



SURFACE VEHICLE RECOMMENDED PRACTICE

J2340

MAR2017

Issued 1999-10
Stabilized 2017-03

Superseding J2340 OCT1999

Categorization and Properties of Dent Resistant, High Strength, and Ultra
High Strength Automotive Sheet Steel

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

STABILIZED NOTICE

This document has been declared "Stabilized" by the SAE Sheet and Strip Steel 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:

**SAE values your input. To provide feedback on this
Technical Report, please visit**
http://standards.sae.org/J2340_201703

Foreword—The primary reason higher strength steels are used is because their yield and tensile strengths are higher than those of low-carbon sheet steel, which are described in SAE J2329. Higher strength steels are desirable for dent resistance, increased load bearing capability, better crash energy management, or for part mass reduction through a decrease in sheet metal thickness.

An increase in strength generally leads to reduced ductility or formability. Care must be taken in designing parts, tooling, and fabrication processes to obtain the greatest benefit from the higher strength sheet steels. Consultation in grade selection between user and steel producer is recommended to insure compatibility of the strength and forming characteristics.

Strength in these steels is achieved through chemical composition (alloying) and special processing. Special processing includes mechanical rolling techniques, temperature control in hot rolling, and time/temperature control in annealing of cold-reduced steel. Further or additional thermal treatment may modify the original mechanical properties.

1. **Scope**—This SAE Recommended Practice defines and establishes mechanical property ranges for seven grades of continuously cast high strength automotive sheet steels that can be formed, welded, assembled, and painted in automotive manufacturing processes. The grade of steel specified for an identified part should be based on part requirements (configuration and strength) as well as formability. Material selection should also take into consideration the amount of strain induced by forming and the impact strain has on the strength achieved in the finished part. These steels can be specified as hot-rolled sheet, cold-reduced sheet, uncoated, or coated by hot dipping, electroplating, or vapor deposition of zinc, aluminum, and organic compounds normally applied by coil coating. The grades and strength levels are achieved through chemical composition and special processing. Not all combinations of strength and coating types may be commercially available. Consult your steel supplier for details.

2. References

2.1 Applicable Publications—The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE and ASTM publications shall apply.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J1058—Standard Sheet Thickness' and Tolerances

SAE J1562—Selection of Zinc and Zinc-Alloy (Hot Dipped and Electrodeposited) Coated Steel Sheet

SAE J2329—Categorization and Properties of Low Carbon Automotive Sheet Steels

2.1.2 ASTM PUBLICATIONS—Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM A 370—Standard Test Methods and Definitions for Mechanical Testing of Steel Products

ASTM A 980—Standard Specification for Steel Sheet, Carbon, Ultra High Strength Cold Rolled

ASTM E 8M—Standard Test Methods of Tension of Metallic Materials

ASTM E 517—Standard Test Method for Plastic Strain Ratio r for Sheet Metal

ASTM E 646—Standard Test Method for Tensile Strain-Hardening Exponents (n value) of Metallic Sheet Materials

2.1.3 ANSI/AWS/SAE PUBLICATION—Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ANSI/AWS/SAE D8.8-97—A Specification for Automotive and Light Truck Component Weld Quality - Arc Welding

2.1.4 OTHER PUBLICATION

AZ-017-02-295 1.0C RI—Weld Quality Test Method Manual; Standardized Welding Test Method Task Force, Auto/Steel Partnership (A/SP)

2.2 Related Publications—The following publications are provided for information purposes only and are not a required part of this document.

2.2.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J416—Tensile Test Specimens

SAE J810—Classifications of Common Imperfections in Sheet Steel

SAE J1392—Steel, High Strength, Hot Rolled Sheet and Strip, Cold Rolled Sheet, and Coated Sheet

SAE J2328—Selection and Specification of Steel Sheet, Hot Rolled, Cold Rolled, and Coated for Automotive Applications.

2.2.2 ASTM PUBLICATIONS—Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM A 463—Standard Specification for Cold Rolled Aluminum Coated Type 1 & Type 2 Steel Sheet

ASTM A 568—General Requirements for Carbon and High Strength, Low Alloy Steel Sheet.

ASTM A 653—Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvanneal) by the Hot-Dip Process.

ASTM A 751—Standard Test Methods for Determining Chemical Composition of Steel Products

ASTM A 924—General Requirements for Steel Sheet Metallic Coated by the Hot Dip Process

2.2.3 ISO PUBLICATION—Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ISO 13887—Cold Reduced Steel Sheet of Higher Strength with Improved Formability