

IIW Guideline INTERNATIONAL WELDER



Minimum Requirements for the Education, Examination and Qualification



IAB-089r4-12 Part II



**MINIMUM REQUIREMENTS FOR THE EDUCATION, TRAINING,
EXAMINATION AND QUALIFICATION OF:**

INTERNATIONAL WELDER
(IW)

**This guideline, part I and II, replaces document IAB-089-
2003/EFW-452-467-480-481, Rev 3 January 2005**

Guideline of the International Institute of Welding

INTERNATIONAL AUTHORISATION BOARD (IAB)

Prepared by IAB Group A, WG A3a

Part II

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Preface

This document is based upon the European Welder series as developed by the European Federation for Welding, Joining and Cutting (EWF), through an Agreement first signed in 19 July, 1997, at the Annual Meeting of the International Institute of Welding (IIW) in San Francisco, California, USA, and which has been further developed since then. It is established in that Agreement that the International Welder Diploma is equivalent to the European Welder Diploma within the same scope.

This document – known in the WG#A3a as the 'Bratislava Agreement' - reflects the results of thorough in-depth discussions to the basics of welding technology and skill, and was finally issued after a meeting of the working group in Bratislava, Slovakia.

This document is split up into two parts, I and II.

Part I is dealing with the standard scheme for educating welders.

Part II provides details on test objects and WPSs to be used for test object examination.

Any EWF ANB is permitted to issue EWF diplomas equivalent to IIW ones that have been issued by the same ANB.

Copies of this document are available from the IIW IAB Secretariat or their designated distributor.

The use of this Guideline is restricted to organisations approved by the Authorised National Body as Approved Training Bodies (ATB)



16 Rules and instructions for the test objects

The purpose of the test object is to test the welder not only on welding skills, but also on his skills for plan reading (with knowledge of welding symbols for drawings), fitting and following the given instructions (i.e. WPS). The welder will receive the plans and the work pieces cutted at the desired dimensions with joint preparations. He will have to choose the needed filler material out of a choice of different types of filler material for that welding process. He will have to check with the WPS to take the right filler material. If the welder starts welding with a wrong filler material, the test will be failed and stopped.

If the welder is ready to weld, he will have to tack all the pieces together according to the plans he received. The test object has to be welded in the standing position as indicated on the drawing. It is only allowed to turn the test object around its vertical axis.

All necessary tools to fulfill the different actions will be held at the disposition of the welder.

The welder will be given a specified time to finish the test object as specified in the table hereunder. When the time limit has been reached, the welder has to stop welding. If the welder fails to finish the test object in the specified time, the test object is considered failed. If the welder has finished the test object in time, it will be submitted to visual inspection by the ANB authorized examiner. One weld on the plate test object shall also be subject to radiographic testing (see assembly drawing). The acceptance criteria shall meet the requirements according to quality level B of the EN-ISO 5817, except for the imperfections types 501 (undercut), 502 (excessive weld metal), 503 (excessive convexity), 504 (excessive penetration), 505 (incorrect weld toe) and 5214 (excessive throat thickness) for which level C shall apply.

The test objects are fixed regarding general geometry and welds. The test object dimensions can be modified to fit local needs. WPS's in the set of documents are examples that could be changed to fit local needs.

<i>Welding time for test objects* (hours)</i>	111	135	141
IFW	6	4	6
IPW	8	6	8
ITW	8	6	8

*The maximum allowed welding time can be adjusted by the ATB if the test object dimensions are modified.



17 Test Object Packages for steel, material groups 1, 2 and 3

For each of the three welding processes 111, 135 and 141 there are three different stand alone packages for the IFW, IPW and ITW Test Objects containing all needed documents for the welder (nine packages in total).

The content of all packages are as follows:

- 1: Assembly drawing
- 2: Detail drawings
- 3: WPS's

The geometry of the International Fillet Weld (IFW) and International Plate Weld (IPW) Test Objects are the same for the three different welding processes (111, 135 and 141). Only the WPS's are different.

The geometry of the International Tube Weld (ITW) Test Object is identical for the 111 and 141 welding processes, but is slightly different for the 135 welding process.

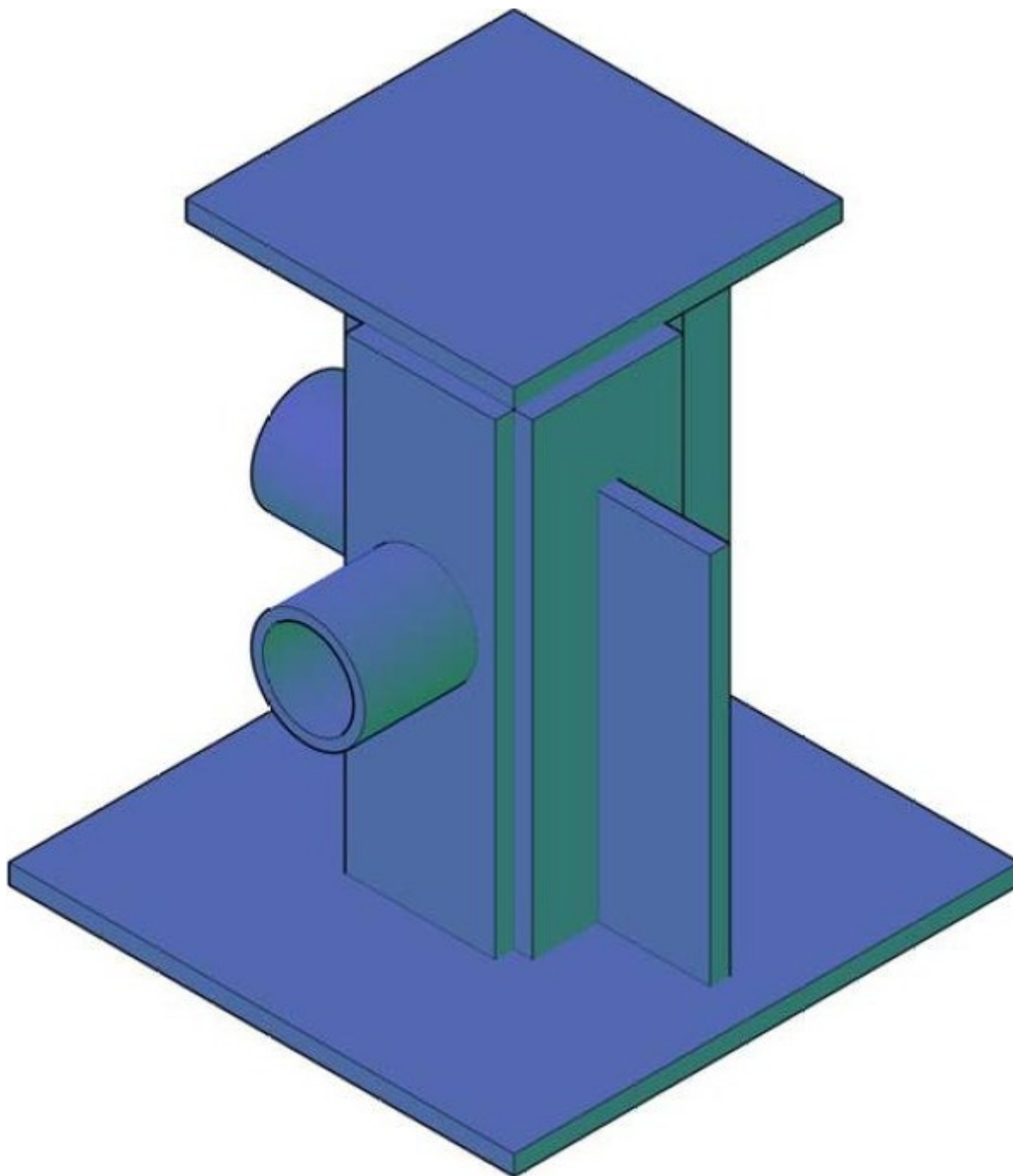
The assembly drawings are in DIN A3 format and the detail drawings in DIN A4 format. If the assembly drawings are printed on A4 paper format, some details may be difficult to read.

The joint preparations for the IPW and ITW must be machined/milled/grinded according to the indications on the assembly drawing. The ATB shall give the candidate the pieces with joint preparations. Failing to mount and tack the plates according to plan, will result in the failing of the Test Object.

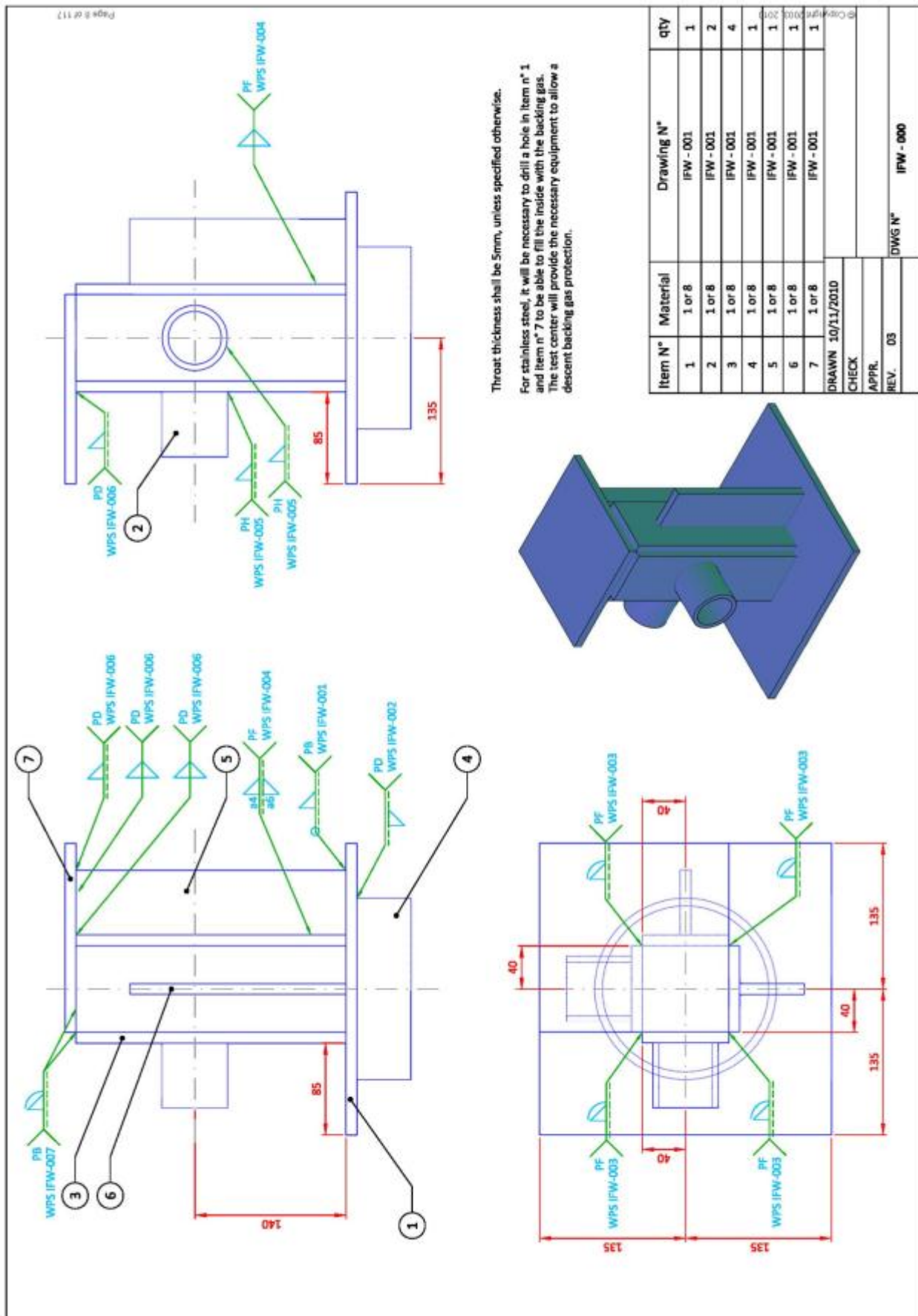
17.1 Welding Process 111

17.1.1 IFW Test Object-111

Material groups 1, 2 and 3



Important note: The assembly drawing was originally created in the DIN A3 format. By printing on A4 or downscaling to A4 format, it is possible that some details are badly or not visible.





Item N° acc. drawing IFW-000	Plate / Tube	Length [mm]	Width [mm]	Thickness [mm]	Diameter [mm]
1	P	270	270	10	
2	T	60		5.5	60.3
3	P	250	80	10	
4	T	50		7.1	168.3
5	P	60	250	10	
6	P	60	200	10	
7	P	175	175	10	

Page 9 of 17

The exact material thicknesses are not mandatory and can be slightly changed according to local needs.

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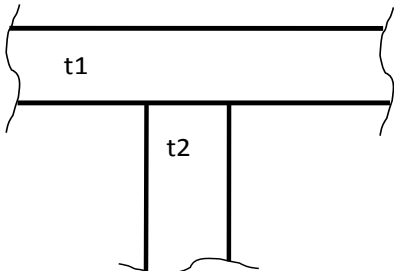
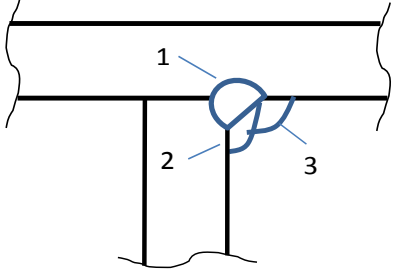
Drawn 10/11/2010	Drawing N° IFW-001
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Rev. 02	



ATB

WPS-Nr.		111 IFW-001		date	24-10-2011
				rev.	5
WELDING PROCEDURE SPECIFICATION				ISO 15609-1	
Parent material :		S235		Joint design 	
to parent material :		S235			
Parent material standard :		EN 10025-2			
ISO/TR15608 Group nr. :		1,1			
Welding process :		111			
Filler material :		Basic electrode Free choice of brand		Welding sequence 	
Welding position :		PB			
Shielding gas :		N/A			
Type of flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		10			
t2		10			
Outside pipe diameter (mm):		N/A			
Backing :		N/A			
Gouging / grinding :		N/A			
Single or multi layer		multi layer			
max. interpass temp. (°C):		250			
PWHT :		none			
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...					
welding parameters					
Run number :		1		2 - 3	
Welding process :		111		111	
Type of current (AC/DC) :		DC		DC	
Polarity (+/-)		+		+	
Size of filler material (diameter mm) :		3,2		3,2	
Welding current (A) :		125-155		105-135	
Arc voltage (V) :		-		-	
Travel speed (cm/min) :		-		-	
Distance contact tube/workpiece (mm) :		N/A		N/A	
Overlap (mm) :		N/A		N/A	
max. weaving (mm) :		3D		3D	
Oscillation (cycles/min) :		N/A		N/A	
Shielding gas flow rate (l/min) :		N/A		N/A	
Backing gas flow rate (l/min) :		N/A		N/A	
Filler material designation :		ISO 2560-A - E42 3 B or E42 2 B			
Heat Input (kJ/cm) :		N/A		N/A	
Tungsten electrode diameter (mm):		N/A		N/A	
Type of tungsten electrode :		N/A		N/A	
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB			
WPS-Nr.	111 IFW-002	date	24-10-2011
		rev.	5
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235	Joint design 	
to parent material :	S235		
Parent material standard :	EN 10025-2		
ISO/TR15608 Group nr. :	1,1		
Welding process :	111		
Filler material :	Basic electrode Free choice of brand	Welding sequence 	
Welding position :	PD		
Shielding gas :	N/A		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	7,1		
Outside pipe diameter (mm):	168,3		
Backing :	N/A		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...			
welding parameters			
Run number :	1	2 - 3	
Welding process :	111	111	
Type of current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Size of filler material (diameter mm) :	3,2	3,2	
Welding current (A) :	125-155	105-135	
Arc voltage (V) :	-	-	
Travel speed (cm/min) :	-	-	
Distance contact tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	N/A	N/A	
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 2560-A - E42 3 B or E42 2 B		
Heat Input (kJ/cm) :	N/A	N/A	
Tungsten electrode diameter (mm):	N/A	N/A	
Type of tungsten electrode :	N/A	N/A	
Welding Procedure Qualification Record Nr. :			
Not qualified	written by :		



ATB

WPS-Nr.		111 IFW-003		date	24-10-2011				
				rev.	5				
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1					
Parent material :	S235								
to parent material :	S235								
Parent material standard :	EN 10025-2								
ISO/TR15608 Group nr. :	1,1								
Welding process :	111								
Filler material :	Basic electrode Free choice of brand								
Welding position :	PF								
Shielding gas :	N/A								
Type of flux :	N/A								
Preheat :	none								
Material thickness (mm): t1	10								
t2	10								
Outside pipe diameter (mm):	N/A								
Backing :	N/A								
Gouging / grinding :	N/A								
Single or multi layer	multi layer								
max. interpass temp. (°C):	250								
PWHT :	none								
Supplementary requirement :									
Clean the welding joint of all oxides, dirt, oil, paint,...									
welding parameters									
Run number :	1	2 - n							
Welding process :	111	111							
Type of current (AC/DC) :	DC	DC							
Polarity (+/-)	+	+							
Size of filler material (diameter mm) :	2,5	3,2 or 2,5							
Welding current (A) :	60-80	80-120							
Arc voltage (V) :	-	-							
Travel speed (cm/min) :	-	-							
Distance contact tube/workpiece (mm) :	N/A	N/A							
Overlap (mm) :	N/A	N/A							
max. weaving (mm) :	3D	3D							
Oscillation (cycles/min) :	N/A	N/A							
Shielding gas flow rate (l/min) :	N/A	N/A							
Backing gas flow rate (l/min) :	N/A	N/A							
Filler material designation :	ISO 2560-A - E42 3 B or E42 2 B								
Heat Input (kJ/cm) :	N/A	N/A							
Tungsten electrode diameter (mm):	N/A	N/A							
Type of tungsten electrode :	N/A	N/A							
Welding Procedure Qualification Record Nr. :									
Not qualified		written by :							



ATB

WPS-Nr.	111 IFW-004		date	24-10-2011
			rev.	5
WELDING PROCEDURE SPECIFICATION			EN ISO 15609-1	
Parent material :	S235	Joint design 		
to parent material :	S235			
Parent material standard :	EN 10025-2			
ISO/TR15608 Group nr. :	1,1			
Welding process :	111			
Filler material :	Basic electrode Free choice of brand	Welding sequence 		
Welding position :	PF			
Shielding gas :	N/A			
Type of flux :	N/A			
Preheat :	none			
Material thickness (mm): t1	10			
t2	10			
Outside pipe diameter (mm):	N/A			
Backing :	N/A			
Gouging / grinding :	N/A			
Single or multi layer	multi layer			
max. interpass temp. (°C):	250			
PWHT :	none			
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...				
welding parameters				
Run number :	1	2 - 3		
Welding process :	111	111		
Type of current (AC/DC) :	DC	DC		
Polarity (+/-)	+	+		
Size of filler material (diameter mm) :	3,2	3,2		
Welding current (A) :	80-120	80-120		
Arc voltage (V) :	-	-		
Travel speed (cm/min) :	-	-		
Distance contact tube/workpiece (mm) :	N/A	N/A		
Overlap (mm) :	N/A	N/A		
max. weaving (mm) :	3D	3D		
Oscillation (cycles/min) :	N/A	N/A		
Shielding gas flow rate (l/min) :	N/A	N/A		
Backing gas flow rate (l/min) :	N/A	N/A		
Filler material designation :	ISO 2560-A - E42 3 B or E42 2 B			
Heat Input (kJ/cm) :	N/A	N/A		
Tungsten electrode diameter (mm):	N/A	N/A		
Type of tungsten electrode :	N/A	N/A		
Welding Procedure Qualification Record Nr. :				
Not qualified	written by :			



ATB

WPS-Nr.		111 IFW-005		date	24-10-2011
				rev.	5
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :		S235		Joint design	
to parent material :		S235			
Parent material standard :		EN 10025-2			
ISO/TR15608 Group nr. :		1,1			
Welding process :		111			
Filler material :		Basic electrode Free choice of brand		Welding sequence	
Welding position :		PH			
Shielding gas :		N/A			
Type of flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		10			
t2		5,5			
Outside pipe diameter (mm):		60,3			
Backing :		N/A			
Gouging / grinding :		N/A			
Single or multi layer		multi layer			
max. interpass temp. (°C):		250			
PWHT :		none			
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...					
welding parameters					
Run number :		1		2 - 3	
Welding process :		111		111	
Type of current (AC/DC) :		DC		DC	
Polarity (+/-)		+		+	
Size of filler material (diameter mm) :		2,5		2,5	
Welding current (A) :		50-80		65-95	
Arc voltage (V) :		-		-	
Travel speed (cm/min) :		-		-	
Distance contact tube/workpiece (mm) :		N/A		N/A	
Overlap (mm) :		N/A		N/A	
max. weaving (mm) :		3D		3D	
Oscillation (cycles/min) :		N/A		N/A	
Shielding gas flow rate (l/min) :		N/A		N/A	
Backing gas flow rate (l/min) :		N/A		N/A	
Filler material designation :		ISO 2560-A - E42 3 B or E42 2 B			
Heat Input (kJ/cm) :		N/A		N/A	
Tungsten electrode diameter (mm):		N/A		N/A	
Type of tungsten electrode :		N/A		N/A	
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB

WPS-Nr.	111 IFW-006		date	24-10-2011
			rev.	5
WELDING PROCEDURE SPECIFICATION			EN ISO 15609-1	
Parent material :	S235	Joint design 		
to parent material :	S235			
Parent material standard :	EN 10025-2			
ISO/TR15608 Group nr. :	1,1			
Welding process :	111			
Filler material :	Basic electrode Free choice of brand	Welding sequence 		
Welding position :	PD			
Shielding gas :	N/A			
Type of flux :	N/A			
Preheat :	none			
Material thickness (mm): t1	10			
t2	10			
Outside pipe diameter (mm):	N/A			
Backing :	N/A			
Gouging / grinding :	N/A			
Single or multi layer	multi layer			
max. interpass temp. (°C):	250			
PWHT :	none			
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...				
welding parameters				
Run number :	1	2 - 3		
Welding process :	111	111		
Type of current (AC/DC) :	DC	DC		
Polarity (+/-)	+	+		
Size of filler material (diameter mm) :	3,2	3,2		
Welding current (A) :	125-155	105-135		
Arc voltage (V) :	-	-		
Travel speed (cm/min) :	-	-		
Distance contact tube/workpiece (mm) :	N/A	N/A		
Overlap (mm) :	N/A	N/A		
max. weaving (mm) :	3D	3D		
Oscillation (cycles/min) :	N/A	N/A		
Shielding gas flow rate (l/min) :	N/A	N/A		
Backing gas flow rate (l/min) :	N/A	N/A		
Filler material designation :	ISO 2560-A - E42 3 B or E42 2 B			
Heat Input (kJ/cm) :	N/A	N/A		
Tungsten electrode diameter (mm):	N/A	N/A		
Type of tungsten electrode :	N/A	N/A		
Welding Procedure Qualification Record Nr. :				
Not qualified	written by :			

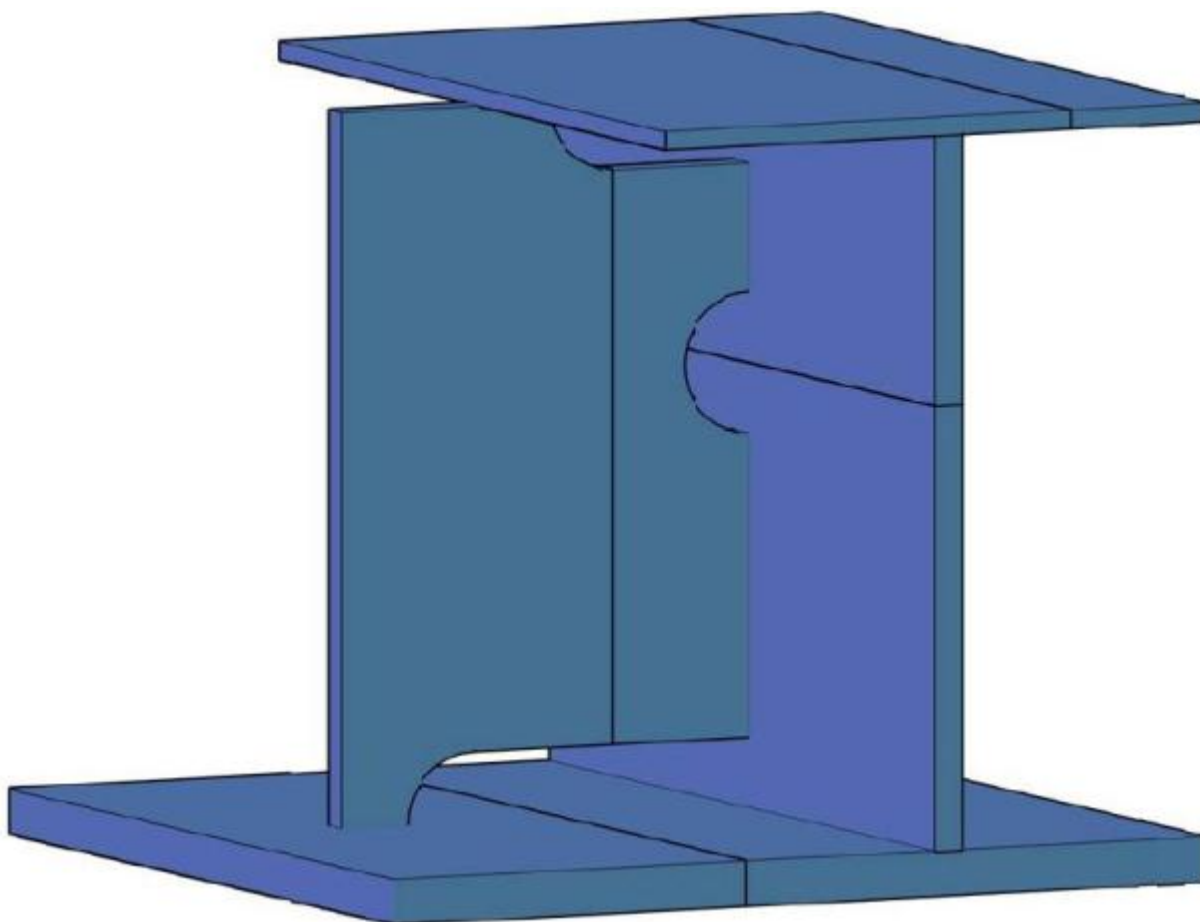


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WPS-Nr.	111 IFW-007	date	24-10-2011
		rev.	5
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235	Joint design	
to parent material :	S235		
Parent material standard :	EN 10025-2		
ISO/TR15608 Group nr. :	1,1		
Welding process :	111		
Filler material :	Basic electrode Free choice of brand	Welding sequence	
Welding position :	PB		
Shielding gas :	N/A		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	10		
Outside pipe diameter (mm):	N/A		
Backing :	N/A		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...			
welding parameters			
Run number :	1	2 - n	
Welding process :	111	111	
Type of current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Size of filler material (diameter mm) :	3,2	3,2	
Welding current (A) :	125-155	105-135	
Arc voltage (V) :	-	-	
Travel speed (cm/min) :	-	-	
Distance contact tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	N/A	N/A	
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 2560-A - E42 3 B or E42 2 B		
Heat Input (kJ/cm) :	N/A	N/A	
Tungsten electrode diameter (mm):	N/A	N/A	
Type of tungsten electrode :	N/A	N/A	
Welding Procedure Qualification Record Nr. :			
Not qualified	written by :		

