



ENGINEERING MATERIAL SPECIFICATION

Material Name

SEALER, HEAT CURING, TAPE, SPOT WELDABLE, EXPANDING
SEALER, HEAT CURING, PUMPABLE, SPOT WELDABLE,
EXPANDING

Specification Number

WSK-M4G325-A1
WSK-M4G325-A2/A3

1. SCOPE

The materials defined by these specifications are spot weldable, heat curing, heat expanding sealers based on polyisobutylene or polyacrylic ester.

2. APPLICATION

WSK-M4G325-A1: This specification was 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/A3: These specifications were 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.

3. REQUIREMENTS

3.1 STATISTICAL PROCESS

Suppliers must conform to the requirements of Ford Quality System Standard Q-101. A mutually acceptable Control Plan as described therein is required for material/source approval. Appropriate statistical tools must be used to analyze process/product data so that variation in the final product quality is continuously reduced.

3.2 INFRARED SPECTROPHOTOMETRY AND/OR THERMAL ANALYSIS

Ford Motor Company, at its option, may conduct infrared and/or thermal analysis of material/parts supplied to this specification. The 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	Release No.	Release/Revision
1993 08 02	EP00E10258823000	Revised 1, 3.4.4 to 3.4.7, 3.4.11, added 3.5 WS
1992 07 01	EP00E10176272000	Released A3, updated 4., revised A1 & A2, 2.
1991 07 01	EP00E01089486000	Released W.Scholz Conc. J.Schult



3.4	PERFORMANCE REQUIREMENTS	A1	A2/A3
3.4.1	Colour (A1/A2/A3)	Black	
3.4.2	Solids, %, min (FLTM BV 150-10)	99	85
3.4.3	Ash, %, max (FLTM BV 150-10)	50	45
3.4.4	Flash Point (ASTM D 56)		> 56 C
3.4.5	Density at 20 C (ASTM D 1475, tolerance +/- 0.05 g/cm ³ , based on the recorded density of supplier's original approved sample)		1.0 to 1.6 g/cm ³
3.4.6	Penetration at 23 C (A1 only) (ASTM D 5, 0.981 N total weight force, 5 s dwell time)		
3.4.6.1	As received		60 - 90
3.4.6.2	After ageing (14 days at 30 +/- 2 C)		50 - 90
Note: See 3.4.7			
3.4.7	Viscosity at 23 C, s (A2/A3 only) (FLTM BV 103-01, line pressure 0.392 MN/m ² , nozzle dia. 2 mm)		
		A2	A3
3.4.7.1	As Received	70 - 200	10 - 20
3.4.7.2	After Ageing, max (14 days at 35 +/- 2 C)	200	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 | A2/A3 |
|--------|---|-----------------|
| 3.4.8 | Flow Rate, max
(FLTM BV 153-01, Method A,
except oiled panels acc. to
FLTM BV 150-11, "Normal Grade") | No flow
3 mm |
| 3.4.9 | Cold Resistance After Ageing

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 to FLTM BV 150-11, "Normal Grade".

(b) Expose test assemblies according to FLTM BV 150-05, Table 1 for

. minimum curing cycle
. 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 deg. | |
| 3.4.10 | Wash-off Resistance (A2/A3 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 with FLTM BV 150-11, "Normal Grade".

(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. | |