

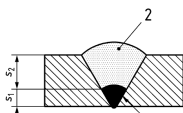
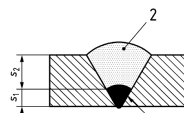
## EN 287-1:2011 versus EN 287-1:2004 (en)

### Lühikokkuvõtte olulisematest muudatustest

EN 287-1 „Keevitajate atesteerimine. Sulakeevitus. Osa 1“ on üks olulisemaid keevitusvaldkonna standardeid, millega puutuvad igapäevaselt kokku nii tootjad, keevitajad, sertifitseerijad, koolitajad kui ka tellijad. Standard määratleb keevitajate atesteerimiskatse reeglid ning protseduurid ning kirjeldab heakskiitmisel oluliste muutujate atesteerimispiirid.

Antud dokumendis on toodud tabelipõhine kirjeldus 2011. aastal toimunud teksti- ja sisumuudatustest ning käesolev dokument on kasutamiseks ainult informatiivse abimaterjalina. Tabelis toodud väljavõtted on standardite ingliskeelsest originaaltekstist.

Võrdlustabel:

EN 287-1_2004 (old/vana)	EN 287-1_2011 (new/uus)
<b>3. Terms and definitions / Terminid ja määratlused</b>	
<i>EKÜ: definitsioon puudub</i>	<b>3.2 manufacturer</b> person or organization that is responsible for the welding production ( <i>EKÜ: tootja - on vastutav keevitustootmise eest</i> )
<b>3.4 backing</b> material placed at the reverse side of a joint preparation for the purpose of supporting molten weld metal	<b>3.5 material backing</b> backing using material for the purpose of supporting molten weld metal ( <i>EKÜ: tõlkena juuretoe materjal. Juuregaas siia alla liigitu</i> )
<i>EKÜ: definitsioon puudub</i>	<b>3.6 layer</b> stratum of weld metal consisting of one or more runs ( <i>EKÜ: Keevismetalli kiht, mis koosneb ühest või mitmest läbimist</i> )
<b>3.8 weld metal thickness</b> thickness of the weld metal excluding any reinforcement	<b>3.10 deposited thickness</b> thickness of the weld metal excluding any reinforcement ( <i>EKÜ: tõlkena keevismetalli paksus</i> )
<i>EKÜ: definitsioon puudub</i>	<b>3.11 leftward welding</b> gas welding technique in which the filler rod is moved ahead of the blow pipe in relation to the welding direction
<i>EKÜ: definitsioon puudub</i>	<b>3.12 rightward welding</b> gas welding technique in which the filler rod is moved behind the blow pipe in relation to the welding direction
<i>EKÜ: definitsioon puudub</i>	<b>3.13 branch connection</b> joint of one or two tubular parts at an angle of less than 180°
<i>EKÜ: definitsioon puudub</i>	<b>3.14 fillet weld</b> triangular weld in a square preparation for making a T-joint, corner joint or lap joint
<i>EKÜ: definitsioon puudub</i>	<b>3.15 verification</b> confirmation, through the provision of objective evidence, that specified requirements have been fulfilled ( <i>EKÜ: kontrollimine, tõendamine</i> )
<i>EKÜ: definitsioon puudub</i>	<b>3.16 filler material</b> welding consumable added during welding to form the weld
<i>EKÜ: definitsioon puudub</i>	<b>3.17 butt weld</b> weld other than a fillet weld (3.14) made in a groove or in a square preparation
<b>4.2 Reference numbers of welding processes/Keevisprotsesside viitenumbrid</b>	
<i>EKÜ: definitsioon puudub, kasutati tähist 136</i> <i>EKÜ: definitsioon puudub, kasutati tähist 141</i> <i>EKÜ: definitsioon puudub</i> <i>EKÜ: definitsioon puudub</i>	<b>138</b> MAG welding with metal cored electrode; ( <i>metalltäidistraat</i> ); <b>142</b> Autogenous TIG welding ( <i>EKÜ: keevitamine ilma lisamaterjalita</i> ); <b>143</b> TIG welding with tubular cored filler material; <b>145</b> TIG welding using reducing gas and solid filler material;
<b>4.3 Symbols and abbreviations / Sümbolid ja lühendid</b>	
<b>s1 weld metal thickness for welding process 1</b> <b>s2 weld metal thickness for welding process 2</b>  $t = s_1, t = s_2, t = s_1 + s_2$	<b>s1 deposited thickness of weld metal for welding process 1</b> <b>s2 deposited thickness of weld metal for welding process 2</b>  $t = s_1, t = s_2, t = s_1 + s_2$

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<p><b>t1</b> material thickness of test piece for welding process 1  <b>t2</b> material thickness of test piece for welding process 2</p> <p><b>t = t1, t = t2, t = t1 + t2</b></p>	<p><b>t</b> material thickness of test piece (plate or wall thickness)  <i>(EKÜ: kontroll-liite materjalipaksust standardis enam ei jaotata)</i></p> <p><b>t = s1, t = s2, t = s1 + s2</b></p>
<p><b>z</b> leg length of fillet weld</p>	<p><i>(EKÜ: standardis keevisõmbuluse kaateti z definitsiooni enam ei kasutata)</i></p>