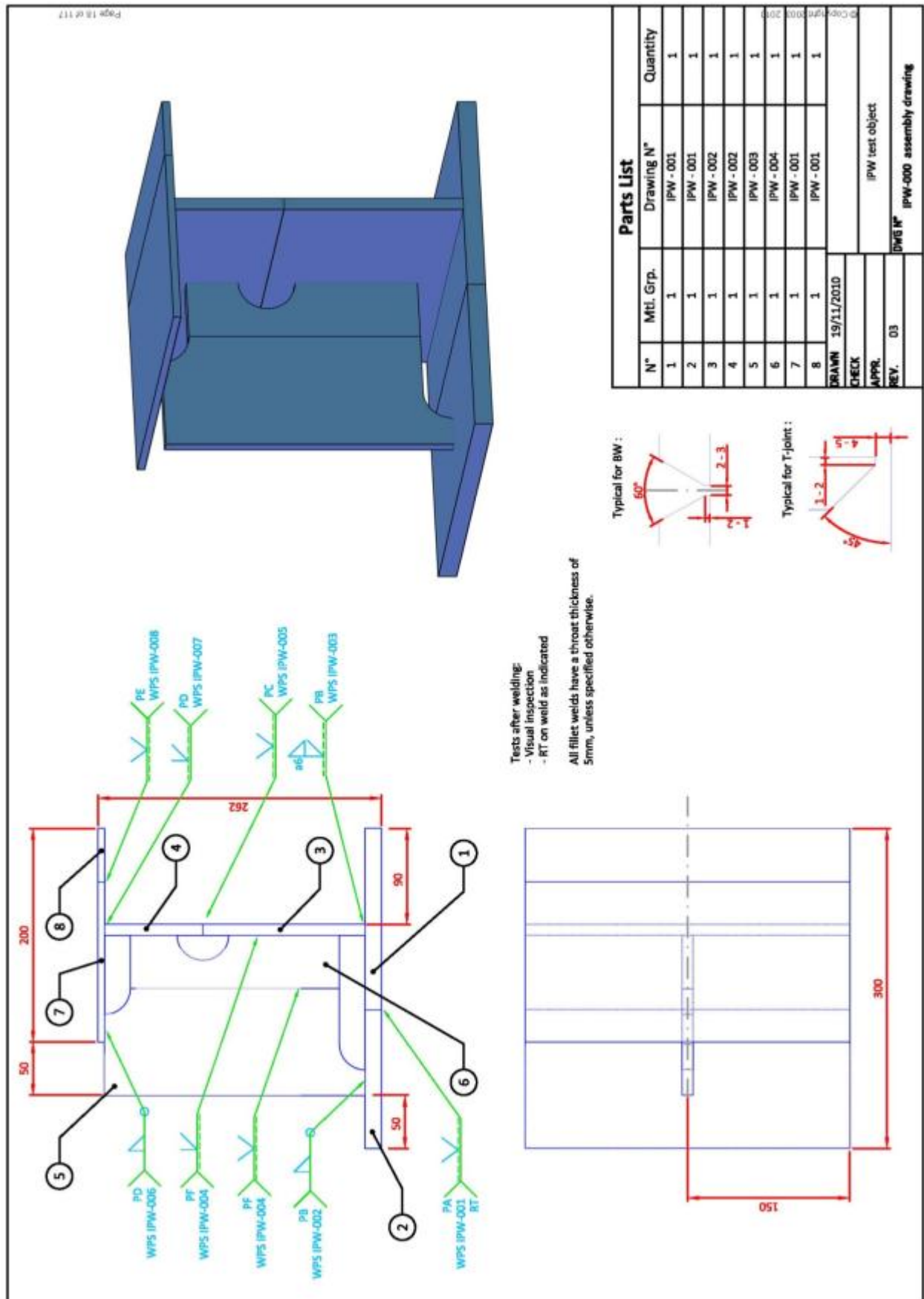
17.1.2 IPW Test Object – 111

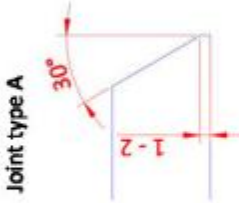
Material groups 1, 2 and 3



Important notes:

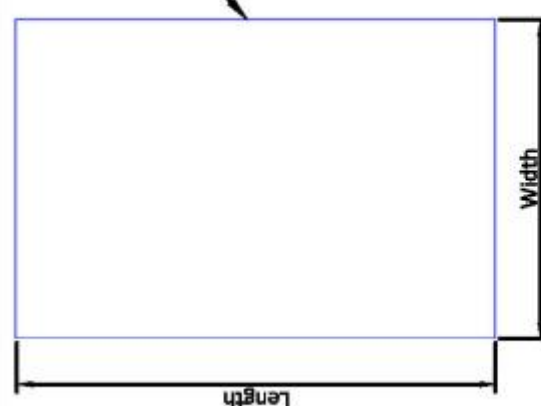
The assembly drawing was originally created in the DIN A3 format. By printing on A4 or downscaling to A4 format, it is possible that some details are badly or not visible.





Joint type A

The root gap hasn't been taken into account in the indicated widths of the plates
The suggested root gap is to be found on the WPS of the corresponding joint.



Joint type A

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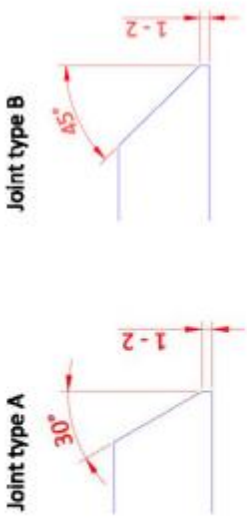
Item N°	Length	Width	Plate thickness
1	300	170	15
2	300	130	15
7	300	150	6
8	300	50	6

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Rev.	01

ipw test object-001 details

Drawing N°

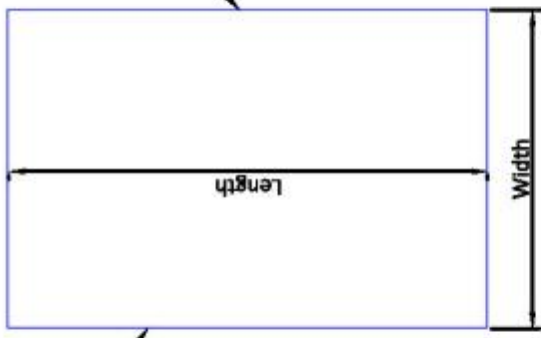
IPW - 001



Joint type A

Joint type B

The root gap hasn't been taken into account in the indicated widths of the plates
The suggested root gap is to be found on the WPS of the corresponding joint.



Joint type A

Joint type B

Length

Width

Item N°	Length	Width	Plate thickness
3	300	150	10
4	300	91	10

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ipw test object-002 details

Drawn 19/11/2010

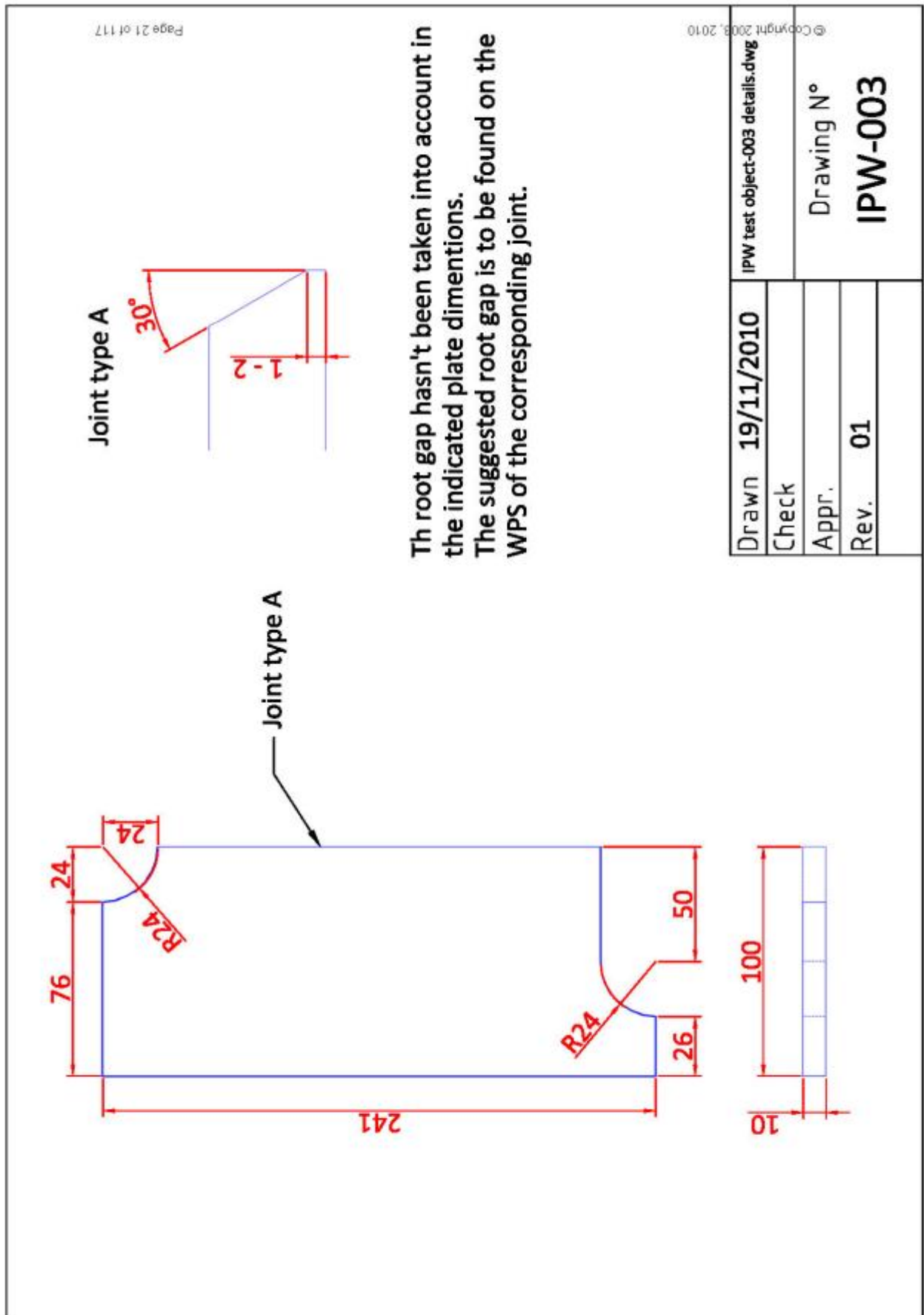
Check

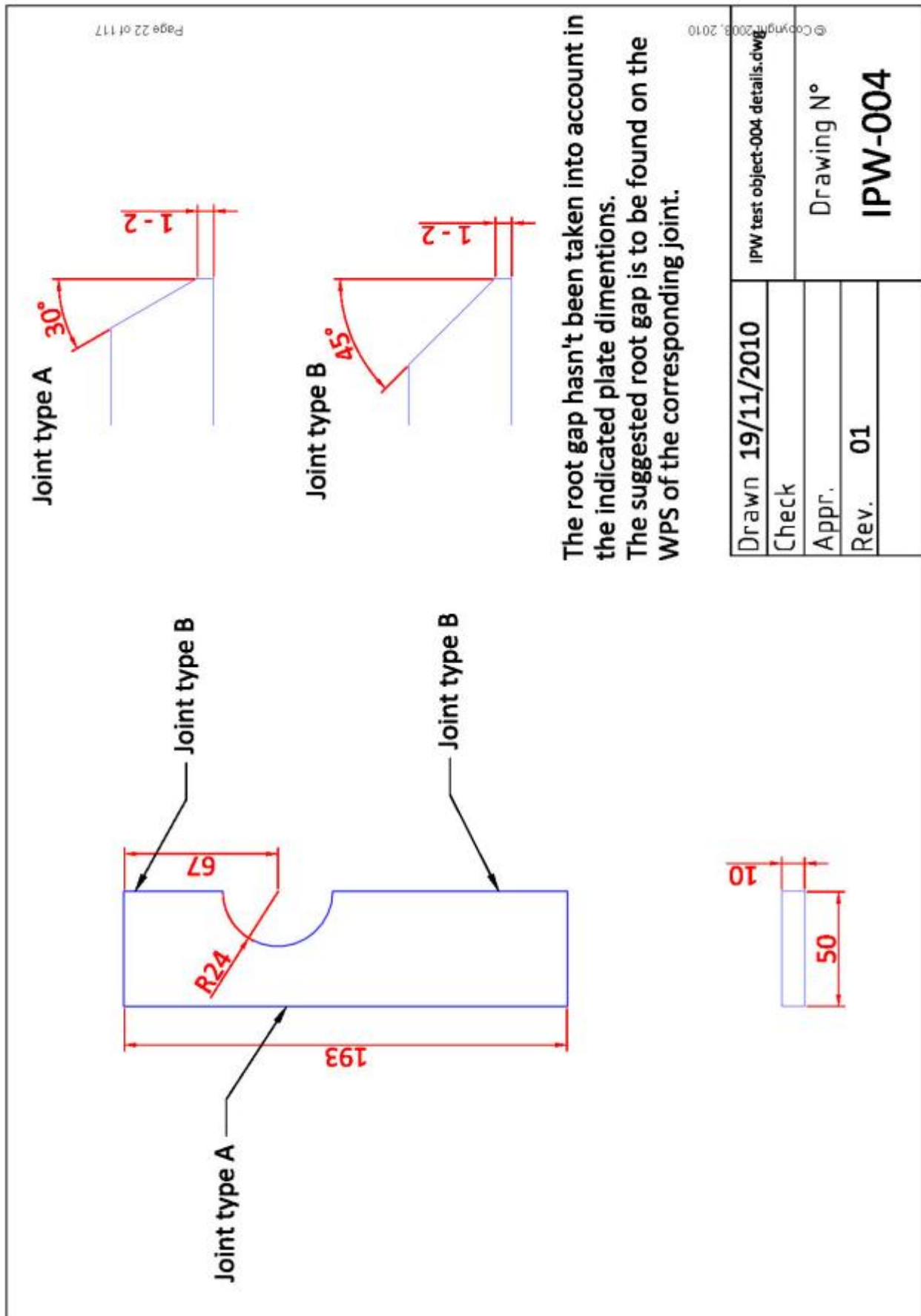
Appr.

Rev. 01

Drawing N°

IPW - 002







ATB

WPS-Nr.		IPW-001		date	26-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :		S235JR		Joint design 	
to parent material :		S235JR			
Parent material standard :		EN 10025			
ISO/TR15608 Group nr. :		1.1			
Welding process :		111			
Filler material :		Basic electrode Free choice of brand		Welding sequence 	
Welding position :		PA			
Shielding gas :		N/A			
Type of flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		15			
t2		15			
Outside pipe diameter (mm):		N/A			
Backing :		none			
Gouging / grinding :		N/A			
Single or multi layer		multi layer			
max. interpass temp. (°C):		250			
PWHT :		none			
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :		1		2 - n	
Welding process :		111		111	
Type of current (AC/DC) :		DC		DC	
Polarity (+/-)		-		+	
Size of filler material (diameter mm) :		2,5		3,2	
Welding current (A) :		85-95		110-130	
Arc voltage (V) :		-		-	
Travel speed (cm/min) :		-		-	
Distance contact tube/workpiece (mm) :		N/A		N/A	
Overlap (mm) :		N/A		N/A	
max. weaving (mm) :		3D		3D	
Oscillation (cycles/min) :		N/A		N/A	
Shielding gas flow rate (l/min) :		N/A		N/A	
Backing gas flow rate (l/min) :		N/A		N/A	
Filler material designation :		ISO 2560-A - E42 3 B or E42 2 B			
Heat Input (kJ/cm) :		N/A		N/A	
Tungsten electrode diameter (mm):		N/A		N/A	
Type of tungsten electrode :		N/A		N/A	
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB

WPS-Nr.		IPW-002		date	26-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :		S235JR		Joint design	
to parent material :		S235JR			
Parent material standard :		EN 10025			
ISO/TR15608 Group nr. :		1.1			
Welding process :		111			
Filler material :		Basic electrode		Welding sequence	
		Free choice of brand			
Welding position :		PB			
Shielding gas :		N/A			
Type of flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		10			
t2		15			
Outside pipe diameter (mm):		-			
Backing :		N/A			
Gouging / grinding :		N/A			
Single or multi layer		multi layer			
max. interpass temp. (°C):		250			
PWHT :		none			
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :	1	2 - n			
Welding process :	111	111			
Type of current (AC/DC) :	DC	DC			
Polarity (+/-)	+	+			
Size of filler material (diameter mm) :	2,5	3,2			
Welding current (A) :	135-145	115-125			
Arc voltage (V) :	-	-			
Travel speed (cm/min) :	-	-			
Distance contact tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	N/A	N/A			
Backing gas flow rate (l/min) :	N/A	N/A			
Filler material designation :	ISO 2560-A - E42 3 B or E42 2 B				
Heat Input (kJ/cm) :	N/A		N/A		
Tungsten electrode diameter (mm):		N/A		N/A	
Type of tungsten electrode :		N/A		N/A	
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB

WPS-Nr.	IPW-003	date	26-10-2011		
		rev.	2		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235JR	Joint design 			
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR15608 Group nr. :	1.1				
Welding process :	111				
Filler material :	Basic electrode Free choice of brand	Welding sequence 			
Welding position :	PB				
Shielding gas :	N/A				
type flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	10				
t2	15				
Outside pipe diameter (mm):	N/A				
Backing :	N/A				
Gouging / grinding :	N/A				
single or multi layer	multi layer				
max. interpass temp. (°C):	250				
PWHT :	none				
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :	1	2 - n			
Welding process :	111	111			
Type of current (AC/DC) :	DC	DC			
Polarity (+/-)	-	+			
Size of filler material (diameter mm) :	2,5	3,2			
Welding current (A) :	90-110	110-130			
Arc voltage (V) :	-	-			
Travel speed (cm/min) :	-	-			
Distance contact tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	N/A	N/A			
Backing gas flow rate (l/min) :	N/A	N/A			
Filler material designation :	ISO 2560-A - E42 3 B or E42 2 B				
Heat Input (kJ/cm) :	N/A				
Tungsten electrode diameter (mm):	N/A	N/A			
Type of tungsten electrode :	N/A	N/A			
Welding Procedure Qualification Record Nr. :					
Not qualified	written by :				



ATB

WPS-Nr.		IPW-004		date	26-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :	S235JR	Joint design 			
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR15608 Group nr. :	1.1				
Welding process :	111				
Filler material :	Basic electrode Free choice of brand				
Welding position :	PF				
Shielding gas :	N/A				
type flux :	N/A				
Preheat :	none	Welding sequence 			
Material thickness (mm): t1	10				
t2	10				
Outside pipe diameter (mm):	N/A				
Backing :	N/A				
Gouging / grinding :	N/A				
single or multi layer	multi layer				
max. interpass temp. (°C):	250				
PWHT :	none				
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :	1	2 - n			
Welding process :	111	111			
Type of current (AC/DC) :	DC	DC			
Polarity (+/-)	-	+			
Size of filler material (diameter mm) :	2,5	3,2			
Welding current (A) :	55-65	115-125			
Arc voltage (V) :	-	-			
Travel speed (cm/min) :	-	-			
Distance contact tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	N/A	N/A			
Backing gas flow rate (l/min) :	N/A	N/A			
Filler material designation :	ISO 2560-A - E42 3 B or E42 2 B				
Heat Input (kJ/cm) :	N/A	N/A			
Tungsten electrode diameter (mm):	N/A	N/A			
Type of tungsten electrode :	N/A	N/A			
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB

WPS-Nr.	IPW-005	date	26-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR15608 Group nr. :	1.1		
Welding process :	111		
Filler material :	Basic electrode Free choice of brand	Welding sequence 	
Welding position :	PC		
Shielding gas :	N/A		
type flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	10		
Outside pipe diameter (mm):	-		
Backing :	N/A		
Gouging / grinding :	N/A		
single or multi layer	multi layer	Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...	
max. interpass temp. (°C):	250		
PWHT :	none		
Welding parameters			
Run number :	1	2 - n	
Welding process :	111	111	
Type of current (AC/DC) :	DC	DC	
Polarity (+/-)	-	+	
Size of filler material (diameter mm) :	2,5	3,2	
Welding current (A) :	65-85	75-85	
Arc voltage (V) :	-	-	
Travel speed (cm/min) :	-	-	
Distance contact tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	N/A	N/A	
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 2560-A - E42 3 B or E42 2 B		
Heat Input (kJ/cm) :	N/A	N/A	
Tungsten electrode diameter (mm):	N/A	N/A	
Type of tungsten electrode :	N/A	N/A	
Welding Procedure Qualification Record Nr. :			
Not qualified	written by :		



ATB

WPS-Nr.		IPW-006		date	26-10-2011		
				rev.	2		
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1			
Parent material :		S235JR		Joint design 			
to parent material :		S235JR					
Parent material standard :		EN 10025					
ISO/TR15608 Group nr. :		1.1					
Welding process :		111					
Filler material :		Basic electrode Free choice of brand		Welding sequence 			
Welding position :		PD					
Shielding gas :		N/A					
type flux :		N/A					
Preheat :		none					
Material thickness (mm): t1		6					
t2		10					
Outside pipe diameter (mm):		N/A					
Backing :		N/A					
Gouging / grinding :		N/A					
single or multi layer		multi layer					
max. interpass temp. (°C):		250					
PWHT :		none					
Supplementary requirement :							
Clean the welding joint of all oxides, dirt, oil, paint,...							
Welding parameters							
Run number :		1		2 - 3			
Welding process :		111		111			
Type of current (AC/DC) :		DC		DC			
Polarity (+/-)		+		+			
Size of filler material (diameter mm) :		2,5		3,2			
Welding current (A) :		115-125		110-120			
Arc voltage (V) :		-		-			
Travel speed (cm/min) :		-		-			
Distance contact tube/workpiece (mm) :		N/A		N/A			
Overlap (mm) :		N/A		N/A			
max. weaving (mm) :		3D		3D			
Oscillation (cycles/min) :		N/A		N/A			
Shielding gas flow rate (l/min) :		N/A		N/A			
Backing gas flow rate (l/min) :		N/A		N/A			
Filler material designation :		ISO 2560-A - E42 3 B or E42 2 B					
Heat Input (kJ/cm) :		N/A		N/A			
Tungsten electrode diameter (mm):		N/A		N/A			
Type of tungsten electrode :		N/A		N/A			
Welding Procedure Qualification Record Nr. :							
Not qualified		written by :					



ATB

WPS-Nr.		IPW-007		date	26-10-2011				
				rev.	2				
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1					
Parent material :	S235JR								
to parent material :	S235JR								
Parent material standard :	EN 10025								
ISO/TR15608 Group nr. :	1.1								
Welding process :	111								
Filler material :	Basic electrode Free choice of brand								
Welding position :	PD								
Shielding gas :	N/A								
type flux :	N/A								
Preheat :	none								
Material thickness (mm): t1	6								
t2	10								
Outside pipe diameter (mm):	N/A								
Backing :	N/A								
Gouging / grinding :	N/A								
single or multi layer	multi layer								
max. interpass temp. (°C):	250								
PWHT :	none								
Supplementary requirement :						Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters									
Run number :	1	2 - n							
Welding process :	111	111							
Type of current (AC/DC) :	DC	DC							
Polarity (+/-)	-	+							
Size of filler material (diameter mm) :	2,5	3,2							
Welding current (A) :	90-100	115-125							
Arc voltage (V) :	-	-							
Travel speed (cm/min) :	-	-							
Distance contact tube/workpiece (mm) :	N/A	N/A							
Overlap (mm) :	N/A	N/A							
max. weaving (mm) :	3D	3D							
Oscillation (cycles/min) :	N/A	N/A							
Shielding gas flow rate (l/min) :	N/A	N/A							
Backing gas flow rate (l/min) :	N/A	N/A							
Filler material designation :	ISO 2560-A - E42 3 B or E42 2 B								
Heat Input (kJ/cm) :	N/A		N/A						
Tungsten electrode diameter (mm):		N/A		N/A					
Type of tungsten electrode :		N/A		N/A					
Welding Procedure Qualification Record Nr. :									
Not qualified		written by :							

