

INTERNATIONAL TRUCK AND ENGINE CORPORATION		
TMS (TRUCK MATERIAL SPECIFICATION)		NUMBER: TMS-7040
TITLE: Polypropylene, Unfilled, Molded		REVISION: F
WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	DATE ISSUED: August 2005
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<i>This specification may involve hazardous materials, equipment, and procedures. This specification does not purport to address all of the safety issues associated with its use. The user is responsible to consult appropriate safety and health practices and to determine the applicability of regulatory limits prior to use.</i>		
Change Notice: Modified UV specification in Section 4.2.1.		
Reference: File 30-14D	Keywords: Molded Polypropylene	

1.0 APPLICATION

This specification covers unfilled polypropylene thermoplastic material suitable for manufacture into finished parts by injection molding, extrusion, vacuum forming, or any other feasible molding process. Parts such as accelerator pedals, kick panels and ducts are typical applications.

2.0 SCOPE

This specification covers the requirements for basic material properties (cell limits), molded part properties (suffixes), and quality.

3.0 REFERENCE DOCUMENTS

Unless otherwise specified, the latest issue of all referenced standards shall apply. The following standards, specifications and regulations are referenced in this specification.

Quality System Standard QS-9000 (<i>ISO 9000 or TS-16949</i>)	ASTM D 638	CEMS GT-31
INTERNATIONAL IQR Quality Standard	ASTM D 256	ASTM D 1238
INTERNATIONAL Manufacturing Std. D-13	ASTM D 648	ASTM D 758
CFR Title 29, Part 1910	TMS-7051	
INTERNATIONAL TMS-9544		

4.0 REQUIREMENTS

4.1 Basic Properties

Material purchased to this specification shall meet the basic property requirements selected from the table. Properties shall be specified by cell limits, such as 3-4-3-0-1. Each digit refers to a cell limit in the table, and represents a property as follows:

	Cell Limits:	3	-	4	-	3	-	0	-	1
Tensile Yield Strength										
18.6 MPa (2700 psi)										
Izod Impact Strength (Notched)										
0.07 J/mm (1.3 ft•lb/in) of Notch										
Deflection Temperature at 455 kPa										
(66 psi) @ 88°C (190°F)										
Low Temperature Izod Impact Strength										
Unspecified										
Nominal Flow Rate										
0.1 - 0.4 g (0.004 - 0.014 oz) per 10 minutes										

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PROPERTIES	ASTM TEST METHOD	CELL LIMITS									
		<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>
Tensile YS, min, MPa psi	D-638		13.7 1900	16.2 2350	18.6 2700	21.1 3060	23.5 3410	26.0 3770	28.5 4130	30.9 4480	33.3 4840
Izod Impact Strength At 23 C (75 F), Min. J/mm of Notch ft•lb/In of Notch	D-256		0.02 0.3	0.03 0.6	0.05 0.9	0.7 1.3	0.10 1.8	0.15 2.8	0.20 3.7	0.25 4.6	0.29 5.5
Deflection Temperature @ 455 kPa (66 Psi), min. Degrees C Degrees F	D-648	U N S P E C I F I E D	77 170	82 180	88 190	99 210	104 220	116 240	127 260	138 280	149 300
Izod Impact Strength At -18 C (0 F) Unnotched, min. Joules ft•lb	D-758		6.2 4.6	8.7 6.4	12.4 9.2	19.0 14	24.4 18	31.2 23	38.0 28	* *	-- --
Normal Flow Rate g/10 Min.	D-1238		0.1- 0.4	0.5- 0.9	1.0- 1.9	2.0- 3.9	4.0- 5.9	6.0- 9.9	10.0- 13.9	14.0- 17.9	18.0- 25.0
Oz/10 Min.			0.004 to 0.014	0.018 to 0.032	0.035 to 0.067	0.070 to 0.136	0.140 to 0.206	0.210 to 0.310	0.350 to 0.485	0.490 to 0.625	0.630 to 0.875

* No Breakage.

4.2 Suffixes

Suffix letters indicate material or molded part property requirements in addition to those shown in the table. The following suffixes shall be used to indicate additional required properties:

4.2.1 Accelerated Weathering per CEMS GT-31

C1: Interior parts which are exposed to sunlight under glass shall be tested per Method A for a minimum of 1200 kj.

C2: Exterior parts shall be tested per Method B for a minimum of 3600 kj.

4.2.1.1 Required – shall have no visible color change greater than ΔE of 3.

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