



Cast Iron Flywheel Porosity

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 specification describes cast iron flywheel porosity inspection requirements.

1.2 Applicability. All GM engines using cast iron flywheels.

1.3 Remarks. This specification serves as a porosity inspection standard to quantify flaws in machined and non-machined flywheel surfaces. It includes "visible to the naked eye" porosity inspection requirements.

2 References

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

2.1 External Standards/Specifications.

ASTM E689

2.2 GM Standards/Specifications.

GMW3059

3 Requirements

3.1 Porosity and other Discontinuities. Applies after machining of the flywheel, prior to the application of any coating or surface treatment where the bottom of the porosity or other discontinuity is "visible to the naked eye". See 6.1 Glossary.

3.1.1 Internal Porosity Inspection.

3.1.1.1 Radiographic Inspection. Radiography inspection to be done in accordance to ASTM E689. Categories A, B, and C not to exceed Level 2.

3.1.1.2 Metallographic Inspection. As an alternative to ASTM E689 (3.1.1.1), a metallographic inspection of a "thin" and "thick" section shall be performed per 3.1.1.2.1 and 3.1.1.2.2.

3.1.1.2.1 Thin Section. Thickness < 9 mm. Pore diameter 1 mm maximum, coverage area < 5%.

3.1.1.2.2 Thick Section. Thickness > 9 mm. Pore diameter 3 mm maximum, coverage area < 10%.

Note:

3.1.2 Surface Porosity Inspection. Figure 1 shows a pictorial representation of various zones of the flywheel where visual surface porosity inspection criteria apply. Table 1 contains a description of the zones.

3.1.2.1 Porosity. The allowable size and quantity limits of porosity are listed in Table 2. A case is defined as an individual hole or a cluster of holes which fit within the sizes shown. Shrinks, inclusions, and blows are all defined as "porosity" and follow the same rules. Each shrink, inclusion, or blow is considered one case.

3.1.2.2 Porosity Spacing. The minimum distance between any porosity holes or clusters in the same zone is 8 mm.

3.1.2.3 Depressions Dings, Dents, etc. The allowable depression sizes are shown in Table 3. The limits allow a local area of the size shown to be outside of profile tolerance.