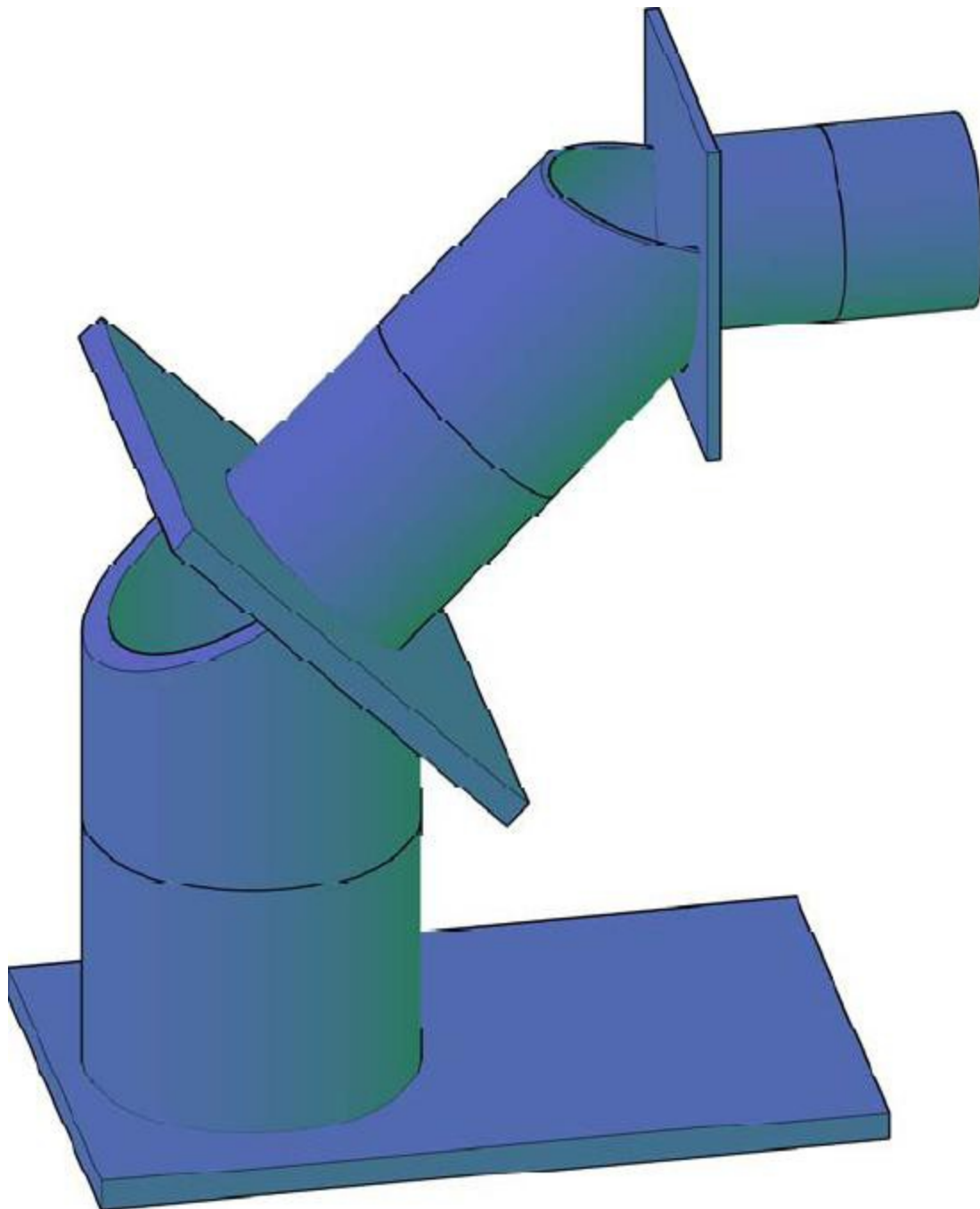


ATB

WPS-Nr.	IPW-008	date	26-10-2011		
		rev.	2		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235JR				
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR15608 Group nr. :	1.1				
Welding process :	111				
Filler material :	Basic electrode Free choice of brand				
Welding position :	PE				
Shielding gas :	N/A				
type flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	6				
t2	6				
Outside pipe diameter (mm):	N/A				
Backing :	N/A				
Gouging / grinding :	N/A				
single or multi layer	multi layer				
max. interpass temp. (°C):	250				
PWHT :	none				
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :	1	2 - n			
Welding process :	111	111			
Type of current (AC/DC) :	DC	DC			
Polarity (+/-)	-	+			
Size of filler material (diameter mm) :	2,5	3,2			
Welding current (A) :	60-80	90-100			
Arc voltage (V) :	-	-			
Travel speed (cm/min) :	-	-			
Distance contact tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	N/A	N/A			
Backing gas flow rate (l/min) :	N/A	N/A			
Filler material designation :	ISO 2560-A - E42 3 B or E42 2 B				
Heat Input (kJ/cm) :	N/A	N/A			
Tungsten electrode diameter (mm):	N/A	N/A			
Type of tungsten electrode :	N/A	N/A			
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			

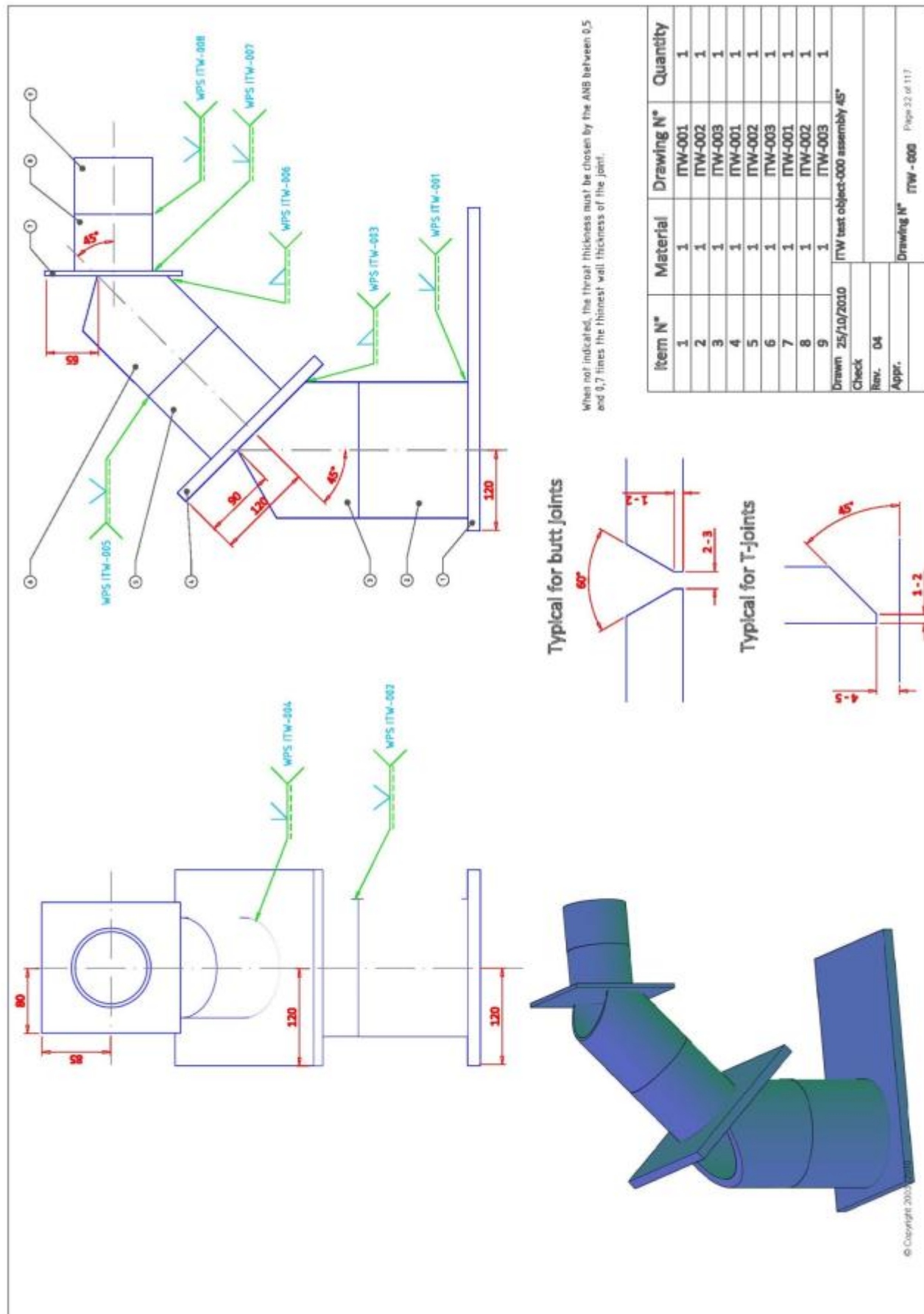
17.1.3 ITW Test Object – 111

Material groups 1, 2 and 3



Important notes:

The assembly drawing was originally created in the DIN A3 format. By printing on A4 or downscaling to A4 format, it is possible that some details are badly or not visible.





Item N° acc. drawing ITW-000 and drawing ITW 135-000	Plate / Tube	Length	Width	Plate thickness
1	Plate	400	240	15
4	Plate	240	240	15
7	Plate	170	160	6

The exact material thicknesses are not mandatory and can be slightly changed according to local needs.

Drawn 22/09/2011	ITW test object-001 details.dwg
Check	
Appr.	
Rev. 02	
	Drawing N° ITW-001

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Item N°	Plate / Tube	Length	Diameter	Wall thickness
2	T	135	168.3	10.97
5	T	110	114.3	6.02
8	T	70	60.3	5.50
9	T	70	60.3	5.50

Item N°	Plate / Tube	Length	Diameter	Wall thickness
2	T	135	168.3	10.97
5	T	110	114.3	6.02
8	T	70	88.9	5.50
9	T	70	88.9	5.50

The exact material thicknesses are not mandatory and can be slightly changed according to local needs.

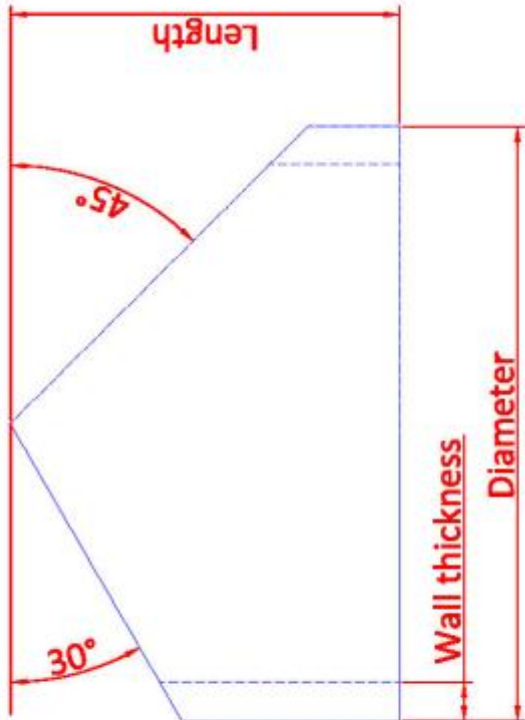
Drawn	22/09/2011	ITW test object-002 details
Check		
Appr.		
Rev.	02	
		Drawing N°
		ITW-002

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Item N°	acc. drawing ITW-000 and drawing ITW 135-000	Plate / Tube	Length	Diameter	Wall thickness
3		T	150	168.3	10,97
6		T	150	114.3	6.02

The exact material thicknesses are not mandatory and can be slightly changed according to local needs.





Drawn 22/09/2011	ITW test object-003 details
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Appr.	
Rev. 02	
Drawing N° ITW-003	

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ATB

WPS-Nr.		ITW-001		date	26-10-2011
				rev.	3
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :	S235JR		Joint design		
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR15608 Group nr. :	1.1				
Welding process :	111				
Filler material :	Basic electrode				
	Free choice of brand				
Welding position :	PB				
Shielding gas :	N/A				
Type of flux :	N/A				
Preheat :	none		Welding sequence		
Material thickness (mm): t1	10,97				
t2	15				
Outside pipe diameter (mm):	168,3				
Backing :	none				
Gouging / grinding :	N/A				
Single or multi layer	multi layer				
max. interpass temp. (°C):	250				
PWHT :	none				
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :	1		2 - n		
Welding process :	111		111		
Type of current (AC/DC) :	DC		DC		
Polarity (+/-)	-		+		
Size of filler material (diameter mm) :	2,5		3,2 / 4,00		
Welding current (A) :	65-85		125-135 / 155-165		
Arc voltage (V) :	-		-		
Travel speed (cm/min) :	-		-		
Distance contact tube/workpiece (mm) :	N/A		N/A		
Overlap (mm) :	N/A		N/A		
max. weaving (mm) :	3D		3D		
Oscillation (cycles/min) :	N/A		N/A		
Shielding gas flow rate (l/min) :	N/A		N/A		
Backing gas flow rate (l/min) :	N/A		N/A		
Filler material designation :	EN ISO 2560-A - E42 3 B or E42 2 B				
Heat Input (kJ/cm) :	N/A		N/A		
Tungsten electrode diameter (mm):		N/A		N/A	
Type of tungsten electrode :		N/A		N/A	
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB

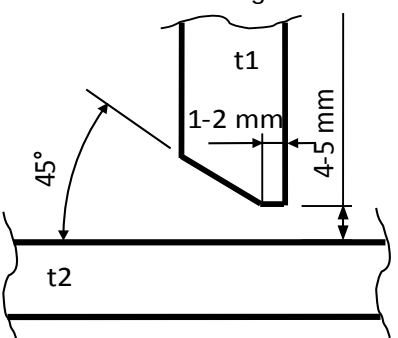
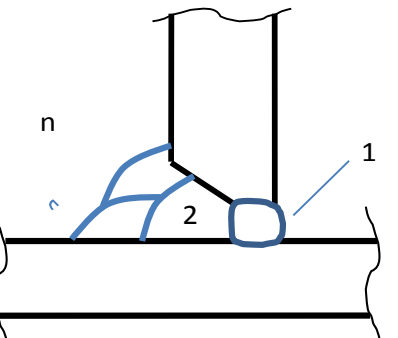
WPS-Nr.		ITW-002		date	26-10-2011
				rev.	3
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :	S235JR	Joint design			
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR15608 Group nr. :	1.1				
Welding process :	111				
Filler material :	Basic electrode Free choice of brand				
Welding position :	PC	Welding sequence			
Shielding gas :	N/A				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	10,97				
t2	10,97				
Outside pipe diameter (mm):	168,3				
Backing :	N/A				
Gouging / grinding :	N/A				
Single or multi layer	multi layer				
max. interpass temp. (°C):	250				
PWHT :	none				
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :	1	2 - n			
Welding process :	111	111			
Type of current (AC/DC) :	DC	DC			
Polarity (+/-)	-	+			
Size of filler material (diameter mm) :	2,5	3,2			
Welding current (A) :	65-85	115-125			
Arc voltage (V) :	-	-			
Travel speed (cm/min) :	-	-			
Distance contact tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	N/A	N/A			
Backing gas flow rate (l/min) :	N/A	N/A			
Filler material designation :	EN ISO 2560-A - E42 3 B or E42 2 B				
Heat Input (kJ/cm) :	N/A	N/A			
Tungsten electrode diameter (mm):	N/A	N/A			
Type of tungsten electrode :	N/A	N/A			
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB

WPS-Nr.		ITW-003		date	26-10-2011		
				rev.	3		
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1			
Parent material :		S235JR		Joint design			
to parent material :		S235JR					
Parent material standard :		EN 10025					
EN15608 Group nr. :		1.1					
Welding process :		111					
Filler material :		Basic electrode Free choice of brand		Welding sequence			
Welding position :		PD 045					
Shielding gas :		N/A					
Type of flux :		N/A					
Preheat :		none					
Material thickness (mm): t1		15					
t2		10,97					
Outside pipe diameter (mm):		168,3					
backing :		N/A					
Gouging / grinding :		N/A					
single or multi layer		multi layer					
max. interpass temp. (°C):		250					
PWHT :		none					
Supplementary requirement :							
Clean the welding joint of all oxides, dirt, oil, paint,...							
Welding parameters							
Run number :	1	2 - n					
Welding process :	111	111					
Type of current (AC/DC) :	DC	DC					
Polarity (+/-)	+	+					
Size of filler material (diameter mm) :	3,2	3,2					
Welding current (A) :	95-105	95-105					
Arc voltage (V) :	-	-					
Travel speed (cm/min) :	-	-					
Distance contact tube/workpiece (mm) :	N/A	N/A					
Overlap (mm) :	N/A	N/A					
max. weaving (mm) :	3D	3D					
Oscillation (cycles/min) :	N/A	N/A					
Shielding gas flow rate (l/min) :	N/A	N/A					
Backing gas flow rate (l/min) :	N/A	N/A					
Filler material designation :	EN ISO 2560-A - E42 3 B or E42 2 B						
Heat Input (kJ/cm) :	N/A	N/A					
Tungsten electrode diameter (mm):		N/A		N/A			
Type of tungsten electrode :		N/A		N/A			
Welding Procedure Qualification Record Nr. :							
Not qualified		written by :					



ATB			
WPS-Nr.	ITW-004	date	26-10-2011
		rev.	3
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
EN15608 Group nr. :	1.1		
Welding process :	111		
Filler material :	Basic electrode Free choice of brand	Welding sequence 	
Welding position :	PB 045		
Shielding gas :	N/A		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	6,02		
t2	15		
Outside pipe diameter (mm):	114,9		
backing :	N/A		
Gouging / grinding :	N/A		
single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement :			
Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	111	111	
Type of current (AC/DC) :	DC	DC	
Polarity (+/-)	-	+	
Size of filler material (diameter mm) :	2,5	3,2	
Welding current (A) :	60-70	95-105	
Arc voltage (V) :	-	-	
Travel speed (cm/min) :	-	-	
Distance contact tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	N/A	N/A	
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	EN ISO 2560-A - E42 3 B or E42 2 B		
Heat Input (kJ/cm) :	N/A	N/A	
Tungsten electrode diameter (mm):	N/A	N/A	
Type of tungsten electrode :	N/A	N/A	
Welding Procedure Qualification Record Nr. :			
Not qualified		written by :	



ATB

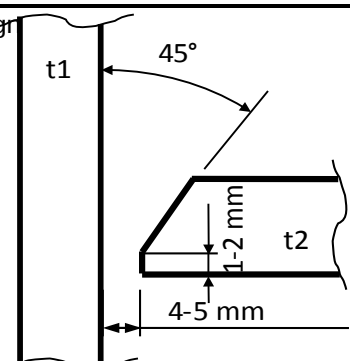
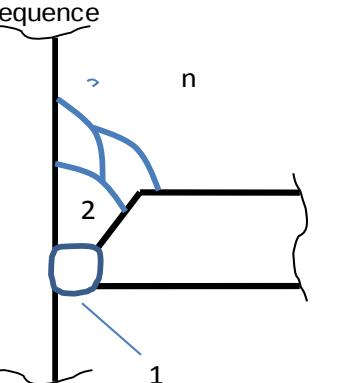
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				rev.	3
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :	S235JR	Joint design			
to parent material :	S235JR				
Parent material standard :	EN 10025				
EN15608 Group nr. :	1.1				
Welding process :	111				
Filler material :	Basic electrode Free choice of brand				
Welding position :	H-L045				
Shielding gas :	N/A				
Type of flux :	N/A				
Preheat :	none	Welding sequence			
Material thickness (mm): t1	6,02				
t2	6,02				
Outside pipe diameter (mm):	114,3				
backing :	N/A				
Gouging / grinding :	N/A				
single or multi layer	multi layer				
max. interpass temp. (°C):	250				
PWHT :	none				
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :	1	2 - n			
Welding process :	111	111			
Type of current (AC/DC) :	DC	DC			
Polarity (+/-)	-	+			
Size of filler material (diameter mm) :	2,5	2,5			
Welding current (A) :	55-65	70-80			
Arc voltage (V) :	-	-			
Travel speed (cm/min) :	-	-			
Distance contact tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	N/A	N/A			
Backing gas flow rate (l/min) :	N/A	N/A			
Filler material designation :	EN ISO 2560-A - E42 3 B or E42 2 B				
Heat Input (kJ/cm) :	N/A	N/A			
Tungsten electrode diameter (mm):	N/A	N/A			
Type of tungsten electrode :	N/A	N/A			
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB

WPS-Nr.		ITW-006		date	26-10-2011
				rev.	3
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :		S235JR		Joint design 	
to parent material :		S235JR			
Parent material standard :		EN 10025			
EN15608 Group nr. :		1.1			
Welding process :		111			
Filler material :		Basic electrode Free choice of brand		Welding sequence 	
Welding position :		PF			
Shielding gas :		N/A			
Type of flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		6			
t2		6,02			
Outside pipe diameter (mm):		114,3			
backing :		N/A			
Gouging / grinding :		N/A			
single or multi layer		multi layer			
max. interpass temp. (°C):		250			
PWHT :		none			
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :		1		2 - 3	
Welding process :		111		111	
Type of current (AC/DC) :		DC		DC	
Polarity (+/-)		+		+	
Size of filler material (diameter mm) :		2,5		2,5	
Welding current (A) :		70-80		70-80	
Arc voltage (V) :		-		-	
Travel speed (cm/min) :		-		-	
Distance contact tube/workpiece (mm) :		N/A		N/A	
Overlap (mm) :		N/A		N/A	
max. weaving (mm) :		3D		3D	
Oscillation (cycles/min) :		N/A		N/A	
Shielding gas flow rate (l/min) :		N/A		N/A	
Backing gas flow rate (l/min) :		N/A		N/A	
Filler material designation :		EN ISO 2560-A - E42 3 B or E42 2 B			
Heat Input (kJ/cm) :		N/A		N/A	
Tungsten electrode diameter (mm):		N/A		N/A	
Type of tungsten electrode :		N/A		N/A	
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB			
WPS-Nr.	ITW-007	date	26-10-2011
		rev.	3
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
EN15608 Group nr. :	1.1		
Welding process :	111		
Filler material :	Basic electrode Free choice of brand	Welding sequence 	
Welding position :	PH		
Shielding gas :	N/A		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	6		
t2	5,5		
Outside pipe diameter (mm):	60,3		
backing :	N/A		
Gouging / grinding :	N/A		
single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement :			
Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	111	111	
Type of current (AC/DC) :	DC	DC	
Polarity (+/-)	-	+	
Size of filler material (diameter mm) :	2,5	2,5	
Welding current (A) :	60-70	65-75	
Arc voltage (V) :	-	-	
Travel speed (cm/min) :	-	-	
Distance contact tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	N/A	N/A	
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	EN ISO 2560-A - E42 3 B or E42 2 B		
Heat Input (kJ/cm) :	N/A	N/A	
Tungsten electrode diameter (mm):	N/A	N/A	
Type of tungsten electrode :	N/A	N/A	
Welding Procedure Qualification Record Nr. :			
Not qualified		written by :	



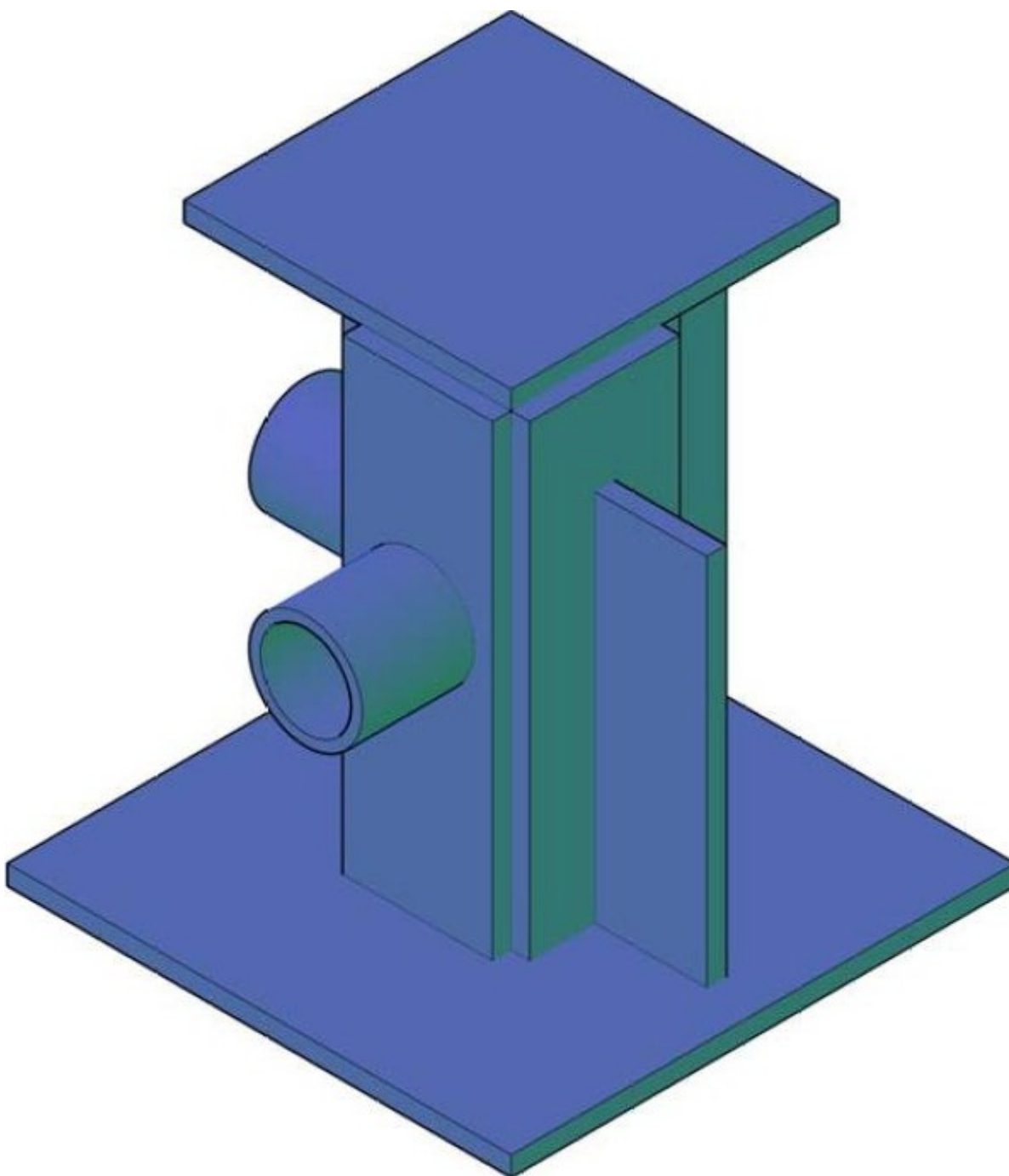
ATB

WPS-Nr.		ITW-008		date	26-10-2011
				rev.	3
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :	S235JR	Joint design			
to parent material :	S235JR				
Parent material standard :	EN 10025				
EN15608 Group nr. :	1.1				
Welding process :	111				
Filler material :	Basic electrode Free choice of brand				
Welding position :	PH	Welding sequence			
Shielding gas :	N/A				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	5,5				
t2	5,5				
Outside pipe diameter (mm):	60,3				
backing :	N/A				
Gouging / grinding :	N/A				
single or multi layer	multi layer				
max. interpass temp. (°C):	250				
PWHT :	none				
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :	1	2 - n			
Welding process :	111	111			
Type of current (AC/DC) :	DC	DC			
Polarity (+/-)	-	+			
Size of filler material (diameter mm) :	2,5	2,5			
Welding current (A) :	50-60	55-65			
Arc voltage (V) :	-	-			
Travel speed (cm/min) :	-	-			
Distance contact tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	N/A	N/A			
Backing gas flow rate (l/min) :	N/A	N/A			
Filler material designation :	EN ISO 2560-A - E42 3 B or E42 2 B				
Heat Input (kJ/cm) :	N/A	N/A			
Tungsten electrode diameter (mm):	N/A	N/A			
Type of tungsten electrode :	N/A	N/A			
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			

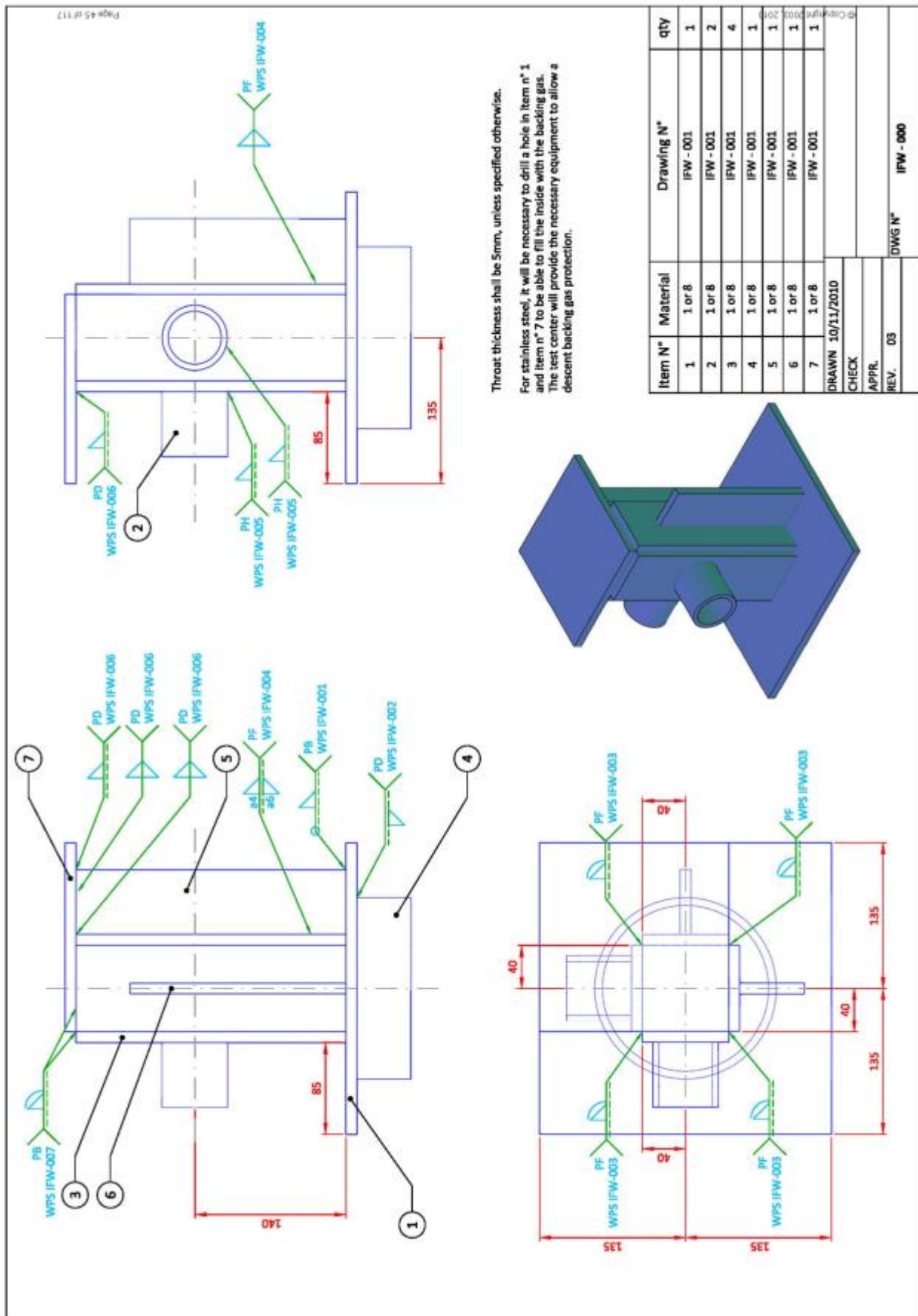
17.2 Welding Process 135

17.2.1 IFW Test Object-135

Material groups 1, 2 and 3



Important note: The assembly drawing was originally created in the DIN A3 format. By printing on A4 or downscaling to A4 format, it is possible that some details are badly or not visible.





