



ENGINEERING MATERIAL SPECIFICATION

ACETAL (POM) HOMOPOLYMER, COLOR PIGMENTED
MOLDING COMPOUND, MELT FLOW RATE 11 - 17,
INTERIOR **NOT TO BE USED FOR NEW DESIGN**

WSK-M4D744-A2

ACETAL (POM) HOMOPOLYMER, COLOR PIGMENTED
MOLDING COMPOUND, MELT FLOW RATE 19 - 31,
INTERIOR **NOT TO BE USED FOR NEW DESIGN**

WSS-M4D744-A3

ACETAL (POM) HOMOPOLYMER, COLOR PIGMENTED
MOLDING COMPOUND, MELT FLOW RATE 1.5 - 3.5,
INTERIOR

WSS-M4D744-A4

1. SCOPE

The materials defined by these specifications are color pigmented, UV stabilized acetal homopolymers based on formaldehyde, with melt flow rates from 1.5 to 31 g/10 minutes.

2. APPLICATION

These specifications were released originally for materials used for interior functional automotive applications such as window regulator handle knob, etc.

3. REQUIREMENTS

3.0 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.1.1 All requirements of this specification, identified by symbol(s), shall be met with data representing 3 sigma values.

3.4 MOLDING COMPOUND

3.4.1 Melt Flow Rate
(ISO 1133, 190 °C, 2.16 kg)

WSK-M4D744-A2

11 - 17 g/10 minutes

WSS-M4D744-A3

19 - 31 g/10 minutes

WSS-M4D744-A4

1.5 - 3.5 g/10 minutes

3.5 MOLDED TEST SPECIMEN

3.5.1 Preparation of Test Specimens

Unless otherwise specified all tests shall be carried out on injection molded one-end gated test specimens.

Date	Action	Revisions	Rev 04
2014 03 25	A4 – Re-activate	Re-activate A4 suffix only	L. Soreide, NA
2011 07 27	N Status	No replacement named	R. Harris, NA
1993 09 01	Released	EP00E10258825000 WSK-M4D744-A2	Rodrigas



The following dimensions are required:

- A. 150 min x 10 x 4.0 +/- 0.2 mm (Tensile Bar, ISO 3167)
- B. 120 x 10 x 4.0 +/- 0.2 mm

Specimens with shorter dimensions shall be cut from the center portion of the test specimen A and/or B. The specimens shall be prepared according to ISO 294. No annealing allowed.

3.5.2 Density (ISO 1183, Method A) 1.39 - 1.44 g/cm³

3.5.3 Tensile Strength at Yield, min (ISO R 527, 150 minimum x 10 x 4.0 +/- 0.2 mm specimen, 50 mm/min test speed) 59 MPa

3.5.3.1 Elongation at Break, min (Test Method according to para 3.5.3)

WSK-M4D744-A2 & WSS-M4D744-A3 10%
WSS-M4D744-A4 25%

3.5.4 Flexural Modulus, min (ISO 178, 80 x 10 x 4.0 +/- 0.2 mm specimen, 2 mm/min test speed, 64 mm support span) 2.5 GPa

3.5.5 Shear Modulus at 23 °C (ASTM D 4065, forced constant amplitude, fixed frequency of 1 Hz +/- 15%, strain level below 1%. Specimen approx. 60 x 10 x 4.0 +/- 0.2 mm cut from the center of specimen A. Specimen length between clamps 35-40 mm. Soak time at each temperature interval - 3 minutes minimum).

Additionally, a Shear Modulus vs. Temperature curve shall be plotted for -50 to +150 °C temperature range, at 5 °C minimum intervals. The plotted curve must be within tolerance range shown on page 7 (-A2 & -A3) and page 8 (-A4).

WSK-M4D744-A2 & WSS-M4D744-A3 0.80 - 1.30 GPa
WSS-M4D744-A4 0.83 - 1.40 GPa

3.5.6 Impact Strength, Izod, min (ISO 180/1A, 80 x 10 x 4.0 +/- 0.2 mm specimen, 10 specimens for each test)

3.5.6.1 At 23 +/- 2 °C

WSK-M4D744-A2 & WSS-M4D744-A3
WSS-M4D744-A4



ENGINEERING MATERIAL SPECIFICATION

WSK-M4D744-A2
WSS-M4D744-A3/A4

3.5.6.2 At -40 +/- 2 °C

WSK-M4D744-A2 & WSS-M4D744-A3	3.0 kJ/m ²
WSS-M4D744-A4	6.0 kJ/m ²

The test specimens must be conditioned for minimum of 6 h at the above specified temperature prior to impact test. Low temperature testing shall be done within the cold box.

3.5.7 Heat Deflection Temperature, min
(ISO 75, 120 x 10 x 4.0
+/- 0.2 mm specimen, edgewise,
0.32 +/- 0.01 mm deflection)

3.5.7.1	At 1.80 MPa	80 °C
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3.5.7.2	At 0.45 MPa	
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WSK-M4D744-A2	143 °C
WSS-M4D744-A3 & WSS-M4D744-A4	150 °C

3.5.8 Heat Aging Performance
(ISO 188, except 150 +/- 50 air
changes/h, 1000 h at 90 +/- 2 °C.
After heat aging test specimens are
to be conditioned in a desiccator for
3 - 5 h at 23 +/- 2 °C. Unaged property
values shall be determined at the time of the aged
properties determination)

3.5.8.1	Tensile Strength at Max Load Change (Test Method per para 3.5.3)	+/- 20%
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3.5.8.2	Impact Strength, Izod Change, max (Test Method per para 3.5.6.1, specimens to be notched before heat aging)	+/- 35%
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3.6 FLAMMABILITY (ISO 3795/SAE J369)

Burn Rate, max	100 mm/minute
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The specimen size required for material approval is 355 x 100 x 1.0 +/- 0.1 mm with a smooth surface.

3.7 FOGGING (FLTM BO 116-03, 3 h at 100 °C heating, 21 °C cooling plate)

Fog Number, min	90
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The formation of clear film, droplets or crystals is cause for rejection.



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