5.2 Welding processes / Keevitusprotsessid

<p>Changes of solid wire <b>S</b> (welding process <b>135</b>) to metal <b>core wire M</b> (welding process <b>136</b>) or vice versa which do not require a new qualification test (see Table 3).</p>	<p>— a change from <b>solid wire</b> electrode <b>135</b> to a <b>metal cored electrode 138</b> or vice versa does not require requalification;          — welding with 141, 143 or 145 qualifies for 141, 142, 143 and 145 but 142 only qualifies for 142.  <i>(EKÜ: täistraat-elektroodiga protsess tähisega 135, metalltäidstraadiga protsess tähisega 138, täidstraat protsess tähisega 136. Protseess 136 atesteerib ainult protseessi 136. Ilma lisamaterjalita protsess 142 (TIG) atesteerib ainult iseennast )</i></p>
<p>The ranges of qualification for each <b>welding process</b> used and for the multi process joint for <b>butt welds</b> are given in Table 1 (see also Table 4).</p>	<p>The ranges of qualification concerning the <b>deposited thickness of weld metal for each welding process</b> used and for the <b>multi process joint for butt welds</b> are given in Table 1 (see also Table 5).  <i>(EKÜ: sõnastuse ja terminoloogia muudatus)</i></p>

5.4 Type of weld / Keevisõmbuluse tüüp

<p>b) in cases where the <b>majority of work is fillet welding</b>, the welder <b>shall also be qualified</b> by an appropriate fillet welding test; <b>in cases where the majority of work is butt welding, butt welds qualify fillet welds;</b>  <i>(EKÜ: definitsioon puudub)</i></p>	<p>b) butt welds <b>do not qualify</b> fillet welds or vice versa;  <i>(EKÜ: NB! Standardi kõige olulisem muudatus: BW liide ei atesteeri enam FW liidet)</i></p>
	<p>c) when a welder is qualified by <b>butt weld test</b>, a <b>supplementary fillet weld test</b> piece can be welded which shall be in a plate thickness of at <b>least 10 mm</b> and completed using a <b>single layer in the PB position</b>. For this supplementary test the welder shall become <b>qualified for all fillet welds as given for the butt weld qualifications;</b> <i>(EKÜ: FW liite saab atsteerida koos BW liitega keevitades ja katsetades standardi nõutud mahus lisakatse)</i></p>

5.6 Welding consumables (old)

5.6 Filler materials (new) / Lisamaterjalid

electrode core (M)	Metal cored (M)
electrode core (B)	Flux cored (B)
electrode core – (R, P, V, W, Y, Z)	Flux cored – (R, P, V, W, Y, Z)

5.8 Welding positions / Keevisõmbuluse asendid

<p>Welding two pipes with the same outside pipe diameter, one in welding position <b>PF</b> and one in welding position <b>PC</b>, also covers the range of qualification of a pipe welded in welding position H-L045.</p>	<p>Welding two pipes with the same outside pipe diameter, one in welding position <b>PH</b> and one in welding position <b>PC</b>, also covers the range of qualification of a pipe welded in welding position H-L045.  <i>(EKÜ: toru keevitusasendi tähise muudatus: PF(pipe) -&gt; PH)</i></p>
<p>Welding two pipes with the same outside pipe diameter, one in welding position <b>PG</b> and one in welding position <b>PC</b>, also covers the range of qualification of a pipe welded in welding position J-L045.</p>	<p>Welding two pipes with the same outside pipe diameter, one in welding position <b>PJ</b> and one in welding position <b>PC</b>, also covers the range of qualification of a pipe welded in welding position J-L045.  <i>(EKÜ: toru keevitusasendi tähise muudatus: PG(pipe) -&gt; PJ)</i></p>
<p>Outside pipe diameters <math>D \geq 150</math> mm can be welded in two welding positions (<b>PF</b> or <b>PG</b> 2/3 of circumference, <b>PC</b> 1/3 of circumference) using only one test piece.</p>	<p>Outside pipe diameters <math>D \geq 150</math> mm can be welded in two welding positions (<b>PH</b> or <b>PJ</b> 2/3 of circumference, <b>PC</b> 1/3 of circumference) using only one test piece.  <i>(EKÜ: toru keevitusasendi tähise muudatus)</i></p>

Table 7 Range of qualification for welding positions

**PF** (Pipe)  
**PG** (Pipe)

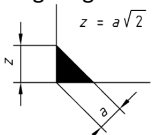
Test pos.	Range of qualification						
	PA	PB	PC	PD	PE	PF (plate)	PF (pipe)
<b>PE</b>	x	x	x	x	x	x	