Item N° acc. drawing IFW-000	Plate / Tube	Length [mm]	Width [mm]	Thickness [mm]	Diameter [mm]
1	P	270	270	10	
2	T	60		5.5	60.3
3	P	250	80	10	
4	T	50		7.1	168.3
5	P	60	250	10	
6	P	60	200	10	
7	P	175	175	10	

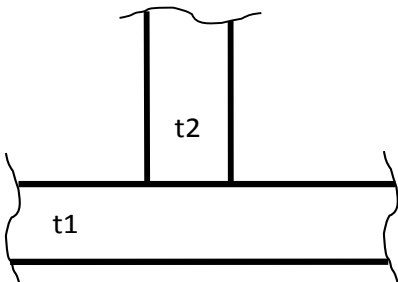
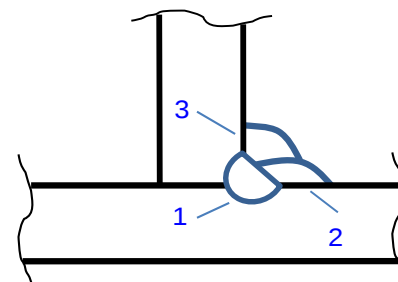
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The exact material thicknesses are not mandatory and can be slightly changed according to local needs.

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Drawn 10/11/2010	Drawing N° IFW-001
Check	
Appr.	
Rev. 02	



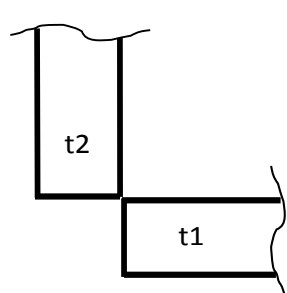
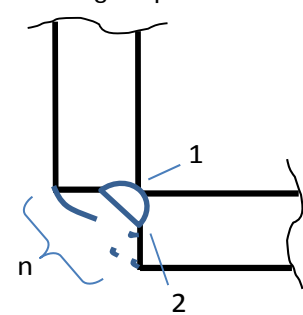
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WPS-Nr.	IFW-001	date	25-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand	Welding sequence 	
Welding position :	PB		
Shielding gas :	ISO 14175 : M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	10		
Outside pipe diameter (mm):	N/A		
Backing :	N/A		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement :			
Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	135	135	
Type of Current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Diameter of filler material (mm) :	1,0	1,0	
Welding current (A) :	180-210	170-200	
Wire feed speed (m/min), informative:	8-10	7-9	
Arc voltage (V) :	23-27	22,5-26,5	
Travel speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :			
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 14341-A-3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Transfer mode			
Welding Procedure Qualification Record Nr. :			
Not qualified		written by :	



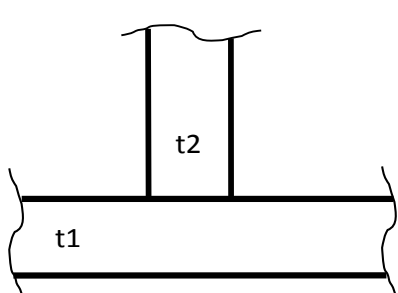
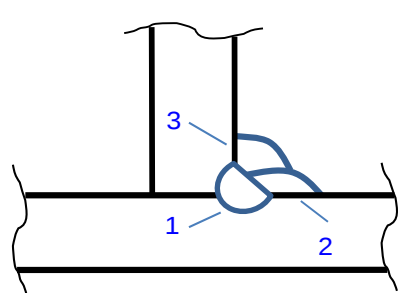
ATB

WPS-Nr.		IFW-002		date	25-10-2011		
				rev.	2		
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1			
Parent material :		S235JR					
to parent material :		S235JR					
Parent material standard :		EN 10025					
ISO/TR 15608 Group nr. :		1.1					
Welding Proces :		135					
Filler material :		any brand					
Welding position :		PD					
Shielding gas :		ISO 14175 : M21					
Type of flux :		N/A					
Preheat :		none					
Material thickness (mm): t1		10					
t2		7,1					
Outside pipe diameter (mm):		168,3					
Backing :		N/A					
Gouging / grinding :		N/A					
Single or multi layer		multi layer					
max. interpass temp. (°C):		250					
PWHT :		none					
Supplementary requirement :							
Clean the welding joint of all oxides, dirt, oil, paint,...							
Welding parameters							
Run number :		1		2 - n			
Welding process :		135		135			
Type of Current (AC/DC) :		DC		DC			
Polarity (+/-)		+		+			
Diameter of filler material (mm) :		1,0		1,0			
Welding current (A) :		180-210		170-200			
Wire feed speed (m/min), informative:		8-10		7-9			
Arc voltage (V) :		23-27		22,5-26,5			
Travel speed (cm/min) :		-		-			
Distance contact-tube/workpiece (mm) :		N/A		N/A			
Overlap (mm) :		N/A		N/A			
max. weaving (mm) :		3D		3D			
Oscillation (cycles/min) :		N/A		N/A			
Shielding gas flow rate (l/min) :							
Backing gas flow rate (l/min) :		N/A		N/A			
Filler material designation :		ISO 14341-A-3Si1					
Heat Input (kJ/cm) :		N/A		N/A			
Transfer mode							
Welding Procedure Qualification Record Nr. :							
Not qualified		written by :					

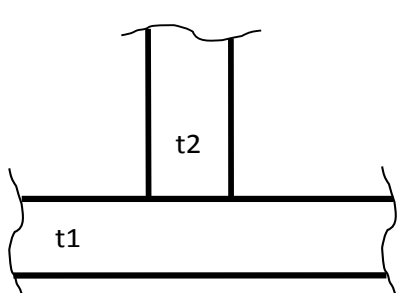
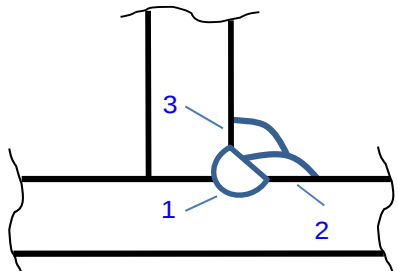


ATB			
WPS-Nr.	IFW-003	date	25-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand	Welding sequence 	
Welding position :	PF		
Shielding gas :	ISO 14175 : M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	10		
Outside pipe diameter (mm):	N/A		
Backing :	N/A		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	135	135	
Type of Current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Diameter of filler material (mm) :	1,0	1,0	
Welding current (A) :	125-155	145-175	
Wire feed speed (m/min), informative:	4-6	5-7	
Arc voltage (V) :	20-24	20,5-24,5	
Travel speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :			
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 14341-A-3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Transfer mode			
Welding Procedure Qualification Record Nr. :			
Not qualified	written by :		

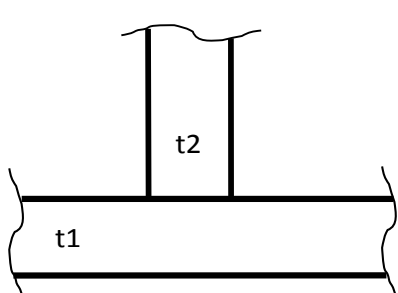
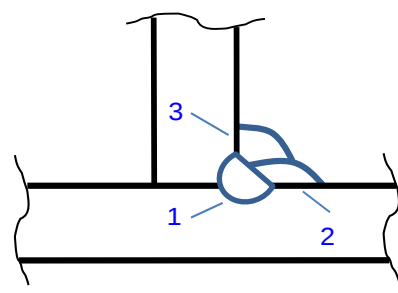


ATB			
WPS-Nr.	IFW-004	date	25-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand	Welding sequence 	
Welding position :	PF		
Shielding gas :	ISO 14175 : M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	10		
Outside pipe diameter (mm):	N/A		
Backing :	N/A		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement :			
Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	135	135	
Type of Current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Diameter of filler material (mm) :	1,0	1,0	
Welding current (A) :	125-155	125-155	
Wire feed speed (m/min), informative:	4-6	4-6	
Arc voltage (V) :	20-24	20-24	
Travel speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :			
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 14341-A-3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Transfer mode			
Welding Procedure Qualification Record Nr. :			
Not qualified	written by :		

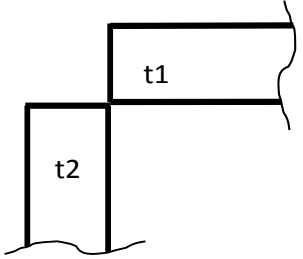
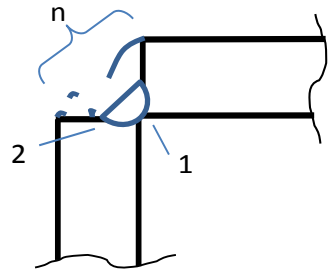


ATB			
WPS-Nr.	IFW-005	date	25-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand	Welding sequence 	
Welding position :	PF (PH)		
Shielding gas :	ISO 14175 : M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	5,5		
Outside pipe diameter (mm):	60,3		
Backing :	N/A		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	135	135	
Type of Current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Diameter of filler material (mm) :	1,0	1,0	
Welding current (A) :	135-165	135-165	
Wire feed speed (m/min), informative:	4,5-6,5	4,5-6,5	
Arc voltage (V) :	20-24	20-24	
Travel speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :			
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 14341-A-3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Transfer mode			
Welding Procedure Qualification Record Nr. :			
Not qualified	written by :		



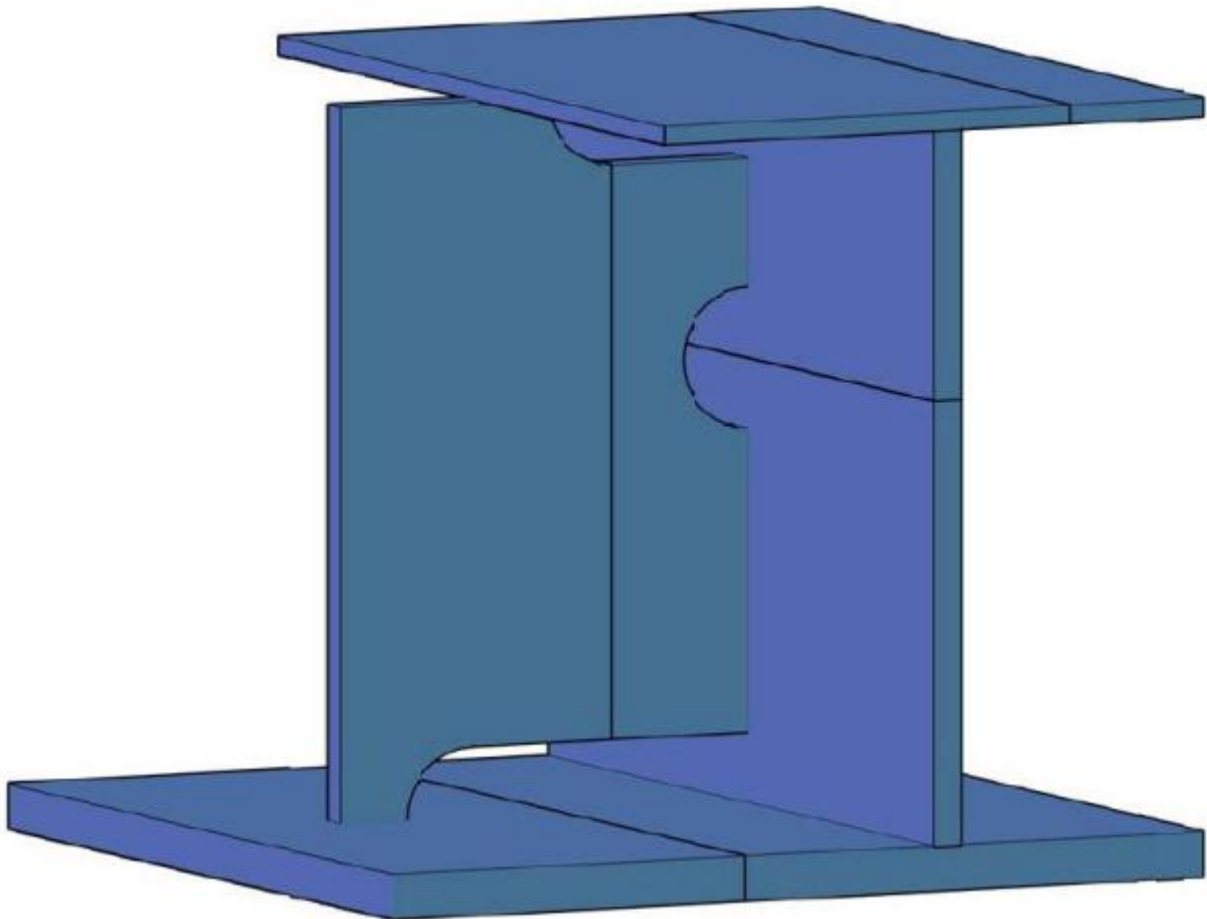
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		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand	Welding sequence 	
Welding position :	PD		
Shielding gas :	ISO 14175 : M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	10		
Outside pipe diameter (mm):	N/A		
Backing :	N/A		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	135	135	
Type of Current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Diameter of filler material (mm) :	1,0	1,0	
Welding current (A) :	180-210	170-200	
Wire feed speed (m/min), informative:	8-10	7-9	
Arc voltage (V) :	23-27	22,5-26,5	
Travel speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :			
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 14341-A-3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Transfer mode			
Welding Procedure Qualification Record Nr. :			
Not qualified	written by :		



ATB			
WPS-Nr.	IFW-007	date	25-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand	Welding sequence 	
Welding position :	PB		
Shielding gas :	ISO 14175 : M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	10		
Outside pipe diameter (mm):	N/A		
Backing :	N/A		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement :			
Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	135	135	
Type of Current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Diameter of filler material (mm) :	1,0	1,0	
Welding current (A) :	150-180	150-180	
Wire feed speed (m/min), informative:	5-7	5-7	
Arc voltage (V) :	21-25	21-25	
Travel speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :			
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 14341-A-3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Transfer mode			
Welding Procedure Qualification Record Nr. :			
Not qualified	written by :		

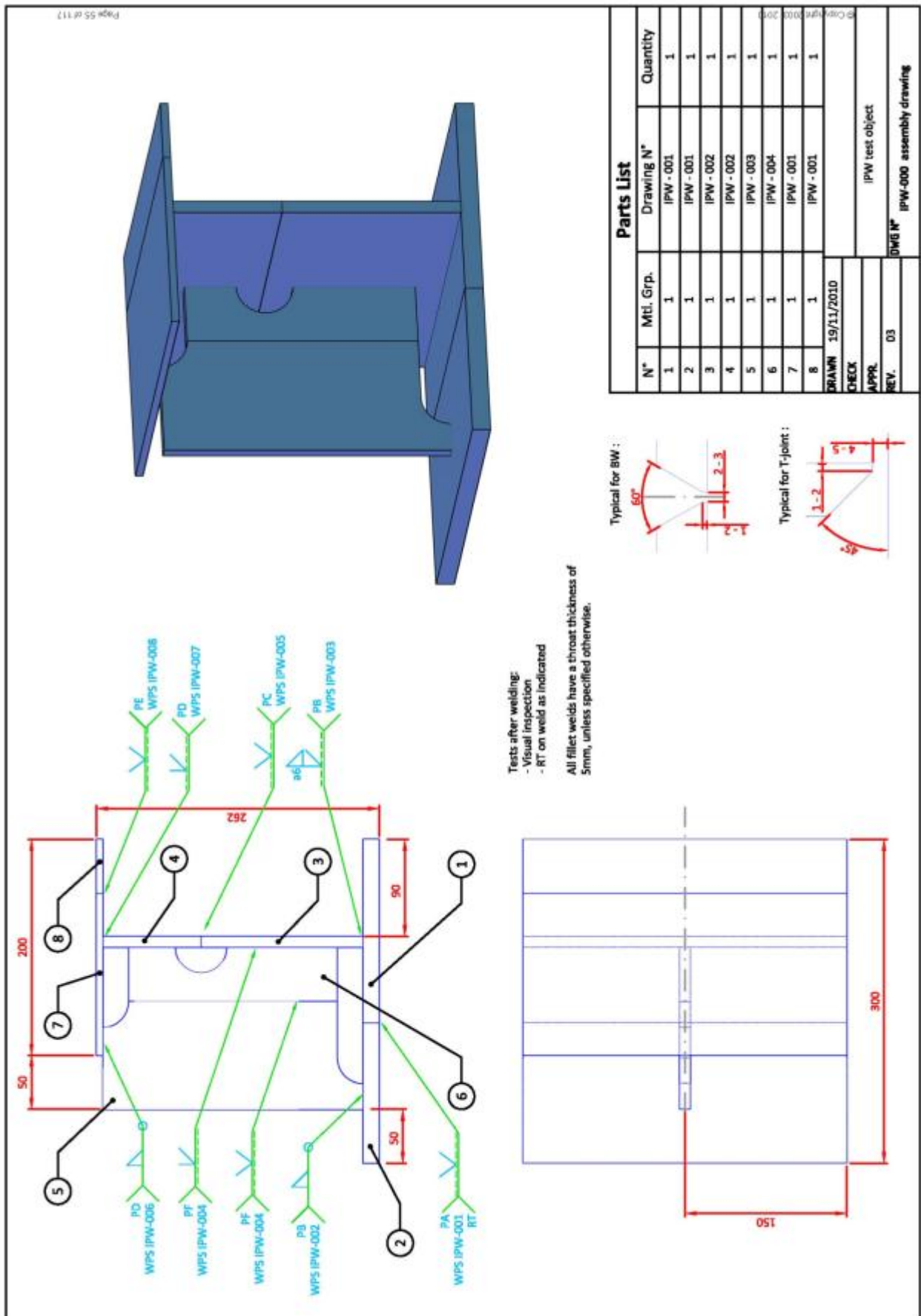
17.2.2 IPW Test Object – 135

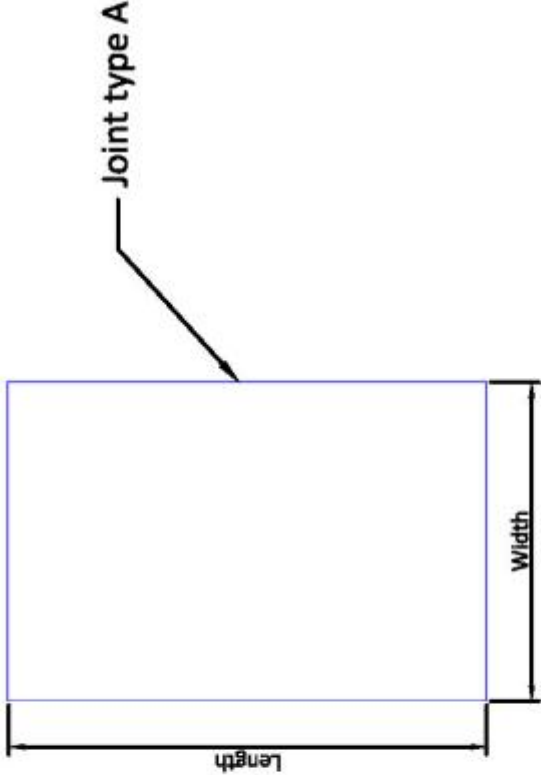
Material groups 1, 2 and 3



Important notes:

The assembly drawing was originally created in the DIN A3 format. By printing on A4 or downscaling to A4 format, it is possible that some details are badly or not visible.





Joint type A

Length

Width

30°

1 - 2

The root gap hasn't been taken into account in the indicated widths of the plates
The suggested root gap is to be found on the WPS of the corresponding joint.

Item N° acc. drawing IPW-000	Length	Width	Plate thickness
1	300	170	15
2	300	130	15
7	300	150	6
8	300	50	6

Drawn 19/11/2010

Check

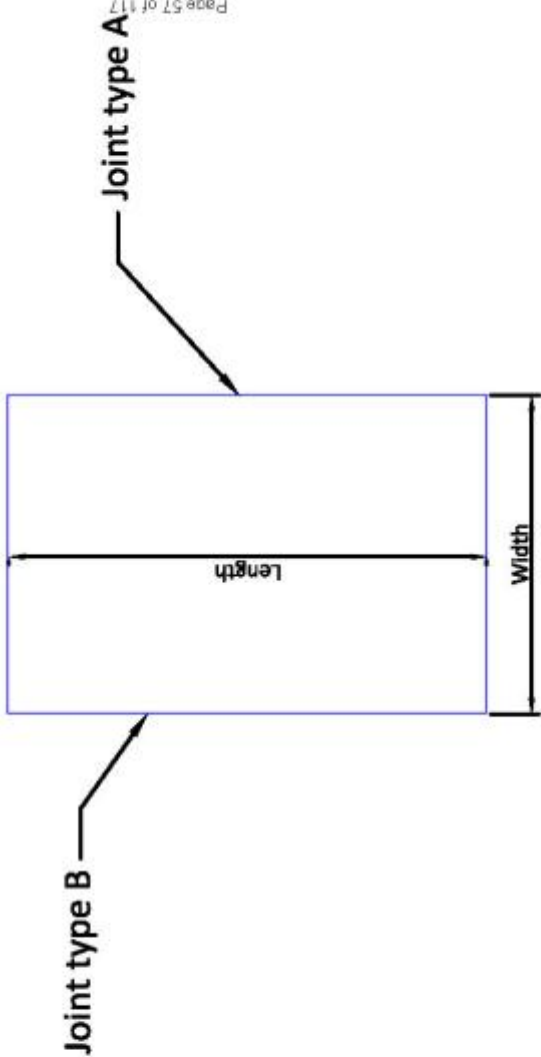
Appr.

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Drawing N°
IPW - 001

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Joint type A

Joint type B

Length

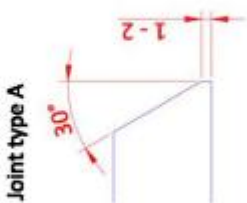
Width

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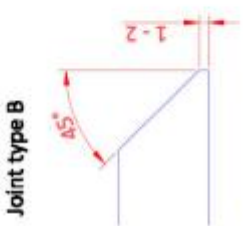
Item N° acc. drawing IPW-000	Length	Width	Plate thickness
3	300	150	10
4	300	91	10

The root gap hasn't been taken into account in the indicated widths of the plates
The suggested root gap is to be found on the WPS of the corresponding joint.

