



FLUID, AUTOMATIC TRANSMISSION

WSS-M2C938-A

1. SCOPE

The material defined by this specification is for factory fill automatic transmission fluid (ATF) composed of base oil and additives.

2. APPLICATION

This specification is released for factory fill application (including top offs) of various automatic transmissions.

3. REQUIREMENTS

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

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).

3.2 COLOR Red
(ISO 2092)

3.3 VISCOSITY

New/Fresh fluid

At 100 °C

(ASTM D 445)

6.2 mm²/sec (max.)

At -40 °C

(ASTM D 2983)

12000 mPas (max.)

Shear Stability (CEC L-45-T93)

After 20 hrs KRL, KV at 100 °C

5.5 mm²/s, min

After 40 hrs KRL, KV at 100 °C

5.0 mm²/s, min

Evaporation loss, 150 °C, 2 hr, max.
(Modified NOACK Test)

10%

After NOACK Test, Viscosity at -40 °C

2000 mPa.s max change

3.4 FLASH POINT
(ASTM D 92)

180 °C (min)

3.5 DENSITY (at 15 °C)

0.841 gm/cc +/- 0.005

Date	Action	Revisions
2007 12 18	Revised	Revised 3.16 C. Ved
2007 04 19	Revised	Revised 3.3, 3.5, 3.6, 3.9.1, 3.9.2, 3.9.3, 3.9.4, 3.9.5, 3.9.6, 3.9.7, 3.10, 3.12.1, 3.12.3, 3.12.4, 3.15.1 table, 3.15.2, 3.15.4 & 3.15.5 C. Ved
2005 12 02	Activated	C. Ved

**3.6 ANTI FOAMING PROPERTIES**
(ASTM D 892)

Sequence I	50/0 ml (max)
Sequence II	50/0 ml (max)
Sequence III	50/0 ml (max)
Sequence IV (ASTM D 6082-01)	100/0 ml (max)

3.7 COPPER STRIP, max
(ISO 2160/ASTM D 130, 3 h at 150 °C, no water added)

1b

3.8 NONCORROSION AND NONRUSTING PROPERTIES
(ASTM D 665, Procedure A, 24 h)

No visible rust

3.9 ELASTOMER COMPATIBILITY

3.9.1 ATRR-101 Nitrile after aging 168 h at 150 +/- 3 °C per ASTM D 471, para 6.1, with aluminum block, must be within the limits below:

. Volume Change from original	-3 to 4%
. Hardness, Durometer A	0 to 10
. Change from original	

3.9.2 ATRR-201 Polyacrylic, after aging 70 h at 163 +/- 3 °C in per ASTM D 471, para 6.1, with aluminum block, must be within the limits below:

. Volume Change from original	0 to 6%
. Hardness, Durometer A	+/- 5
. Change from original	

3.9.3 ATRR-300 Silicone after aging 240 h at 163 +/- 3 °C per ASTM D 471, para 6.1, with aluminum block must be within the limits below:

. Volume Change from original	20 to 48%
. Hardness, Durometer A	-40 to -15
. Change from original	

3.9.4 ATRR-400 Fluoroelastomer after aging 240 h at 163 +/- 3 °C per ASTM D 471, para 6.1, with aluminum block, must be within the limits below:

. Volume Change from original	0 to 4%
. Hardness, Durometer A	+/- 8
. Change from original	



3.9.5 ATRR-500 Ethylene-Acrylic after aging 240 h at 163 +/- 3 °C per ASTM D 471, para 6.1, with aluminum block, must be within the limits below:

. Volume Change from original	5 to 15%
. Hardness, Durometer A	+/- 5
Change from original	

3.9.6 ATRR-600 Hypalon after aging 240 hrs. in candidate fluid at 163 +/-1 °C per ASTM D 471, para 6.1, with aluminum block or fluid bath, must be within the limits below:

. Volume Change from original	5 to 35%
. Hardness, Durometer A	-30 to 0
Change from original	

3.9.7 ATRR-700 Hydrogenated Nitrile after aging 240 hrs. in candidate fluid at 163 +/-1 °C per ASTM D 471, para 6.1, with aluminum block, must be within the limits below:

. Volume Change from original	-2 to 4%
. Hardness, Durometer A	0 to 5
Change from original	

3.10 ODOR

The fluid manufactured to this specification shall meet the Automatic Transmission Operations Odor Test procedure. The fluids shall be found to be acceptable when it receives an acceptability rating of 2 or less. The Automatic Transmission Engineering Operations odor test procedure can be obtained by written request to:

Ford O H & S Department
Occupational and Environmental Health Sciences
20901 Oakwood Blvd
Dearborn, MI 48124
Tel: (313) 845-4588

3.11 TOXICITY

The fluid manufactured and formulated to this specification must not contain skin sensitization components. The entire formulation must be validated by testing, the following specific rigorous protocol. MSDS must accompany all containers other than tank cars quantities and Ford Toxicology Identification Number must be prominently displayed.

The protocol details can be obtained by written communication to:

Occupational and Environmental Health Sciences
Central Laboratory Building CPN
15000 Century Drive, Room S-120
Dearborn, MI 48120
Tel: (313) 322-4113
Fax: (313) 845-5578

And requesting the following procedure: "Decision Tree: Dermatotoxicology Assessment of High Production Volume Vehicle Fluids such as Transmission Fluids"