SVENSK STANDARD
SS-EN ISO 12996:2013

Fastställd/Approved: 2013-07-07
Publicerad/Published: 2013-07-08
Utgåva/Edition: 1
Språk/Language: engelska/English
ICS: 25.160.10; 25.160.40

Mekanisk sammanfogning – Skjuvdragprovning av enkelnitförband – Dimensioner för provstycken och provningsförfarande (ISO 12996:2013)

Mechanical joining – Destructive testing of joints – Specimen dimensions and test procedure for tensile shear testing of single joints (ISO 12996:2013)

Standarder får världen att fungera

SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.

Delta och påverka
Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

Ta del av det färdiga arbetet
Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standard-paket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

Utveckla din kompetens och lyckas bättre i ditt arbete
Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på www.sis.se eller ta kontakt med oss på tel 08-555 523 00.

Standards make the world go round

SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.

Take part and have influence
As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

Get to know the finished work
We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

Increase understanding and improve perception
With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

If you want to know more about SIS, or how standards can streamline your organisation, please visit www.sis.se or contact us on phone +46 (0)8-555 523 00

Europastandarden EN ISO 12996:2013 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 12996:2013.

The European Standard EN ISO 12996:2013 has the status of a Swedish Standard. This document contains the official version of EN ISO 12996:2013.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Svetsteknik, SIS/TK 134.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 12996

July 2013

ICS 25.160.40; 25.160.10

English Version

Mechanical joining - Destructive testing of joints - Specimen dimensions and test procedure for tensile shear testing of single joints (ISO 12996:2013)

Assemblage mécanique - Essais destructifs des jonctions - Dimensions des éprouvettes et procédures d'essai pour essais de traction-cisaillement des jonctions uniques (ISO 12996:2013)

Mechanisches Fügen - Zerstörende Prüfung von Verbindungen - Probenmaße und Prüfverfahren für die Scherzugprüfung von Einpunktproben (ISO 12996:2013)

This European Standard was approved by CEN on 15 June 2013.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN ISO 12996:2013: E

Contents

Page

Foreword

This document (EN ISO 12996:2013) has been prepared by Technical Committee ISO/TC 44 "Welding and allied processes" in collaboration with Technical Committee CEN/TC 121 “Welding and allied processes” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2014, and conflicting national standards shall be withdrawn at the latest by January 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 12996:2013 has been approved by CEN as EN ISO 12996:2013 without any modification.

Mechanical joining — Destructive testing of joints — Specimen dimensions and test procedure for tensile shear testing of single joints

1 Scope

This International Standard specifies the geometry of the test specimens and the procedure for the tensile shear testing of single mechanical joints on single and multilayer specimens up to a single sheet thickness of 4,5 mm.

The term sheet, as used in this International Standard, includes extrusions and cast materials.

The purpose of the tensile shear test is to determine the mechanical characteristics and failure modes of the joints made with the different methods.

This International Standard does not apply to civil engineering applications such as metal building and steel construction which are covered by other applicable standards.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

ISO 7500-1, *Metallic materials — Verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Verification and calibration of the force-measuring system*

3 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

3.1
tensile shear force
F_{max}
maximum force recorded in the test

Note 1 to entry: If required, further characteristic data, e.g. $F_{p0,2}$ (see 3.2), stiffness of the specimen c (see 3.7) or slope of the force curve, energy dissipation W (see 3.8), can be determined according to the shear diagram given in Figure 4.

3.2
elastic force limit
F_e
force where predetermined plastic or permanent displacement of the test specimen occurs

3.3
slippage force
F_s
force at which a relative movement of the joined parts is registered

3.4
displacement
s
change in the length of a specimen due to the application of a force

[SOURCE: ISO 18592:2009,[1] 3.15 modified — symbol changed; "force" replaces "load"]

3.5
displacement at the tensile shear force F_{max}
$s_{F_{max}}$
amount of displacement measured at tensile shear force F_{max}

3.6
displacement at $0{,}3F_{max}$
$s_{0,3F_{max}}$
amount of displacement measured at $0{,}3F_{max}$

3.7
stiffness in elastic range
c
ratio of increase of force to the increase of elongation in the elastic range ($c = \Delta F/\Delta s$)

3.8
dissipated energy
W
work or area under the force curve

3.9
dissipated energy up to F_{max}
$W_{F_{max}}$
area under the force curve up to the point of maximum tensile shear force F_{max}

$$W_{F_{max}} = \int_{s=0}^{s_{F_{max}}} F.\mathrm{d}s$$

3.10
dissipated energy up to $0{,}3F_{max}$
$W_{0,3F_{max}}$
area under the force curve up to the point where the tensile shear force drops to 30 % of F_{max}

$$W_{0,3F_{max}} = \int_{s=0}^{s_{0,3F_{max}}} F.\mathrm{d}s$$

Note 1 to entry: The $0{,}3F_{max}$ limit was introduced in order to reduce the time for carrying out the tensile shear test, because generally the area under the force curve after $0{,}3F_{max}$ does not contribute significantly to the dissipated energy.