Joint type A

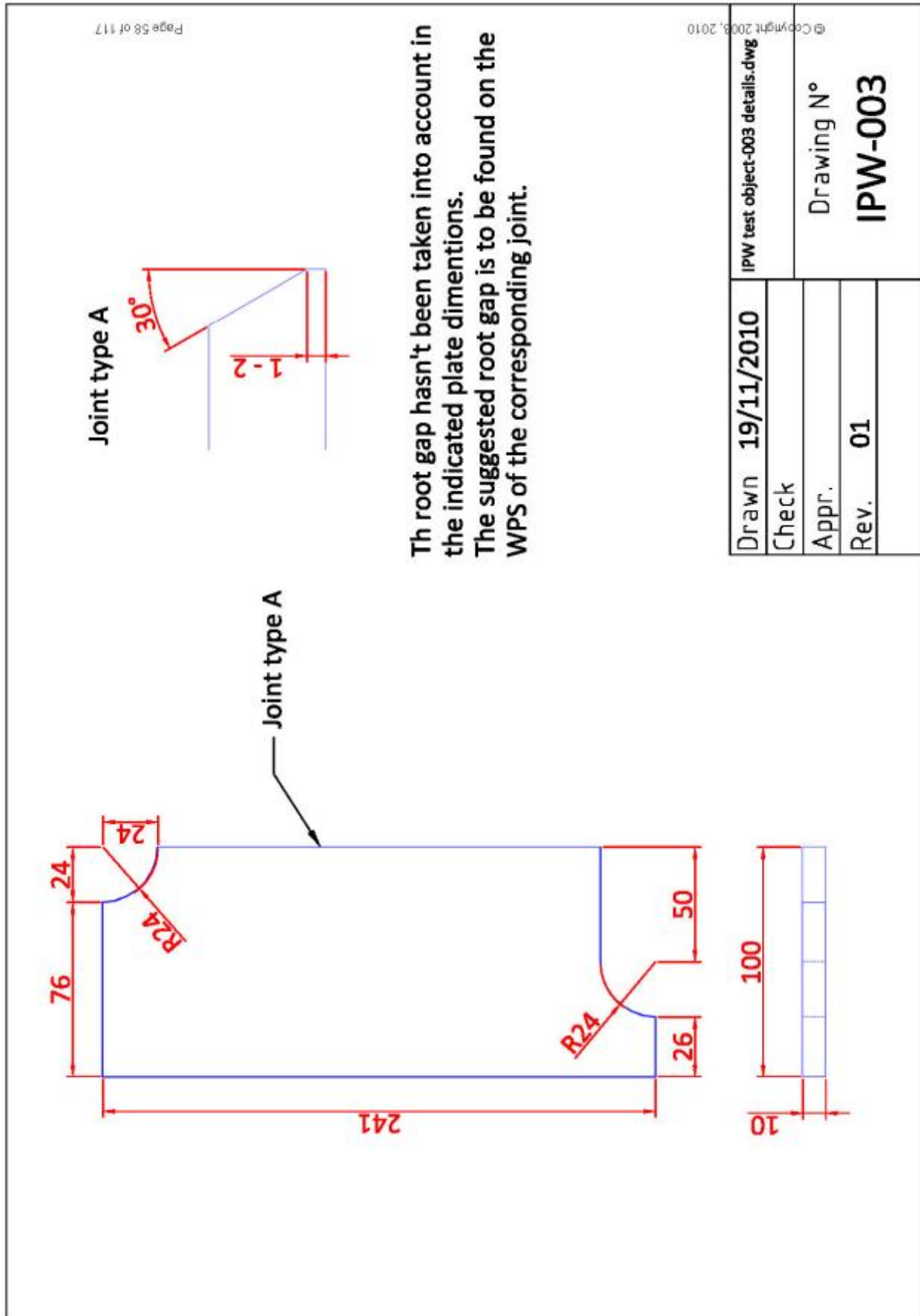


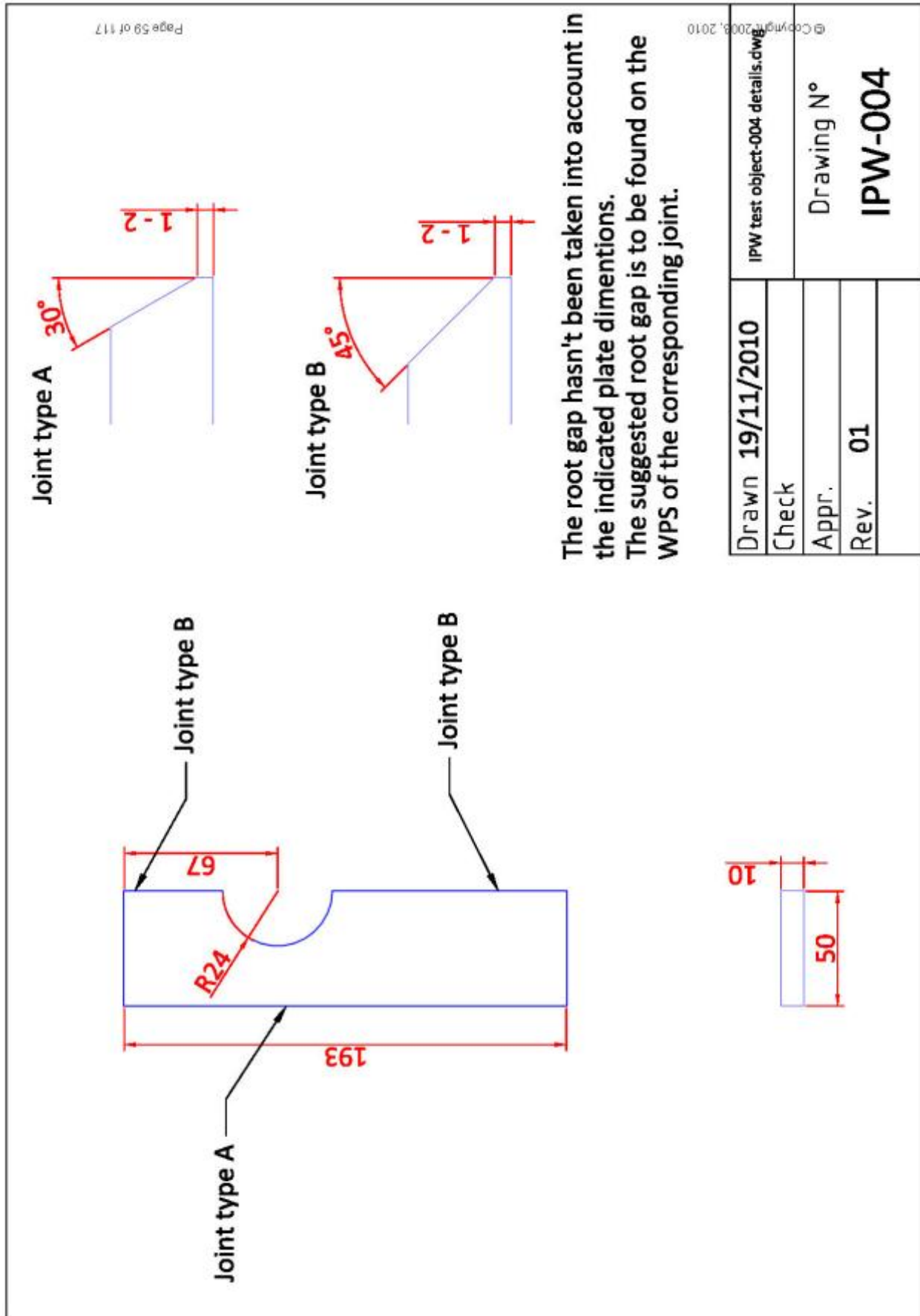
Joint type B



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Drawn 19/11/2010 Check Appr. Rev. 01	ipw test object-002 details Drawing N° IPW - 002
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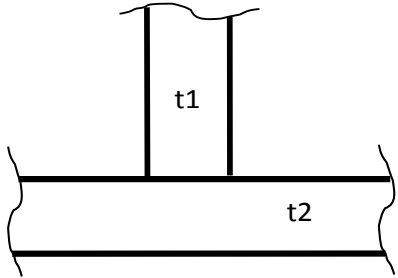
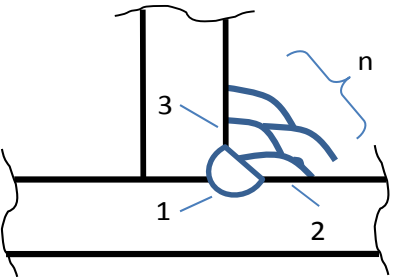






ATB			
WPS-Nr.	IPW-001	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand	Welding sequence	
Welding position :	PA		
Shielding gas :	ISO 14175 : M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	15		
t2	15		
Outside pipe diameter (mm):	N/A		
Backing :	none		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement :			
Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	135	135	
Type of Current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Diameter of filler material (mm) :	1,0	1,0	
Welding current (A) :	100-130	170-200	
Wire feed speed (m/min), informative:	3-4	7-9	
Arc voltage (V) :	18-20	22-26	
Travel speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	N/A	N/A	
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 14341 - A-3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Transfer mode			
Welding Procedure Qualification Record Nr. :			
Not qualified		written by :	



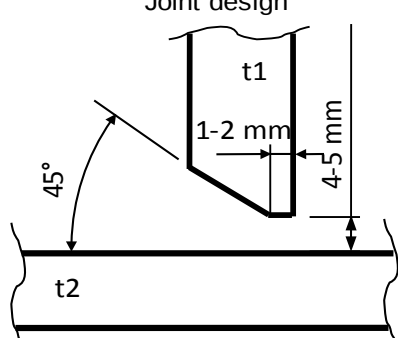
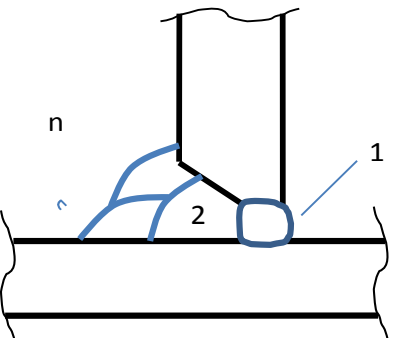
ATB			
WPS-Nr.	IPW-002	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand	Welding sequence 	
Welding position :	PB		
Shielding gas :	ISO 14175 : M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	15		
Outside pipe diameter (mm):	-		
Backing :	N/A		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	135	135	
Type of Current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Diameter of filler material (mm) :	1,0	1,0	
Welding current (A) :	175-205	175-205	
Wire feed speed (m/min), informative:	7-10	7-10	
Arc voltage (V) :	23-27	23-27	
Travel speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	N/A	N/A	
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 14341 - A-3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Transfer mode			
Welding Procedure Qualification Record Nr. : Not qualified		written by :	



ATB

WPS-Nr.		IPW-003		date	28-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :	S235JR		Joint design		
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR 15608 Group nr. :	1.1				
Welding Proces :	135				
Filler material :	any brand		Welding sequence		
Welding position :	PB				
Shielding gas :	ISO 14175 - M21				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	10				
t2	15				
Outside pipe diameter (mm):	N/A				
Backing :	N/A				
Gouging / grinding :	N/A				
Single or multi layer	multi layer				
max. interpass temp. (°C):	250				
PWHT :	none				
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :	1		2 - n		
Welding process :	135		135		
Type of Current (AC/DC) :	DC		DC		
Polarity (+/-)	+		+		
Diameter of filler material (mm) :	1,0		1,0		
Welding current (A) :	150-180		175-205		
Wire feed speed (m/min), informative:	5-7		7-10		
Arc voltage (V) :	23-25		22-27		
Travel speed (cm/min) :	-		-		
Distance contact-tube/workpiece (mm) :	N/A		N/A		
Overlap (mm) :	N/A		N/A		
max. weaving (mm) :	3D		3D		
Oscillation (cycles/min) :	N/A		N/A		
Shielding gas flow rate (l/min) :	N/A		N/A		
Backing gas flow rate (l/min) :	N/A		N/A		
Filler material designation :	ISO 14341 - A-3Si1				
Heat Input (kJ/cm) :	N/A		N/A		
Transfer mode					
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB			
WPS-Nr.	IPW-004	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand	Welding sequence 	
Welding position :	PF		
Shielding gas :	ISO 14175 - M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	10		
Outside pipe diameter (mm):	N/A		
Backing :	N/A		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	135	135	
Type of Current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Diameter of filler material (mm) :	1,0	1,0	
Welding current (A) :	110-140	125-155	
Wire feed speed (m/min), informative:	3,5-4,5	4-6	
Arc voltage (V) :	18-20	20-22	
Travel speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	N/A	N/A	
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 14341 - A-3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Transfer mode			
Welding Procedure Qualification Record Nr. :			
Not qualified	written by :		



ATB

WPS-Nr.	IPW-005	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand	Welding sequence 	
Welding position :	PC		
Shielding gas :	ISO 14175 - M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	10		
Outside pipe diameter (mm):	-		
Backing :	N/A		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement :			
Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	135	135	
Type of Current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Diameter of filler material (mm) :	1,0	1,0	
Welding current (A) :	100-130	170-200	
Wire feed speed (m/min), informative:	3-4	7-9	
Arc voltage (V) :	18-20	20-24	
Travel speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	N/A	N/A	
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 14341 - A-3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Transfer mode			
Welding Procedure Qualification Record Nr. :			
Not qualified	written by :		



ATB

WPS-Nr.		IPW-006		date	28-10-2011		
				rev.	2		
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1			
Parent material :		S235JR		Joint design			
to parent material :		S235JR					
Parent material standard :		EN 10025					
ISO/TR 15608 Group nr. :		1.1					
Welding Proces :		135					
Filler material :		any brand		Welding sequence			
Welding position :		PD					
Shielding gas :		ISO 14175 - M21					
Type of flux :		N/A					
Preheat :		none					
Material thickness (mm): t1		6		Welding sequence			
t2		10					
Outside pipe diameter (mm):		N/A					
Backing :		N/A					
Gouging / grinding :		N/A					
Single or multi layer		multi layer					
max. interpass temp. (°C):		250					
PWHT :		none					
Supplementary requirement :							
Clean the welding joint of all oxides, dirt, oil, paint,...							
Welding parameters							
Run number :		1		2 - 3			
Welding process :		135		135			
Type of Current (AC/DC) :		DC		DC			
Polarity (+/-)		+		+			
Diameter of filler material (mm) :		1,0		1,0			
Welding current (A) :		165-195		165-195			
Wire feed speed (m/min), informative:		6-9		6-9			
Arc voltage (V) :		21-25		21-25			
Travel speed (cm/min) :		-		-			
Distance contact-tube/workpiece (mm) :		N/A		N/A			
Overlap (mm) :		N/A		N/A			
max. weaving (mm) :		3D		3D			
Oscillation (cycles/min) :		N/A		N/A			
Shielding gas flow rate (l/min) :		N/A		N/A			
Backing gas flow rate (l/min) :		N/A		N/A			
Filler material designation :		ISO 14341 - A-3Si1					
Heat Input (kJ/cm) :		N/A		N/A			
Transfer mode							
Welding Procedure Qualification Record Nr. :							
Not qualified		written by :					



ATB

WPS-Nr.		IPW-007		date	28-10-2011				
				rev.	2				
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1					
Parent material :	S235JR								
to parent material :	S235JR								
Parent material standard :	EN 10025								
ISO/TR 15608 Group nr. :	1.1								
Welding Proces :	135								
Filler material :	any brand								
Welding position :	PD								
Shielding gas :	ISO 14175 - M21								
Type of flux :	N/A								
Preheat :	none								
Material thickness (mm): t1	6								
t2	10								
Outside pipe diameter (mm):	N/A								
Backing :	N/A								
Gouging / grinding :	N/A								
Single or multi layer	multi layer								
max. interpass temp. (°C):	250								
PWHT :	none								
Supplementary requirement :						Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters									
Run number :	1	2 - n							
Welding process :	135	135							
Type of Current (AC/DC) :	DC	DC							
Polarity (+/-)	+	+							
Diameter of filler material (mm) :	1,0	1,0							
Welding current (A) :	125-155	155-185							
Wire feed speed (m/min), informative:	4-6	6-8							
Arc voltage (V) :	20-22	21-25							
Travel speed (cm/min) :	-	-							
Distance contact-tube/workpiece (mm) :	N/A	N/A							
Overlap (mm) :	N/A	N/A							
max. weaving (mm) :	3D	3D							
Oscillation (cycles/min) :	N/A	N/A							
Shielding gas flow rate (l/min) :	N/A	N/A							
Backing gas flow rate (l/min) :	N/A	N/A							
Filler material designation :	ISO 14341 - A-3Si1								
Heat Input (kJ/cm) :	N/A	N/A							
Transfer mode									
Welding Procedure Qualification Record Nr. :									
Not qualified		written by :							

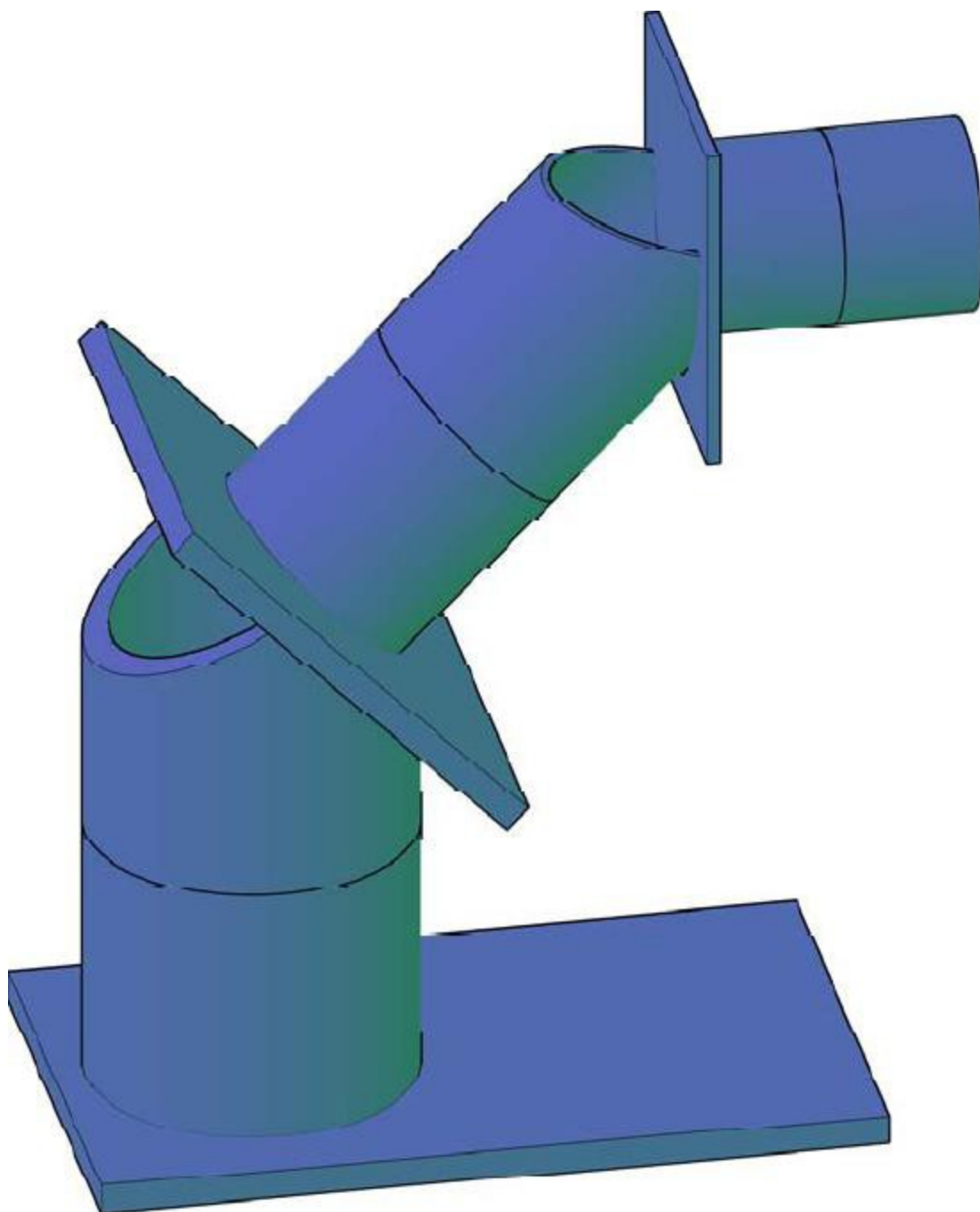


ATB

WPS-Nr.		IPW-008		date	28-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :	S235JR	Joint design			
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR 15608 Group nr. :	1.1				
Welding Proces :	135				
Filler material :	any brand				
Welding position :	PE				
Shielding gas :	ISO 14175 - M21				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	6	Welding sequence			
t2	6				
Outside pipe diameter (mm):	N/A				
Backing :	N/A				
Gouging / grinding :	N/A				
Single or multi layer	multi layer				
max. interpass temp. (°C):	250				
PWHT :	none				
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :	1	2 - n			
Welding process :	135	135			
Type of Current (AC/DC) :	DC	DC			
Polarity (+/-)	+	+			
Diameter of filler material (mm) :	1,0	1,0			
Welding current (A) :	100-130	125-155			
Wire feed speed (m/min), informative:	3-4	4-6			
Arc voltage (V) :	18-20	20-22			
Travel speed (cm/min) :	-	-			
Distance contact-tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	N/A	N/A			
Backing gas flow rate (l/min) :	N/A	N/A			
Filler material designation :	ISO 14341 - A-3Si1				
Heat Input (kJ/cm) :	N/A	N/A			
Transfer mode					
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			

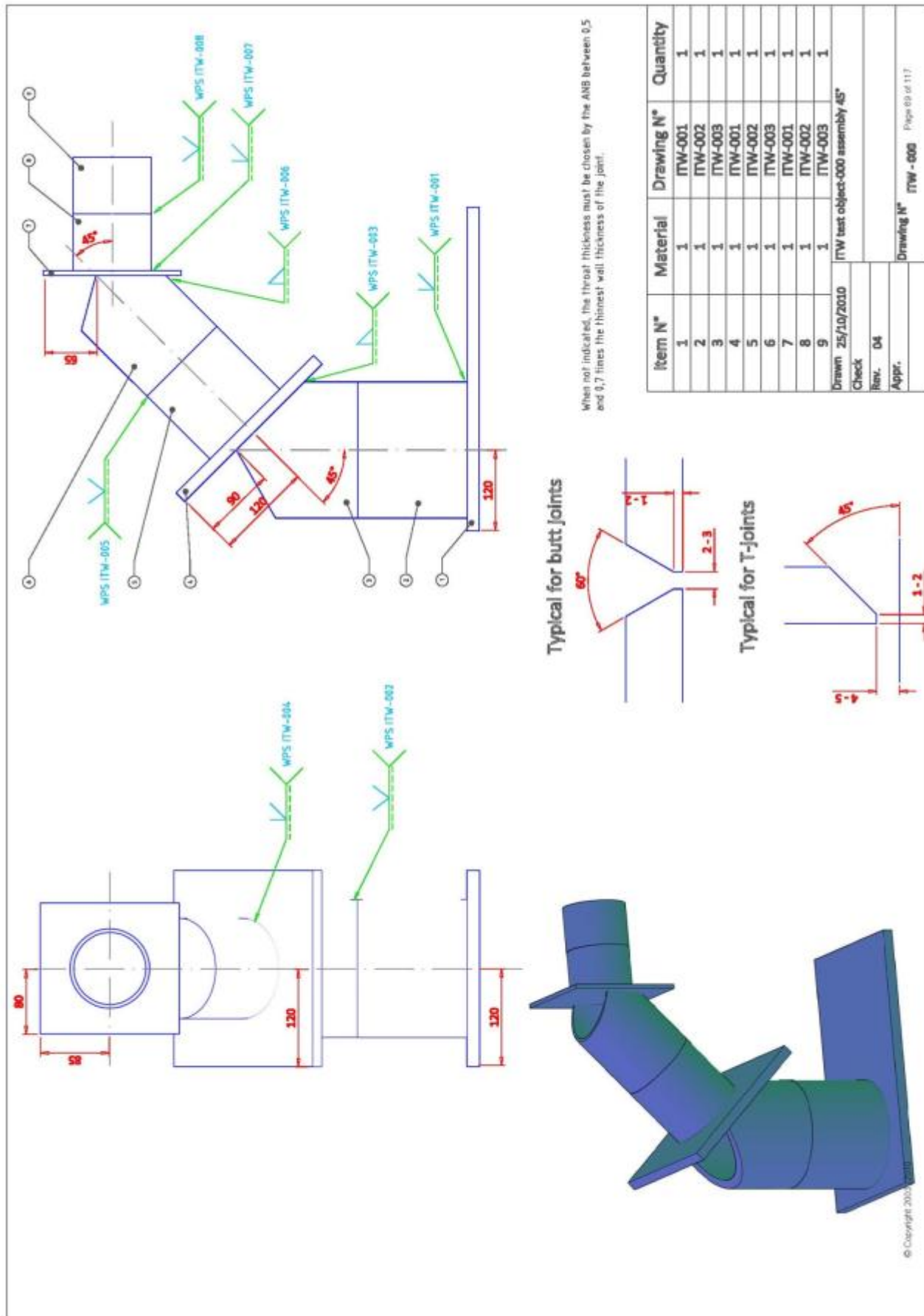
17.2.3 ITW Test Object – 135

Material groups 1, 2 and 3



Important notes:

The assembly drawing was originally created in the DIN A3 format. By printing on A4 or downscaling to A4 format, it is possible that some details become badly or not visible.



Item N° acc. drawing ITW-000 and drawing ITW 135-000	Plate / Tube	Length	Width	Plate thickness
1	Plate	400	240	15
4	Plate	240	240	15
7	Plate	170	160	6

The exact material thicknesses are not mandatory and can be slightly changed according to local needs.

Drawn	22/09/2011	ITW test object-001 details.dwg
Check		
Appr.		
Rev.	02	
		Drawing N° ITW-001

Item N° acc. drawing ITW-000	Plate / Tube	Length	Diameter	Wall thickness
2	T	135	168.3	10.97
5	T	110	114.3	6.02
8	T	70	60.3	5.50
9	T	70	60.3	5.50

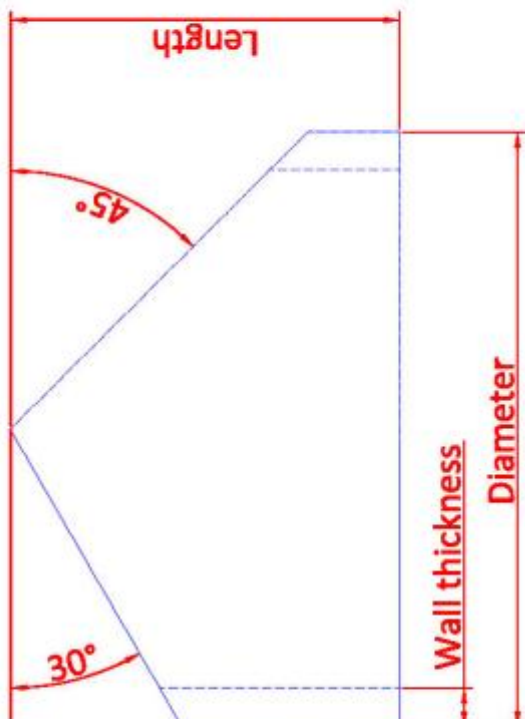
Item N° acc. drawing ITW 135-000	Plate / Tube	Length	Diameter	Wall thickness
2	T	135	168.3	10.97
5	T	110	114.3	6.02
8	T	70	88.9	5.50
9	T	70	88.9	5.50

The exact material thicknesses are not mandatory and can be slightly changed according to local needs.

Drawn 22/09/2011	ITW test object-002 details
Check	
Appr.	Drawing N°
Rev. 02	ITW-002

Item N°	acc. drawing ITW-000 and drawing ITW 135-000	Plate / Tube	Length	Diameter	Wall thickness
3		T	150	168.3	10,97
6		T	150	114.3	6.02

The exact material thicknesses are not mandatory and can be slightly changed according to local needs.




