



SVETS
KOMMISSIONEN

Del II. Kursplaner för internationell svetsare

Minimikrav på utbildning, övning examinering och kvalificering av:

Internationell svetsare (IW)

**Dessa riktlinjer del I och II, ersätter dokument IAB-089-2003/EFW-452-467-480-481,
Rev 3 januari 2005**

Riktlinjer från International Institute of Welding, IIW

International Authorisation Board (IAB) utarbetade av IAB Group A, WG A3a

Del II

Detta är den officiella versionen av dokument IAB-089r4-12, del II, delvis översatt till svenska. För översättningen svarar Svetskommissionen. Svetskommissionen är av IIW auktoriserat nationellt organ.



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Förord

Detta dokument bygger på Europasvetsareserien som utvecklats av European Federation for Welding, Joining and Cutting (EWF), genom en överenskommelse först undertecknad den 19 juli, 1997, vid International Institute of Weldings årsmöte i San Francisco, Kalifornien, USA, och som därefter har vidareutvecklats. Det fastslås i den överenskommelsen att IIW-diplom för internationell svetsare är likvärdigt med EWF-diplom för europasvetsare med samma omfattning.

Detta dokument – känt i WG#A3a som "Bratislavaöverenskommelsen" – återspeglar resultaten av ingående diskussioner om grunderna för svetsteknik och skicklighet och publicerades till slut efter ett möte med arbetsgruppen i Bratislava, Slovakien.

Detta dokument är delat i två delar, I och II.

Del I innehåller utbildningssystemet

Del II innehåller detaljer om provobjekt och svetsdatablad att användas vid examinering med provobjekt

Alla EWF ANB (auktoriserat nationellt organ) tillåts utfärda EWF-diplom likvärdiga med de IIW-diplom som utfärdats av samma ANB

Kopior av detta dokument finns hos IIWs IAB-sekretariat eller dess utsedda representant.

Användningen av denna utbildningsriktlinje är begränsad till de organisationer som godkänts av ANB som godkänd utbildningsanordnare (ATB).



16 Regler och instruktioner för provobjekten

Syftet med provobjekten är att pröva svetsaren, inte bara i skicklighet i svetsning utan också i hans förmåga i ritningsläsning (inklusive kännedom om svetsbeteckningar), häftning och i att följa givna instruktioner (dvs. svetsdatablad)

Svetsaren får ritningar och svetsdatablad och plåtdetaljerna måttskurna och fogberedda. Han har att välja tillsatsmaterial från ett urval av olika tillsatsmaterial för aktuell svetsmetod. Han måste kontrollera mot svetsdatabladet för att välja rätt tillsatsmaterial. Om svetsaren börjar svetsa med fel tillsatsmaterial avbryts provet och underkänns.

När svetsaren är redo att börja skall han först häfta samman alla detaljer enligt de ritningar han fått. Provobjektet skall svetsas i stående läge som det visas på ritningen. Det är endast tillåtet att vrida provobjektet runt dess vertikala axel.

Alla nödvändiga verktyg för att genomföra de olika momenten skall finnas tillgängliga för svetsaren.

Svetsaren ges en viss maximal tid för att slutföra provobjektet vilken framgår av nedanstående tabell, När den maximala tiden gått ut skall svetsaren sluta svetsa. Om svetsaren inte lyckas färdigställa provobjektet inom den maximala tiden underkänns provet.

Om svetsare slutfört provobjektet i tid skall det provas genom visuell kontroll av auktoriserad examinator. En svets i provobjektet för plåtnivån skall dessutom provas med radiografisk undersökning (se sammanställningsritning)

Svetsaren godkänns om svetsfelen ligger inom kvalitetsnivå B i EN ISO 5817, förutom för följande feltyper: 501 (smältdike), 502 (svetsråge stumsvets), 503 (svetsråge kälsvets), 504 (rotvulst), 505 (felaktig fattningskant) and 5214 (för stort a-mått), där nivå C skall gälla.

Provobjekten är bestämda till sin allmänna geometri och svetsar. Objektets dimensioner kan anpassas till lokala behov. Svetsdatabladet i uppsättningen av dokument för provobjekten är exempel som kan ändras för att passa lokala behov.

<i>Svetstid för provobjekten* (timmar)</i>	111	135	141
IFW	6	4	6
IPW	8	6	8
ITW	8	6	8

*Den maximalt tillåtna tiden kan justeras av den godkända utbildningsanordnaren (ATB) om provobjektets dimensioner ändras.



17 Dokument för provobjekt för stål, materialgrupperna 1, 2 och 3

För var och en av de tre svetsmetoderna 111, 135 och 141 finns tre olika uppsättningar dokument för provobjekten för internationell kälsvetsare, IFW, internationell plåtsvetsare, IPW och internationell rörsvetsare, ITW. Uppsättningarna innehåller alla nödvändiga dokument för svetsaren (totalt nio uppsättningar).

Uppsättningarna innehåller:

- 1: Sammanställningsritning
- 2: Detaljritningar
- 3: Svetsdatablad

Geometrin för provobjekten för IFW och IPW densamma för de tre svetsmetoderna (111, 135 and 141). Endast svetsdatabladen är olika.

Geometrin för provobjekten för ITW är identisk för svetsmetod 111 och 141, men skiljer sig något för svetsmetod 135.

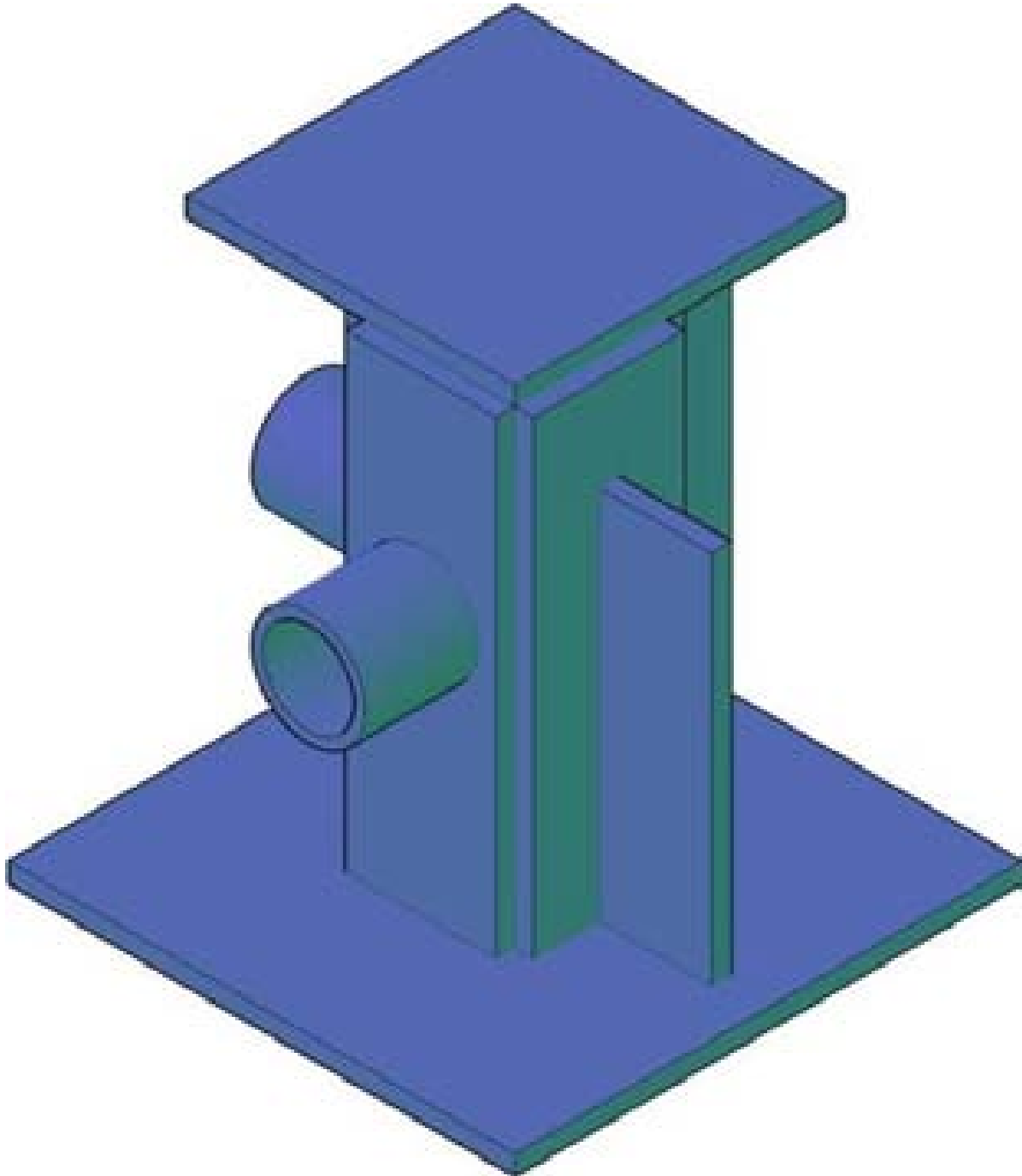
Sammanställningsritningarna är gjorda i A3-format och detaljritningarna i A4-format. Om sammanställningsritningarna skrivs ut på A4-papp kan vissa detaljer vara svåra att läsa.

Fogberedningen skall göras genom maskinbearbetning/fräsning/slipning till mått enligt ritning. Utbildningsanordnaren skall ge kandidaten detaljerna fogberedda. Misslyckande med att montera och häfta detaljerna enligt ritning skall resultera i att provet underkänns.

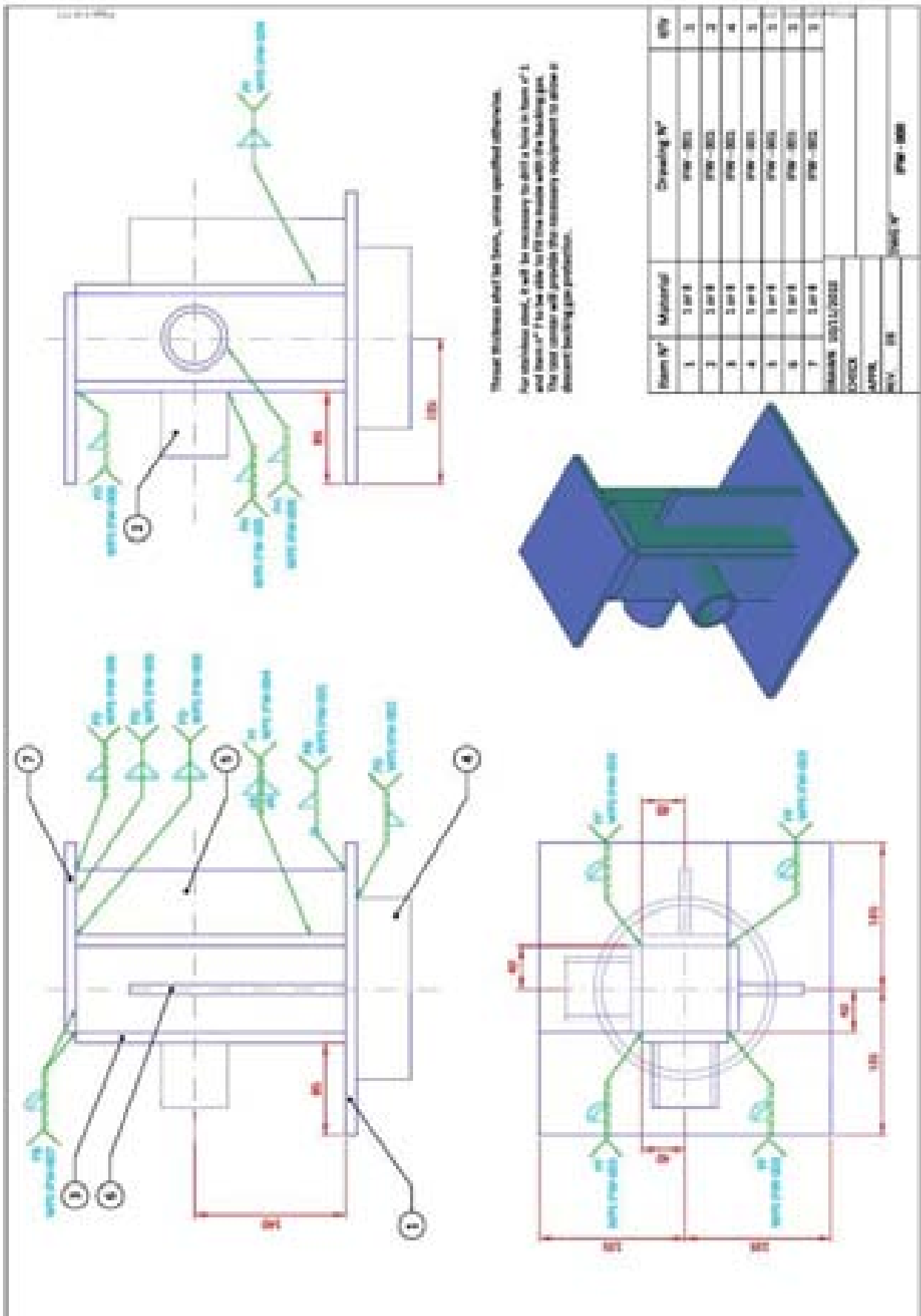
17.1 Welding Process 111

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.



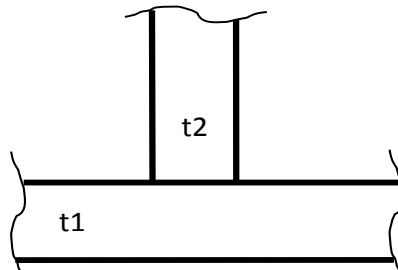
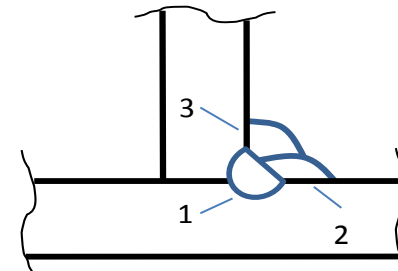


Item N° acc. drawing IFW-000	Plate / Tube	Length [mm]	Width [mm]	Thickness [mm]	Diameter [mm]
1	P	270	270	10	
2	T	60		5.5	60.3
3	P	250	80	10	
4	T	50		7.1	168.3
5	P	60	250	10	
6	P	60	200	10	
7	P	175	175	10	

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

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



ATB					
WPS-Nr.	111 IFW-001	date	2011-10-24		
		rev.	5		
WELDING PROCEDURE SPECIFICATION		ISO 15609-1			
Parent material :	S235	<div style="text-align: center;">Joint design</div>  <div style="text-align: center;">Welding sequence</div> 			
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 :	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. :	written by :				
Not qualified					



ATB				
WPS-Nr.	111 IFW-002		date	24-10-2011
			rev.	5
WELDING PROCEDURE SPECIFICATION			EN ISO 15609-1	
Parent material :	S235		<p style="text-align: center;">Joint design</p>	
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 :	PD			
Shielding gas :	N/A			
Type of flux :	N/A			
Preheat :	none		<p style="text-align: center;">Welding sequence</p>	
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	<p>Joint design</p>			
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	<p>Welding sequence</p>			
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 :		

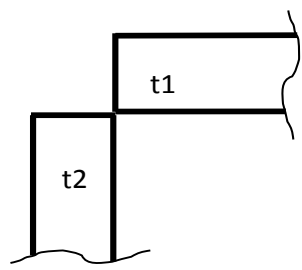


ATB					
WPS-Nr.	111 IFW-005	date	24-10-2011		
		rev.	5		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235	<p style="text-align: center;">Joint design</p>			
to parent material :	S235				
Parent material standard :	EN 10025-2				
ISO/TR15608 Group nr. :	1,1				
Welding process :	111				
Filler material :	Basic electrode Free choice of brand				
Welding position :	PH				
Shielding gas :	N/A				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p>			
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 :				



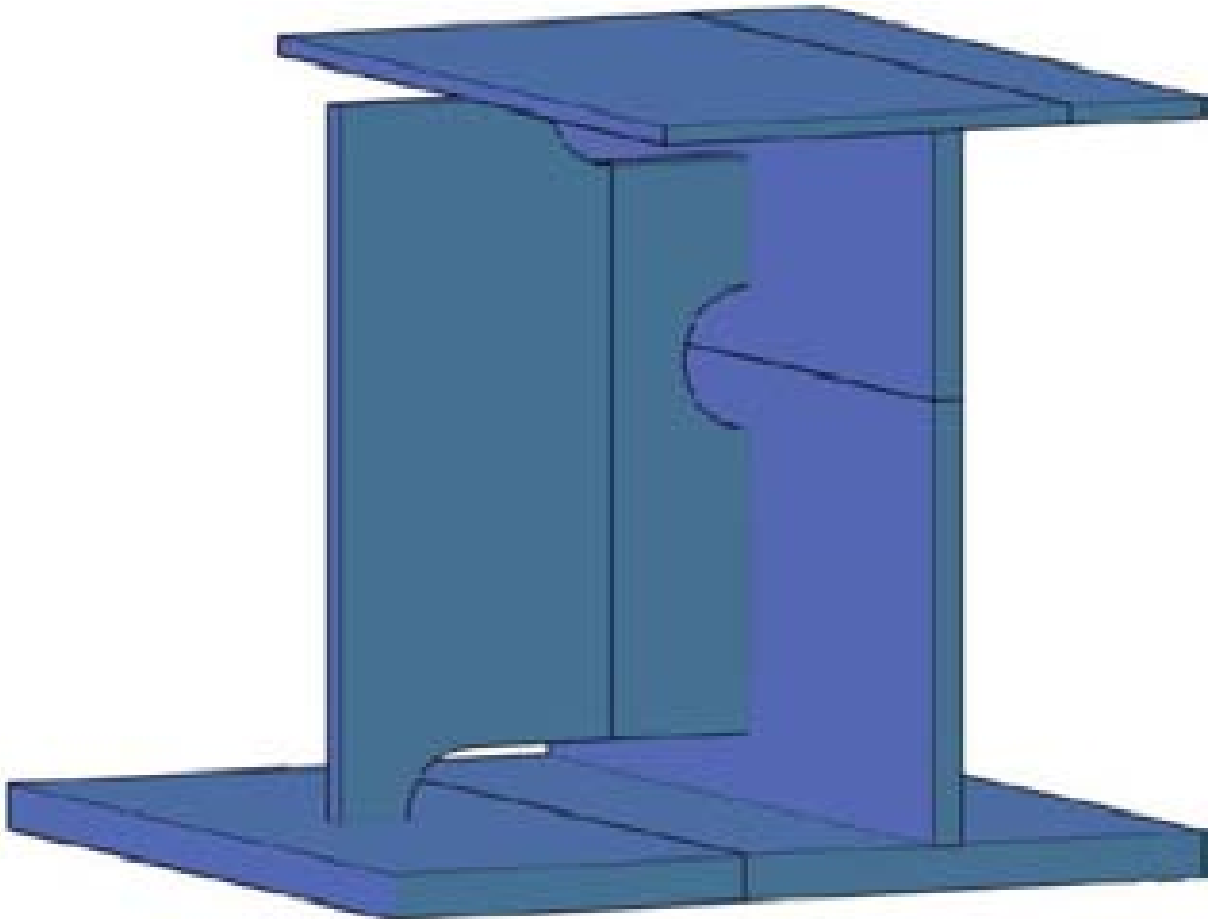
ATB					
WPS-Nr.	111 IFW-006	date	24-10-2011		
		rev.	5		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235	<p style="text-align: center;">Joint design</p>			
to parent material :	S235				
Parent material standard :	EN 10025-2				
ISO/TR15608 Group nr. :	1,1				
Welding process :	111				
Filler material :	Basic electrode Free choice of brand				
Welding position :	PD				
Shielding gas :	N/A				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p>			
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-007	date	24-10-2011
		rev.	5
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235	<p style="text-align: center;">Joint design</p> 	
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 :	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 :	