Table 8 Range of qualification for welding positions

**PH** (Pipe)  
**PJ** (Pipe)

Test pos.	Range of qualification						
	PA	PB	PC	PD	PE	PF (plate)	PH (pipe)
<b>PE</b>	x	x	x	x	x	x	<b>x</b>

*(EKÜ: Atesteerimispiiri muudatus. Täiendus viidi sisse 2006. aastal lisaga A1. Muudetud toru keevitusasendi tähistust.)*

6.2 Shapes, dimensions and numbers of test pieces (old)	6.2 Test pieces (new)/ Kontroll-liited
<p>Figure 2 and 4 Dimensions of test piece for a fillet weld on plate</p> <p><b>Key</b></p> <p><b>a</b> Design throat thickness</p> <p><b>t</b> Material thickness of test piece</p> <p><b>z</b> Leg length of fillet weld</p>  <p><math>z = a\sqrt{2}</math></p> <p><math>0,5 \times t \leq a \leq 0,7 \times t</math></p>	<p>Figure 2 and 4 Dimensions of test piece for a fillet weld on plate</p> <p><b>Key</b></p> <p><b>t</b> material thickness of test piece</p> <p>NOTE: The parent materials may be of dissimilar thickness.</p> <p><i>(EKÜ: standardis enam ei kasutata tähiseid a, z ning on eemaldatud nurkõmbuse eskiis koos soovitusliku vahemikuga)</i></p>
6.3 Welding conditions / Keevitamise tingimused	
<p>- the welder shall be allowed to remove minor imperfections by grinding, except on the <b>surfaces after finishing the weld</b>. The permission of the examiner or examining body shall be obtained;</p>	<p>- the welder shall be allowed to remove minor imperfections by grinding, except for <b>capping run(s)</b> for which <b>only the stop and start</b> may be ground; the permission of the examiner or examining body shall be obtained; <i>(EKÜ: täpsustatud on lubatud keevitusjärgset töötlust. Võimalik lihvida pinnaläbimi peatus/jätkamiskohta ja seda ainult eksamineerija loal)</i></p>
<p>— any post-welded heat treatment required in the pWPS or WPS can be omitted unless <b>bend tests are required</b>;</p>	<p>— any post-welded heat treatment required in the pWPS or WPS can be omitted at the <b>discretion of the manufacturer</b>. <i>(EKÜ: tootjal on õigus ära jätta WPSis näidatud keevitusjärgne termotöötlus)</i></p>
6.4 Test methods / Katsemeetodid	
<p>When permanent backing was used in the qualification test it shall be removed prior to destructive testing.</p>	<p>When permanent backing was used in the qualification test it shall be removed prior to destructive testing, <b>but need not be removed before non-destructive testing (NDT)</b>. <i>(EKÜ: kui see ei sega katsete läbiviimist ega tulemuste hindamist, siis püsivat juuretuge ei pea enne NDT teste eemaldama)</i></p>
6.5.2 Butt weld in plate and pipe / Plaadi ja toru pökkõmbus	
<p><b>For pipes</b>, the number of the additional fracture or transverse bend test specimens to welding processes 131, 135, <b>136 (only metal cored wire)</b> or 311, using the radiographic testing, depends on the welding position.</p>	<p>When using radiography, the number of additional fracture or transverse bend test specimens for welding processes 131, 135, <b>138</b> or 311, depends on the welding position. <i>(EKÜ: metalltäidistraat-protsessi tähise muudatus: 136 -&gt; 138)</i></p>
7 Acceptance requirements for test pieces /Kontroll-liidete aktsepteerimise nõuded	
<p>A welder is qualified if the imperfections are within quality level B in EN ISO 5817, except for imperfections types as follows; excess weld metal, excessive convexity, excessive throat thickness and excessive penetration, for which level C shall apply.</p>	<p>A welder is qualified if the imperfections are within quality level B in EN ISO 5817, except for imperfections types as follows; excess weld metal, excessive convexity, excessive throat thickness, excessive penetration, <b>incorrect weld toe and undercut</b> for which level C shall apply. <i>(EKÜ: järsk õmbuse üleminek ja sisselõige lisatud C taseme aktsepteerimisnõuete alla)</i></p>
8 Re-tests / Korduskatsed	
<p>If it is established that failure is due to metallurgical or other extraneous causes that cannot be directly attributed to the welder's lack of skill, an additional test is required in order to assess the quality and integrity of the new test material and/or new test conditions.</p>	<p><i>(EKÜ: atesteerimisel antud reeglit enam ei kasutata)</i></p>
9.2 Confirmation of the validity / Kehtivuse kinnitamine	
<p>This is providing that the welding coordinator or the responsible personnel of the employer can confirm that the welder has been working within the initial range of qualification. This shall be confirmed every six months.</p>	<p>This is providing that the welding coordinator or the responsible personnel of the employer can confirm that the welder has been welding within the initial range of qualification. This shall be confirmed every six months <b>and an electronic signature may be used</b>. <i>(EKÜ: tunnistuse pikendamisel lubatud elektrooniline kinnitamine/signeerimine)</i></p>