Drawn 22/09/2011	ITW test object-003 details
Check	
Appr.	
Rev. 02	
Drawing N° ITW-003	

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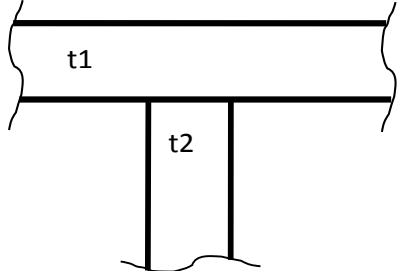
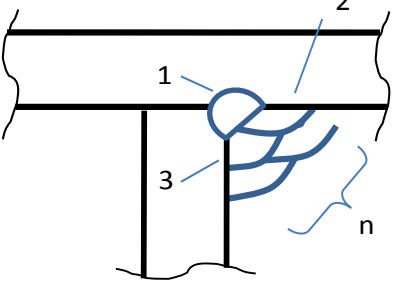
ATB			
WPS-Nr.	ITW-001	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand		
Welding position :	PB		
Shielding gas :	ISO 14175 : M21		
Type flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10,97	Welding sequence	
t2	15		
Outside pipe diameter (mm):	168,3		
Backing :	none		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement :			
Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	135	135	
Type of Current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Diameter of filler material (mm) :	1,0	1,0	
Welding current (A) :	145-175	170-200	
Wire feed speed (m/min), informative:	5-7	7-9	
Arc voltage (V) :	20-24	22-26	
Travel speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	N/A	N/A	
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 14341 - A-3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Transfer mode			
Welding Procedure Qualification Record Nr. :			
Not qualified	written by :		



ATB

WPS-Nr.		ITW-002		date	28-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :		S235JR		Joint design 	
to parent material :		S235JR			
Parent material standard :		EN 10025			
ISO/TR 15608 Group nr. :		1.1			
Welding Proces :		135			
Filler material :		any brand		Welding sequence 	
Welding position :		PC			
Shielding gas :		ISO 14175 : M21			
Type flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		10,97			
t2		10,97			
Outside pipe diameter (mm):		168,3			
Backing :		N/A			
Gouging / grinding :		N/A			
Single or multi layer		multi layer		Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...	
max. interpass temp. (°C):		250			
PWHT :		none			
Welding parameters					
Run number :	1	2 - n			
Welding process :	135	135			
Type of Current (AC/DC) :	DC	DC			
Polarity (+/-)	+	+			
Diameter of filler material (mm) :	1,0	1,0			
Welding current (A) :	110-150	175-195			
Wire feed speed (m/min), informative:	3-5	7-8			
Arc voltage (V) :	18-20	21-25			
Travel speed (cm/min) :	-	-			
Distance contact-tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	N/A	N/A			
Backing gas flow rate (l/min) :	N/A	N/A			
Filler material designation :	ISO 14341 - A-3Si1				
Heat Input (kJ/cm) :	N/A	N/A			
Transfer mode					
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB			
WPS-Nr.	ITW-003	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand	Welding sequence 	
Welding position :	PD 045		
Shielding gas :	ISO 14175 - M21		
Type flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	15		
t2	10,97		
Outside pipe diameter (mm):	168,3		
Backing :	N/A		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	135	135	
Type of Current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Diameter of filler material (mm) :	1,0	1,0	
Welding current (A) :	180-210	180-210	
Wire feed speed (m/min), informative:	8-10	8-10	
Arc voltage (V) :	23-27	23-27	
Travel speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	N/A	N/A	
Backing gas flow rate (l/min) :	N/A	N/A	
Filler material designation :	ISO 14341 - A-3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Transfer mode			
Welding Procedure Qualification Record Nr. :			
Not qualified		written by :	



ATB

WPS-Nr.	ITW-004	date	28-10-2011		
		rev.	2		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235JR	Joint design 			
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR 15608 Group nr. :	1.1				
Welding Proces :	135				
Filler material :	any brand	Welding sequence 			
Welding position :	PB 045				
Shielding gas :	ISO 14175 : M21				
Type flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	6,02				
t2	15				
Outside pipe diameter (mm):	114,9				
Backing :	N/A				
Gouging / grinding :	N/A				
Single or multi layer	multi layer				
max. interpass temp. (°C):	250				
PWHT :	none				
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :	1	2 - n			
Welding process :	135	135			
Type of Current (AC/DC) :	DC	DC			
Polarity (+/-)	+	+			
Diameter of filler material (mm) :	1,0	1,0			
Welding current (A) :	100-130	150-180			
Wire feed speed (m/min), informative:	3-4	5-7			
Arc voltage (V) :	18-20	20-24			
Travel speed (cm/min) :	-	-			
Distance contact-tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	N/A	N/A			
Backing gas flow rate (l/min) :	N/A	N/A			
Filler material designation :	ISO 14341 - A-3Si1				
Heat Input (kJ/cm) :	N/A	N/A			
Transfer mode					
Welding Procedure Qualification Record Nr. :					
Not qualified	written by :				



ATB

WPS-Nr.		ITW-005		date	28-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :		S235JR		Joint design 	
to parent material :		S235JR			
Parent material standard :		EN 10025			
ISO/TR 15608 Group nr. :		1.1			
Welding Proces :		135			
Filler material :		any brand		Welding sequence 	
Welding position :		H-L045			
Shielding gas :		ISO 14175 : M21			
Type flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		6,02			
t2		6,02			
Outside pipe diameter (mm):		114,3			
Backing :		N/A			
Gouging / grinding :		N/A			
Single or multi layer		multi layer		Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...	
max. interpass temp. (°C):		250			
PWHT :		none			
Welding parameters					
Run number :		1		2 - n	
Welding process :		135		135	
Type of Current (AC/DC) :		DC		DC	
Polarity (+/-)		+		+	
Diameter of filler material (mm) :		1,0		1,0	
Welding current (A) :		100-130		125-155	
Wire feed speed (m/min), informative:		3-4		4-6	
Arc voltage (V) :		18-20		20-23	
Travel speed (cm/min) :		-		-	
Distance contact-tube/workpiece (mm) :		N/A		N/A	
Overlap (mm) :		N/A		N/A	
max. weaving (mm) :		3D		3D	
Oscillation (cycles/min) :		N/A		N/A	
Shielding gas flow rate (l/min) :		N/A		N/A	
Backing gas flow rate (l/min) :		N/A		N/A	
Filler material designation :		ISO 14341 - A-3Si1			
Heat Input (kJ/cm) :		N/A		N/A	
Transfer mode					
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB

WPS-Nr.		ITW-006		date	28-10-2011		
				rev.	2		
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1			
Parent material :		S235JR		Joint design			
to parent material :		S235JR					
Parent material standard :		EN 10025					
ISO/TR 15608 Group nr. :		1.1					
Welding Proces :		135					
Filler material :		any brand		Welding sequence			
Welding position :		PF					
Shielding gas :		ISO 14175 - M21					
Type flux :		N/A					
Preheat :		none					
Material thickness (mm): t1		6		Welding sequence			
t2		6,02					
Outside pipe diameter (mm):		114,3					
Backing :		N/A					
Gouging / grinding :		N/A					
Single or multi layer		multi layer					
max. interpass temp. (°C):		250					
PWHT :		none					
Supplementary requirement :						Clean the welding joint of all oxides, dirt, oil, paint,...	
Welding parameters							
Run number :		1		2 - 3			
Welding process :		135		135			
Type of Current (AC/DC) :		DC		DC			
Polarity (+/-)		+		+			
Diameter of filler material (mm) :		1,0		1,0			
Welding current (A) :		155-185		155-185			
Wire feed speed (m/min), informative:		6-8		6-8			
Arc voltage (V) :		21-23		21-23			
Travel speed (cm/min) :		-		-			
Distance contact-tube/workpiece (mm) :		N/A		N/A			
Overlap (mm) :		N/A		N/A			
max. weaving (mm) :		3D		3D			
Oscillation (cycles/min) :		N/A		N/A			
Shielding gas flow rate (l/min) :		N/A		N/A			
Backing gas flow rate (l/min) :		N/A		N/A			
Filler material designation :		ISO 14341 - A-3Si1					
Heat Input (kJ/cm) :		N/A		N/A			
Transfer mode							
Welding Procedure Qualification Record Nr. :							
Not qualified		written by :					



ATB					
WPS-Nr.		ITW-007	date 28-10-2011		
			rev. 2		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235JR				
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR 15608 Group nr. :	1.1				
Welding Proces :	135				
Filler material :	any brand				
Welding position :	PH				
Shielding gas :	ISO 14175 : M21				
Type flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	6				
t2	5,5				
Outside pipe diameter (mm):	89,3				
Backing :	N/A				
Gouging / grinding :	N/A				
Single or multi layer	multi layer				
max. interpass temp. (°C):	250				
PWHT :	none				
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :	1	2 - n			
Welding process :	135	135			
Type of Current (AC/DC) :	DC	DC			
Polarity (+/-)	+	+			
Diameter of filler material (mm) :	1,0	1,0			
Welding current (A) :	100-130	150-180			
Wire feed speed (m/min), informative:	3-5	5-7			
Arc voltage (V) :	18-20	21-25			
Travel speed (cm/min) :	-	-			
Distance contact-tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	N/A	N/A			
Backing gas flow rate (l/min) :	N/A	N/A			
Filler material designation :	ISO 14341 - A-3Si1				
Heat Input (kJ/cm) :	N/A	N/A			
Transfer mode					
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



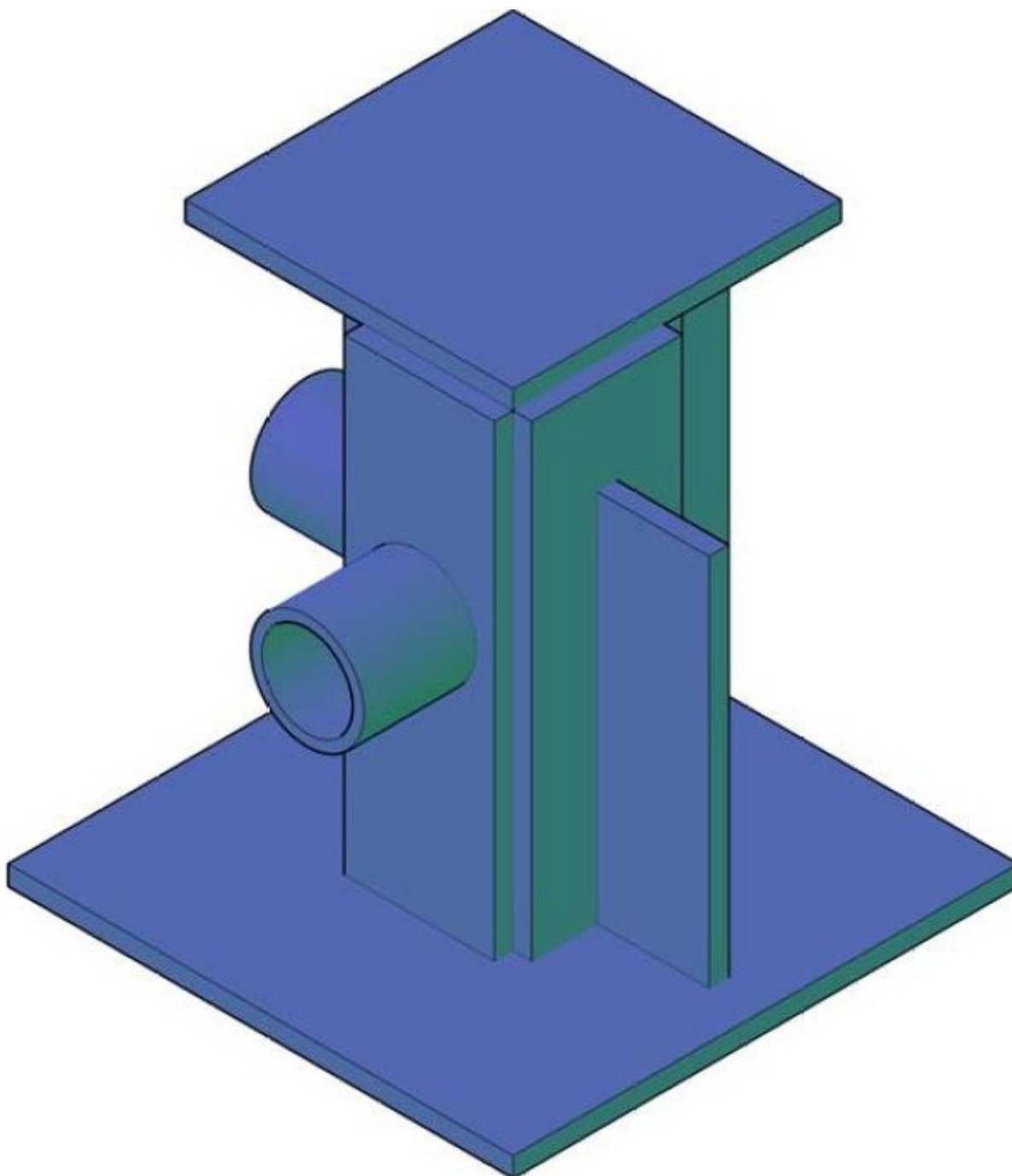
ATB

WPS-Nr.		ITW-008		date	28-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :		S235JR		Joint design	
to parent material :		S235JR			
Parent material standard :		EN 10025			
ISO/TR 15608 Group nr. :		1.1			
Welding Proces :		135			
Filler material :		any brand		Welding sequence	
Welding position :		PH			
Shielding gas :		ISO 14175 : M21			
Type flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		5,5			
t2		5,5			
Outside pipe diameter (mm):		89,3			
Backing :		N/A			
Gouging / grinding :		N/A			
Single or multi layer		multi layer		Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...	
max. interpass temp. (°C):		250			
PWHT :		none			
Welding parameters					
Run number :	1	2 - n			
Welding process :	135	135			
Type of Current (AC/DC) :	DC	DC			
Polarity (+/-)	+	+			
Diameter of filler material (mm) :	1,0	1,0			
Welding current (A) :	100-130	125-155			
Wire feed speed (m/min), informative:	3-4	4-6			
Arc voltage (V) :	18-20	20-22			
Travel speed (cm/min) :	-	-			
Distance contact-tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	N/A	N/A			
Backing gas flow rate (l/min) :	N/A	N/A			
Filler material designation :	ISO 14341 - A-3Si1				
Heat Input (kJ/cm) :	N/A	N/A			
Transfer mode					
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			

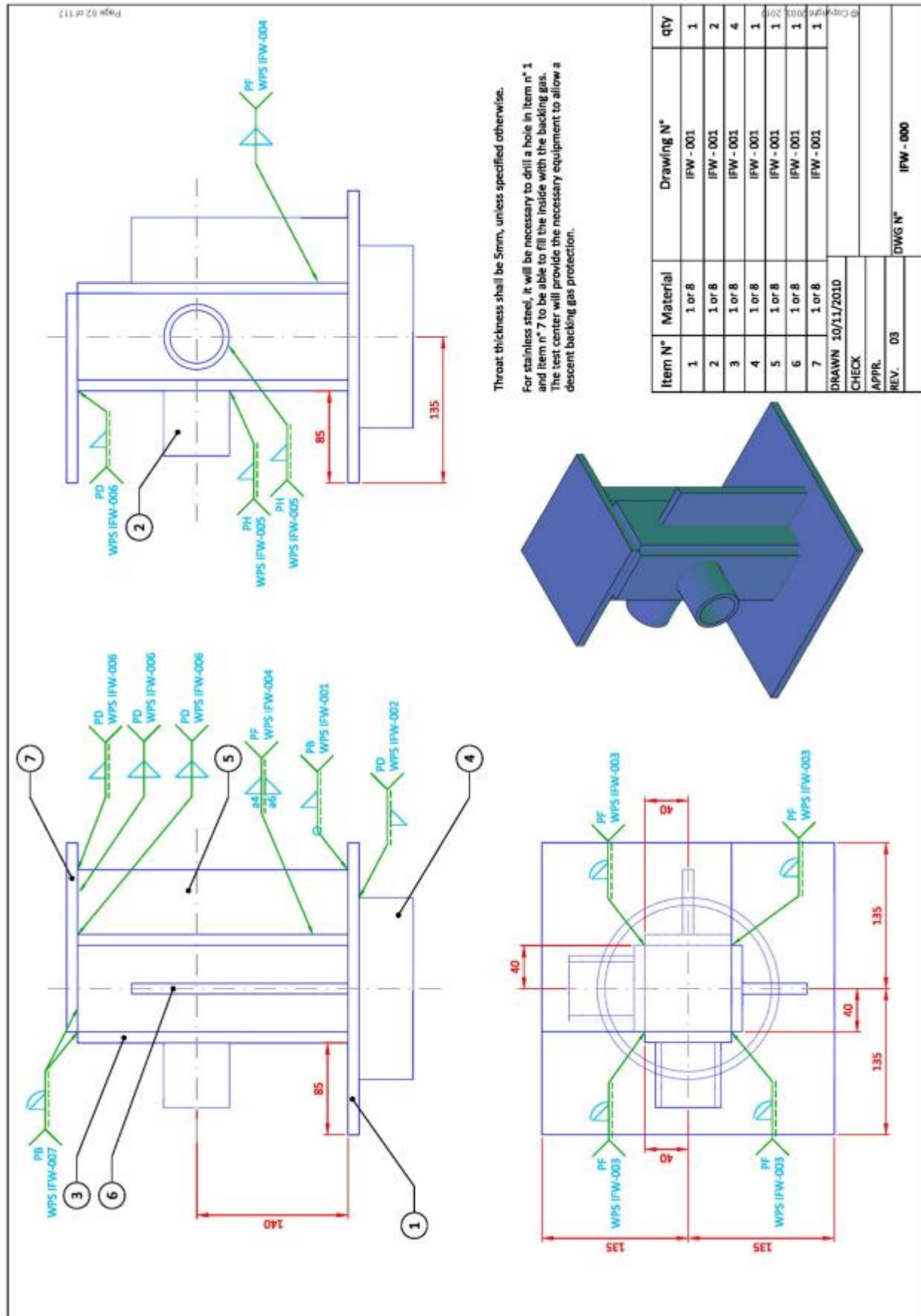
17.3 Welding Process 141

17.3.1 IFW Test Object-141

Material groups 1, 2 and 3



Important note: The assembly drawing was originally created in the DIN A3 format. By printing on A4 or downscaling to A4 format, it is possible that some details are badly or not visible.





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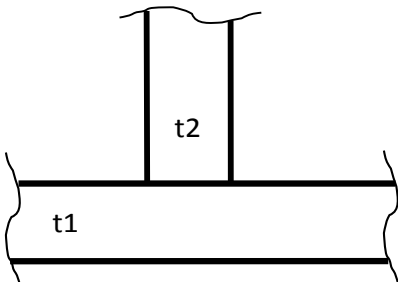
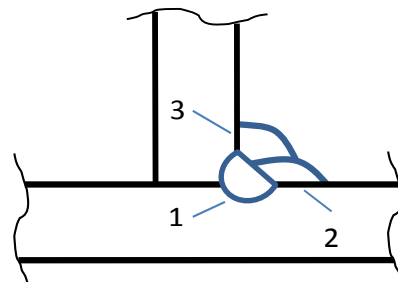
Item N° acc. drawing IFW-000	Plate / Tube	Length [mm]	Width [mm]	Thickness [mm]	Diameter [mm]
1	P	270	270	10	
2	T	60		5.5	60.3
3	P	250	80	10	
4	T	50		7.1	168.3
5	P	60	250	10	
6	P	60	200	10	
7	P	175	175	10	

The exact material thicknesses are not mandatory and can be slightly changed according to local needs.

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Drawn 10/11/2010	
Check	
Appr.	
Rev. 02	
	Drawing N° IFW-001



ATB			
WPS-Nr.	IFW-001	date	24-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :		Welding sequence 	
Welding position :	PB		
Shielding gas :	ISO 14175 : I1		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	10		
Outside pipe diameter (mm):	N/A		
Backing :	none		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	141	141	
Type of current (AC/DC) :	DC	DC	
Polarity (+/-)	-	-	
Diameter of filler material (mm) :	2,40	2,40	
Welding current (A) :	160-190	145-175	
Voltage range (V) :	-	-	
Welding speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	8 - 12	8 - 12	
Backing gas flow rate (l/min) :	none	none	
Filler material designation :	ISO 636-A - W42 5 W3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Tungsten electrode diameter (mm):	1,6	1,6	
Type of tungsten electrode (ISO 6848) :	Wth 20 or Wla 15	Wth 20 or Wla 15	
Welding Procedure Qualification Record Nr. :			
Not qualified		written by :	



ATB

WPS-Nr.		IFW-002		date	24-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :		S235JR		Joint design	
to parent material :		S235JR			
Parent material standard :		EN 10025			
ISO/TR 15608 Group nr. :		1.1			
Welding Process :		141			
Filler material :				Welding sequence	
Welding position :		PD			
Shielding gas :		ISO 14175 : I1			
Type of flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		10			
t2		7,1			
Outside pipe diameter (mm):		168,3			
Backing :		none			
Gouging / grinding :		N/A			
Single or multi layer		multi layer			
max. interpass temp. (°C):		250			
PWHT :		none			
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :		1		2 - n	
Welding process :		141		141	
Type of current (AC/DC) :		DC		DC	
Polarity (+/-)		-		-	
Diameter of filler material (mm) :		2,40		2,40	
Welding current (A) :		160-190		145-175	
Voltage range (V) :		-		-	
Welding speed (cm/min) :		-		-	
Distance contact-tube/workpiece (mm) :		N/A		N/A	
Overlap (mm) :		N/A		N/A	
max. weaving (mm) :		3D		3D	
Oscillation (cycles/min) :		N/A		N/A	
Shielding gas flow rate (l/min) :		8 - 12		8 - 12	
Backing gas flow rate (l/min) :		none		none	
Filler material designation :		ISO 636-A - W42 5 W3Si1			
Heat Input (kJ/cm) :		N/A		N/A	
Tungsten electrode diameter (mm):		1,6		1,6	
Type of tungsten electrode (ISO 6848) :		Wth 20 or Wla 15		Wth 20 or Wla 15	
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB

WPS-Nr.		IFW-003		date	24-10-2011		
				rev.	2		
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1			
Parent material :		S235JR		Joint design			
to parent material :		S235JR					
Parent material standard :		EN 10025					
ISO/TR 15608 Group nr. :		1.1					
Welding Process :		141					
Filler material :				Welding sequence			
Welding position :		PF					
Shielding gas :		ISO 14175 : I1					
Type of flux :		N/A					
Preheat :		none					
Material thickness (mm): t1		10		Welding sequence			
t2		10					
Outside pipe diameter (mm):		N/A					
Backing :		none					
Gouging / grinding :		N/A					
Single or multi layer		multi layer					
max. interpass temp. (°C):		250					
PWHT :		none					
Supplementary requirement :						Clean the welding joint of all oxides, dirt, oil, paint,...	
Welding parameters							
Run number :	1	2 - n					
Welding process :	141	141					
Type of current (AC/DC) :	DC	DC					
Polarity (+/-)	-	-					
Diameter of filler material (mm) :	2,40	2,40					
Welding current (A) :	105-135	125-155					
Voltage range (V) :	-	-					
Welding speed (cm/min) :	-	-					
Distance contact-tube/workpiece (mm) :	N/A	N/A					
Overlap (mm) :	N/A	N/A					
max. weaving (mm) :	3D	3D					
Oscillation (cycles/min) :	N/A	N/A					
Shielding gas flow rate (l/min) :	8 - 12	8 - 12					
Backing gas flow rate (l/min) :	none	none					
Filler material designation :	ISO 636-A - W42 5 W3Si1						
Heat Input (kJ/cm) :	N/A	N/A					
Tungsten electrode diameter (mm):		1,6		1,6			
Type of tungsten electrode (ISO 6848) :		Wth 20 or Wla 15		Wth 20 or Wla 15			
Welding Procedure Qualification Record Nr. :							
Not qualified		written by :					





ATB			
WPS-Nr.		IFW-004	date 24-10-2011
			rev. 2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :		Welding sequence 	
Welding position :	PF		
Shielding gas :	ISO 14175 : I1		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	10		
Outside pipe diameter (mm):	N/A		
Backing :	none		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	141	141	
Type of current (AC/DC) :	DC	DC	
Polarity (+/-)	-	-	
Diameter of filler material (mm) :	2,40	2,40	
Welding current (A) :	160-190	145-175	
Voltage range (V) :	-	-	
Welding speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	8 - 12	8 - 12	
Backing gas flow rate (l/min) :	none	none	
Filler material designation :	ISO 636-A - W42 5 W3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Tungsten electrode diameter (mm):	1,6	1,6	
Type of tungsten electrode (ISO 6848) :	Wth 20 or Wla 15	Wth 20 or Wla 15	
Welding Procedure Qualification Record Nr. :			
Not qualified		written by :	



ATB			
WPS-Nr.		IFW-005	date 24-10-2011
			rev. 2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :		Welding sequence	
Welding position :	PF tube (PH)		
Shielding gas :	ISO 14175 : I1		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
t2	5,5		
Outside pipe diameter (mm):	60,3		
Backing :	none		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement :			
Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	141	141	
Type of current (AC/DC) :	DC	DC	
Polarity (+/-)	-	-	
Diameter of filler material (mm) :	2,40	2,40	
Welding current (A) :	125-155	125-155	
Voltage range (V) :	-	-	
Welding speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	8 - 12	8 - 12	
Backing gas flow rate (l/min) :	none	none	
Filler material designation :	ISO 636-A - W42 5 W3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Tungsten electrode diameter (mm):	1,6	1,6	
Type of tungsten electrode (ISO 6848) :	Wth 20 or Wla 15	Wth 20 or Wla 15	
Welding Procedure Qualification Record Nr. :			
Not qualified		written by :	





ATB

WPS-Nr.		IFW-006		date	24-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :		S235JR		Joint design	
to parent material :		S235JR			
Parent material standard :		EN 10025			
ISO/TR 15608 Group nr. :		1.1			
Welding Process :		141			
Filler material :				Welding sequence	
Welding position :		PD			
Shielding gas :		ISO 14175 : I1			
Type of flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		10			
t2		10			
Outside pipe diameter (mm):		N/A			
Backing :		none			
Gouging / grinding :		N/A			
Single or multi layer		multi layer			
max. interpass temp. (°C):		250			
PWHT :		none			
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :		1		2 - n	
Welding process :		141		141	
Type of current (AC/DC) :		DC		DC	
Polarity (+/-)		-		-	
Diameter of filler material (mm) :		2,40		2,40	
Welding current (A) :		160-190		145-175	
Voltage range (V) :		-		-	
Welding speed (cm/min) :		-		-	
Distance contact-tube/workpiece (mm) :		N/A		N/A	
Overlap (mm) :		N/A		N/A	
max. weaving (mm) :		3D		3D	
Oscillation (cycles/min) :		N/A		N/A	
Shielding gas flow rate (l/min) :		8 - 12		8 - 12	
Backing gas flow rate (l/min) :		none		none	
Filler material designation :		ISO 636-A - W42 5 W3Si1			
Heat Input (kJ/cm) :		N/A		N/A	
Tungsten electrode diameter (mm):		1,6		1,6	
Type of tungsten electrode (ISO 6848) :		Wth 20 or Wla 15		Wth 20 or Wla 15	
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			