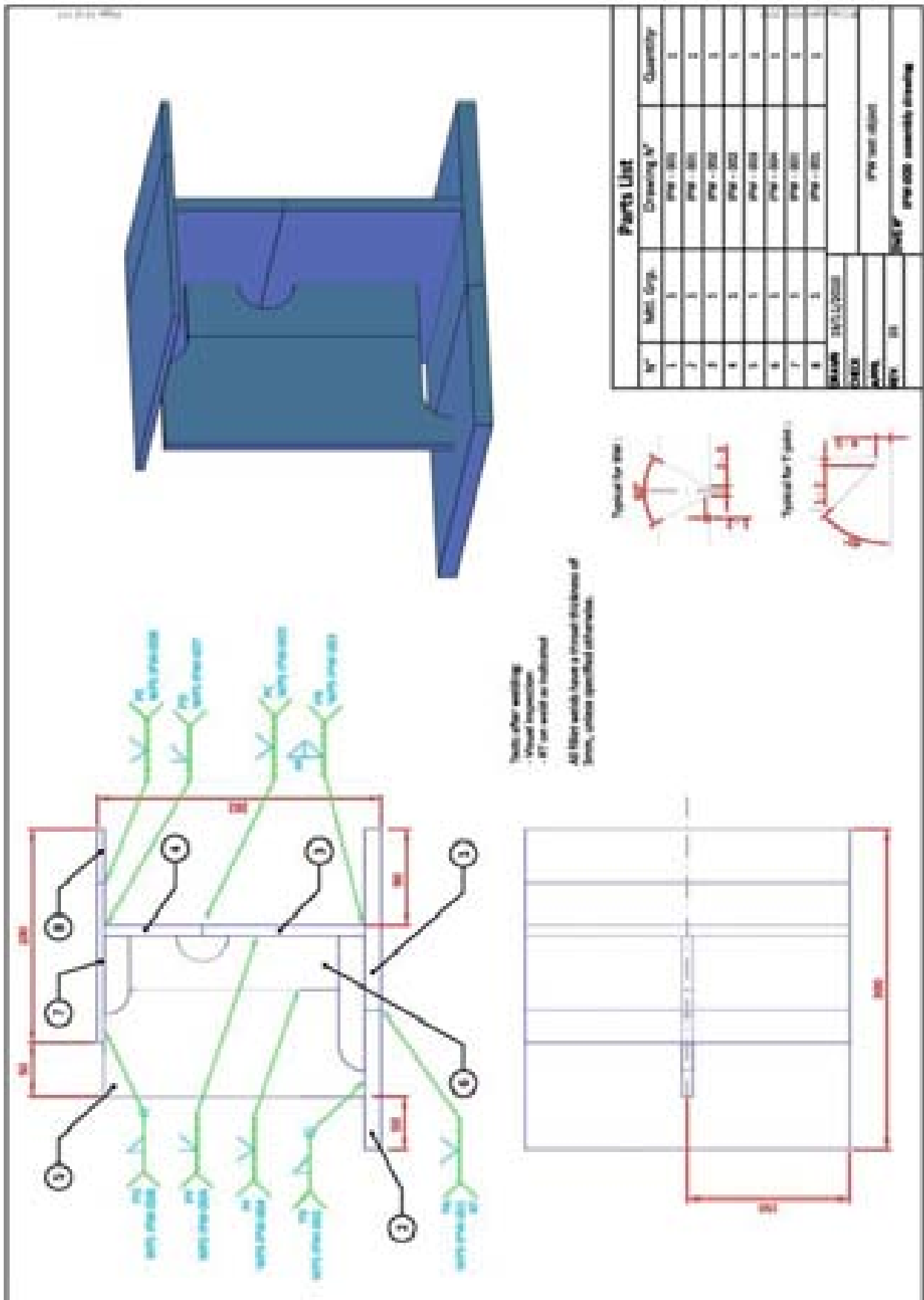
17.1.2 IPW Test Object – 111

Material groups 1, 2 and 3

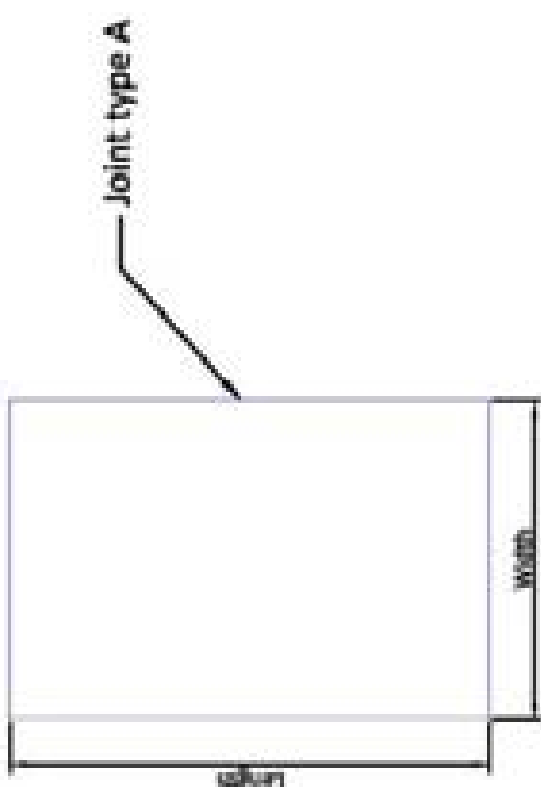


Important notes:

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.

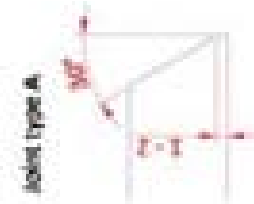


IPW-000
REV. 001



Joint type A

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

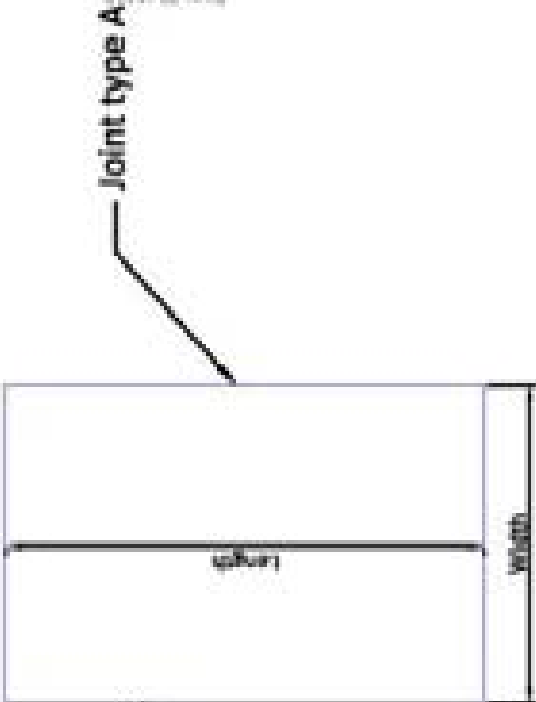


Joint type A

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 VRTS of the corresponding joint.

Drawn	19/11/2010
Check	
Appr.	
Rev.	01

Drawing N°	IPW - 001
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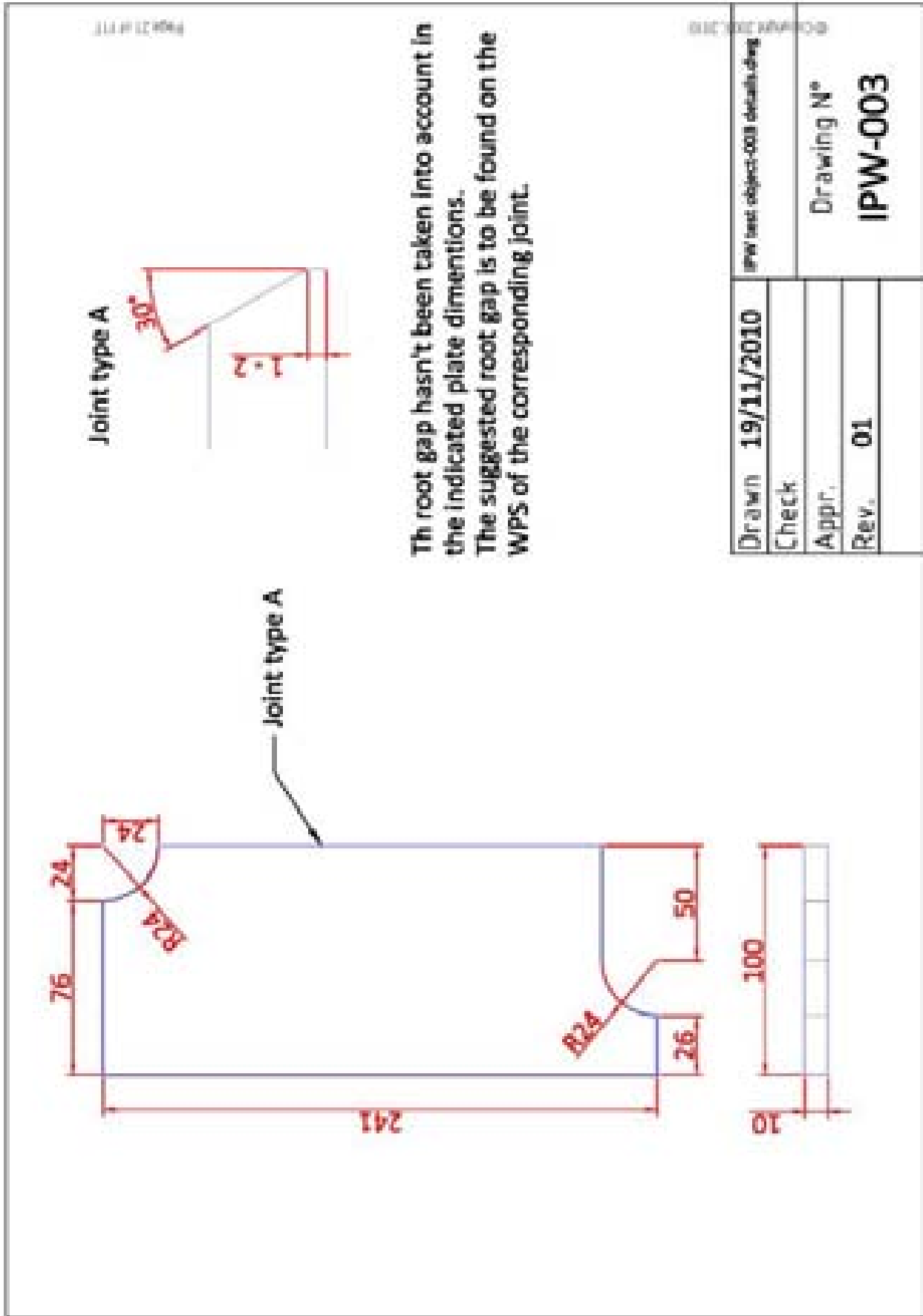
The root gap hasn't been taken into account in the indicated widths of the plates.
The suggested root gap is to be found on the VPPs of the corresponding joint.

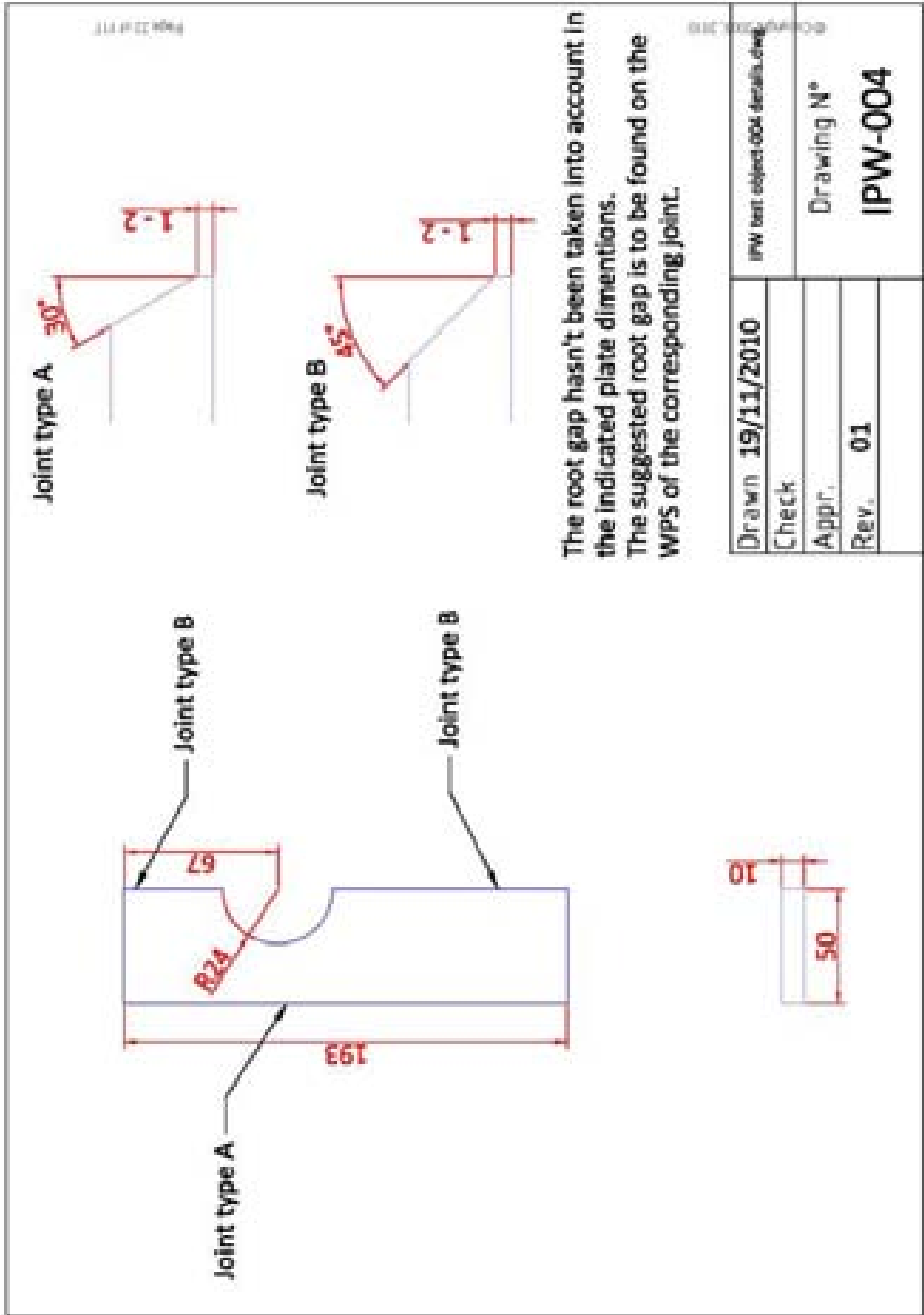
type text object-002 details

Drawing N°
IPW - 002

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

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





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



ATB

WPS-Nr.	IPW-001	date	26-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	<p>Joint design</p>	
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 :	PA		
Shielding gas :	N/A		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	15	<p>Welding sequence</p>	
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 :		



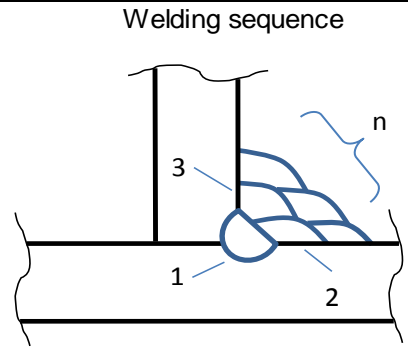
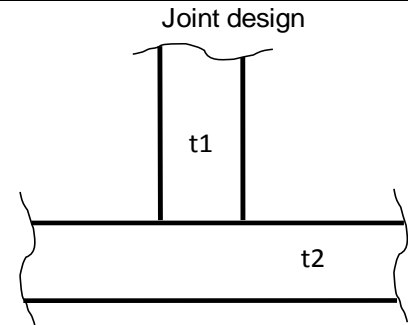
ATB

WPS-Nr.	IPW-002	date	26-10-2011
		rev.	2

WELDING PROCEDURE SPECIFICATION

EN ISO 15609-1

Parent material :	S235JR
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
Material thickness (mm): t1	10
	t2
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				
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 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	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 :			