3.11
dissipated energy up to fracture
$W_{fracture}$
total area under the force curve

$$W_{fracture} = \int_{s=0}^{s_{fracture}} F.\mathrm{d}s$$

3.12
interference fit joint
form fit joint
property of a joint in which the transmission of external forces, in particular shear forces, is effected by geometrical elements which prevent the movement of the components relative to one another

Note 1 to entry: This condition is frequently achieved by the fastener's outer diameter surface having complete contact with the joint's component holes.

Note 2 to entry: Compare *clearance fit joint* (3.13).

3.13
clearance fit joint
force fit joint
non-interference fit joint
property of a joint in which external forces, in particular shear forces, are transmitted through friction and if the force to be transmitted is greater than the frictional force, then frictional locking is overcome and the components move relative to one another

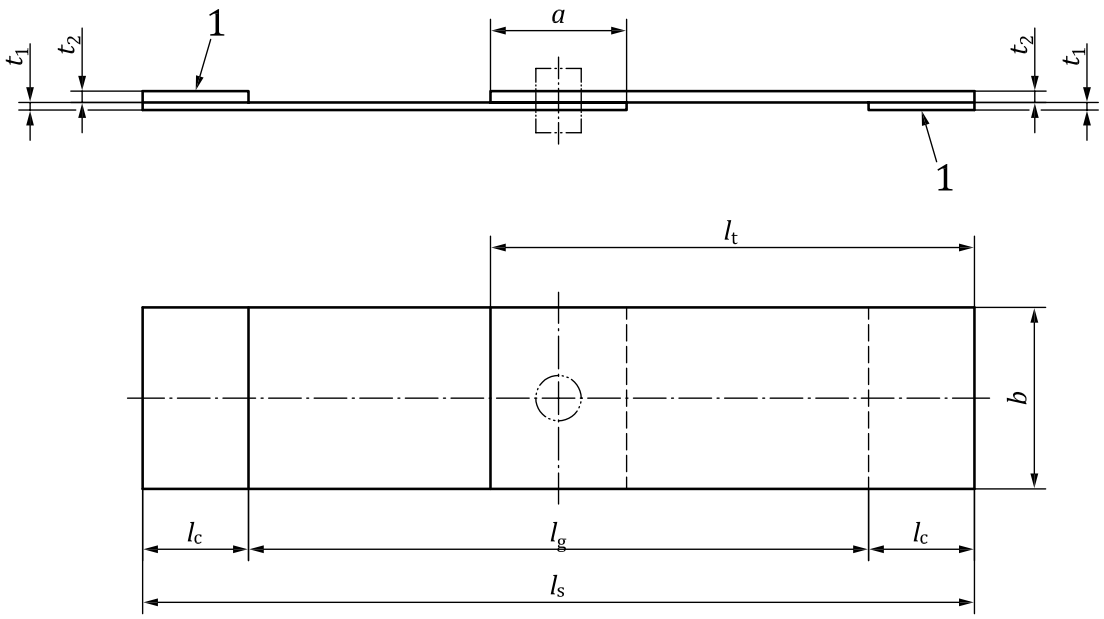
Note 1 to entry: This condition is frequently achieved by the fastener's outer diameter surface having incomplete contact with the joint's component holes.

Note 2 to entry: Compare *interference fit joint* (3.12).

4 Test specimens and types of tests

See Figures 1 and 2.

Tolerances according to ISO 2768-1 are applicable to the dimensions of the specimens given in Table 1.



Key

a	overlap	l_s	total length of specimen	t_1, t_2	sheet thickness
b	coupon width	l_g	specimen length between clamps	1	shim plates
l_c	length of clamped area	l_t	coupon length	2	mechanical joint

Figure 1 — Single-lap tensile shear test specimens