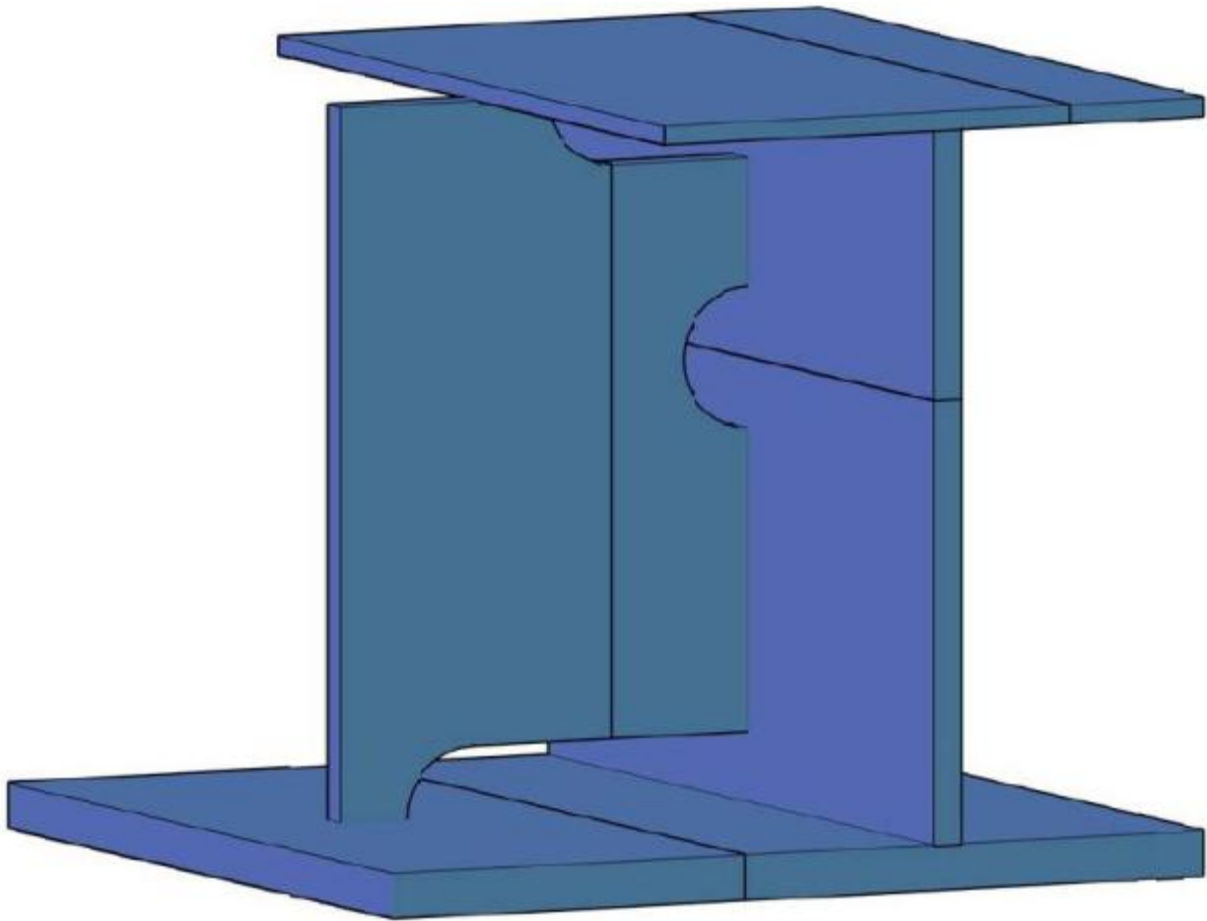


ATB

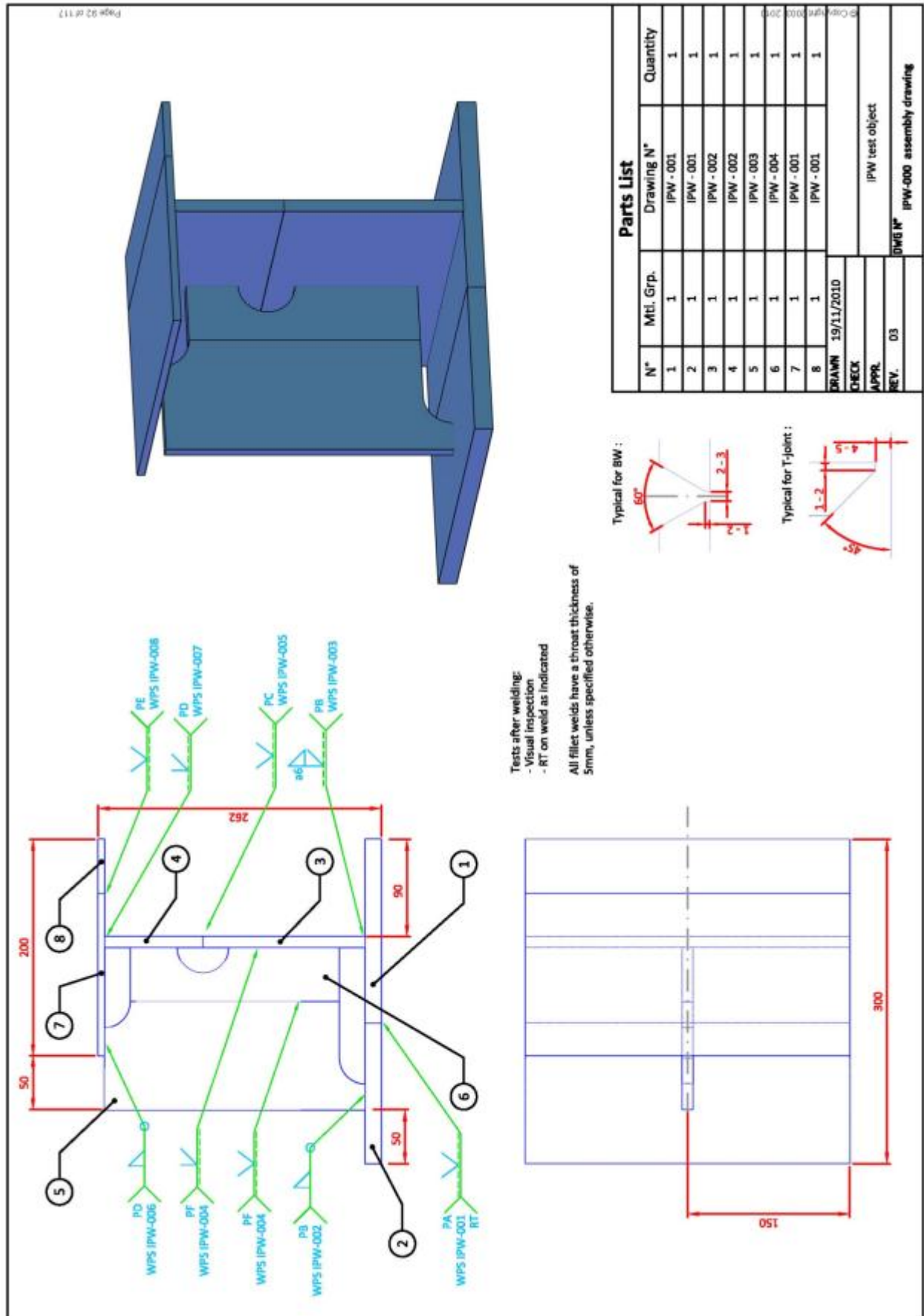
WPS-Nr.		IFW-007		date	24-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :		S235JR		Joint design	
to parent material :		S235JR			
Parent material standard :		EN 10025			
ISO/TR 15608 Group nr. :		1.1			
Welding Process :		141			
Filler material :				Welding sequence	
Welding position :		PB			
Shielding gas :		ISO 14175 : I1			
Type of flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		10			
t2		10			
Outside pipe diameter (mm):		N/A			
Backing :		none			
Gouging / grinding :		N/A			
Single or multi layer		multi layer			
max. interpass temp. (°C):		250			
PWHT :		none			
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :		1		2 - n	
Welding process :		141		141	
Type of current (AC/DC) :		DC		DC	
Polarity (+/-)		-		-	
Diameter of filler material (mm) :		2,40		2,40	
Welding current (A) :		105-135		125-155	
Voltage range (V) :		-		-	
Welding speed (cm/min) :		-		-	
Distance contact-tube/workpiece (mm) :		N/A		N/A	
Overlap (mm) :		N/A		N/A	
max. weaving (mm) :		3D		3D	
Oscillation (cycles/min) :		N/A		N/A	
Shielding gas flow rate (l/min) :		8 - 12		8 - 12	
Backing gas flow rate (l/min) :		none		none	
Filler material designation :		ISO 636-A - W42 5 W3Si1			
Heat Input (kJ/cm) :		N/A		N/A	
Tungsten electrode diameter (mm):		1,6		1,6	
Type of tungsten electrode (ISO 6848) :		Wth 20 or Wla 15		Wth 20 or Wla 15	
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			

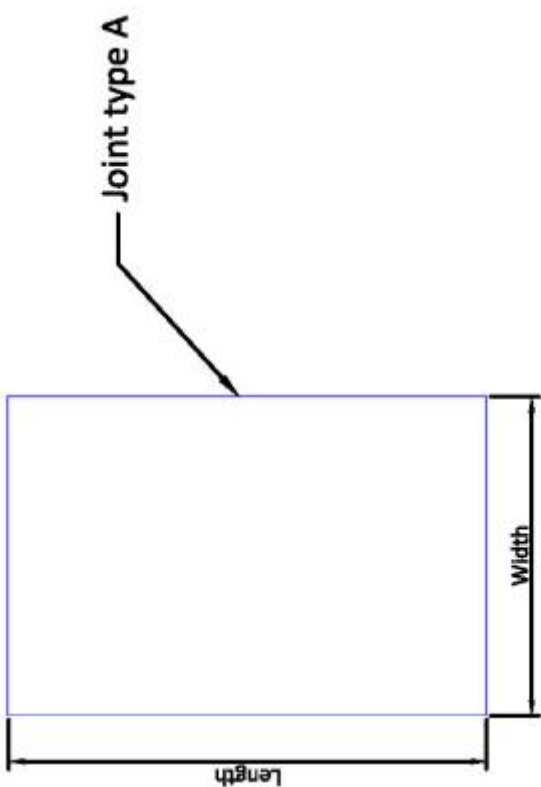
17.3.2 IPW Test Object – 141

Material groups 1, 2 and 3



Important note: The assembly drawing was originally created in the DIN A3 format. By printing on A4 or downscaling to A4 format, it is possible that some details are badly or not visible.





Joint type A

The root gap hasn't been taken into account in the indicated widths of the plates
The suggested root gap is to be found on the WPS of the corresponding joint.

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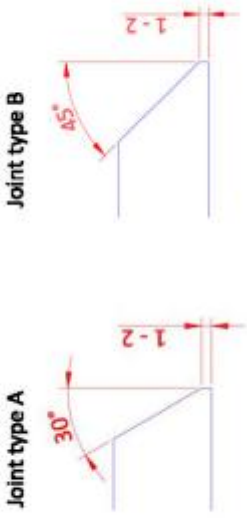
Copyright 2009, 2010

Item N°	Length	Width	Plate thickness
1	300	170	15
2	300	130	15
7	300	150	6
8	300	50	6

Drawn 19/11/2010	ipw test object-001 details
Check	
Appr.	
Rev. 01	

Drawing N°

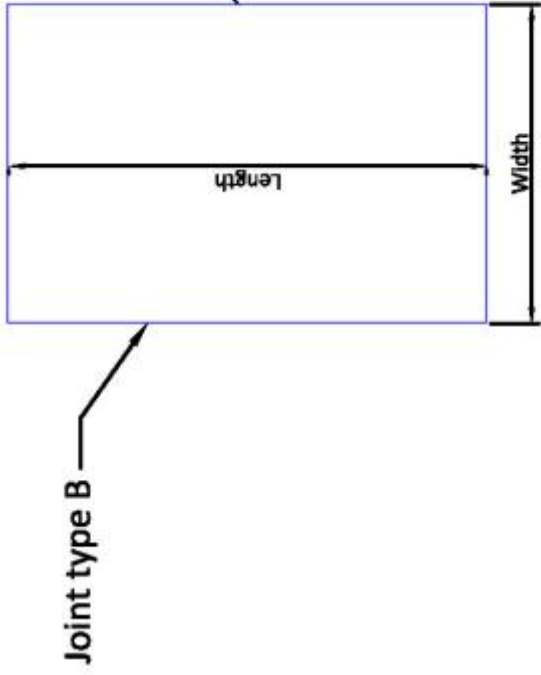
IPW - 001



Joint type A

Joint type B

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Joint type A

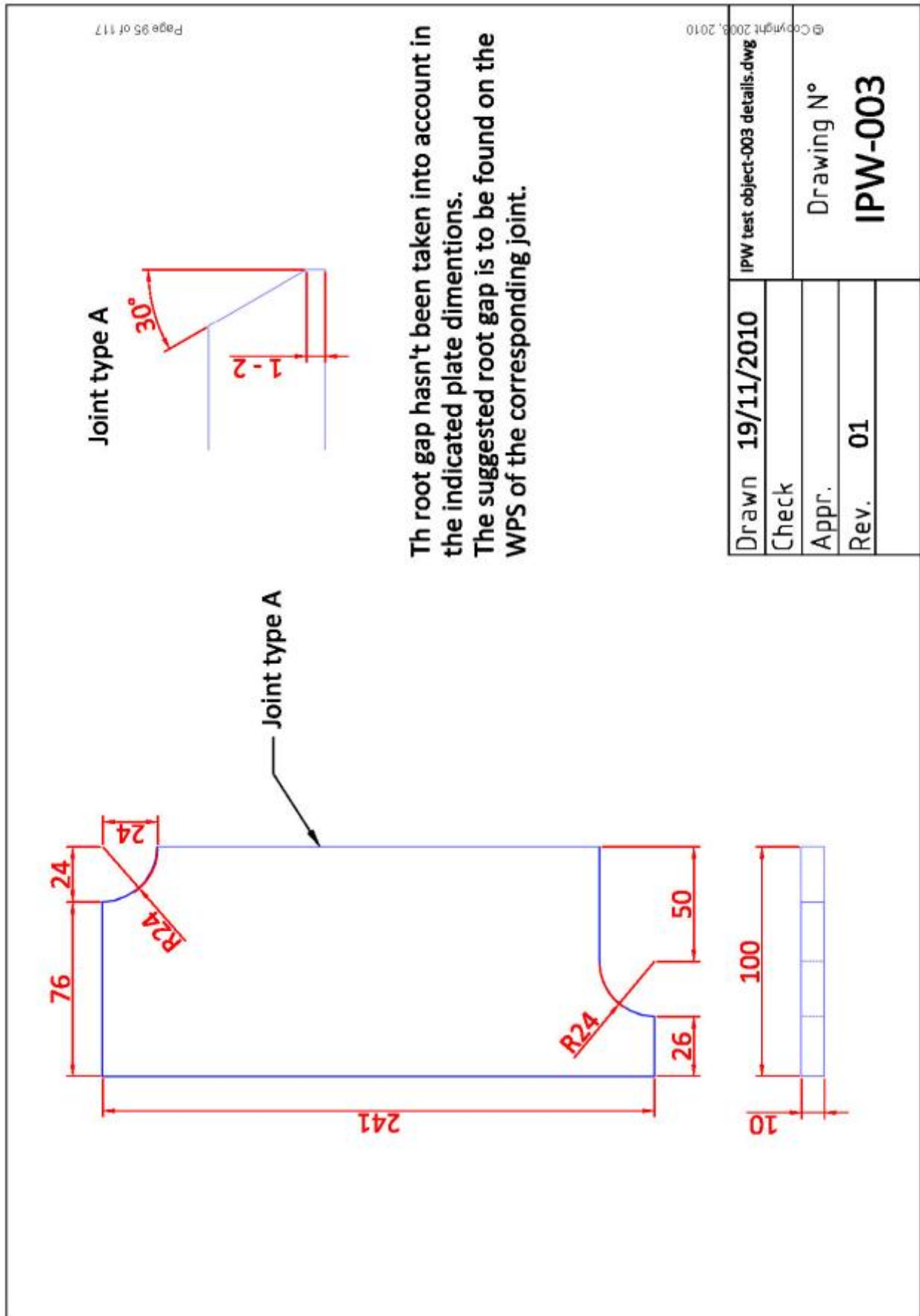
Joint type B

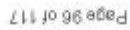
The root gap hasn't been taken into account in the indicated widths of the plates
The suggested root gap is to be found on the WPS of the corresponding joint.

Item N°	Length	Width	Plate thickness
acc. drawing IPW-000			
3	300	150	10
4	300	91	10

Drawn 19/11/2010	Drawing N° IPW - 002
Check	
Appr.	
Rev. 01	

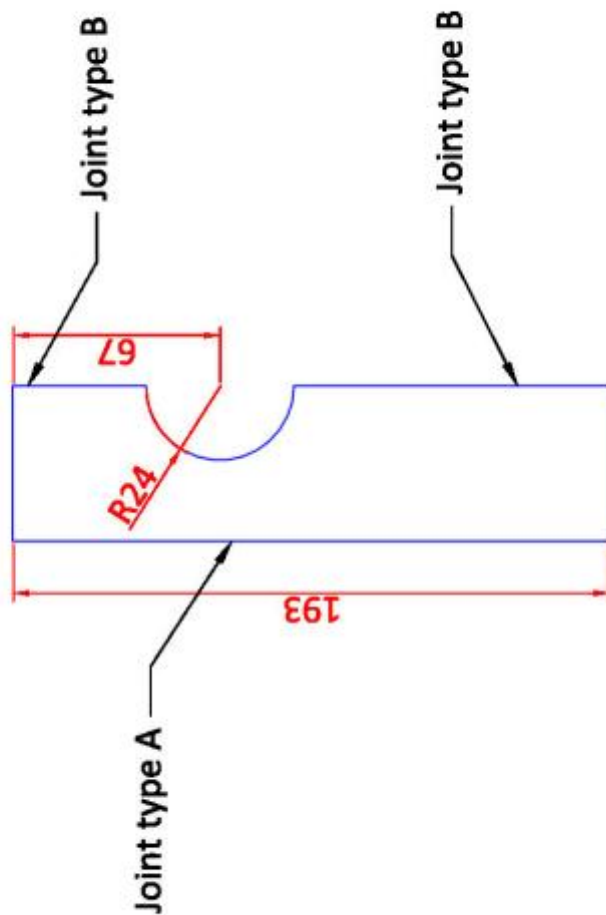
© Copyright 2009, 2010
ipw test object-002 details





© Copyright 2008, 2010

A diagram of a rectangular prism. The front face is a rectangle with a width of 10 and a height of 50. The depth of the prism is 10. The dimensions are labeled with red numbers and arrows: 10 for the width, 50 for the height, and 10 for the depth.





ATB

WPS-Nr.		IPW-001		date	28-10-2011				
				rev.	2				
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1					
Parent material :	S235JR	Joint design							
to parent material :	S235JR								
Parent material standard :	EN 10025								
ISO/TR 15608 Group nr. :	1.1								
Welding Process :	141								
Filler material :		Welding sequence							
Welding position :	PA								
Shielding gas :	ISO 14175 : I1								
Type of flux :	N/A								
Preheat :	none								
Material thickness (mm): t1	15								
t2	15								
Outside pipe diameter (mm):	N/A								
Backing :	none								
Gouging / grinding :	N/A								
Single or multi layer	multi layer								
max. interpass temp. (°C):	250								
PWHT :	none								
Supplementary requirement :									
Clean the welding joint of all oxides, dirt, oil, paint,...									
Welding parameters									
Run number :	1	2 - n							
Welding process :	141	141							
Type of current (AC/DC) :	DC	DC							
Polarity (+/-)	-	-							
Diameter of filler material (mm) :	2,40	2,40							
Welding current (A) :	105-135	145-175							
Voltage range (V) :	-	-							
Welding speed (cm/min) :	-	-							
Distance contact-tube/workpiece (mm) :	N/A	N/A							
Overlap (mm) :	N/A	N/A							
max. weaving (mm) :	3D	3D							
Oscillation (cycles/min) :	N/A	N/A							
Shielding gas flow rate (l/min) :	8 - 12	8 -12							
Backing gas flow rate (l/min) :	none	none							
Filler material designation :	ISO 636-A: W42 5 W3Si1								
Heat Input (kJ/cm) :	N/A	N/A							
Tungsten electrode diameter (mm):	1,6	1,6							
Type of tungsten electrode (ISO 6848) :	Wth 20 or Wla 15	Wth 20 or Wla 15							
Welding Procedure Qualification Record Nr. :									
Not qualified		written by :							



ATB

WPS-Nr.		IPW-002		date	28-10-2011		
				rev.	2		
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1			
Parent material :		S235JR		Joint design			
to parent material :		S235JR					
Parent material standard :		EN 10025					
ISO/TR 15608 Group nr. :		1.1					
Welding Process :		141					
Filler material :				Welding sequence			
Welding position :		PB					
Shielding gas :		ISO 14175 : I1					
Type of flux :		N/A					
Preheat :		none					
Material thickness (mm): t1		10		Welding sequence			
t2		15					
Outside pipe diameter (mm):		-					
Backing :		N/A					
Gouging / grinding :		N/A					
Single or multi layer		multi layer					
max. interpass temp. (°C):		250					
PWHT :		none					
Supplementary requirement :						Clean the welding joint of all oxides, dirt, oil, paint,...	
Clean the welding joint of all oxides, dirt, oil, paint,...							
Welding parameters							
Run number :		1		2 - n			
Welding process :		141		141			
Type of current (AC/DC) :		DC		DC			
Polarity (+/-)		-		-			
Diameter of filler material (mm) :		2,40		2,40			
Welding current (A) :		145-175		145-175			
Voltage range (V) :		-		-			
Welding speed (cm/min) :		-		-			
Distance contact-tube/workpiece (mm) :		N/A		N/A			
Overlap (mm) :		N/A		N/A			
max. weaving (mm) :		3D		3D			
Oscillation (cycles/min) :		N/A		N/A			
Shielding gas flow rate (l/min) :		8 - 12		8 -12			
Backing gas flow rate (l/min) :		none		none			
Filler material designation :		ISO 636-A: W42 5 W3Si1					
Heat Input (kJ/cm) :		N/A		N/A			
Tungsten electrode diameter (mm):		1,6		1,6			
Type of tungsten electrode (ISO 6848) :		Wth 20 or Wla 15		Wth 20 or Wla 15			
Welding Procedure Qualification Record Nr. :							
Not qualified		written by :					



ATB

WPS-Nr.		IPW-003		date	28-10-2011		
				rev.	2		
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1			
Parent material :		S235JR					
to parent material :		S235JR					
Parent material standard :		EN 10025					
ISO/TR 15608 Group nr. :		1.1					
Welding Process :		141					
Filler material :							
Welding position :		PB					
Shielding gas :		ISO 14175 : I1					
Type of flux :		N/A					
Preheat :		none					
Material thickness (mm): t1		10					
t2		15					
Outside pipe diameter (mm):		N/A					
Backing :		N/A					
Gouging / grinding :		N/A					
Single or multi layer		multi layer					
max. interpass temp. (°C):		250					
PWHT :		none					
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...							
Welding parameters							
Run number :		1		2 - n			
Welding process :		141		141			
Type of current (AC/DC) :		DC		DC			
Polarity (+/-)		-		-			
Diameter of filler material (mm) :		2,40		2,40			
Welding current (A) :		135-165		145-175			
Voltage range (V) :		-		-			
Welding speed (cm/min) :		-		-			
Distance contact-tube/workpiece (mm) :		N/A		N/A			
Overlap (mm) :		N/A		N/A			
max. weaving (mm) :		3D		3D			
Oscillation (cycles/min) :		N/A		N/A			
Shielding gas flow rate (l/min) :		8 - 12		8 -12			
Backing gas flow rate (l/min) :		none		none			
Filler material designation :		ISO 636-A: W42 5 W3Si1					
Heat Input (kJ/cm) :		N/A		N/A			
Tungsten electrode diameter (mm):		1,6		1,6			
Type of tungsten electrode (ISO 6848) :		Wth 20 or Wla 15		Wth 20 or Wla 15			
Welding Procedure Qualification Record Nr. :							
Not qualified		written by :					



ATB

WPS-Nr.		IPW-004		date	28-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :	S235JR	Joint design 			
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR 15608 Group nr. :	1.1				
Welding Process :	141				
Filler material :		Welding sequence 			
Welding position :	PF				
Shielding gas :	ISO 14175 : I1				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	10				
t2	10				
Outside pipe diameter (mm):	N/A				
Backing :	N/A				
Gouging / grinding :	N/A				
Single or multi layer	multi layer				
max. interpass temp. (°C):	250				
PWHT :	none				
Supplementary requirement :					
Welding parameters					
Run number :	1	2 - n			
Welding process :	141	141			
Type of current (AC/DC) :	DC	DC			
Polarity (+/-)	-	-			
Diameter of filler material (mm) :	2,40	2,40			
Welding current (A) :	135-165	145-175			
Voltage range (V) :	-	-			
Welding speed (cm/min) :	-	-			
Distance contact-tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	8 - 12	8 -12			
Backing gas flow rate (l/min) :	none	none			
Filler material designation :	ISO 636-A: W42 5 W3Si1				
Heat Input (kJ/cm) :	N/A	N/A			
Tungsten electrode diameter (mm):	1,6	1,6			
Type of tungsten electrode (ISO 6848) :	Wth 20 or Wla 15	Wth 20 or Wla 15			
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB

WPS-Nr.		IPW-005		date	28-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :		S235JR		Joint design	
to parent material :		S235JR			
Parent material standard :		EN 10025			
ISO/TR 15608 Group nr. :		1.1			
Welding Process :		141			
Filler material :				Welding sequence	
Welding position :		PC			
Shielding gas :		ISO 14175 : I1			
Type of flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		10			
t2		10			
Outside pipe diameter (mm):		-			
Backing :		N/A			
Gouging / grinding :		N/A			
Single or multi layer		multi layer			
max. interpass temp. (°C):		250			
PWHT :		none			
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :		1		2 - n	
Welding process :		141		141	
Type of current (AC/DC) :		DC		DC	
Polarity (+/-)		-		-	
Diameter of filler material (mm) :		2,40		2,40	
Welding current (A) :		105-135		145-175	
Voltage range (V) :		-		-	
Welding speed (cm/min) :		-		-	
Distance contact-tube/workpiece (mm) :		N/A		N/A	
Overlap (mm) :		N/A		N/A	
max. weaving (mm) :		3D		3D	
Oscillation (cycles/min) :		N/A		N/A	
Shielding gas flow rate (l/min) :		8 - 12		8 -12	
Backing gas flow rate (l/min) :		none		none	
Filler material designation :		ISO 636-A: W42 5 W3Si1			
Heat Input (kJ/cm) :		N/A		N/A	
Tungsten electrode diameter (mm):		1,6		1,6	
Type of tungsten electrode (ISO 6848) :		Wth 20 or Wla 15		Wth 20 or Wla 15	
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB