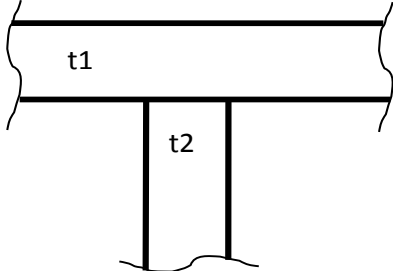
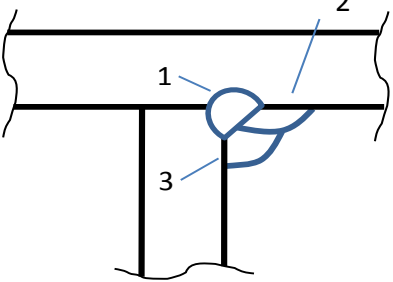


<h1 style="color: blue;">ATB</h1>						
WPS-Nr.	IPW-004		date	26-10-2011		
			rev.	2		
WELDING PROCEDURE SPECIFICATION			EN ISO 15609-1			
Parent material :	S235JR		<p style="text-align: center;">Joint design</p>			
to parent material :	S235JR					
Parent material standard :	EN 10025					
ISO/TR15608 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					
Material thickness (mm): t1	10		<p style="text-align: center;">Welding sequence</p>			
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	<p style="text-align: center;">Joint design</p>	
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		
Shielding gas :	N/A		
type flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p>	
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 :	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 :		



<h1>ATB</h1>			
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	<p style="text-align: center;">Joint design</p>			
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	<p style="text-align: center;">Welding sequence</p>			
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 :				



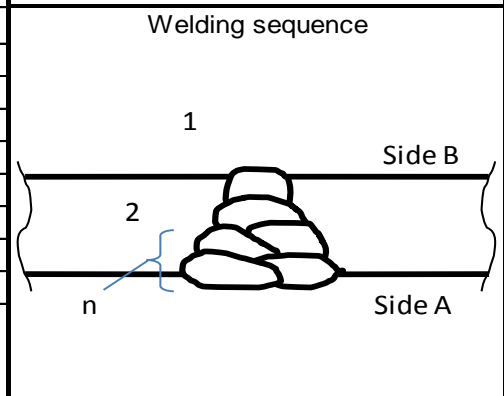
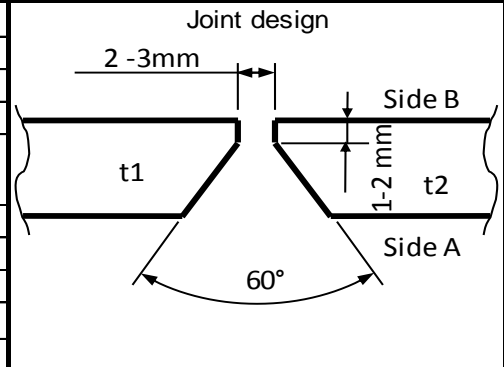
ATB

WPS-Nr.	IPW-008	date	26-10-2011
		rev.	2

WELDING PROCEDURE SPECIFICATION

EN ISO 15609-1

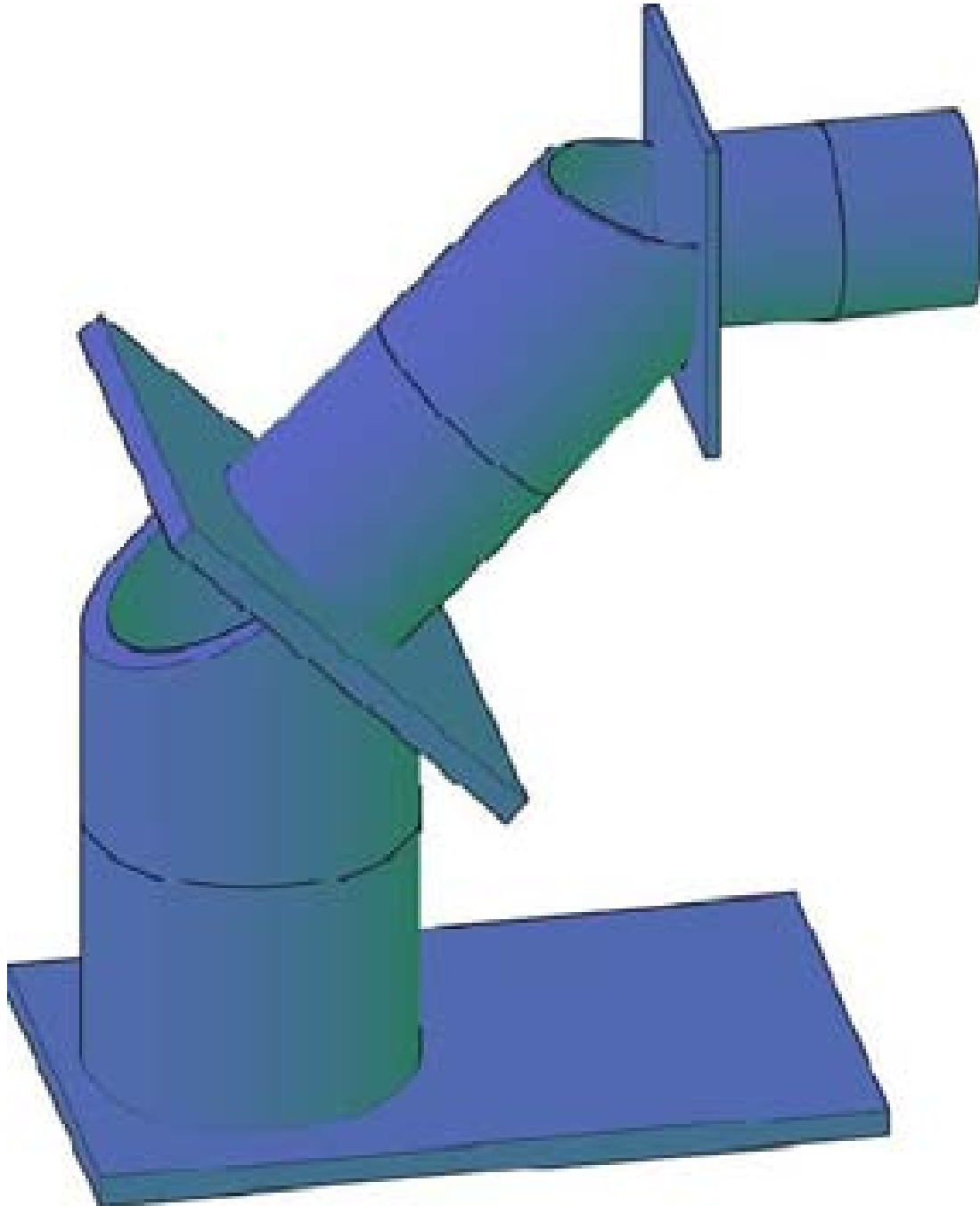
Parent material :	S235JR
to parent material :	S235JR
Parent material standard :	EN 10025
ISO/TR15608 Group nr. :	1.1
Welding process :	111
Filler material :	Basic electrode Free choice of brand
Welding position :	PE
Shielding gas :	N/A
type flux :	N/A
Preheat :	none
Material thickness (mm): t1	6
t2	6
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 1.35-000	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°	Plate / Tube	Length	Diameter	Wall thickness
acc. drawing ITW-000				
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
acc. drawing ITW 135-000				
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


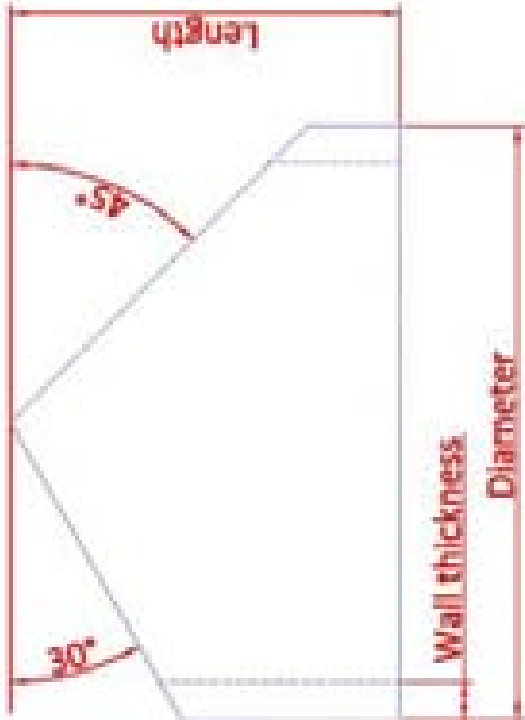
The exact material thicknesses are not mandatory and can be slightly changed according to local needs.

Drawn	22/09/2011
Check	
Appr.	
Rev.	02

Drawing N°
ITW-002

Item N°	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 Check Appr. Rev. 02	ITW test object-003 details 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	<p>Joint design</p>			
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				
Material thickness (mm): t1	10,97	<p>Welding sequence</p>			
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	<p>Joint design</p>	
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		
Shielding gas :	N/A		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10,97	<p>Welding sequence</p>	
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	<p style="text-align: center;">Joint design</p>	
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	<p style="text-align: center;">Welding sequence</p>	
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 :		

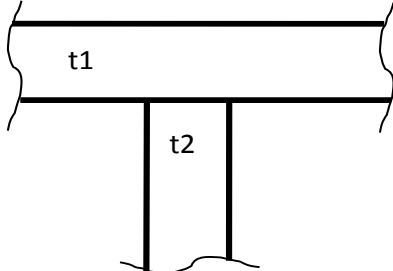
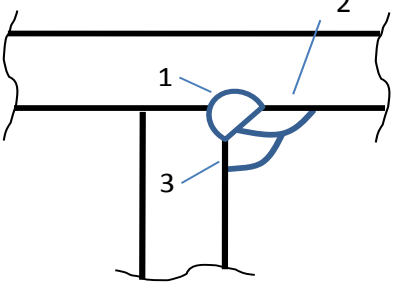


ATB					
WPS-Nr.	ITW-004	date	26-10-2011		
		rev.	3		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>			
to parent material :	S235JR				
Parent material standard :	EN 10025				
EN15608 Group nr. :	1.1				
Welding process :	111				
Filler material :	Basic electrode Free choice of brand				
Welding position :	PB 045				
Shielding gas :	N/A				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	6,02	<p style="text-align: center;">Welding sequence</p>			
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			
WPS-Nr.	ITW-005	date	26-10-2011
		rev.	3
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>	
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		
Material thickness (mm): t1	6,02	<p style="text-align: center;">Welding sequence</p>	
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		
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		
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 :		

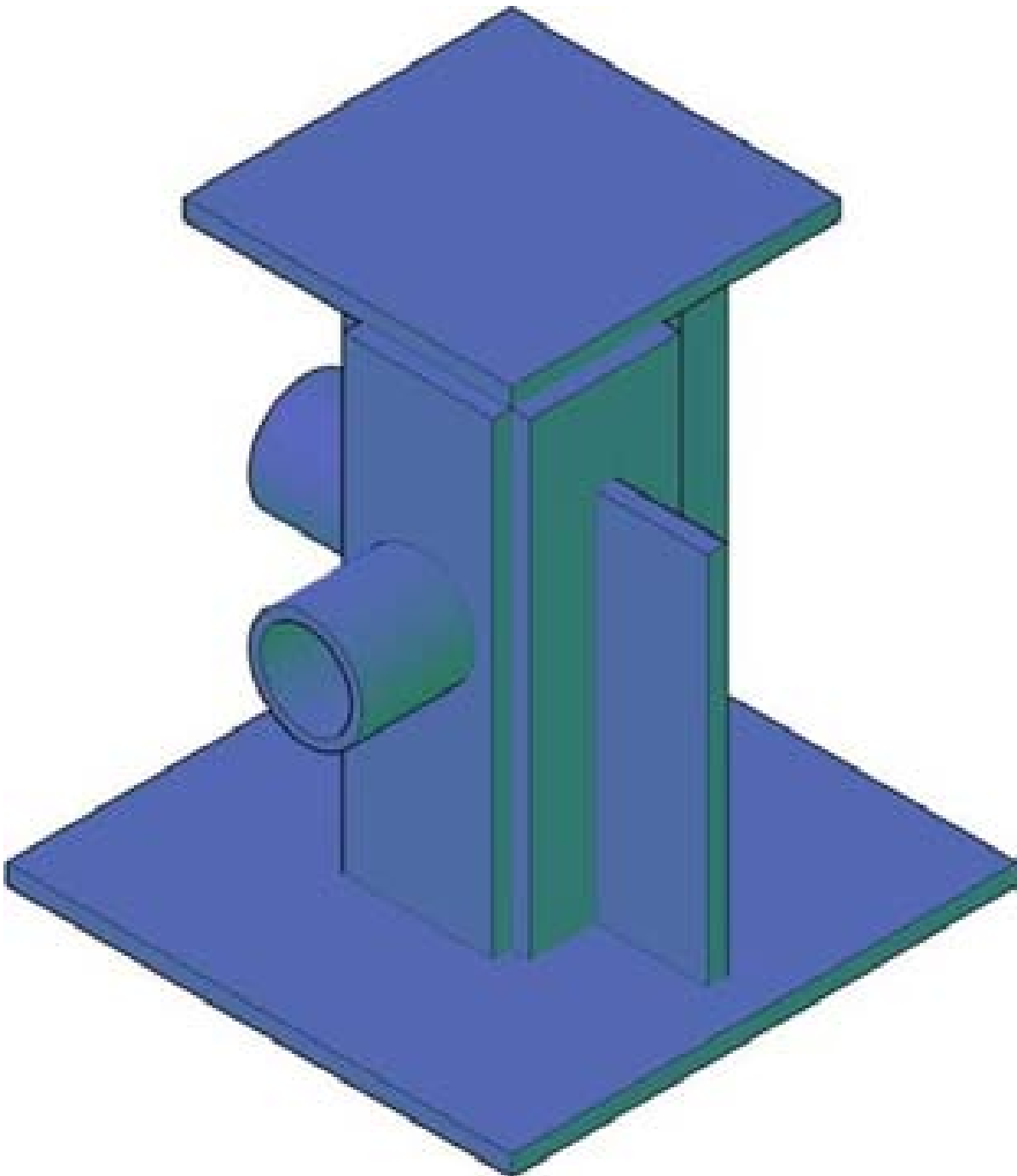


ATB					
WPS-Nr.	ITW-008	date	26-10-2011		
		rev.	3		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>			
to parent material :	S235JR				
Parent material standard :	EN 10025				
EN15608 Group nr. :	1.1				
Welding process :	111				
Filler material :	Basic electrode Free choice of brand				
Welding position :	PH				
Shielding gas :	N/A				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	5,5	<p style="text-align: center;">Welding sequence</p>			
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 :			

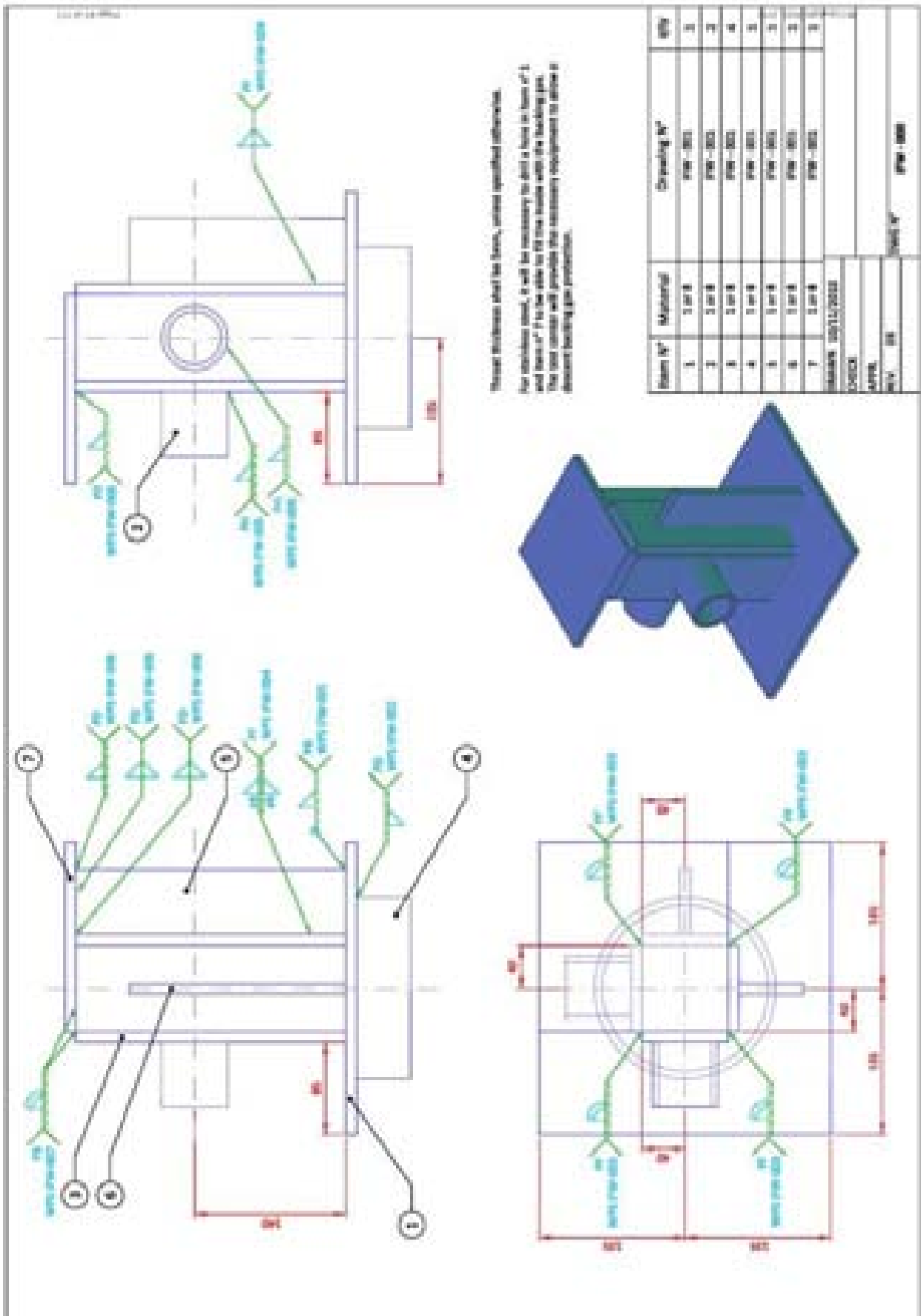
17.2 Welding Process 135

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	

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

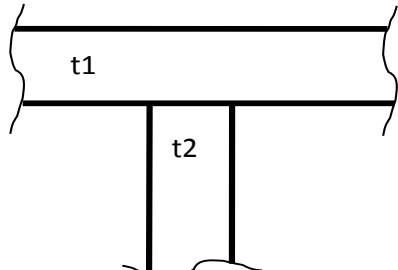
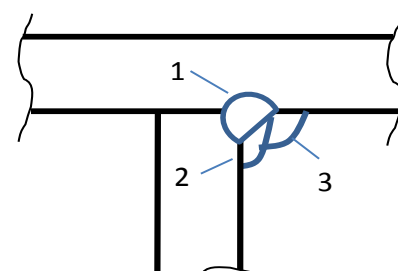
Drawing N°

