3	Ash, %, max (FLTM BV 150-10)	50	45
3.2.4	Flash Point (ASTM D56)	N.A.	>56 °C
3.2.5	Density at 20 °C (ASTM D1475, tolerance +/- 0.05 g/cm^3, based on the recorded density of supplier's original approved sample)	1.2 to 1.9 g/cm^3	1.0 to 1.6 g/cm^3
3.2.6	Penetration at 23 °C (**A1/A3** only) (ASTM D5, 0.981 N total weight force, 5 s dwell time)		
3.2.6.1	As received		60 - 90
3.2.6.2	After aging (14 days at 30 +/- 2 °C)		50 - 90
	Note: See note in 3.2.7		

3.2.7 Viscosity at 23 °C, s (**A2/A4/A5/A6** only) (FLTM BV 103-01, line pressure 0.392 MN/m^2, nozzle dia. 2 mm)

		A2/A4	A5	A6
3.2.7.1	As Received	70 – 200	500 – 700	20 - 100
3.2.7.2	After Aging, max (14 days at 35 +/- 2 °C)	200	700	100

Note: Final approval of a specific viscosity of material for production shipments shall be made by affected Manufacturing Division. In all cases, however, the viscosity shall be within the limits specified above and shall meet all requirements of this specification (Control Sample Laboratory Report).

		A1/A3	A2/A4/A5/A6
3.2.8	Flow Rate, max (FLTM BV 153-01, Method A, except oiled panels according to para. 3.4.	No flow	3 mm

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3.2.9 Cold Resistance after Aging

No loss of adhesion, no chipping.

Test Method:

(a) Apply 250 x 30 x 3 mm ribbons of material under test to 300 x 100 mm test panels prepared according para 3.4.

(b) Expose test assemblies according to FLTM BV 150-05, (for each individual region) for:

. minimum curing cycle (165 °C, 10 minutes material temp in EC oven)
. maximum curing cycle

(c) Expose test assemblies in a mechanically convected air-dry oven at 80 +/- 2 °C for two weeks.

(d) After cooling to 23 +/- 2 °C expose test assemblies and bending fixture (see FLTM BV 153-04, except 100 mm mandrel) in a cold box at -30 +/- 1 °C for 4 h.

(e) While still in the cold box, bend test assemblies within 2 s around the 100 mm mandrel through an angle of 90°.

3.2.10 Wash-off Resistance (**A2/A4/A5/A6** only)

No wash-off of sealer, deformation of sealer surface permitted.

Test Method:

(a) Apply two ribbons of material under test 250 x 30 x 3 mm and 50 mm apart from each other to a 300 x 300 mm oiled panel, prepared in accordance para. 3.7.

(b) After conditioning for 2 h at 23 +/- 2 °C expose test assembly in horizontal position to a water jet of 50 +/- 5 °C using a nozzle No. 1/2 GG-25 Full Jet and a pressure of 200 kN/m^2. The distance between the nozzle and test material shall be 300 mm. The water jet shall be applied between the beads for 1 minute.

3.2.11 Wash and Phosphating Solution Resistance (**A2/A4/A5/A6** only)

A. Non-Cured Material

No evidence of dissolution of material or lifting from panel.

Test Method:

(1) Apply 250 x 40 x 0.1 - 0.2 mm ribbons of material under test to 250 x 60 mm oiled test panels, prepared according to para. 3.7.

(2) After conditioning for 2 h at 23 +/- 2 °C expose test assemblies one after another in each wash and phosphating solution of the affected plant where this material is to be used and maintain for 15 minutes at 60 +/- 1 °C.

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