



SURFACE VEHICLE INFORMATION REPORT

J358™

DEC2017

Issued 1968-09
Revised 1991-02
Stabilized 2017-12

Superseding J358 FEB1991

Nondestructive Tests

RATIONALE

The technical report covers technology, products, or processes which are mature and not likely to change in the foreseeable future.

STABILIZED NOTICE

This document has been declared "Stabilized" by the SAE Metals Technical Executive Steering Committee and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2017 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
<http://www.sae.org>

SAE WEB ADDRESS:

Full document details: SAE J358_201712

SAE values your input. To provide feedback on this Technical Report, please visit http://standards.sae.org/J358_201712

Foreword—This Document has also changed to comply the new SAE Technical Standards Board Format.

1. **Scope**—Nondestructive tests are those tests which detect factors related to the serviceability or quality of a part or material without limiting its usefulness. Material defects such as surface cracks, laps, pits, internal inclusions, bursts, shrink, seam, hot tears, and composition analysis can be detected. Sometimes their dimensions and exact location can be determined. Such tests can usually be made rapidly. Processing results such as hardness, case depth, wall thickness, ductility, decarburization, cracks, apparent tensile strength, grain size, and lack of weld penetration or fusion may be detectable and measurable. Service results such as corrosion and fatigue cracking may be detected and measured by nondestructive test methods. In many cases, imperfections can be automatically detected so that parts or materials can be classified.

The SAE Handbook describes the following nondestructive test methods:

SAE J359—Infrared
SAE J420—Magnetic Particle
SAE J425—Eddy Current
SAE J426—Liquid Penetrant
SAE J427—Penetrating Radiation
SAE J428—Ultrasonic
SAE J1242—Acoustic Emission
SAE J1267—Leakage Testing

Table 1 summarizes the principal features of most of these tests. In addition to the tests described, other nondestructive tests exist which are less well established, but whose use is expanding. Among these are microwave tests, holography, and sonic tests. Microwaves are used to locate defects in nonmetallic substances and to determine some physical characteristics of those materials. Optical holography uses coherent light from a laser beam to detect strains and defects in materials by means of three-dimensional imaging and interferometry techniques. Acoustical holography uses ultrasonic waves to image discontinuities in the interior of solids. Recent refinements in sonic testing permit more objective determination of the physical properties of cast iron. Complete information concerning each nondestructive test can be obtained from books listed in the bibliographies of the aforementioned reports.