

Welding — Design and non-destructive testing of welds

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National foreword

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Summary of pages

This document comprises a front cover, an inside front cover, the CEN/TR title page, pages 2 to 20, an inside back cover and a back cover.

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English version

Welding - Design and non-destructive testing of welds

Soudage - Conception et essais non destructifs des
assemblages soudés

Schweißen - Gestaltung von Schweißnähten und ihre
zerstörungsfreie Prüfung

This Technical Report was approved by CEN on 15 May 2005. It has been drawn up by the Technical Committee CEN/TC 121.

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Foreword

This Technical Report (CEN/TR 15135:2005) has been prepared by Technical Committee CEN/TC 121 “Welding”, the secretariat of which is held by DIN.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Report: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This Technical Report is an information document and provides guidance for design and evaluation of various joint types and geometrical configurations concerning the accessibility or ability of the weld to be examined with non-destructive testing methods.

2 General

The application of non-destructive testing is highly dependent on the geometrical conditions (among others) of the component, the configuration and accessibility of the joint.

This is particularly true for volumetric methods, radiographic and ultrasonic testing.

The methods for surface testing visual, magnetic particle, penetrant and eddy current are primarily dependent on the surface conditions and accessibility.

There are a very wide range of geometrical conditions. This Technical Report shows examples for general non-destructive evaluation of welded joints in Table 1. More specific examples for the evaluation of different weld types representing various applications are shown in Table 2.

The examples are intended to give guidance when planning for non-destructive testing during design and fabrication.

The examples in this Technical Report can be used for specifying non-destructive methods in accordance with EN 12062.

3 Evaluation of a design for non-destructive testing

The following tables show the suitability of the non-destructive testing methods for different types of joint configuration.

Each serial number starts with a joint configuration, showing:

- a) the least acceptable configuration for testing;
- b) a better joint configuration for testing;
- c) the best configuration;
- d) more modifications.

The letters following the serial number define the different test methods:

- visual testing VT;
- ultrasonic testing UT;
- radiographic testing RT;
- magnetic particle testing MT;
- penetrant testing PT.

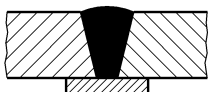
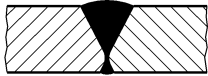
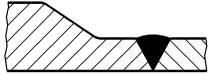
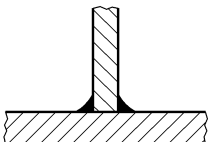
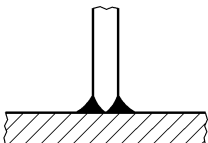
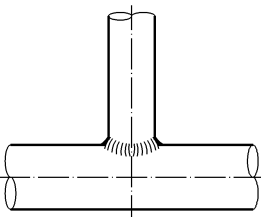
The following conventions are also used:

- + implies that the method is applicable and that the results will satisfy ordinary requirements;
- (+) implies that the method has a limited application. The method should be supplemented with another method;
- - implies that the method cannot be used or that the results are not sufficient.

It should be noted that in ultrasonic testing the direction of the sound beam, and in radiography the direction of the radiation beam relative to the anticipated imperfections, is very important.

The metallurgical structure of a material, its thickness, surface finish and geometry can have a significant affect on the non-destructive test method.

Table 1 — General evaluation of welded joints

Serial no.	Example		NDT method					Remarks
			VT	UT	RT	MT	PT	
1a			+	-	(+)	+	+	
1b			+	(+)	+	+	+	
1c			+	+	+	+	+	
1d			+	+	+	+	+	
2a			+	+	+	+	+	
2b			+	+	+	+	+	
3a			+	(+)	(+)	+	+	
3b			+	+	(+)	+	+	
4a			+	(+)	(+)	+	+	
(to be continued)								