

QUALITY REQUIREMENTS for welding <sup>a</sup>
EN ISO 3834

Grouping of materials
Welder qualification
WPS
Welding procedure qualification
Welding operator qualification
NDT-personnel
Welding coordination
Inspection & testing during welding
- Measurement of preheat and interpass temp.
- Recommendations for welding
- Comparison of methods for avoidance of cold cracks
Inspection & testing after welding
- NDT – General rules
- Visual testing
- Radiographic testing
- Ultrasonic testing
- Magnetic particle testing
- Macro- & microscopic testing
- Penetrant testing (general)
Post-weld heat treatment
Calibration/validation

Qual.lev. fusion welding (not beam)
Quality levels for beam welding
Quality levels for cutting
Joint preparation

	Other	
Joint details	Pressurized comp./Steel constr.	EN 1708-1 & -2 (ISO 'missing')
Geometric imperfections	Fusion welding/Pressure welding	EN ISO 6520-1 & -2
	Thermal cuts	EN 12584 (ISO 'missing')
	Designation system	CEN ISO/TS 17845
	See continued	

<sup>a</sup> References in fields with this colour are directly linked to EN ISO 3834 (ex EN 729)  
<sup>b</sup> The ISO-reference in brackets is in most cases identical with or is based on corresponding EN  
<sup>c</sup> Not published February 2008

## European (international<sup>b</sup>) standards for fusion welding

Copper		Nickel		Titanium & Zirconium			
EN ISO 9606-3		EN ISO 9606-4		EN ISO 9606-5			
Gas welding		Electron beam welding		Laser welding			
EN ISO 15609-2		EN ISO 15609-3		EN ISO 15609-4			
Cast iron		Titanium & Zirconium		Copper			
prEN ISO 15614-3 <sup>c</sup>		EN ISO 15614-5		EN ISO 15614-6			
Overlay welding		Tube to tube plate		Beam welding			
EN ISO 15614-7		EN ISO 15614-8		EN ISO 15614-11			
Clad steel		Laser		Electron beam		Cast iron	
EN 1011-5 (ISO/TR 17671-5)		EN 1011-6 (ISO/TR 17671-6)		EN 1011-7 (ISO/TR 17671-7)		EN 1011-8 (ISO/TR 17671-8)	
Environment, health & safety						Product	
Fume sampling in laboratory						Quality req. for manufacturing	
Fume sampling in breathing zone						Technical delivery conditions	
Filters						Procurement	
Eye protection						Type testing	
Protective clothing						Testing	
Welding curtains						TIG-electrodes	
Environm. checklist						Hard facing	

	Classification of welding consumables								
	Steel				Other materials				
	Non-alloy and fine grain	High strength	Creep resistant	Stainless and heat resisting	Nickel	Copper	Aluminium	Cast iron	Titanium
MMA	EN ISO 2560	EN 757 (ISO 18275)	EN 1599 (ISO 3580)	EN 1600 (ISO 3581)	EN ISO 14172				
MIG/MAG	EN 440 (ISO 14341)	EN ISO 16834	EN ISO 21952	EN ISO 14343	EN ISO 18274	EN 14640 (ISO 24373 <sup>c</sup> )	EN ISO 18273	EN ISO 1071	EN ISO 24034
TIG	EN 1668 (ISO 636)								
Electrodes etc for submerged arc	EN 756 (ISO 14171)	EN 14295 (ISO 26304 <sup>c</sup> )	EN ISO 24598						
Fluxes for submerged arc	EN 760 (ISO 14174)								
Cored wires	EN 758 (ISO 17632)	EN ISO 18276	EN ISO 17634	EN ISO 17633				EN ISO 1071	
Gas welding	EN 12536 (ISO 'missing')		EN 12536 (ISO 'missing')						
Shielding gas	EN 439 (ISO 14175)								

Other continued
ISO 2553
EN ISO 4063
CEN/TR 14599 (ISO/TR 25901)
EN 14610
EN ISO 17659
EN ISO 13920
EN ISO 6947, CEN/TR 14633
EN ISO 17660

Welding consumables
EN 13479
EN 12074
EN ISO 544
EN ISO 14344
EN 14532-1, -2 & -3
EN 1597-1, -2 & -3, EN ISO 6847, 14372, 8249, 3690 & ISO 2401
EN ISO 6848
EN 14700 (ISO/TR xxxxx <sup>c</sup> )

Impact
Tensile long.
Tensile perp.
Tensile cruc.
Bend
Fracture
Hardness
Macroscopic
Hot crack
Cold crack
Delta ferrite

Destructive testing
EN 875 (ISO 9016)
EN 876 (ISO 5178)
EN 895 (ISO 4136)
EN ISO 9018
EN 910 (ISO 5173)
EN 1320 (ISO 9017)
EN 1043-1 & -2 (ISO 9015-1 & -2)
EN 1321 (ISO 17639), CR 12361 (ISO/TR 16060)
EN ISO 17641-1, -2 & -3
EN ISO 17642-1, -2 & -3
EN ISO 17655

Acceptance levels for NDT
EN 12517-1
EN 1712, EN 1713
EN 1291
EN 1289
For all imperfections EN ISO 5817 etc apply

Radiography
Ultrasonic
Magnetic particle
Penetrant
Visual testing (also macro- & microscopic etc)