

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)	NUMBER: MPAPS GT-31	
	Former Designation: CEMS GT-31	
TITLE: Accelerated Weathering of Non-Metallic Materials	CURRENT REV No.: 1402	DATE: February 2014
WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	SUPERSEDES: CEMS GT-31 – Feb. 2010
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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: Added section 2.2 for reference documents and sections 3.3 and 4.5 for sample evaluation. Updated section 6.0. Editorial changes.		

1.0 APPLICATION

This method outlines conditions required for the accelerated weathering of non-metallic materials for the purpose of acceptance testing.

2.0 SCOPE

Non-metallic materials submitted for approval to Materials Engineering that are subject to ultraviolet weatherability requirements are to be tested as stated in the following methods. The specific method required, test duration, and pass/fail criteria are described in the applicable material specification. Refer to the General Information section on page 2.

2.1 Restricted Chemical Substances

Effective January 1, 2007, all product supplied to the requirements of this specification must comply with the requirements of the MPAPS B-50 specification.

2.2 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.

NAVISTAR MPAPS B-50 ASTM G154
SAE J2412
SAE J2527

3.0 PREFERRED TEST METHODS

New materials submitted for approval should be qualified using one of the following two methods, depending upon application.

3.1 Method A – Interior Exposure (See Appendix A.1 for guidance on recommended exposure levels for interior trim materials.)

Xenon Arc exposure per SAE J2412 with the following modifications:

The filter shall provide a spectral power distribution similar to that of a Window-Q filter.

The irradiance control point shall be 0.74W/m² at 420 nm.

3.2 Method B – Exterior Exposure

Xenon Arc exposure per SAE J2527 with the following modifications:

The filter shall provide a spectral power distribution similar to that of a Daylight-Q filter.

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3.3 Sample Evaluation

The material shall not show any surface deterioration, minimal color or gloss change, warpage, sag, staining, delamination, or other undesirable effects after exposure. Objectionable color change is defined as a measured color change of $\Delta E \geq 3$ measured at the same location before and after exposure or on an as-received sample and exposed sample. Spectrophotometric measurements of samples shall be taken with the specular component included (SPI) or with a 0°/45° (45°/0°) geometry. The colorimetric data shall be calculated using CIE 1964 10° observer data for Illumination D₆₅. Three points must be measured and averaged in a general region per measurement reported. Exposed samples may be washed with water and blotted dry with a clean cloth prior to measurement.

4.0 ALTERNATE TEST METHODS

Existing materials may have previously been qualified using one of the following methods, and some material specifications may continue to reference these methods. If so, the test data remains valid, and there is no need to requalify the material. The method used for material qualification shall be stated in all relevant documentation.

4.1 Method C – Exterior Exposure

QUV exposure per ASTM G154 using UVA-340 lamps at an irradiance of 0.77 W/m². Test cycle will alternate 8 hours of ultraviolet light exposure at 60° C, followed by 4 hours of condensing humidity at 50° C, and then repeat.

4.2 Method D – Exterior Exposure

QUV exposure per ASTM G154 using UVB-313 QFS-40 lamps at an irradiance of 0.43 W/m². Test cycle will alternate 8 hours of light exposure at 60°C, followed by 4 hours of condensing humidity at 50° C, and then repeat.

4.3 Method E – Interior Exposure

QUV exposure per ASTM G154 using UVA-351 lamps. Test cycle will alternate 8 hours of ultraviolet light exposure at 50° C, followed by 4 hours of condensing humidity at 40° C, and then repeat.

4.4 Method F –Interior Exposure

QUV exposure per ASTM G154 using UVA-351 lamps. Test cycle is continuous ultraviolet light at 50° C only, with no condensing humidity.

4.5 Sample Evaluation

The material shall not show any surface deterioration, minimal color or gloss change, warpage, sag, staining, delamination, or other undesirable effects after exposure. Objectionable color change is defined as a measured color change of $\Delta E \geq 3$ measured at the same location before and after exposure or on an as-received sample and exposed sample. Spectrophotometric measurements of samples shall be taken with the specular component included (SPI) or with a 0°/45° (45°/0°) geometry. The colorimetric data shall be calculated using CIE 1964 10° observer data for Illumination D₆₅. Three points must be measured and averaged in a general region per measurement reported. Exposed samples may be washed with water and blotted dry with a clean cloth prior to measurement.

Additional mechanical testing may be required on select samples from Navistar Design or Materials Engineering if UV exposure is expected to result in loss of mechanical properties (i.e. Nylon materials). Specific instructions and expectations to be provided by Navistar Engineering.

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5.0 REPORT

Requirements for reporting test results are stated in the applicable materials specifications.

6.0 TECHNICAL INFORMATION

For further information related to the technical content of this specification, contact:	Suppliers may purchase controlled copies of this specification by contacting:
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