Ford Motor Company

ENGINEERING MATERIAL SPECIFICATION

Material Name	Specification Number
ADHESIVE, THERMOSETTING - FOR FRICTION MATERIALS	**ESW-M2G142-A1** **ESW-M2G142-A2** **ESW-M2G142-A3**

1. SCOPE

The material defined by these specifications is a thermosetting, nitrile-phenolic base adhesive.

2. APPLICATION

These specifications were released originally for material used to bond friction materials to steel in the manufacture of automatic transmission clutch and/or brake band assemblies for operation in transmission and axle approved automatic transmission fluids.

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).

		A1	A2	A3
3.2	**VISCOSITY, cP** (MPa.s)			
3.2.1	As Received at 23 +/- 2 °C (Brookfield RVF, #4 spindle, 10 rpm)	3500 to 4500	1200 to 2200	1500 to 2500
3.2.2	Aged at 23 +/- 2 °C, max	5000	3000	3000
	Test Method			
3.3	**SOLIDS**, %, min (ASTM D 2834, except heat 2 g for 4 h at 102 +/- 3 °C)	24	20	21

Condition a filled, closed container of ESW-M2G142 in a cold box for 30 days at 7 +/- 3 °C. Remove and determine the viscosity at 23 +/- 2 °C.

Date	Action	Revisions
2002 09 13	Revised	Updated and renumbered
1978 11 15		Metricated and Retyped PCR RD82440-P3
1967 11 10		Released 928965

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3.4 SHEAR STRENGTH

(FLTM BU 3-2, except substitute cold rolled steel for the aluminum strip and disc: cure at 177 +/- 3 °C at the bond line for 15 - 20 min. at 100 psi (690 kPa)

3.4.1	Disc Shear at 23 +/- 2 °C, min	1000 psi (6.9 MPa)
3.4.2	Disc Shear at 204 +/- 3 °C, min	500 psi (3.4 MPa)

3.5 HOT AUTOMATIC TRANSMISSION FLUID RESISTANCE

(FLTM BU 3-2, except cure the steel disc shear assemblies in a proved ATF, ESW-M2C33, for 24 h at 149 +/- 1 °C in beakers in aluminum block with condensers attached)

3.5.1	Disc Shear at 23 +/- 2 °C, min	2000 psi (13.8 MPa)
3.5.2	Disc Shear at 204 +/- 3 °C, min	1000 psi (6.9 MPa)

3.6 STORAGE

Material shall be stored at a temperature of 7 +/- 3 °C in order to meet the aged viscosity requirement listed in para 3.2.2.

4. GENERAL INFORMATION

The information given below is provided for clarification and assistance in meeting the requirements of these specifications.

4.1 FLAMMABILITY AND/OR TOXICITY

This material represents a potential fire and/or health hazard. The Manufacturing Engineering Department shall notify both the Plant Security and the Safety Units of its presence in the Plant to assure that proper fire and/or health precautions are provided. The location in which it is used or stored shall be included in the notifications.

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