IFW-001

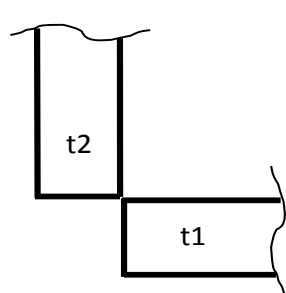


ATB			
WPS-Nr.	IFW-001	date	25-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand		
Welding position :	PB		
Shielding gas :	ISO 14175 : M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p>	
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 :		



<h1>ATB</h1>			
WPS-Nr.	IFW-002	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 position :	PD		
Shielding gas :	ISO 14175 : M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10	Welding sequence 	
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	<p style="text-align: center;">Joint design</p> 	
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 :	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 :		



<h1>ATB</h1>					
WPS-Nr.	IFW-004	date	25-10-2011		
		rev.	2		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>			
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 :	PF				
Shielding gas :	ISO 14175 : M21				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p>			
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 :				

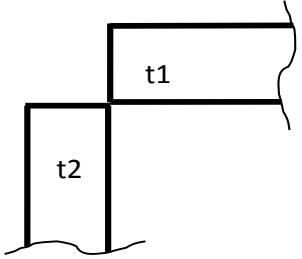
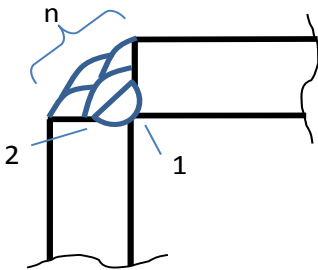


ATB			
WPS-Nr.	IFW-005	date	25-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand		
Welding position :	PF (PH)		
Shielding gas :	ISO 14175 : M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p>	
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 :		



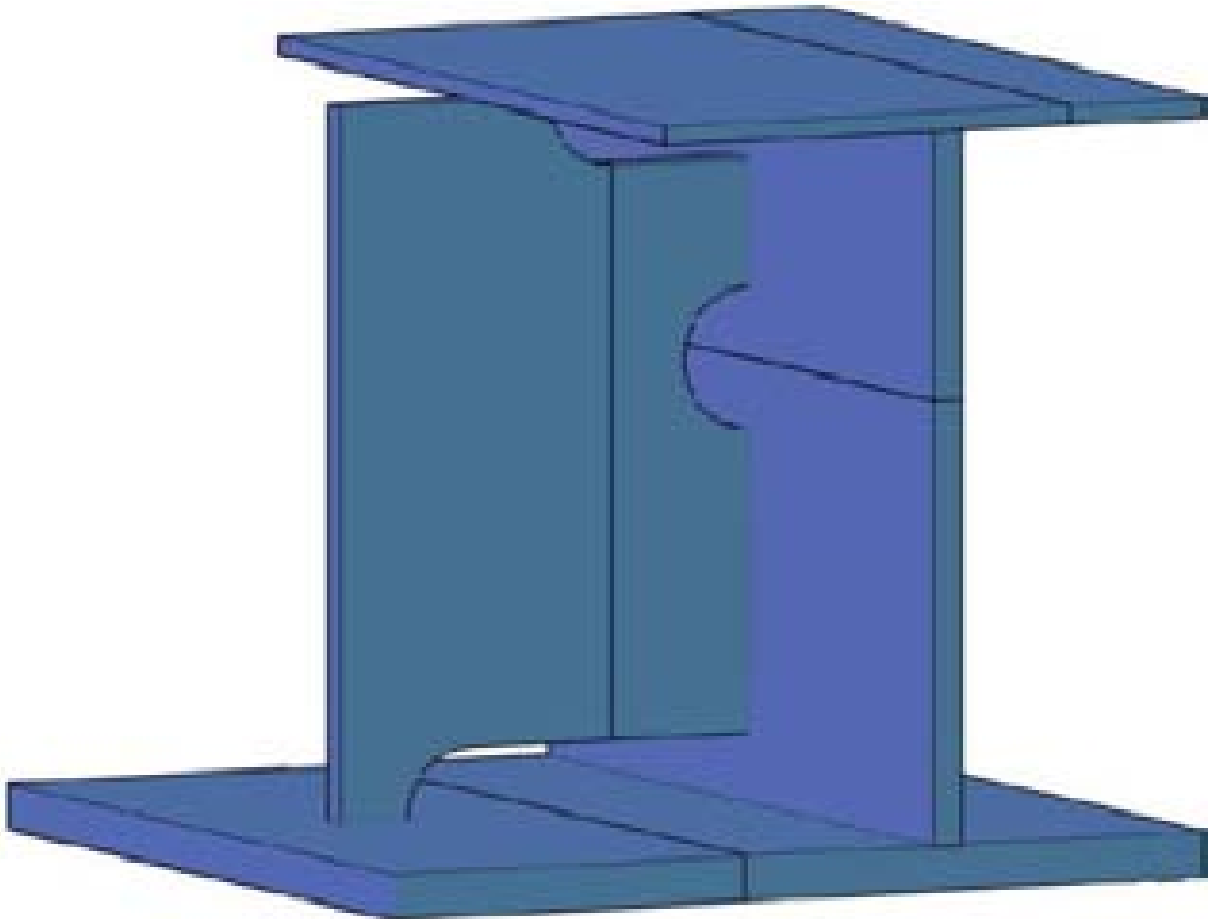
ATB			
WPS-Nr.	IFW-006	date	25-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Proces :	135		
Filler material :	any brand		
Welding position :	PD		
Shielding gas :	ISO 14175 : M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p>	
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	<p style="text-align: center;">Joint design</p> 	
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 of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p> 	
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 :		

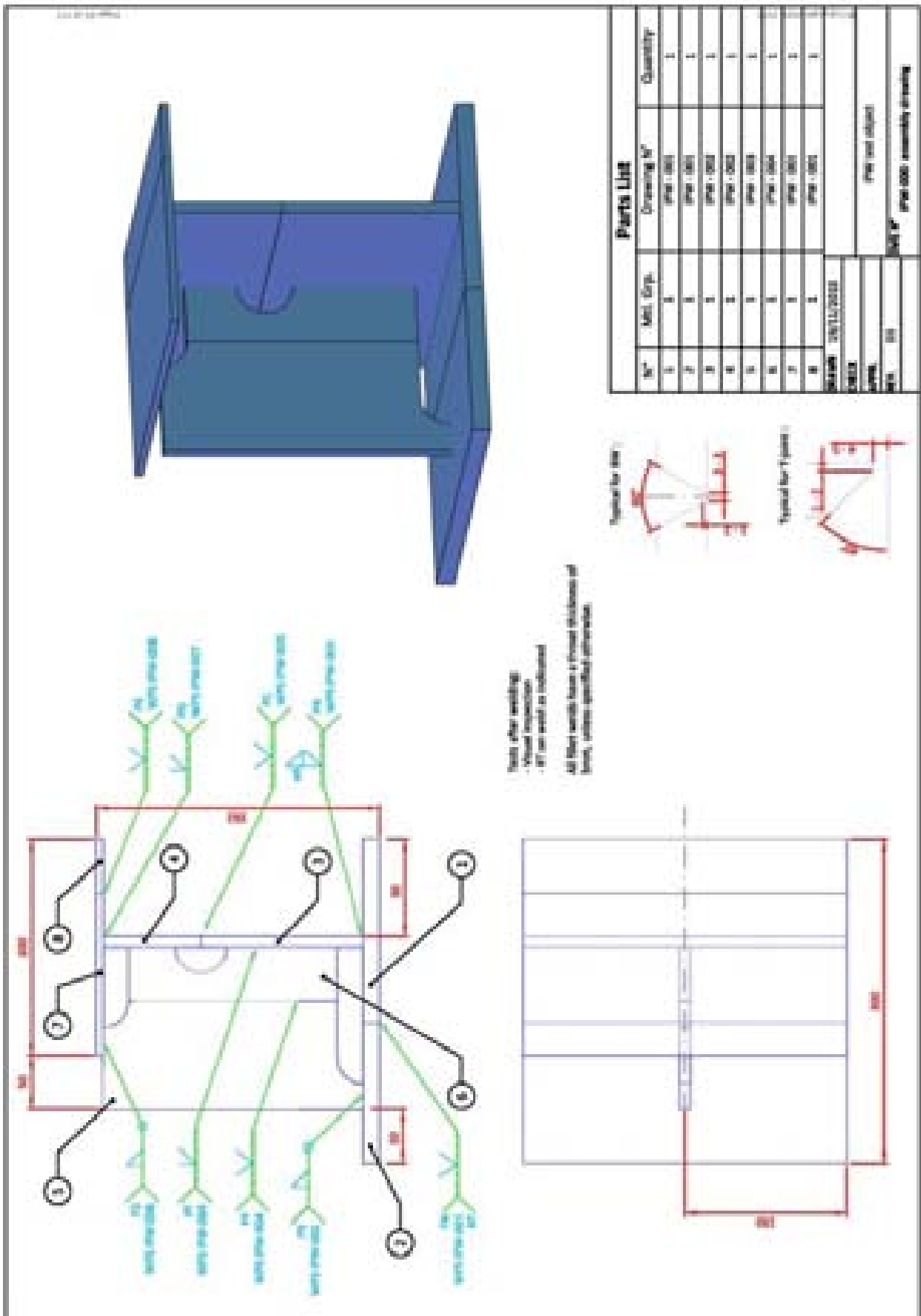
17.2.2 IPW Test Object – 135

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.



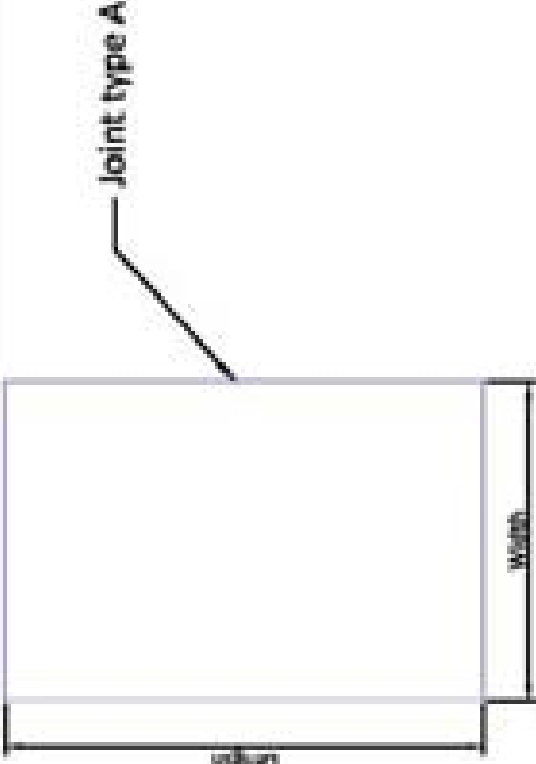
Note the welding:
- Fusion temperature: 170°C
- All fillet welds to be done in accordance with IAB-089r4-12

Typical for 100

Typical for 150

Parts List			
N°	Mkt. Desc.	Drawing N°	Quantity
1		001	1
2		001	1
3		001	1
4		001	1
5		001	1
6		001	1
7		001	1
8		001	1
PARTS LIST			
DATE: 10/11/2011			
DRAWN: [Name]			
CHECKED: [Name]			
APPROVED: [Name]			
PART N°			
IAB-089r4-12			

IPW-001
IPW-001

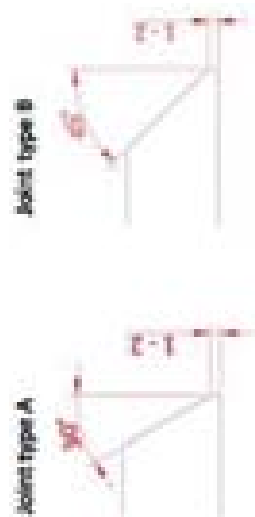


Joint type A

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.

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

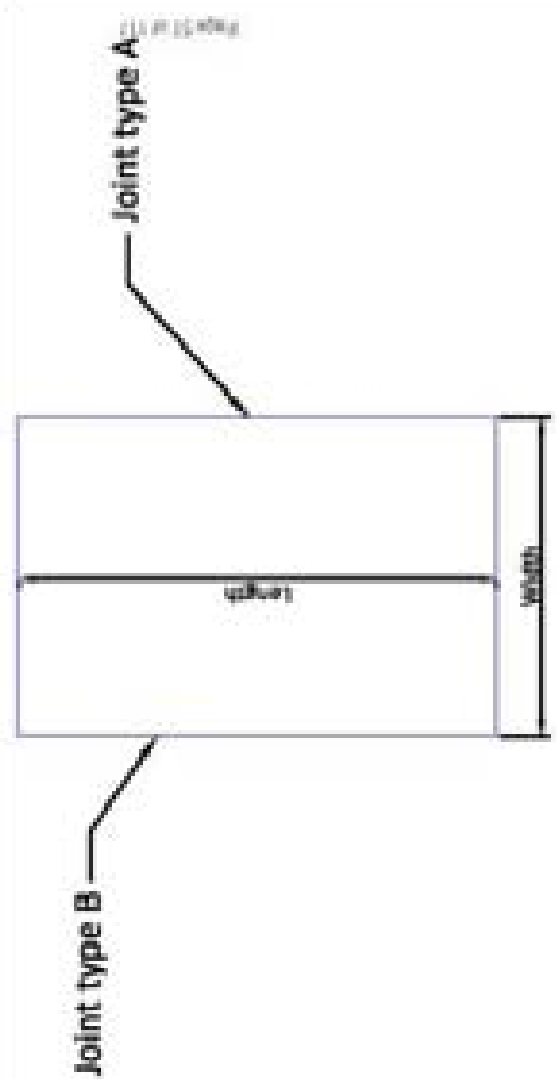
Drawn 19/11/2010 Check Appr. Rev. 01	Drawing N° IPW - 001
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Joint type A

