
**Metallic materials — Sheet and strip
— Hole expanding test**

Matériaux métalliques — Tôles et bandes — Essai d'expansion de trou

Sample Document

get full document from standards.iteh.ai



Reference number
ISO 16630:2017(E)

© ISO 2017

Sample Document

get full document from standards.iteh.ai



COPYRIGHT PROTECTED DOCUMENT

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Symbols and designations	2
5 Principle	2
6 Apparatus	3
7 Test piece	3
8 Test procedure	5
9 Calculation of test data	6
10 Test report	7

Sample Document

get full document from standards.iteh.ai

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 2, *Ductility testing*.

This second edition cancels and replaces the first edition (ISO 16630:2009), which has been technically revised.

The main changes compared to the previous edition are:

- “through-thickness crack” (3.3) and “microcrack” (3.4) have been added;
- the statement regarding an inspection of the punching tool in 7.5 has been revised and a note has been added;
- the requirement during the punching process has been added as 7.6;
- the test procedures in 8.6 and 8.7 have been revised;
- it has been revised that the average limiting hole expansion ration, $\bar{\lambda}$, shall be rounded to an integer value. Also, the method of rounding-off has been revised from ISO 497 to ISO 80000-1:2009 (Clause 2 and 9.4).

Introduction

In automotive parts manufacturing, sheet metal is primarily processed by shearing, bending and stretch-drawing operations.

Included with these processes are the bending up (plunging) of flanges (rims) around punched holes, and this can result in rupture of the material.

Various test methods are available to establish the suitability of the sheet metal for the forming processes involved. The hole expanding test is one of the best methods for evaluating the suitability of the sheet metal for forming such “flanges” because it closely resembles the process used under production conditions to form such flanges (plunged rims) starting with punched holes.

Because of the details given in this document, the relevance of the test will be immediately apparent. By adhering to the procedures laid down in this document, scatter in the test results is minimized.

Sample Document

get full document from standards.iteh.ai