



Loose Dirt and Debris on Raw Substrates, Coated Catalysts and Catalytic Converter Assemblies

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This standard determines loose dirt and debris on/in Catalytic Converter Assemblies and their subcomponents. This document defines a Test Procedure for the determination of loose washcoat, loose substrate mass, other loose residual mass on raw substrate, coated catalysts and canned catalytic converter assemblies. The requirements for the determination for dirt and debris particulate number count are also specified.

1.2 Applicability. For all delivered catalytic converter assembly and its (sub)-systems (mat materials, metallic and ceramic raw and coated flow through substrates and ceramic raw and coated wall flow substrates).

This standard is applicable to all raw substrates, Catalytic Coatings on both metallic and non-metallic substrates and for their Catalytic Converter Assemblies including Maniverter Assemblies.

1.3 Remarks. The Catalytic Converter Assembly and its subsystems are critical emission control components. The Catalytic Converter Assembly and its subsystems interact with the Powertrain Controls and Diagnostics Systems to provide exhaust after treatment and the performance diagnostics necessary to meet all legislated requirements. To guarantee full functionality loose residual dirt and debris in the exhaust after treatment system must be limited to avoid fouling of key critical systems such as Exhaust Gas Recirculation (EGR), Turbo chargers and or otherwise detrimental to adjoining system elements (e.g., abrasive and "chemical" corrosion to the combustion chamber).

This standard aims at limiting accumulation of loose dirt along the catalytic converter assembly supply chain. For all delivered catalytic converter assembly (sub)-systems the suppliers shall guarantee conformance of herein specified residual dirt and debris values upon delivery to the next tier supplier and or assembly plant via the test procedure described. Each supplier will be held responsible for residual dirt and debris picked up after in production plant final Quality Check inspection, i.e., during shipment and storage to the next tier supplier and or assembly plant. Residual dirt and debris can originate from internal sources such as resulting from part corrosion or as resulting from damage to the part during handling or originate from external sources such as resulting from uncleanness of packaging material.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

None

2.3 Additional References.

- Catalytic Converter Assembly Component Technical Specification
- Catalytic Element Component Technical Specification

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3 Resources

The test facilities and equipment shall be in good working order and shall have a valid calibration label. Alternative test facilities and equipment may also be used if equivalency is proven. All measuring variables as specified in this specification shall be determined correctly with respect to its physical definition.

For tests performed at external supplier's test method setups and work instructions will require explicit approval through General Motors prior to first use.

3.1 Facilities.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment.

3.2.1 Unheated air vacuum pump unit with 2000 W minimum power.

3.2.2 Dry Filter material, Class A dust filter with pore sizes < 10 µm.

3.2.3 Adaptors to guarantee air tight seals between vacuum unit and test samples.

3.2.4 Fixtures for holding test samples in position.

3.2.5 Balance, accuracy ± 1 mg (e.g., Sartorius GMF 29848).

3.2.6 1 mm square opening wire mesh (e.g., SAULAS stainless steel No. 18).

3.3 Test Vehicle/Test Piece. The test material is the Catalytic Converter (Sub)-Assembly according to part drawing. The manufacturing process of the test piece shall have been finalized for the respective Supplier performing the test prior to testing.

3.4 Test Time.

Calendar time: ≈ 0.1 d

Test time: < 1 h

Coordination time: < 1 h

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Test cell operator(s) trained in setup, use, and maintenance of herein described systems.

4 Procedure

4.1 Preparation. Use of a new or an appropriately cleaned filter unit is mandatory for each test. Before sampling, test equipment cleanliness is to be assured with high air pressure to remove all residual dirt and debris from the test equipment tubing system. Prior to sampling the weight of the cleaned filter material recorded. If necessary, moisture uptake shall be accommodated for in the measured result.

4.2 Conditions.

4.2.1 Environmental Conditions. The test shall be performed under ambient atmospheric conditions (room temperature).

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 The test sample(s) shall be secured in a leakage free rig designed specifically for the herein specified vacuuming process, e.g., the rig shall be suited to accommodate the outer dimensions and flange/exterior interfaces of the specific part (see Appendix A, Figure A1 and Figure A2).

4.3.2 The test sample shall be vacuumed for 30 s at a constant air mass throughput similar to the maximum exhaust gas flow of the engine application for which the test sample has been designated for. Vacuum operation shall be repeated with the test sample rotated 180 degrees relative to exhaust flow direction at identical air throughput and duration at same conditions. After vacuuming it shall be ensured that the piping upstream of the

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