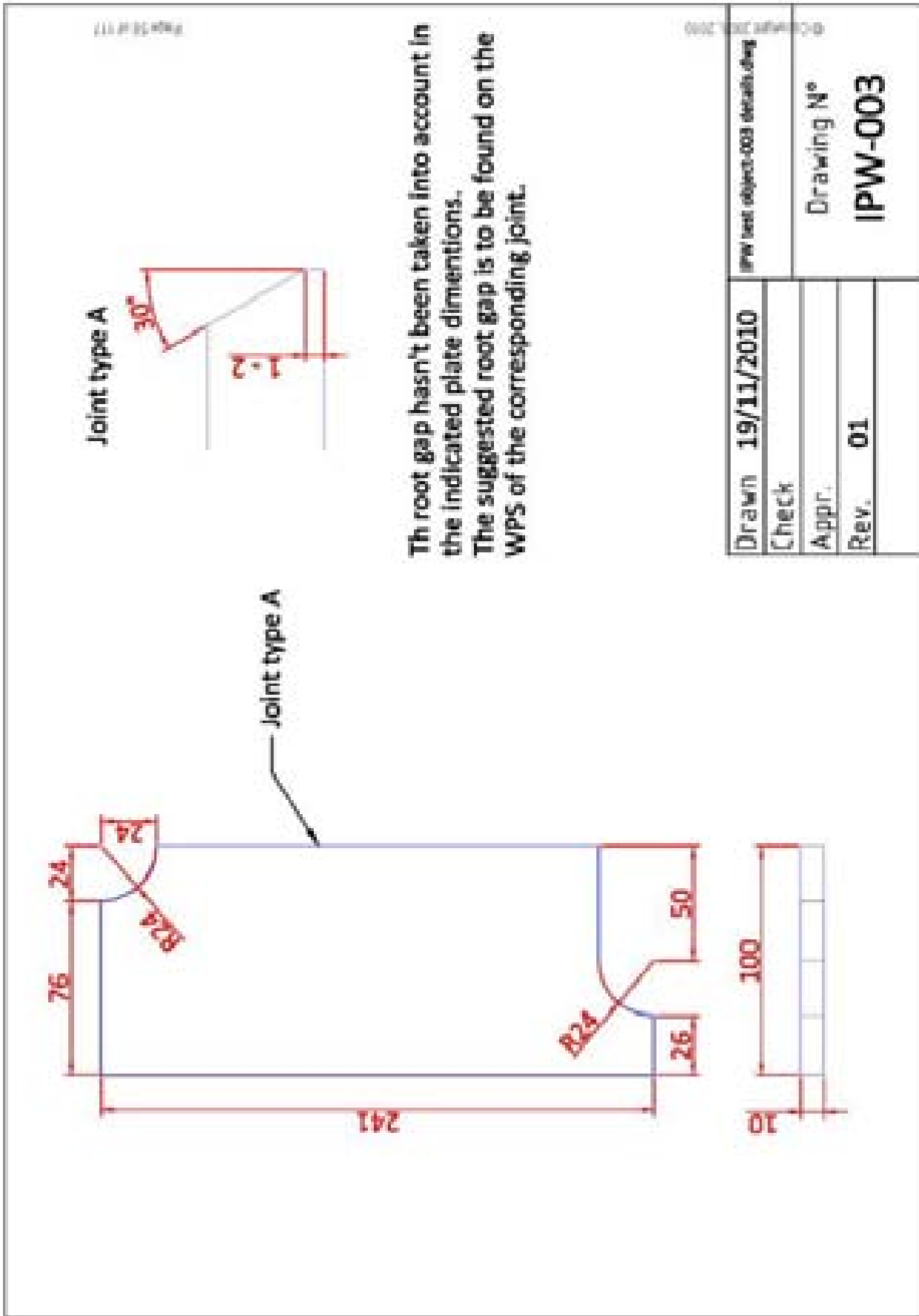
Joint type B

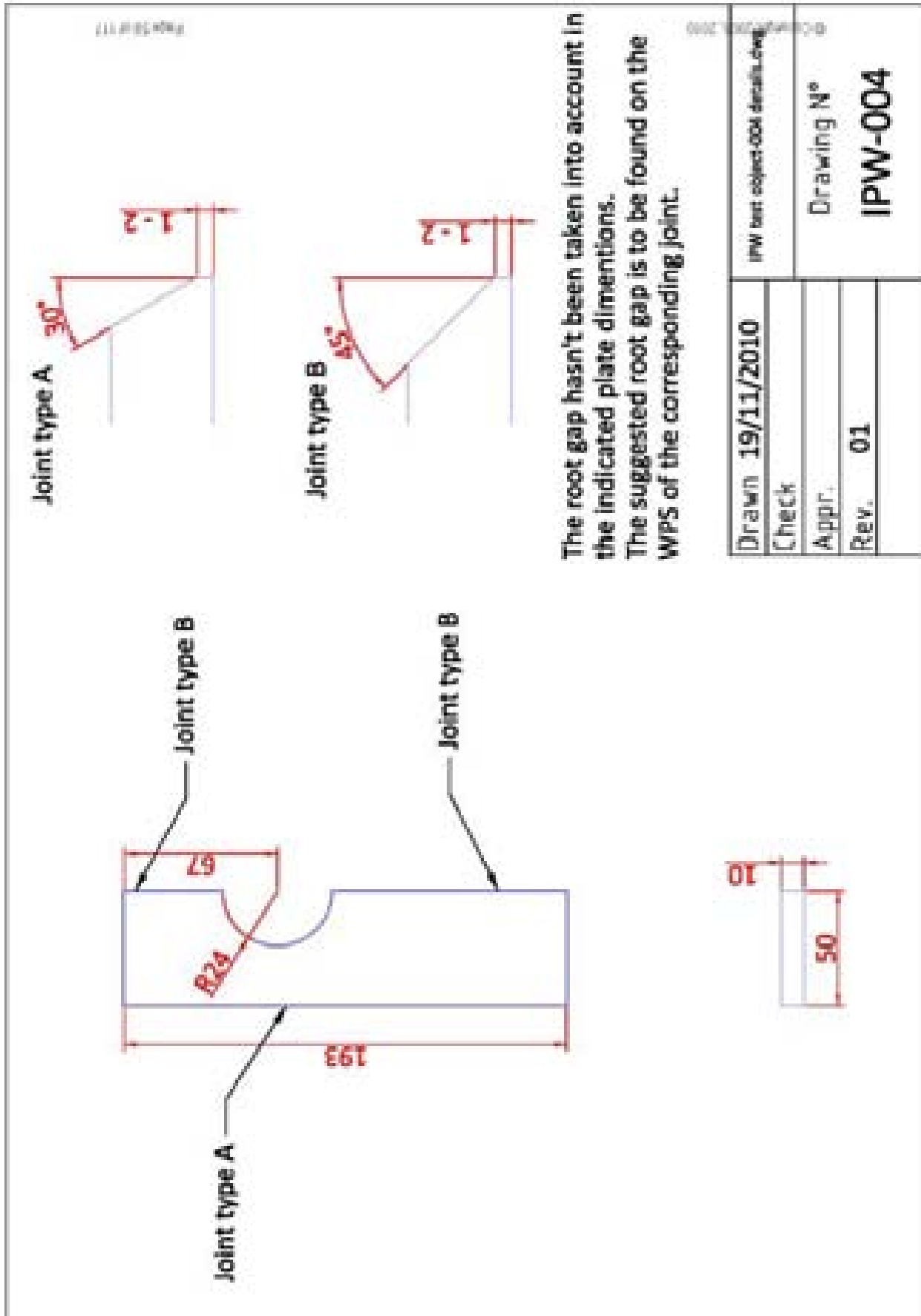
The root gap hasn't been taken into account in the indicated widths of the plates.
The suggested root gap is to be found on the VPS of the corresponding joint.



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

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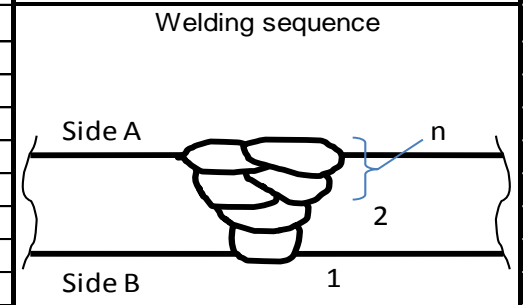
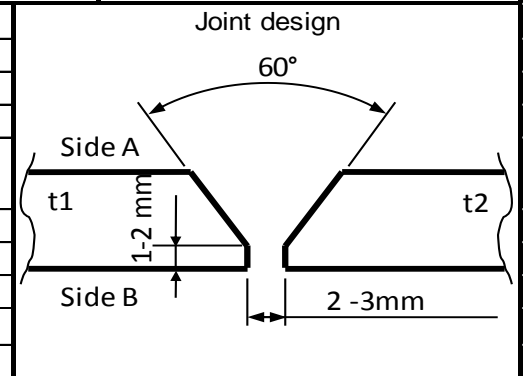
ATB

WPS-Nr.	IPW-001	date	2011-10-28
		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 :	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 :	



<h1>ATB</h1>					
WPS-Nr.	IPW-002	date	28-10-2011		
		rev.	2		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>			
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 of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p>			
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 :				



<h1>ATB</h1>			
WPS-Nr.	IPW-003	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>	
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 of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p>	
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 :		



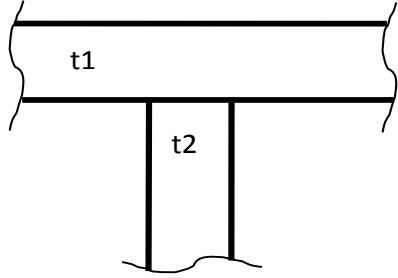
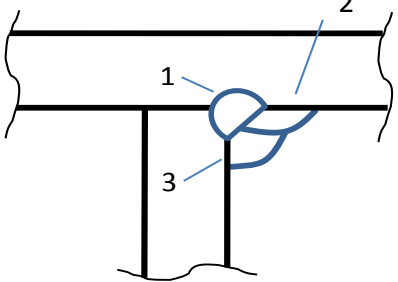
ATB					
WPS-Nr.	IPW-004	date	28-10-2011		
		rev.	2		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>			
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR 15608 Group nr. :	1.1				
Welding Proces :	135				
Filler material :	any brand				
Welding position :	PF				
Shielding gas :	ISO 14175 : M21				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p>			
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	<p style="text-align: center;">Joint design</p>	
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 :	PC		
Shielding gas :	ISO 14175 : M21		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p>	
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	<p>Joint design</p> 			
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	<p>Welding sequence</p> 			
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 :				



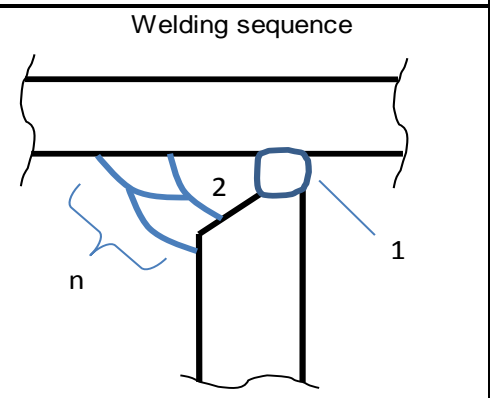
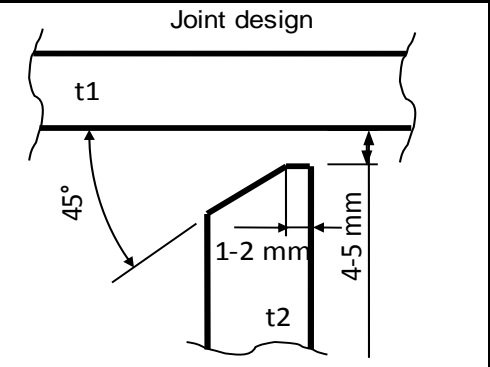
ATB

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			

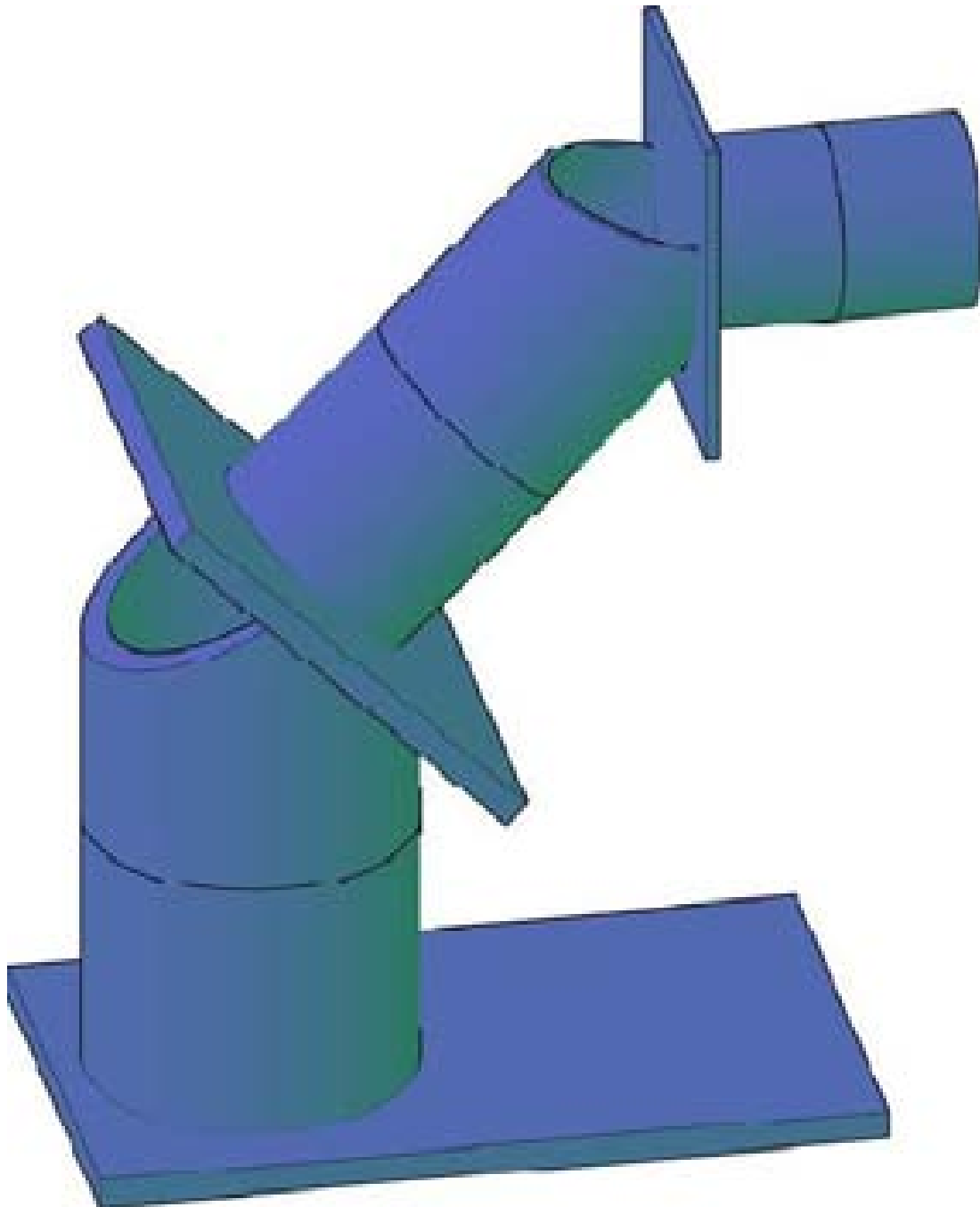
Welding Procedure Qualification Record Nr. :		
Not qualified	written by :	



ATB			
WPS-Nr.	IPW-008	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	<div style="display: flex; flex-direction: column;"> <div style="margin-bottom: 10px;"> <p style="text-align: center;">Joint design</p> </div> <div> <p style="text-align: center;">Welding sequence</p> </div> </div>	
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		
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 :		

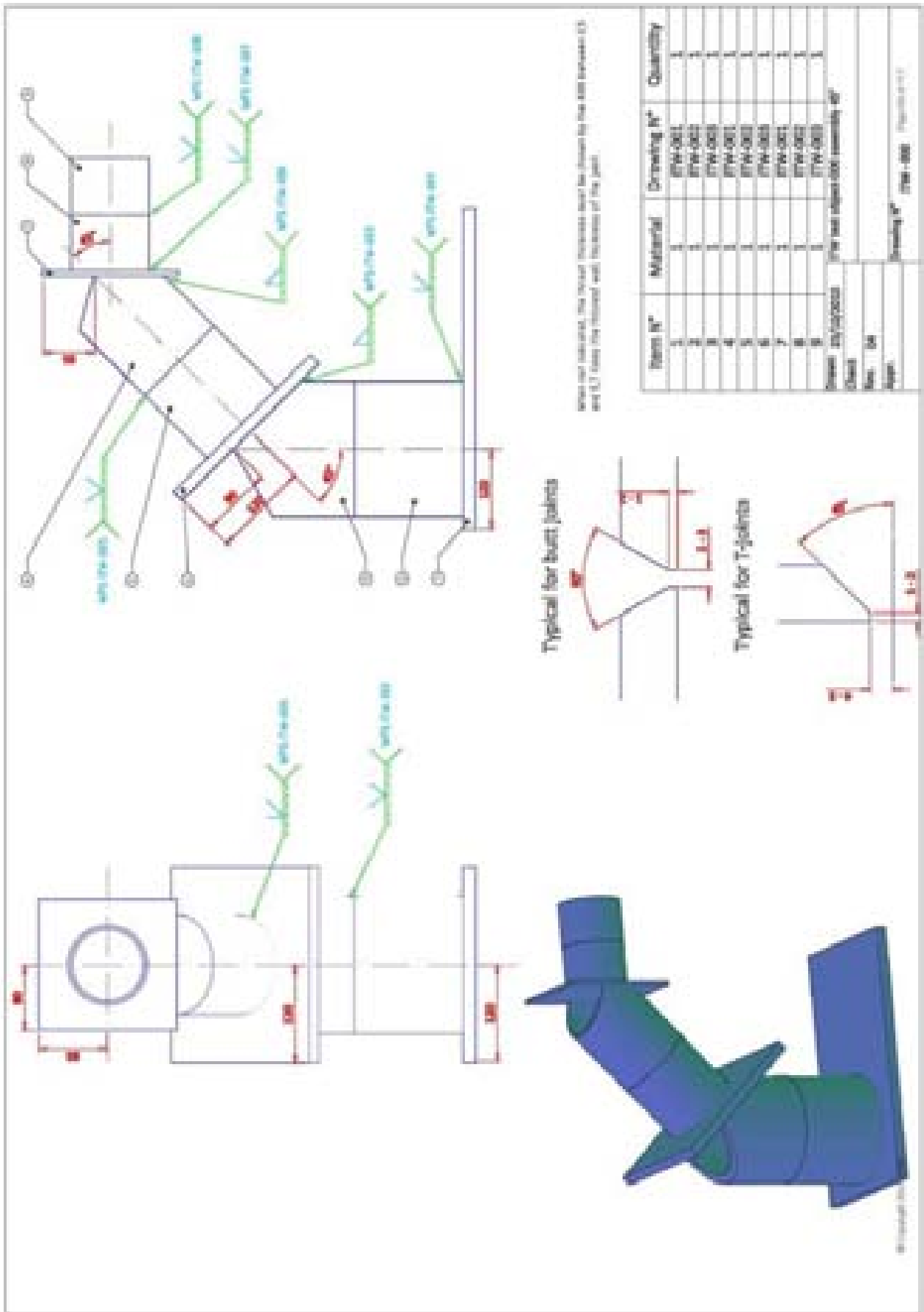
17.2.3 ITW Test Object – 135

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°	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	Drawing N° ITW-001
Check		
Appr.		
Rev.	02	



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


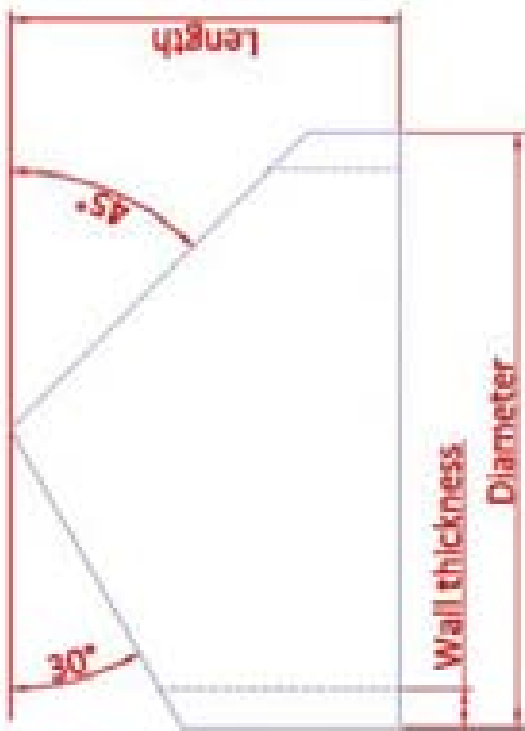
The exact material thicknesses are not mandatory and can be slightly changed according to local needs.

