

INTERNATIONAL TRUCK AND ENGINE CORPORATION		
TMS (TRUCK MATERIAL SPECIFICATION)		NUMBER: TMS-7131
TITLE: Driver Air Bag (DAB)		REVISION: C
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 4.2.2.		
Reference: File 16-13	Keywords: Driver Air Bag	

1.0 APPLICATION

This specification covers the driver airbag module assembly which consists of an inflator assembly, a cushion assembly, a housing assembly, and a cover assembly with a total mass of approx. 1.5 kg.. The inflator assembly is a non-azide pyrotechnic that produces gases to fill the cushion and is activated by the initiator (squib) that is permanently secured to the side of the inflator assembly. The inflator shall be equipped with an integral two-way connector that will incorporate an internal shorting clip to eliminate a direct path to the initiator bridge wire to prevent inadvertent deployment due to radiant energy or during shipping and handling. The airbag module shall be operational under the following conditions: -30°C to 80°C, zero to 95% relative humidity, and 61 kPa to 105 kPa.

2.0 SCOPE

This specification covers the general requirements, property and performance requirements, qualification, KCC and quality control, and dimensional tolerances for International air bags.

3.0 REFERENCE DOCUMENTS

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

Quality System Standard QS-9000 (ISO 9001)	ASTM B-117	FMVSS-302
INTERNATIONAL IQR Quality Standard	ASTM D-1683	MIL-STD-1576 Method 2117
INTERNATIONAL Manufacturing Std. D-13	ASTM D-2136	MIL-STD-1576 Method 2201
INTERNATIONAL Eng., Design Standard A-16	ASTM D-5428	SAE J323
CFR 29, Part 1910	ASTM D-5822	SAE J551/11
AATCC Evaluation Procedure 1	ECE R16	TMS-9543
AATCC Test Method 8		TMS-9544
INTERNATIONAL CEMS GT-31		

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4.0 GENERAL REQUIREMENTS

4.1 Construction

The airbag assembly shall be fabricated in such a manner that criteria of appearance, fit and adherence to drawing tolerances and material specifications shall be observed. The cover shall be free from flash or roughness at the die parting line, gate, or vent point. The cover exterior surface shall be uniform in appearance and must be free of die, tool, sink marks, bubbles and pits.

Color, texture and finish of production material supplied must match master samples of the pre-production material originally approved and on file in the Master Fabric Book at Industrial Design Department at TDTC.

4.2 Property And Performance Requirements for Cover Assembly

4.2.1 Low Temperature Bend Test: ASTM D-2136 or SAE J323, Method A

4.2.1.1 Method: Bend around a 3mm (1/8 in) diameter after 4 hours at -30°C (-22°F)

4.2.1.2 Required: The coating shall remain flexible and shall not crack or check.

4.2.2 Accelerated Weathering per CEMS GT-31

All material shall qualify to one of the two following tests:

4.2.2.1 Xenon Arc:

4.2.2.1.1 Interior parts, per Method A for a minimum of 1200 kj.

4.2.2.2 Fluorescent UV:

4.2.2.2.1 Interior parts, per Method F for a minimum of 1000 kj.

4.2.2.3 Required (Either Method): There shall be no sign of color alteration greater than a ΔE of 3, or any other form of degradation. A minimum rating of 3.0 per AATCC Evaluation Procedure 1, is required

4.2.3 Cover Seam Strength Test: ASTM D-5822

4.2.3.1 Method: Measure the seam strength of the specimens in accordance with ASTM D-1683.

4.2.3.2 Required: Seam strength of specimens must be 300N (67.4 lb.) minimum.

4.2.4 Thermal Cycle and Humidity Test

4.2.4.1 Method: Test samples will run 5 cycles of the following environmental stages with a 2 hour ramp between stages:

- a) 23 hours @ 50°C $\pm$ 2°C with 95% relative humidity
- b) 1 hour @ 21°C $\pm$ 2°C with 50% relative humidity
- c) 8 hours @ -35°C $\pm$ 2°C with <50% relative humidity
- d) 1 hours @ 21°C $\pm$ 2°C with 50% relative humidity
- e) 15 hours @ 85°C $\pm$ 2°C with 95% relative humidity
- f) 1 hours @ 21°C $\pm$ 2°C with 50% relative humidity

4.2.4.2 Required: All samples must not show any evidence of degradation after completion of the 5th cycle.

4.2.5 Abrasion Resistance Test: ASTM D-3884

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4.2.5.1 Method: Rotary Platform, Double Head Method (Taber Abrader) Run 1000 cycles using a 500 gram load.

4.2.5.2 Required: There shall be no appreciable color change of the abraded surface and the appearance shall be comparable to the approved master samples. Weight loss shall not exceed 0.05 grams.

4.2.6 Rubbing Wear Test: CEMS DT-10

4.2.6.1 Method: Mount the cover assembly in "truck position" and apply a reciprocating rubbing motion per CEMS DT-10.

4.2.6.2 Required: There shall be no appreciable color change of the abraded surface and the appearance shall be comparable to the approved master samples after 1000 cycles. Report the color transference by AATCC Number and describe the extent of the wear pattern.

4.2.7 Paint Adhesion Test: CEMS GT-5A

4.2.7.1 Method: Using the samples from the UV Resistance Test, brush off any debris and measure the paint film thickness. Then perform paint adhesion test per CEMS GT-5A.

4.2.7.2 Required: Adhesion rating must have a 4B (95% adhesion) classification or higher.

4.2.8 Chemical Resistance: CEMS DT-12

4.2.8.1 Method: Expose cover material to the following chemicals: (1)water, (2)Peerless Chemical Liquid Soap M1034 or equivalent, (3)0.1N HCl, (4)SAE J313 No. 1-D diesel fuel oil, (5)SAE J313 No. 2-D diesel fuel oil, and (6)SAE 10W-30 motor oil, as per CEMS DT-12.

4.2.8.2 Required: Sample surface shall not show any evidence of degradation.

4.2.9 Perspiration Test

4.2.9.1 Method: Prepare the following solution:

Glacial Acetic Acid	25 grams
Sodium Chloride	25 grams
Butyric Acid	15 grams
Isovaleric Acid	15 grams
Water	420 grams

4.2.9.2 After aging the solution for 24 hours, place a 50 x 50 mm (2 x 2 in) gauze pad on the cover assembly surface and saturate with the synthetic perspiration solution. Allow to set for 15 minutes and remove the pad. Test the paint immediately for softening by pressing a fingernail under moderate pressure into the film. A cycle shall consist of the 15 minute application plus the fingernail test.

4.2.9.3 Required: The coated cover assembly shall complete ten cycles min. without softening (leaving a fingernail imprint), discoloring, separating, staining, swelling or blistering.

4.2.10 Heat Aging Test

4.2.10.1 Method: Mount the sample cover to a module assembly and expose the sample to 100°C ± 2°C for 500 hours.

4.2.10.2 Required: All samples must not show any evidence of degradation.

4.2.11 Flammability Resistance: TMS-9544 (FMVSS 302)

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