WPS-Nr.		IPW-006		date	28-10-2011		
				rev.	2		
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1			
Parent material :		S235JR		Joint design			
to parent material :		S235JR					
Parent material standard :		EN 10025					
ISO/TR 15608 Group nr. :		1.1					
Welding Process :		141					
Filler material :				Welding sequence			
Welding position :		PD					
Shielding gas :		ISO 14175 : I1					
Type of flux :		N/A					
Preheat :		none					
Material thickness (mm): t1		6		Welding sequence			
t2		10					
Outside pipe diameter (mm):		N/A					
Backing :		N/A					
Gouging / grinding :		N/A					
Single or multi layer		multi layer					
max. interpass temp. (°C):		250					
PWHT :		none					
Supplementary requirement :							
Clean the welding joint of all oxides, dirt, oil, paint,...							
Welding parameters							
Run number :		1		2 - 3			
Welding process :		141		141			
Type of current (AC/DC) :		DC		DC			
Polarity (+/-)		-		-			
Diameter of filler material (mm) :		2,40		2,40			
Welding current (A) :		145-175		145-175			
Voltage range (V) :		-		-			
Welding speed (cm/min) :		-		-			
Distance contact-tube/workpiece (mm) :		N/A		N/A			
Overlap (mm) :		N/A		N/A			
max. weaving (mm) :		3D		3D			
Oscillation (cycles/min) :		N/A		N/A			
Shielding gas flow rate (l/min) :		8 - 12		8 -12			
Backing gas flow rate (l/min) :		none		none			
Filler material designation :		ISO 636-A: W42 5 W3Si1					
Heat Input (kJ/cm) :		N/A		N/A			
Tungsten electrode diameter (mm):		1,6		1,6			
Type of tungsten electrode (ISO 6848) :		Wth 20 or Wla 15		Wth 20 or Wla 15			
Welding Procedure Qualification Record Nr. :							
Not qualified		written by :					



ATB

WPS-Nr.		IPW-007		date	28-10-2011		
				rev.	2		
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1			
Parent material :		S235JR					
to parent material :		S235JR					
Parent material standard :		EN 10025					
ISO/TR 15608 Group nr. :		1.1					
Welding Process :		141					
Filler material :							
Welding position :		PD					
Shielding gas :		ISO 14175 : I1					
Type of flux :		N/A					
Preheat :		none					
Material thickness (mm): t1		6					
t2		10					
Outside pipe diameter (mm):		N/A					
Backing :		N/A					
Gouging / grinding :		N/A					
Single or multi layer		multi layer					
max. interpass temp. (°C):		250					
PWHT :		none					
Supplementary requirement :							
Clean the welding joint of all oxides, dirt, oil, paint,...							
Welding parameters							
Run number :		1		2 - n			
Welding process :		141		141			
Type of current (AC/DC) :		DC		DC			
Polarity (+/-)		-		-			
Diameter of filler material (mm) :		2,40		2,40			
Welding current (A) :		135-165		145-175			
Voltage range (V) :		-		-			
Welding speed (cm/min) :		-		-			
Distance contact-tube/workpiece (mm) :		N/A		N/A			
Overlap (mm) :		N/A		N/A			
max. weaving (mm) :		3D		3D			
Oscillation (cycles/min) :		N/A		N/A			
Shielding gas flow rate (l/min) :		8 - 12		8 -12			
Backing gas flow rate (l/min) :		none		none			
Filler material designation :		ISO 636-A: W42 5 W3Si1					
Heat Input (kJ/cm) :		N/A		N/A			
Tungsten electrode diameter (mm):		1,6		1,6			
Type of tungsten electrode (ISO 6848) :		Wth 20 or Wla 15		Wth 20 or Wla 15			
Welding Procedure Qualification Record Nr. :							
Not qualified		written by :					

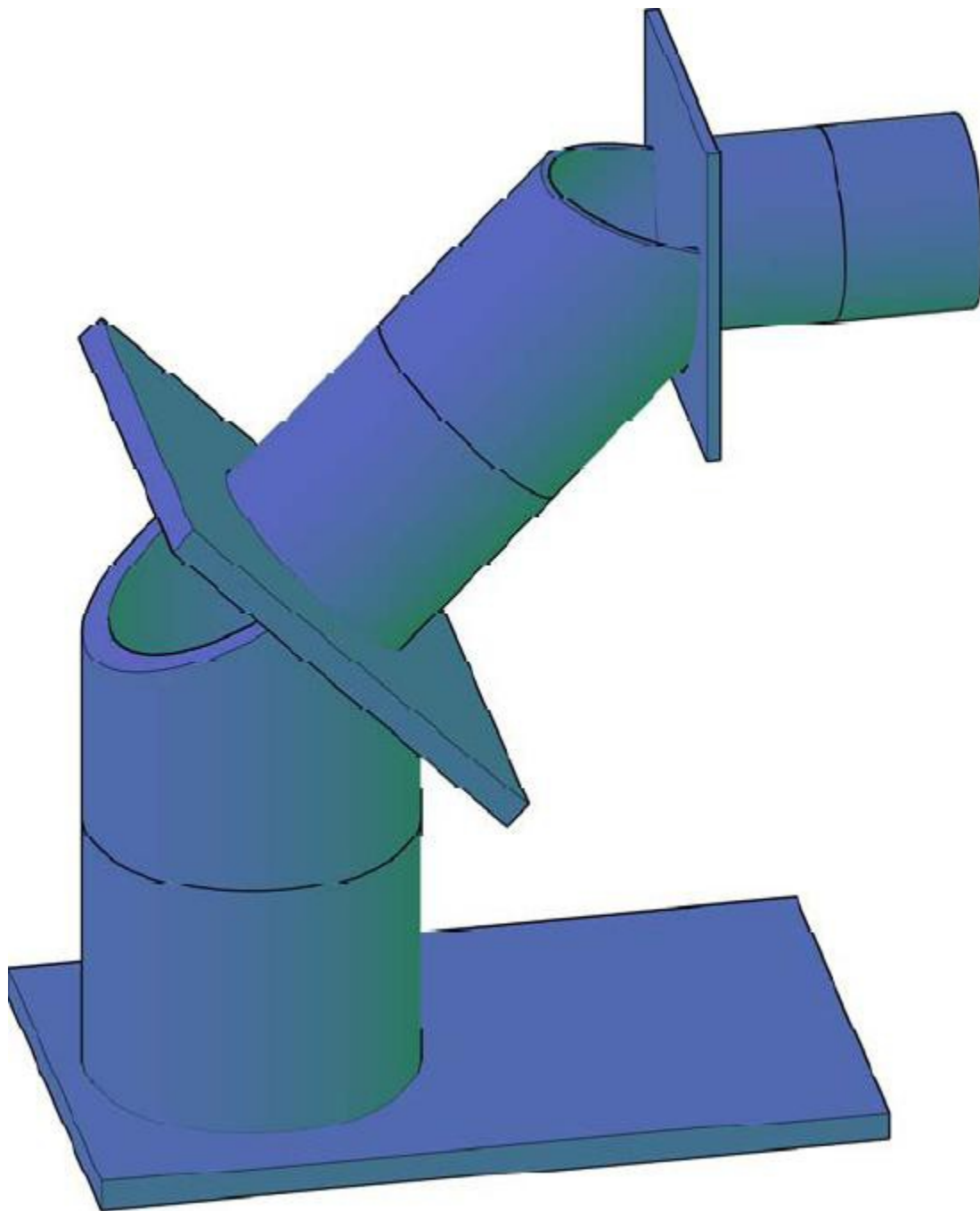


ATB

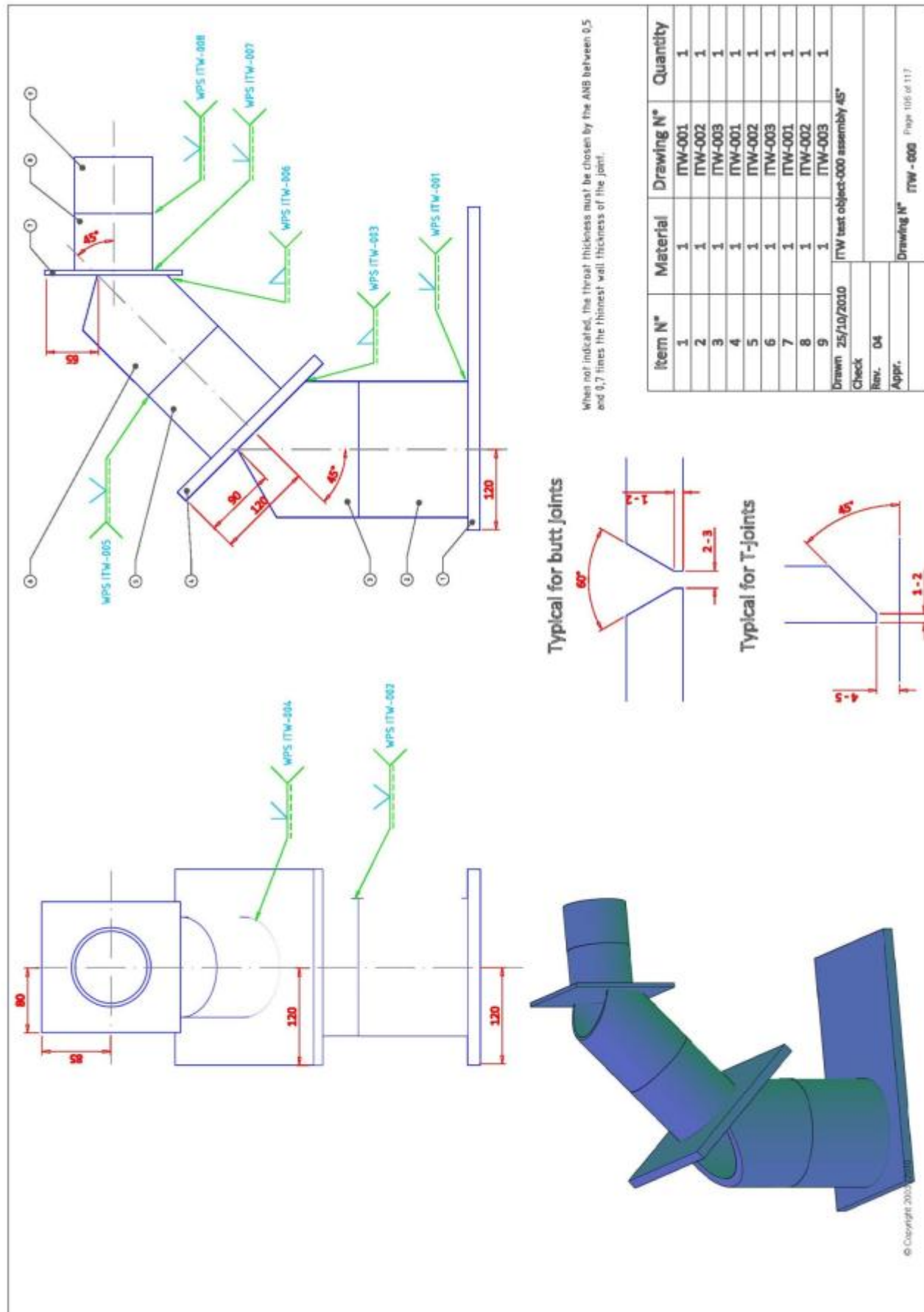
WPS-Nr.	IPW-008	date	28-10-2011		
		rev.	2		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235JR				
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR 15608 Group nr. :	1.1				
Welding Process :	141				
Filler material :					
Welding position :	PE				
Shielding gas :	ISO 14175 : I1				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	6	Welding sequence			
t2	6				
Outside pipe diameter (mm):	N/A				
Backing :	N/A				
Gouging / grinding :	N/A				
Single or multi layer	multi layer				
max. interpass temp. (°C):	250				
PWHT :	none				
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :	1	2 - n			
Welding process :	141	141			
Type of current (AC/DC) :	DC	DC			
Polarity (+/-)	-	-			
Diameter of filler material (mm) :	2,40	2,40			
Welding current (A) :	95-125	115-145			
Voltage range (V) :	-	-			
Welding speed (cm/min) :	-	-			
Distance contact-tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	8 - 12	8 -12			
Backing gas flow rate (l/min) :	none	none			
Filler material designation :	ISO 636-A: W42 5 W3Si1				
Heat Input (kJ/cm) :	N/A	N/A			
Tungsten electrode diameter (mm):	1,6	1,6			
Type of tungsten electrode (ISO 6848) :	Wth 20 or Wla 15	Wth 20 or Wla 15			
Welding Procedure Qualification Record Nr. :					
Not qualified	written by :				

17.3.3 ITW Test Object – 141

Material groups 1, 2 and 3



Important note: The assembly drawing was originally created in the DIN A3 format. By printing on A4 or downscaling to A4 format, it is possible that some details are badly or not visible.



Item N°	acc. drawing ITW-000 and drawing ITW 135-000	Plate / Tube	Length	Width	Plate thickness
1		Plate	400	240	15
4		Plate	240	240	15
7		Plate	170	160	6

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The exact material thicknesses are not mandatory and can be slightly changed according to local needs.

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Drawn	22/09/2011	ITW test object-001 details.dwg
Check		
Appr.		
Rev.	02	
		Drawing N° ITW-001

Item N° acc. drawing ITW-000	Plate / Tube	Length	Diameter	Wall thickness
2	T	135	168.3	10.97
5	T	110	114.3	6.02
8	T	70	60.3	5.50
9	T	70	60.3	5.50

Item N° acc. drawing ITW 135-000	Plate / Tube	Length	Diameter	Wall thickness
2	T	135	168.3	10.97
5	T	110	114.3	6.02
8	T	70	88.9	5.50
9	T	70	88.9	5.50

The exact material thicknesses are not mandatory and can be slightly changed according to local needs.

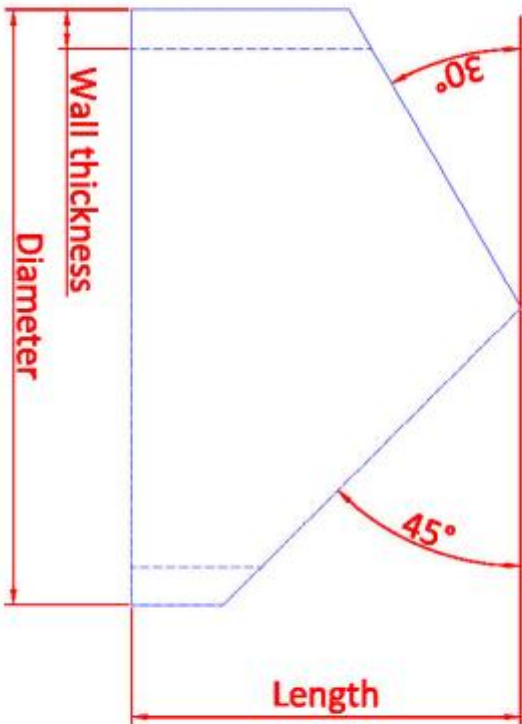
Drawn 22/09/2011	ITW test object-002 details
Check	
Appr.	Drawing N°
Rev. 02	ITW-002

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Item N° acc. drawing ITW-000 and drawing ITW 135-000	Plate / Tube	Length	Diameter	Wall thickness
3	T	150	168.3	10,97
6	T	150	114.3	6.02

The exact material thicknesses are not mandatory and can be slightly changed according to local needs.



Drawn 22/09/2011	ITW test object-003 details
Check	
Appr.	
Rev. 02	
	Drawing N° ITW-003



ATB

WPS-Nr.	ITW-001	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR		
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :			
Welding position :	PB		
Shielding gas :	ISO 14175 : I1		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10,97		
t2	15		
Outside pipe diameter (mm):	168,3		
Backing :	none		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement :			
Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	141	141	
Type of current (AC/DC) :	DC	DC	
Polarity (+/-)	-	-	
Diameter of filler material (mm) :	2,40	2,40	
Welding current (A) :	125-155	155-185	
Voltage range (V) :	-	-	
Welding speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	8 - 12	8 - 12	
Backing gas flow rate (l/min) :	none	none	
Filler material designation :	ISO 636-A - W42 5 W3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Tungsten electrode diameter (mm):	1,6	1,6	
Type of tungsten electrode (ISO 6848) :	Wth 20 or Wla 15	Wth 20 or Wla 15	
Welding Procedure Qualification Record Nr. :			
Not qualified	written by :		



ATB

WPS-Nr.		ITW-002		date	28-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :		S235JR		Joint design	
to parent material :		S235JR			
Parent material standard :		EN 10025			
ISO/TR 15608 Group nr. :		1.1			
Welding Process :		141			
Filler material :				Welding sequence	
Welding position :		PC			
Shielding gas :		ISO 14175 : I1			
Type of flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		10,97			
t2		10,97			
Outside pipe diameter (mm):		168,3			
Backing :		N/A			
Gouging / grinding :		N/A			
Single or multi layer		multi layer			
max. interpass temp. (°C):		250			
PWHT :		none			
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :		1		2 - n	
Welding process :		141		141	
Type of current (AC/DC) :		DC		DC	
Polarity (+/-)		-		-	
Diameter of filler material (mm) :		2,40		2,40	
Welding current (A) :		100-130		125-155	
Voltage range (V) :		-		-	
Welding speed (cm/min) :		-		-	
Distance contact-tube/workpiece (mm) :		N/A		N/A	
Overlap (mm) :		N/A		N/A	
max. weaving (mm) :		3D		3D	
Oscillation (cycles/min) :		N/A		N/A	
Shielding gas flow rate (l/min) :		8 - 12		8 - 12	
Backing gas flow rate (l/min) :		none		none	
Filler material designation :		ISO 636-A - W42 5 W3Si1			
Heat Input (kJ/cm) :		N/A		N/A	
Tungsten electrode diameter (mm):		1,6		1,6	
Type of tungsten electrode (ISO 6848) :		Wth 20 or Wla 15		Wth 20 or Wla 15	
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB

WPS-Nr.	ITW-003	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :		Welding sequence	
Welding position :	PD 045		
Shielding gas :	ISO 14175 : I1		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	15		
t2	10,97		
Outside pipe diameter (mm):	168,3		
Backing :	N/A		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement :			
Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	141	141	
Type of current (AC/DC) :	DC	DC	
Polarity (+/-)	-	-	
Diameter of filler material (mm) :	2,40	2,40	
Welding current (A) :	155-185	155-185	
Voltage range (V) :	-	-	
Welding speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	8 - 12	8 - 12	
Backing gas flow rate (l/min) :	none	none	
Filler material designation :	ISO 636-A - W42 5 W3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Tungsten electrode diameter (mm):	1,6	1,6	
Type of tungsten electrode (ISO 6848) :	Wth 20 or Wla 15	Wth 20 or Wla 15	
Welding Procedure Qualification Record Nr. :			
Not qualified	written by :		



ATB					
WPS-Nr.		ITW-004	date		
			28-10-2011		
		rev.	2		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235JR	Joint design			
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR 15608 Group nr. :	1.1				
Welding Process :	141				
Filler material :		Welding sequence			
Welding position :	PB 045				
Shielding gas :	ISO 14175 : I1				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	6,02				
t2	15				
Outside pipe diameter (mm):	114,9				
Backing :	N/A				
Gouging / grinding :	N/A				
Single or multi layer	multi layer				
max. interpass temp. (°C):	250				
PWHT :	none				
Supplementary requirement :					
Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :	1	2 - n			
Welding process :	141	141			
Type of current (AC/DC) :	DC	DC			
Polarity (+/-)	-	-			
Diameter of filler material (mm) :	2,40	2,40			
Welding current (A) :	125-155	155-185			
Voltage range (V) :	-	-			
Welding speed (cm/min) :	-	-			
Distance contact-tube/workpiece (mm) :	N/A	N/A			
Overlap (mm) :	N/A	N/A			
max. weaving (mm) :	3D	3D			
Oscillation (cycles/min) :	N/A	N/A			
Shielding gas flow rate (l/min) :	8 - 12	8 - 12			
Backing gas flow rate (l/min) :	none	none			
Filler material designation :	ISO 636-A - W42 5 W3Si1				
Heat Input (kJ/cm) :	N/A	N/A			
Tungsten electrode diameter (mm):	1,6	1,6			
Type of tungsten electrode (ISO 6848) :	Wth 20 or Wla 15	Wth 20 or Wla 15			
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB

WPS-Nr.		ITW-005		date	28-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :		S235JR		Joint design 	
to parent material :		S235JR			
Parent material standard :		EN 10025			
ISO/TR 15608 Group nr. :		1.1			
Welding Process :		141			
Filler material :				Welding sequence 	
Welding position :		H-L045			
Shielding gas :		ISO 14175 : I1			
Type of flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		6,02			
t2		6,02			
Outside pipe diameter (mm):		114,3			
Backing :		N/A			
Gouging / grinding :		N/A			
Single or multi layer		multi layer			
max. interpass temp. (°C):		250			
PWHT :		none			
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :		1		2 - n	
Welding process :		141		141	
Type of current (AC/DC) :		DC		DC	
Polarity (+/-)		-		-	
Diameter of filler material (mm) :		2,40		2,40	
Welding current (A) :		100-130		125-155	
Voltage range (V) :		-		-	
Welding speed (cm/min) :		-		-	
Distance contact-tube/workpiece (mm) :		N/A		N/A	
Overlap (mm) :		N/A		N/A	
max. weaving (mm) :		3D		3D	
Oscillation (cycles/min) :		N/A		N/A	
Shielding gas flow rate (l/min) :		8 - 12		8 - 12	
Backing gas flow rate (l/min) :		none		none	
Filler material designation :		ISO 636-A - W42 5 W3Si1			
Heat Input (kJ/cm) :		N/A		N/A	
Tungsten electrode diameter (mm):		1,6		1,6	
Type of tungsten electrode (ISO 6848) :		Wth 20 or Wla 15		Wth 20 or Wla 15	
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			



ATB

WPS-Nr.		ITW-006		date	28-10-2011		
				rev.	2		
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1			
Parent material :		S235JR		Joint design 			
to parent material :		S235JR					
Parent material standard :		EN 10025					
ISO/TR 15608 Group nr. :		1.1					
Welding Process :		141					
Filler material :				Welding sequence 			
Welding position :		PF					
Shielding gas :		ISO 14175 : I1					
Type of flux :		N/A					
Preheat :		none					
Material thickness (mm): t1		6					
t2		6,02					
Outside pipe diameter (mm):		114,3					
Backing :		N/A					
Gouging / grinding :		N/A					
Single or multi layer		multi layer					
max. interpass temp. (°C):		250					
PWHT :		none					
Supplementary requirement :							
Clean the welding joint of all oxides, dirt, oil, paint,...							
Welding parameters							
Run number :		1		2 - 3			
Welding process :		141		141			
Type of current (AC/DC) :		DC		DC			
Polarity (+/-)		-		-			
Diameter of filler material (mm) :		2,40		2,40			
Welding current (A) :		155-185		155-185			
Voltage range (V) :		-		-			
Welding speed (cm/min) :		-		-			
Distance contact-tube/workpiece (mm) :		N/A		N/A			
Overlap (mm) :		N/A		N/A			
max. weaving (mm) :		3D		3D			
Oscillation (cycles/min) :		N/A		N/A			
Shielding gas flow rate (l/min) :		8 - 12		8 - 12			
Backing gas flow rate (l/min) :		none		none			
Filler material designation :		ISO 636-A - W42 5 W3Si1					
Heat Input (kJ/cm) :		N/A		N/A			
Tungsten electrode diameter (mm):		1,6		1,6			
Type of tungsten electrode (ISO 6848) :		Wth 20 or Wla 15		Wth 20 or Wla 15			
Welding Procedure Qualification Record Nr. :							
Not qualified		written by :					



ATB			
WPS-Nr.		ITW-007	date 28-10-2011
			rev. 2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR		
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :			
Welding position :	PF tube (PH)		
Shielding gas :	ISO 14175 : I1		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	6		
t2	5,5		
Outside pipe diameter (mm):	60,3		
Backing :	N/A		
Gouging / grinding :	N/A		
Single or multi layer	multi layer		
max. interpass temp. (°C):	250		
PWHT :	none		
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...			
Welding parameters			
Run number :	1	2 - n	
Welding process :	141	141	
Type of current (AC/DC) :	DC	DC	
Polarity (+/-)	-	-	
Diameter of filler material (mm) :	2,40	2,40	
Welding current (A) :	125-155	145-175	
Voltage range (V) :	-	-	
Welding speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	N/A	N/A	
Overlap (mm) :	N/A	N/A	
max. weaving (mm) :	3D	3D	
Oscillation (cycles/min) :	N/A	N/A	
Shielding gas flow rate (l/min) :	8 - 12	8 - 12	
Backing gas flow rate (l/min) :	none	none	
Filler material designation :	ISO 636-A - W42 5 W3Si1		
Heat Input (kJ/cm) :	N/A	N/A	
Tungsten electrode diameter (mm):		1,6	1,6
Type of tungsten electrode (ISO 6848) :		Wth 20 or Wla 15	Wth 20 or Wla 15
Welding Procedure Qualification Record Nr. :			
Not qualified		written by :	



ATB

WPS-Nr.		ITW-008		date	28-10-2011
				rev.	2
WELDING PROCEDURE SPECIFICATION				EN ISO 15609-1	
Parent material :		S235JR		Joint design	
to parent material :		S235JR			
Parent material standard :		EN 10025			
ISO/TR 15608 Group nr. :		1.1			
Welding Process :		141			
Filler material :				Welding sequence	
Welding position :		PF (PH)			
Shielding gas :		ISO 14175 : I1			
Type of flux :		N/A			
Preheat :		none			
Material thickness (mm): t1		5,5			
t2		5,5			
Outside pipe diameter (mm):		60,3			
Backing :		N/A			
Gouging / grinding :		N/A			
Single or multi layer		multi layer			
max. interpass temp. (°C):		250			
PWHT :		none			
Supplementary requirement : Clean the welding joint of all oxides, dirt, oil, paint,...					
Welding parameters					
Run number :		1		2 - n	
Welding process :		141		141	
Type of current (AC/DC) :		DC		DC	
Polarity (+/-) :		-		-	
Diameter of filler material (mm) :		2,40		2,40	
Welding current (A) :		100-130		125-155	
Voltage range (V) :		-		-	
Welding speed (cm/min) :		-		-	
Distance contact-tube/workpiece (mm) :		N/A		N/A	
Overlap (mm) :		N/A		N/A	
max. weaving (mm) :		3D		3D	
Oscillation (cycles/min) :		N/A		N/A	
Shielding gas flow rate (l/min) :		8 - 12		8 - 12	
Backing gas flow rate (l/min) :		none		none	
Filler material designation :		ISO 636-A - W42 5 W3Si1			
Heat Input (kJ/cm) :		N/A		N/A	
Tungsten electrode diameter (mm):		1,6		1,6	
Type of tungsten electrode (ISO 6848) :		Wth 20 or Wla 15		Wth 20 or Wla 15	
Welding Procedure Qualification Record Nr. :					
Not qualified		written by :			