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

Drawing N°
ITW-002

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.		Drawing N°
Rev.	02	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 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				
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 :				



<h1>ATB</h1>			
WPS-Nr.	ITW-002	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>	
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 :	PC		
Shielding gas :	ISO 14175 : M21		
Type flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10,97	<p style="text-align: center;">Welding sequence</p>	
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) :	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	<p style="text-align: center;">Joint design</p>			
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 045				
Shielding gas :	ISO 14175 - M21				
Type flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	15	<p style="text-align: center;">Welding sequence</p>			
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 :				



<h1>ATB</h1>			
WPS-Nr.	ITW-004	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>	
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 045		
Shielding gas :	ISO 14175 : M21		
Type flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	6,02	<p style="text-align: center;">Welding sequence</p>	
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 :		



<h1>ATB</h1>			
WPS-Nr.	ITW-005	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>	
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 :	H-L045		
Shielding gas :	ISO 14175 : M21		
Type flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	6,02	<p style="text-align: center;">Welding sequence</p>	
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 :	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		
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 :		



<h1>ATB</h1>			
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 :		



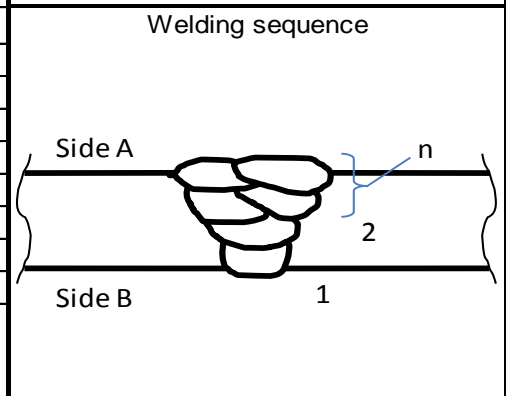
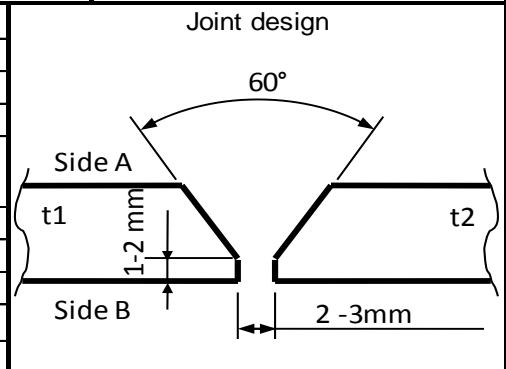
ATB

WPS-Nr.	ITW-008	date	28-10-2011
		rev.	2

WELDING PROCEDURE SPECIFICATION

EN ISO 15609-1

Parent material :	S235JR
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	5,5
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,...	



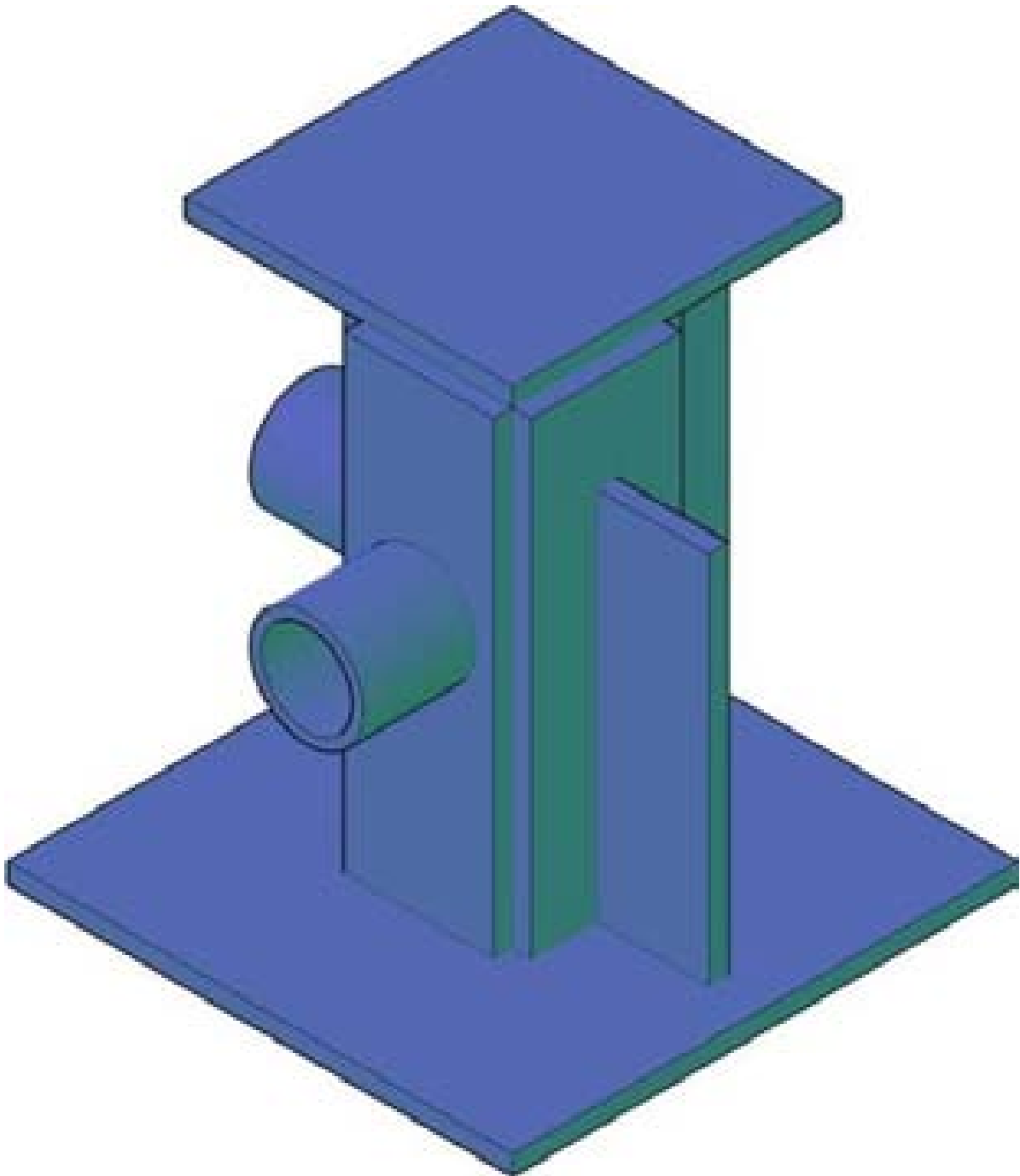
Welding parameters			
Run number :	1	2 - n	
Welding process :	135	135	
Type of Current (AC/DC) :	DC	DC	
Polarity (+/-)	+	+	
Diameter of filler material (mm) :	1,0	1,0	
Welding current (A) :	100-130	125-155	
Wire feed speed (m/min), informative:	3-4	4-6	
Arc voltage (V) :	18-20	20-22	
Travel speed (cm/min) :	-	-	
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 :		

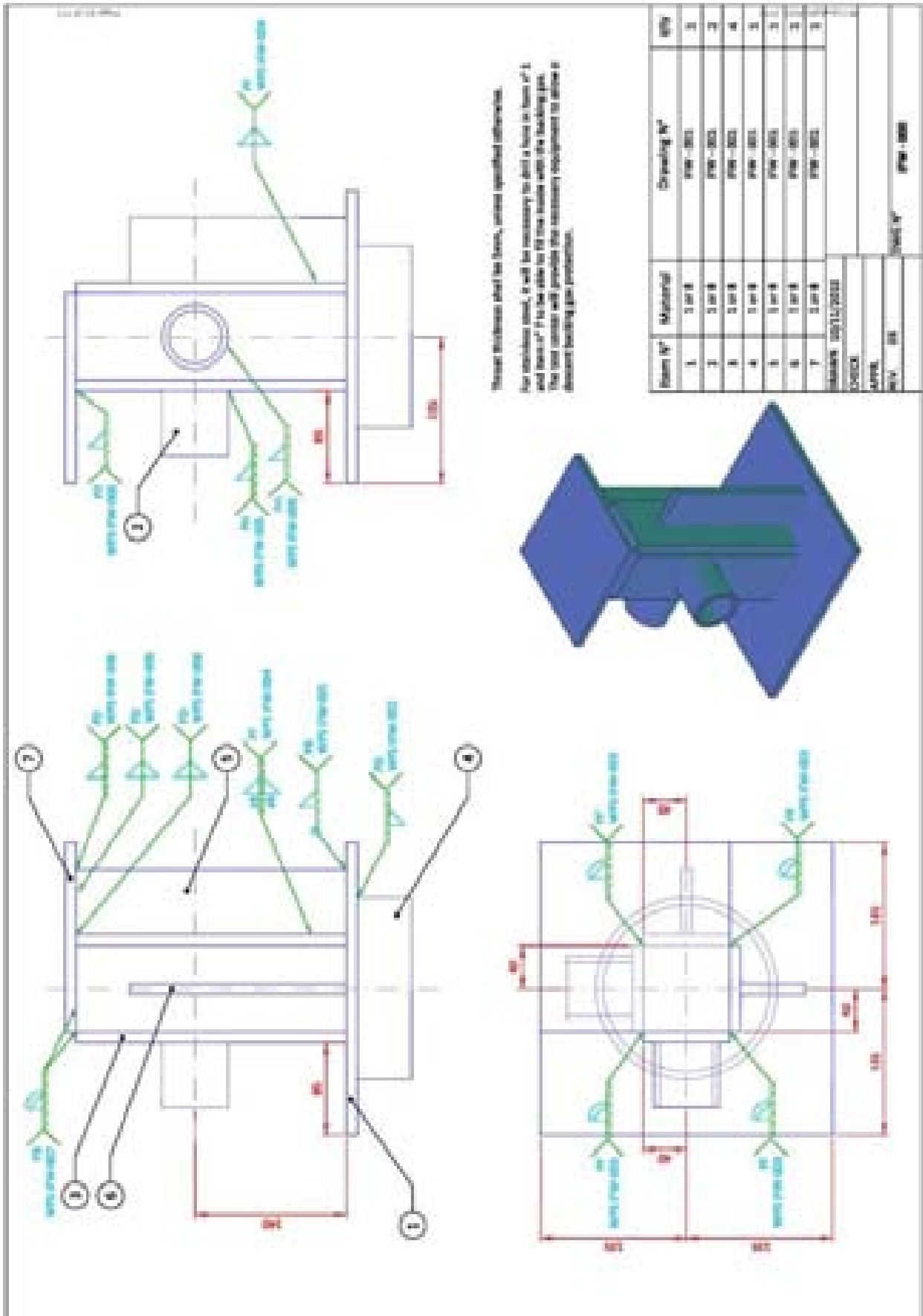
17.3 Welding Process 141

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.



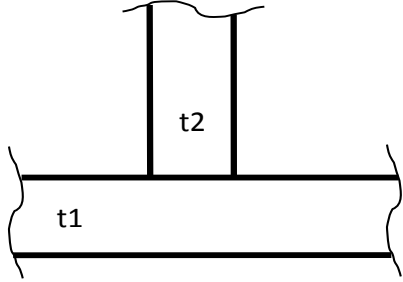
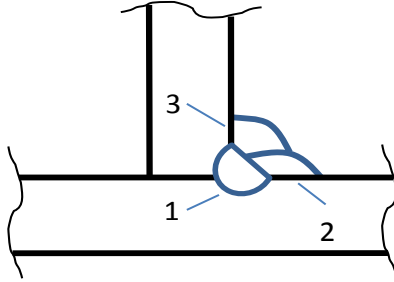


Item N° acc. drawing IFW-000	Plate / Tube	Length [mm]	Width [mm]	Thickness [mm]	Diameter [mm]
1	P	270	270	10	
2	T	60		5.5	60.3
3	P	250	80	10	
4	T	50		7.1	168.3
5	P	60	250	10	
6	P	60	200	10	
7	P	175	175	10	

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

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



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 W1a 15	Wth 20 or W1a 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	<p style="text-align: center;">Joint design</p>			
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 : 11				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p>			
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 :				

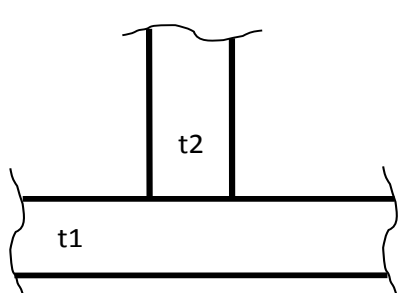
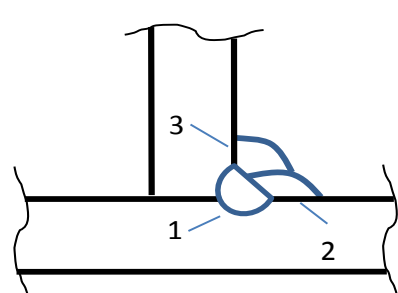


ATB			
WPS-Nr.	IFW-003	date	24-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :		Welding sequence 	
Welding position :	PF		
Shielding gas :	ISO 14175 : I1		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10		
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 :		

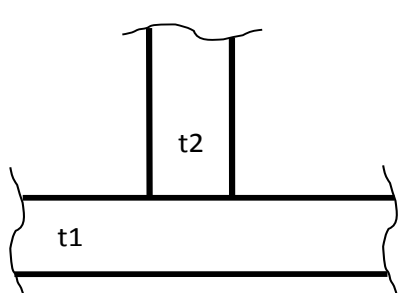
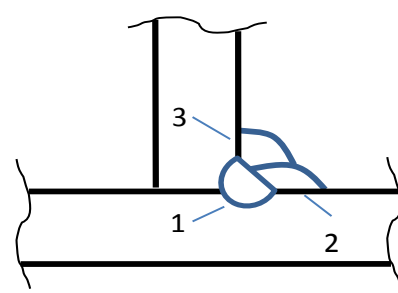


ATB					
WPS-Nr.	IFW-004	date	24-10-2011		
		rev.	2		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>			
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR 15608 Group nr. :	1.1				
Welding Process :	141				
Filler material :					
Welding position :	PF				
Shielding gas :	ISO 14175 : I1				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p>			
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 :				

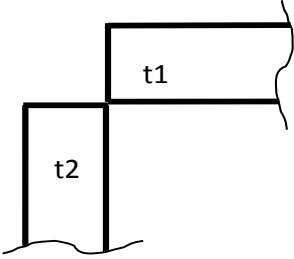
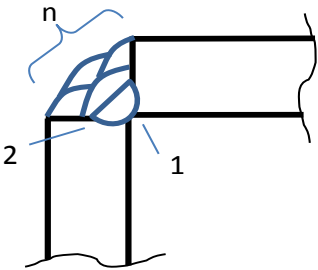


ATB			
WPS-Nr.	IFW-005	date	24-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :		Welding sequence 	
Welding 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 :		



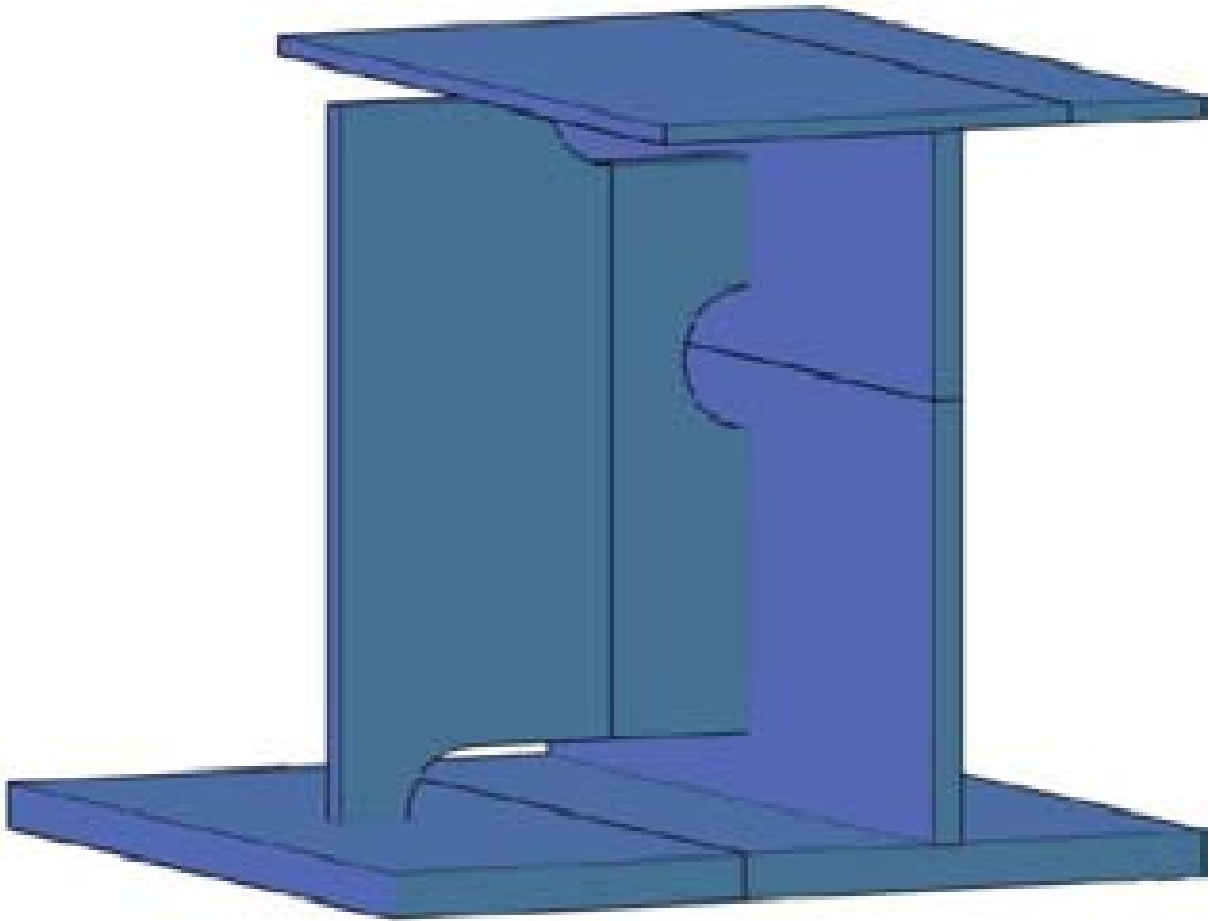
ATB			
WPS-Nr.	IFW-006	date	24-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :		Welding sequence 	
Welding 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 :		



