

INTERNATIONAL TRUCK AND ENGINE CORPORATION		
TMS (TRUCK MATERIAL SPECIFICATION)		NUMBER: TMS-7119
TITLE: Plastic Aerodynamic Components		REVISION: F
WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	DATE ISSUED: June 2005
PRINTED COPIES OF THIS DOCUMENT MUST BE VERIFIED FOR CURRENT REVISION		
<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: Added QUV specification in Table 2.		
Reference: File 30-14	Keywords: Aerodynamic components, plastic parts.	

1.0 APPLICATION

This specification covers five types of polymeric materials used for bumper FASCIA and aerodynamic components. Current parts use thermoplastic materials produced by injection molding, blow molding, or thermo forming. Applications include: bumpers, bumper extensions, fuel tank skirts, fairings, and valance panels.

Note: Parts used in future applications of aerodynamic components may be produced by Reaction-Injection-Molding (RIM) of thermosetting plastic materials. New material types and property requirements will be added as they become necessary.

2.0 SCOPE

This specification covers basic materials and mechanical property requirements for five types of thermoplastic materials. Requirements for finished parts, painting, quality and identification/markings are also covered. Qualification, Quality Control and Source Approval procedures are included.

3.0 REFERENCE DOCUMENTS

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

Quality System Standard QS-9000 (<i>ISO 9000 or TS-16949</i>)	INTERNATIONAL TMS-9008	ASTM D 790
INTERNATIONAL IQR Quality Standard	CFR 29, Part 1910	ASTM D 792
INTERNATIONAL Manufacturing Std. D-13	ASTM D 256	ASTM D 955
INTERNATIONAL CEMS D-28	ASTM D 638	ASTM D 1238
INTERNATIONAL CEMS G-5, Parts I, and II	ASTM D 746	ASTM G 53
INTERNATIONAL CEMS DT-4		SAE J 1344
INTERNATIONAL CEMS GT-31		

4.0 GENERAL REQUIREMENTS

4.1 Material Type

General characteristics of the five material types are shown in Table 1.

4.2 Molding Compound

This document is restricted and may not be sent outside International Truck and Engine Corporation or reproduced without permission from Corporate Technical Standards. Suppliers are required to assume all patent liability. ©2005 by International Truck and Engine Corporation

JUNE 2005

NUMBER: TMS-7119	TITLE <i>Plastic Aerodynamic Components</i>	REVISION F
----------------------------	---	----------------------

Infrared spectra and rheometric analysis of molding compound and material taken from molded production parts must match standards developed during initial qualification.

TABLE 1 - GENERAL CHARACTERISTICS

<u>TYPE</u>	<u>BASE MATERIAL*</u>	<u>STIFFNESS</u>	<u>UV RESISTANCE</u>
1	TPO	FLEXIBLE	YES
2	TPO	SEMI-RIGID	YES
3	ABS	RIGID	NO
4	PA + PPE	RIGID	NO
5	PC + ABS	RIGID	NO

* Refer to CEMS D-28.

4.2.1 Filler type and amount in molding compound and material taken from molded parts must correspond ($\pm 1.0\%$) to standards developed during initial qualification.

4.3 Mechanical Properties

Test plaques measuring 4x6x.125 inch, (100x150x3mm) prepared using virgin compound, shall meet the minimum requirements shown in Table 2. Impact and UV resistance requirements, when specified, must be determined on each specific color being qualified.

4.4 Finished Part Requirements

4.4.1 Identification/Marking

Parts supplied to the requirements of this specification shall be permanently marked to identify the material the part is from. Marking shall be in accordance with SAE J 1344. Examples are:

	<u>Type 1</u>	<u>Type 2</u>	<u>Type 3</u>	<u>Type 4</u>	<u>Type 5</u>
4.4.1.1 Marking Symbol:	TPO	TPO	ABS	PA + PPE	PC + ABS

4.4.1.2 Marking is not permitted on the cosmetic surface of the part.

4.4.1.3 Wherever practical, the marking should be located in an area where it will not be seen when the part is attached to the vehicle, but it must be readable when the part is disassembled.

4.4.1.4 Markings applied with inks, dyes, paint, etc. shall be nonstaining to the part and to other contacted materials or parts.

4.4.1.5 Marking must remain legible during the life of the part.

4.4.1.6 Markings which are molded into the part shall not create a stress concentration site which could result in premature cracking of the part.

4.4.2 Surface Finish

Surface finish of untextured molded parts shall be such that, after painting, there shall be no visible waviness, gate blush, flow lines, flash, knit lines, sink, warpage or other cosmetic defects.

4.4.3 Texture Finish - E Suffix

Textured finish, when required, shall be specified separately on the part drawing, using the E Suffix.

4.4.4 Resin Pigmentation - D1 Suffix

Parts requiring molded-in-color shall exhibit uniform pigmentation throughout the molded part. Color shall be specified separately on the part drawing, using the D1 Suffix. Color of parts supplied must match International Paint Chip Color Standards, available from Materials Engineering at the Truck

This document is restricted and may not be sent outside International Truck and Engine Corporation or reproduced without permission from Corporate Technical Standards. Suppliers are required to assume all patent liability. ©2005 by International Truck and Engine Corporation

JUNE 2005