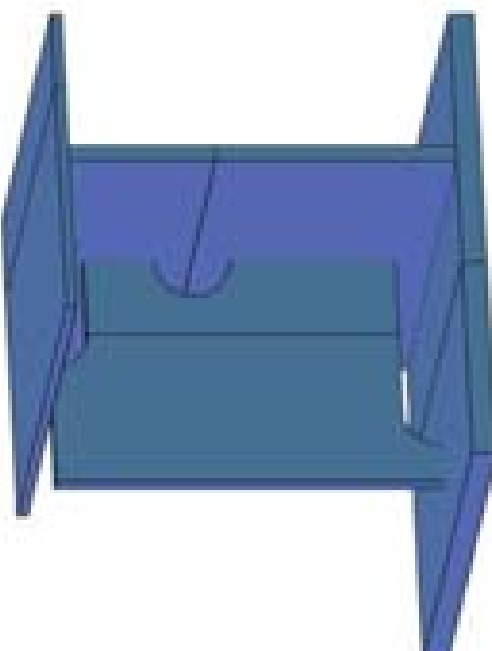
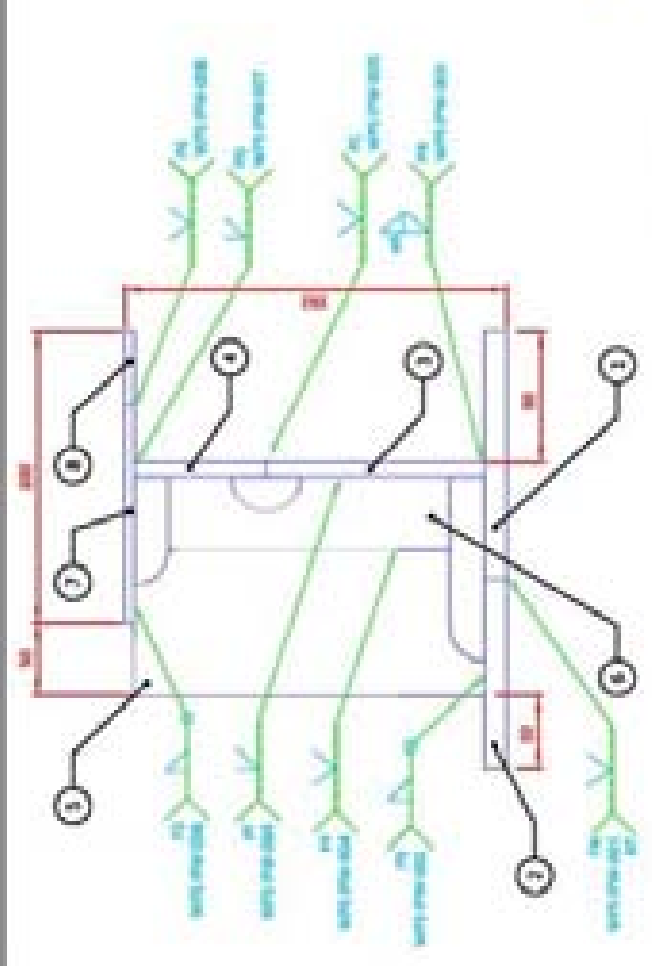
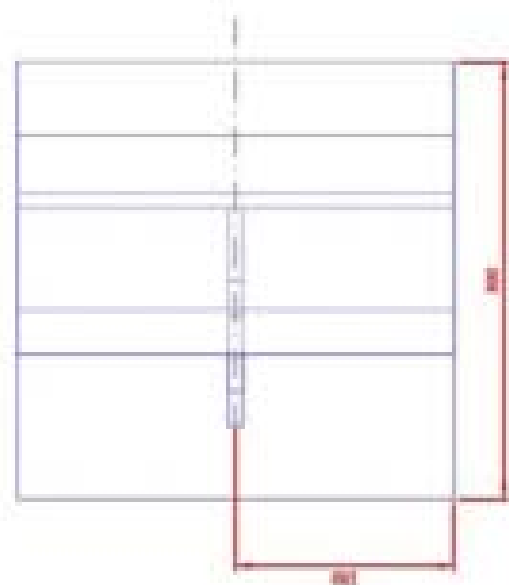
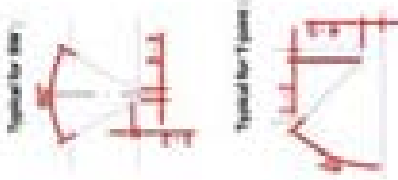
ATB			
WPS-Nr.	IFW-007	date	24-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	Joint design 	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :		Welding sequence 	
Welding 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.

Notes after writing:

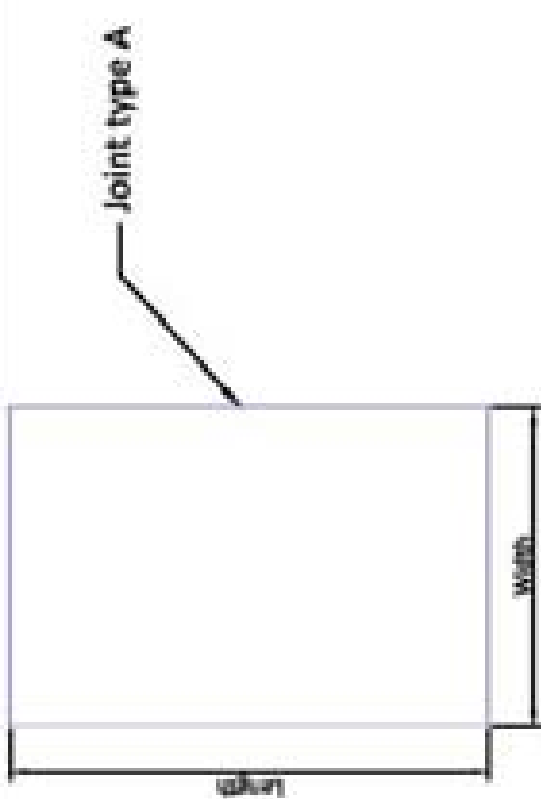
- Visual inspection
- If no weld is required

All files with blue frames indicate that they have a frame thickness of zero, unless specified otherwise.

Parts List

N°	Mtl. Qty.	Drawing N°	Quantity
1	8	PR01-001	8
2	8	PR01-001	8
3	1	PR01-002	1
4	2	PR01-003	2
5	2	PR01-003	2
6	2	PR01-004	2
7	2	PR01-005	2
8	2	PR01-005	2
PR01-000-001			
PR01-000-002			
PR01-000-003			
PR01-000-004			
PR01-000-005			
PR01-000-assembly drawing			

IIW DRAWING
001 - 001

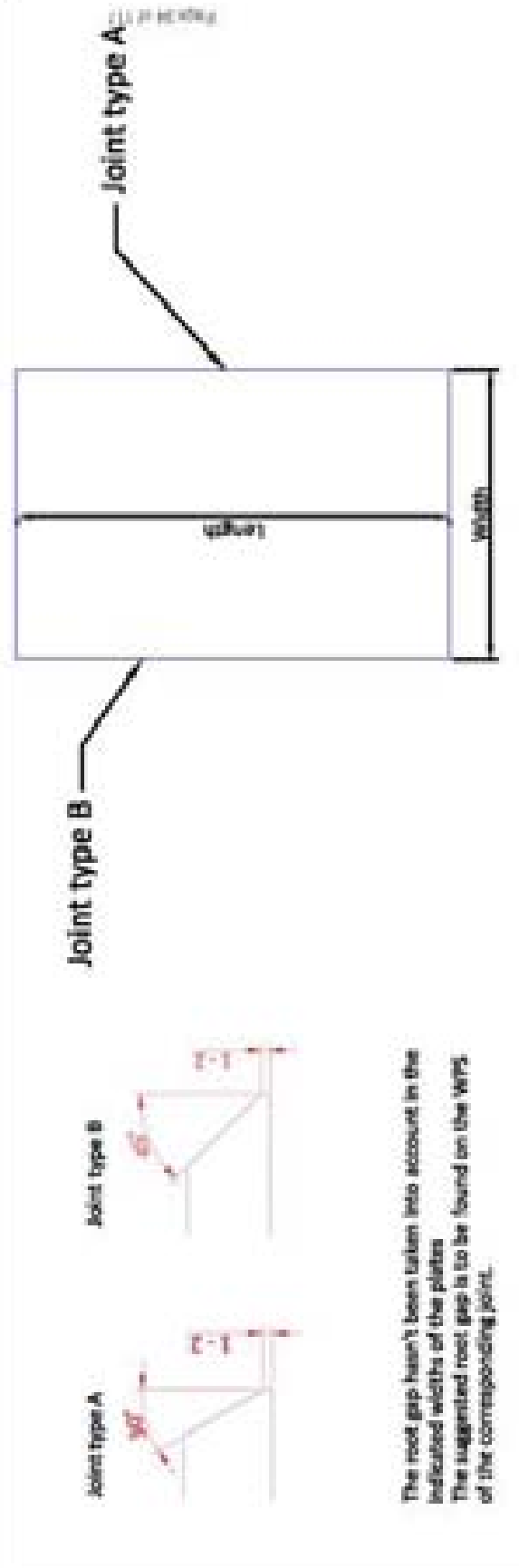


Joint type A

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 VERTS of the corresponding joint.

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

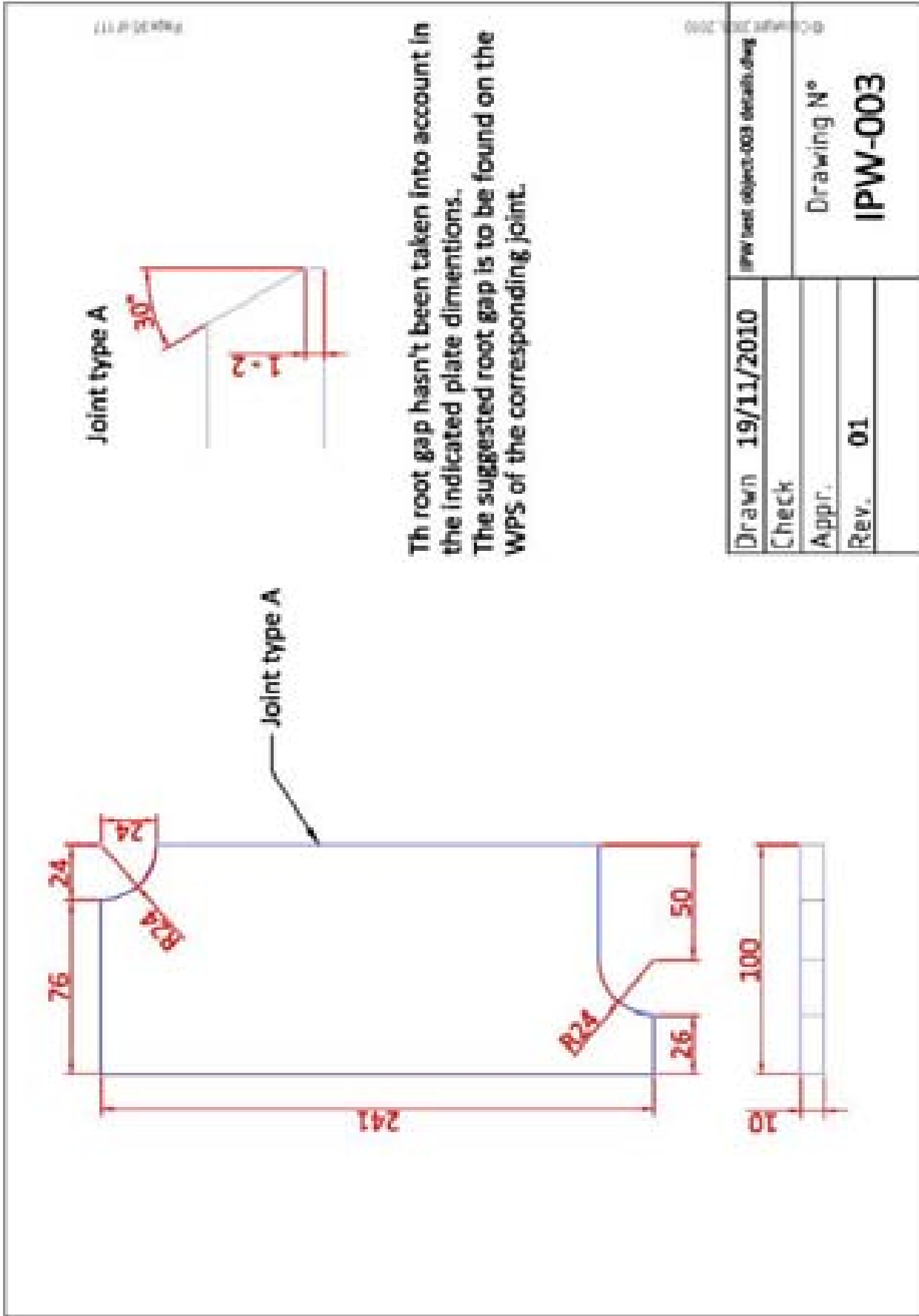
Drawn 19/11/2010	<small>ipw test object-001 details</small>
Check	
Appr.	Drawing N°
Rev. 01	IPW - 001



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 VMPs of the corresponding joint.

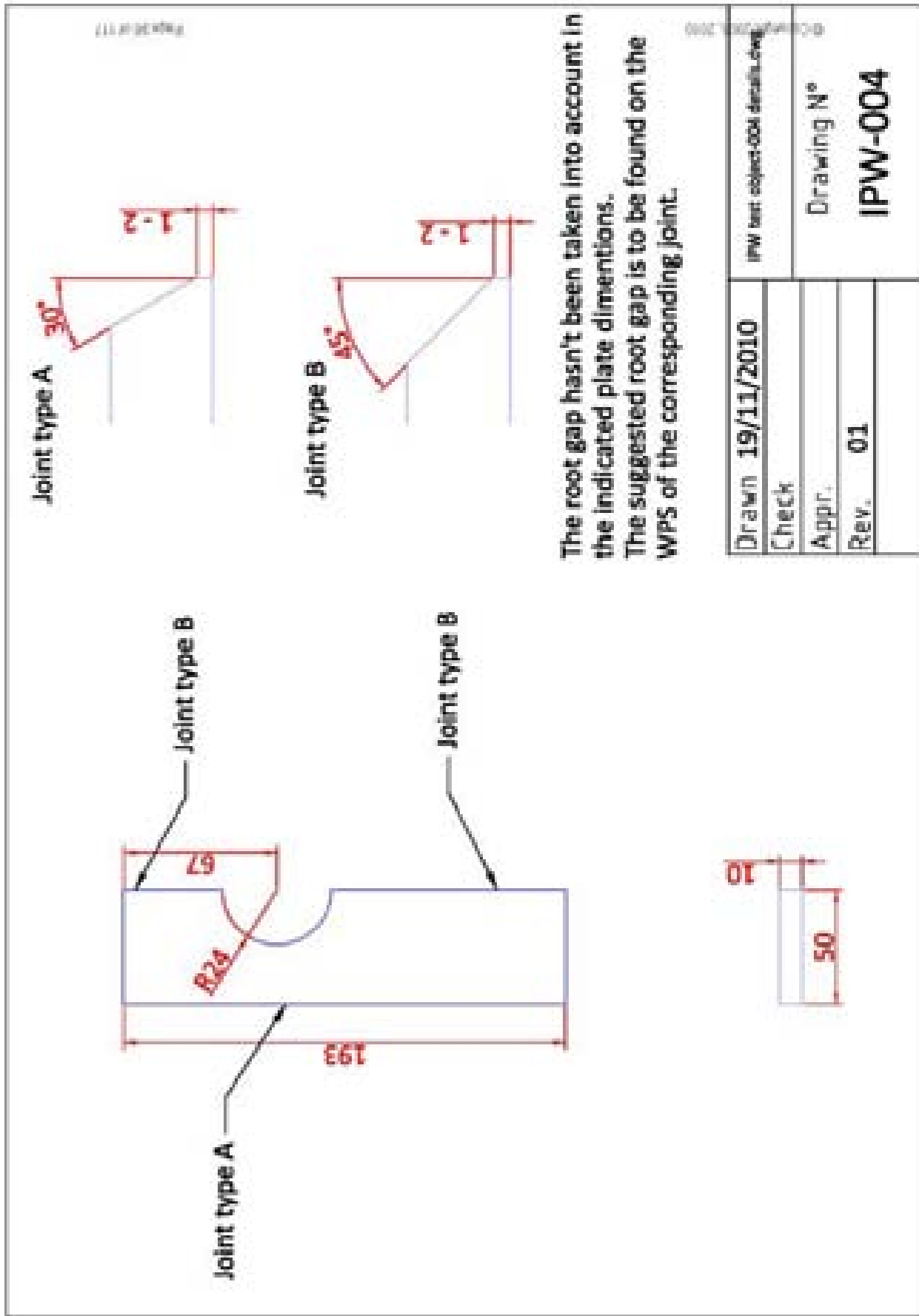
Item N°	Length	Width	Plate thickness
acc. drawing IPW-000			
3	300	150	10
4	300	91	10

Drawn 19/11/2010	ipw test object-003 details
Check	
Appr.	Drawing N°
Rev. 01	IPW - 002



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

Drawn	19/11/2010	IPW-003 details.dwg	
Check			
Appr.		Drawing N°	
Rev.	01	IPW-003	





ATB			
WPS-Nr.	IPW-001	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :			
Welding position :	PA		
Shielding gas :	ISO 14175 : I1		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	15	<p style="text-align: center;">Welding sequence</p>	
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	<p style="text-align: center;">Joint design</p>	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :		<p style="text-align: center;">Welding sequence</p>	
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):	-		
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) :	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	<p style="text-align: center;">Joint design</p>			
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR 15608 Group nr. :	1.1				
Welding Process :	141				
Filler material :		<p style="text-align: center;">Welding sequence</p>			
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 :				

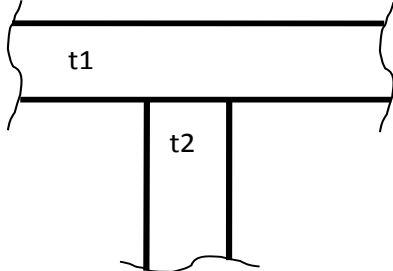
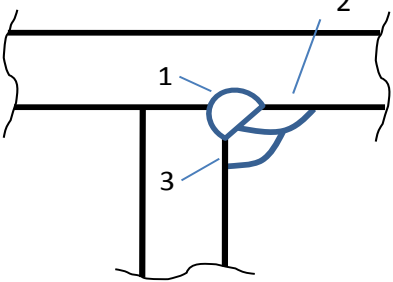


ATB			
WPS-Nr.	IPW-004	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :			
Welding position :	PF		
Shielding gas :	ISO 14175 : I1		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	10	<p style="text-align: center;">Welding sequence</p>	
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-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		
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 :		



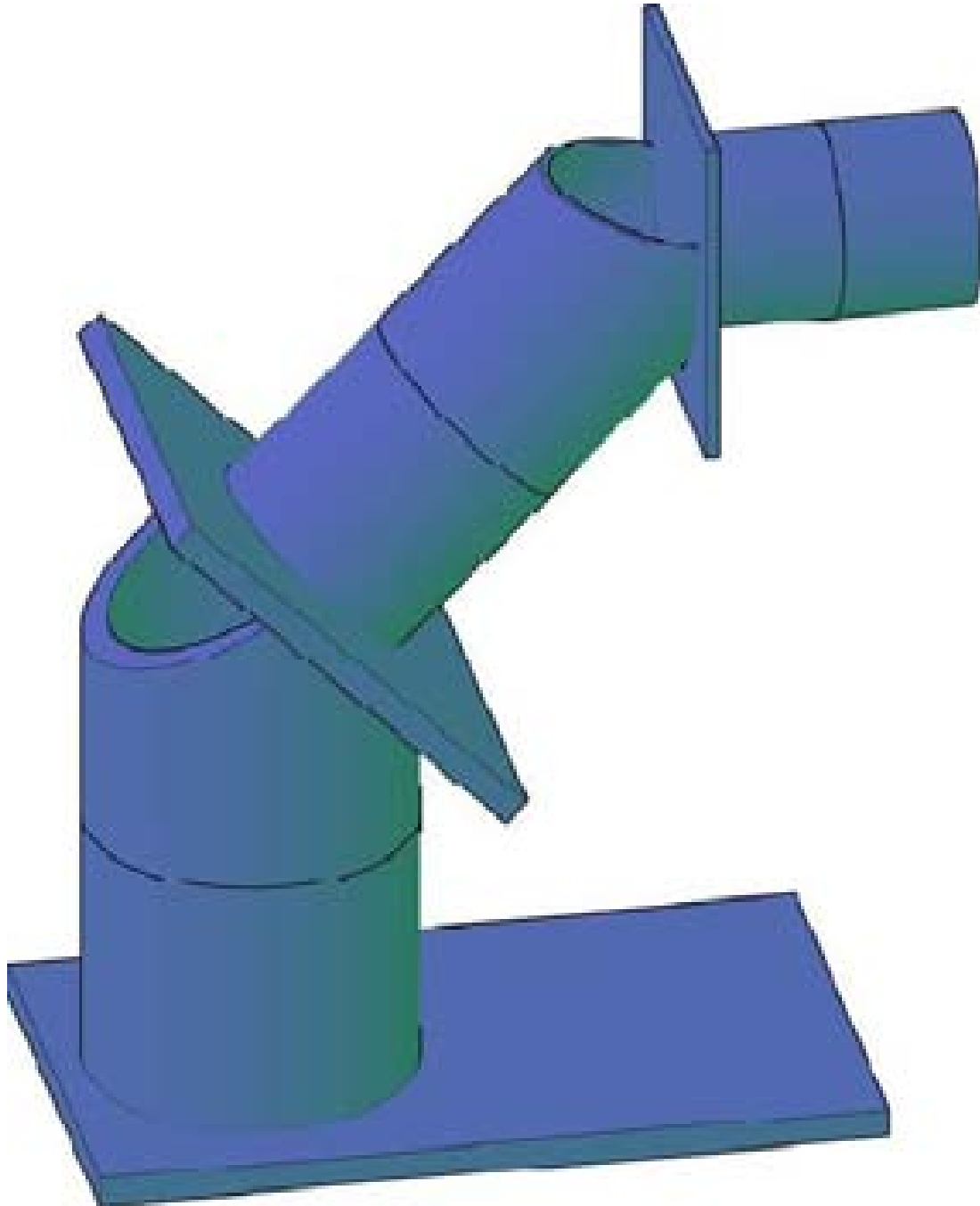
ATB			
WPS-Nr.	IPW-007	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR		
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :			
Welding position :	PD		
Shielding 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 :		



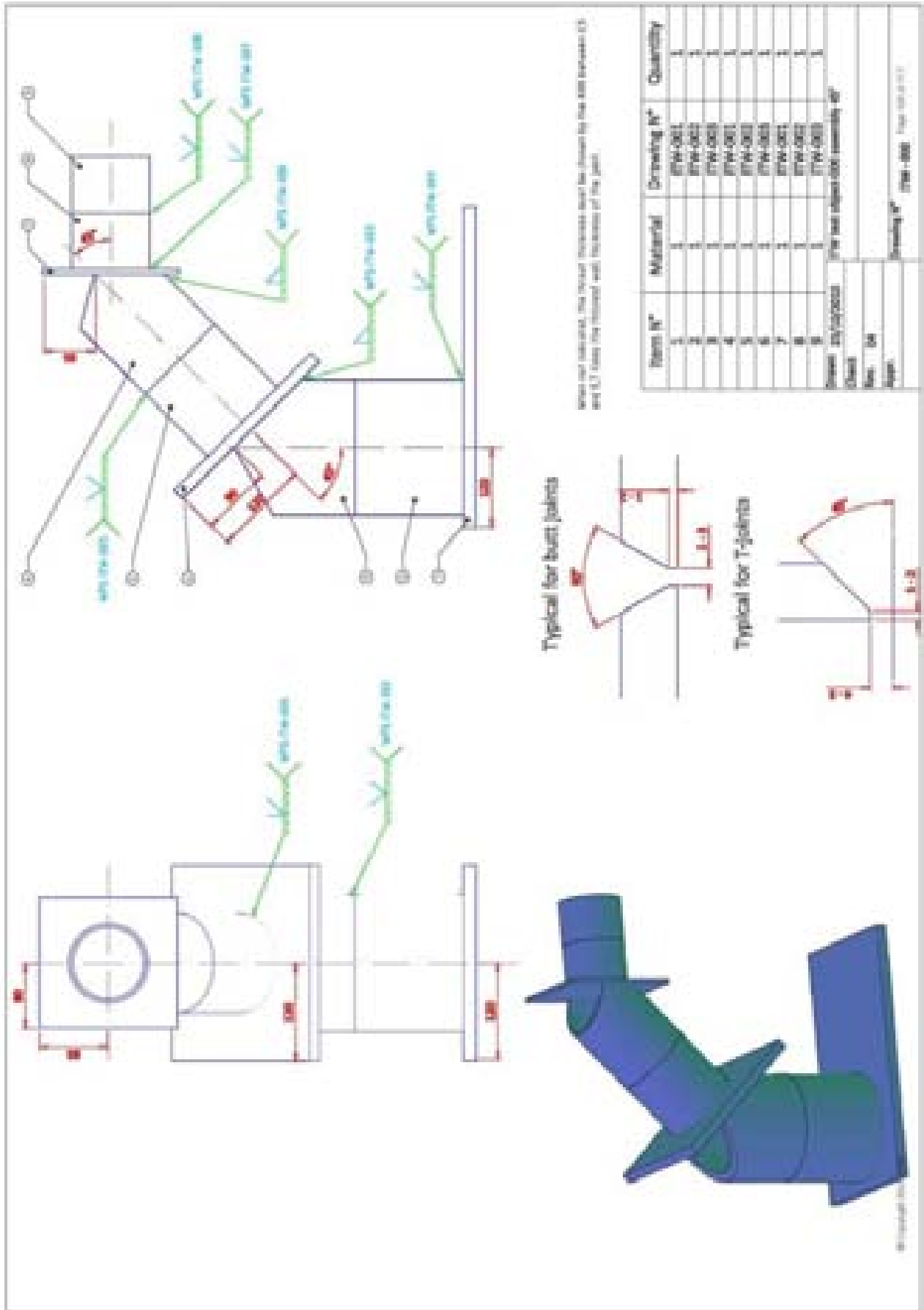
ATB			
WPS-Nr.	IPW-008	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :			
Welding position :	PE		
Shielding gas :	ISO 14175 : I1		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	6	<p style="text-align: center;">Welding sequence</p>	
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°	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	Drawing N° ITW-001
Check		
Appr.		
Rev.	02	



Item N°	Plate / Tube	Length	Diameter	Wall thickness
acc. drawing ITW-000				
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
acc. drawing ITW 135-000				
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.


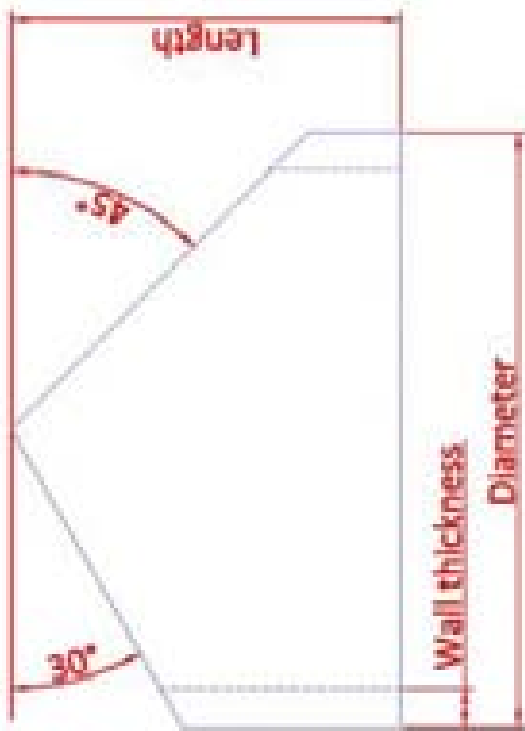
Drawn	22/09/2011	ITW test object-002 details
Check		
Appr.		
Rev.	02	
		Drawing N°
		ITW-002

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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
Check		
Appr.		Drawing N°
Rev.	02	ITW-003

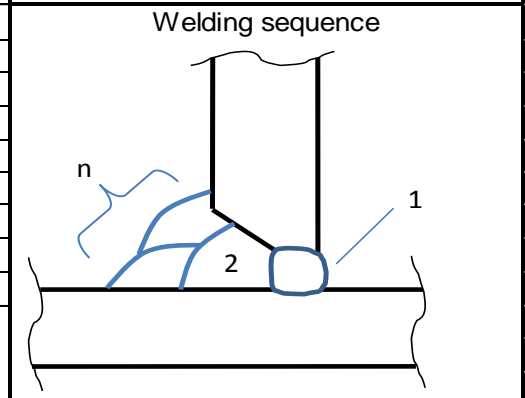
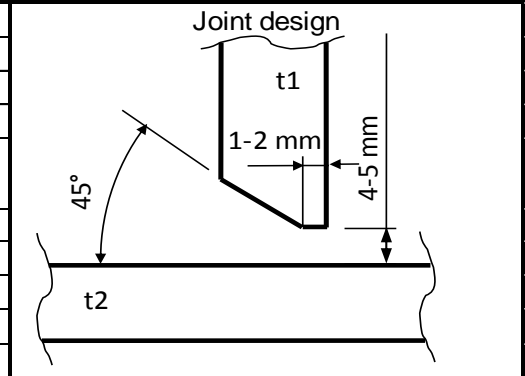


ATB

WPS-Nr.	ITW-001	date	28-10-2011
		rev.	2

WELDING PROCEDURE SPECIFICATION	EN ISO 15609-1
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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,...	

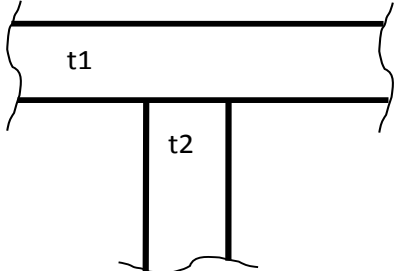
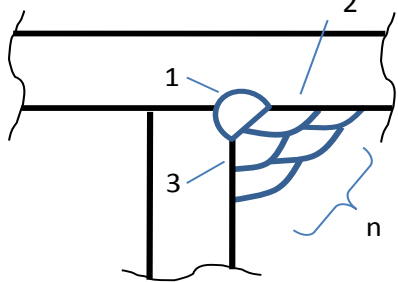


Welding parameters			
Run number :	1	2 - n	
Welding process :	141	141	
Type of current (AC/DC) :	DC	DC	
Polarity (+/-)	-	-	
Diameter of filler material (mm) :	2,40	2,40	
Welding current (A) :	125-155	155-185	
Voltage range (V) :	-	-	
Welding speed (cm/min) :	-	-	
Distance contact-tube/workpiece (mm) :	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 :		



<h1>ATB</h1>					
WPS-Nr.	ITW-002	date	28-10-2011		
		rev.	2		
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1			
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>			
to parent material :	S235JR				
Parent material standard :	EN 10025				
ISO/TR 15608 Group nr. :	1.1				
Welding Process :	141				
Filler material :					
Welding position :	PC				
Shielding gas :	ISO 14175 : I1				
Type of flux :	N/A				
Preheat :	none				
Material thickness (mm): t1	10,97	<p style="text-align: center;">Welding sequence</p>			
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 W1a 15	Wth 20 or W1a 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 :				

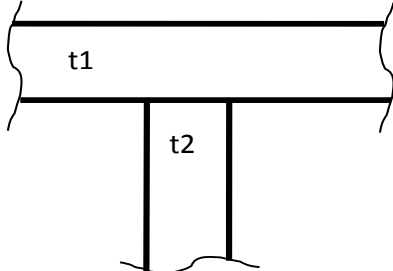
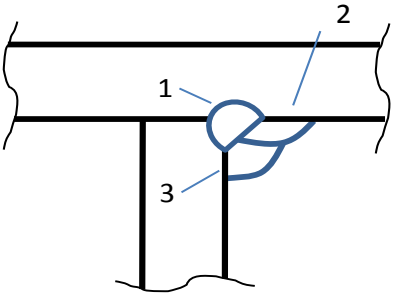


ATB			
WPS-Nr.	ITW-004	date	28-10-2011
		rev.	2
WELDING PROCEDURE SPECIFICATION		EN ISO 15609-1	
Parent material :	S235JR	<p style="text-align: center;">Joint design</p>	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :			
Welding position :	PB 045		
Shielding gas :	ISO 14175 : I1		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	6,02	<p style="text-align: center;">Welding sequence</p>	
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	<p style="text-align: center;">Joint design</p>	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :			
Welding position :	H-L045		
Shielding gas :	ISO 14175 : I1		
Type of flux :	N/A		
Preheat :	none		
Material thickness (mm): t1	6,02	<p style="text-align: center;">Welding sequence</p>	
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 W1a 15	Wth 20 or W1a 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	Joint design					
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)	Welding sequence					
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 W1a 15		Wth 20 or W1a 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	<p style="text-align: center;">Joint design</p>	
to parent material :	S235JR		
Parent material standard :	EN 10025		
ISO/TR 15608 Group nr. :	1.1		
Welding Process :	141		
Filler material :		<p style="text-align: center;">Welding sequence</p>	
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 W1a 15	Wth 20 or W1a 15	
Welding Procedure Qualification Record Nr. :			
Not qualified	written by :		



17.3.4 Ordlista för svetstermer i IW kursplaner del II	
arc voltage	bågspänning
assembly drawing	sammansättningsritning
backing	rotstöd
backing gas protection	rotgasskydd
clean	rengör
designation (filler material)	beteckning (tillsatsmaterial)
detail drawing	detaljritning
diameter	diameter
dirt	smuts
distance contact tube/work piece	avstånd kontaktrör/arbetsstycke
drawing	ritning
drill	borra
filler material	tillsatsmaterial
fillet	kål
flow rate	flödes hastighet
gouging	mejsling
grinding	slipning
heat input	sträckenergi
hole	hål
interpass temperature	mellansträngstemperatur
item	detalj
joint	fog
joint design	fogutformning
length	längd
material group	materialgrupp
multi layer	flera lager
N/A (Not applicable)	inte tillämplig
oil	olja
oscillation	pendlingsfrekvens
outside pipe diameter	rörytterdiameter
overlap	överlappning
oxides	oxider
paint	färg
parent material	grundmaterial
plate	plåt
polarity	polaritet
preheat	förhöjd arbetstemperatur
PWHT, post weld heat treatment	värmebehandling efter svetsning
qualified	kvalificerad
root gap	rotspalt
RT (Radiographic test)	radiografering
run number	svetssträng nummer
shielding gas	skyddsgas
single layer	ett lager
stainless steel	rostfritt stål
supplementary requirement	tilläggskrav
test object	provobjekt
thickness	tjocklek



throat thickness	a-mått
transfer mode	bågtyp
travel speed	svets hastighet
tube	rör
tungsten electrode diameter	volframelektrodens diameter
type of current	typ av ström
type of flux	typ av pulver
wall thickness	godstjocklek
weaving	pendling
weld	svets
welding current	svetsström
welding joint	svetsfog
welding position	svetsläge
Welding Procedure Qualification Record (WPQR)	protokoll för att kvalificera en svetsprocedur (WPQR)
Welding Procedure Specification (WPS)	svetsdatablad (WPS)
welding process	svetsmetod
welding sequence	svetsföljd
width	bredd
visual inspection	syning