



C-spec
 P.O. Box 27604, Concord, California 94527, +1-877-977-7999
Welding Procedure Specification - Page 1
 C-spec WeldOffice® Software

WPS record number Date	P1-AT-Lh-CVH 11/28/2000	Revision 0	Qualified to Company name	ASME Section IX C-spec
Supporting PQR(s) Reference docs.	PQR-100 - Rev 0 General Welding Standard GWS1			

Scope	Gas Tungsten arc and Shielded metal arc welding of carbon steel for both impact and non-impact tested applications. Groove, no PWHT (As-welded), impact testing, with PWHT
Joint	Joint details for this welding procedure specification in JOINTS section of this WPS, Production drawings, Engineering specifications, Reference documents

BASE METALS (QW -403)

Type	Carbon steel (P1)	P-no. 1	Grp-no. 1
Welded to	Carbon steel (P1)	P-no. 1	Grp-no. 1
Backing:	None	P-no.	Grp-no. -
Retainers	None		
Notes	Any group number for non impact tested applications		

THICKNESS RANGE QUALIFIED (in.)

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Complete pen.	0.188	8	0.188	8
Impact tested	0.625	8	0.625	8
Partial pen.	0.188	8	0.188	8
Fillet welds	-	-	-	-

DIAMETER RANGE QUALIFIED (in.)

	As-welded		With PWHT	
	Min.	Max.	Min.	Max.
Nominal pipe size	no min.	no max.	no min.	no max.

FILLER METALS (QW -404)

	SFA	Classification	F-no.	A-no.	Chemical analysis or Trade name	As-welded		With PWHT	
						Min.	Max.	Min.	Max.
GTAW	5.18	ER70S-2	6	1	-	no min.	8	no min.	8
SMAW	5.1	E7018	4	1	-	no min.	8	no min.	8
Cons. insert	-	-	-	-	-	- None -			
Flux	-	-	-	-	-	- None -			

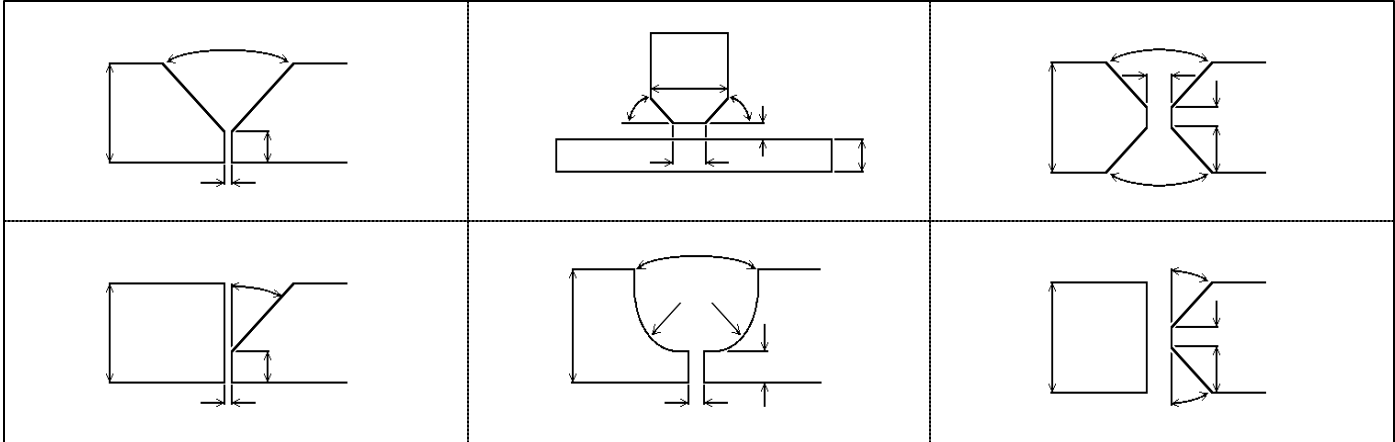
WELDING PROCEDURE

	GTAW	SMAW
Welding process	GTAW	SMAW
Type	Manual	Manual
Preheat temperature (°F)	50	50
Maximum interpass temperature (°F)	420	610
Tungsten size (in.)	0.125	-
Tungsten type	SFA 5.12 EWTh-2	-
Filler metal size (in.)	0.125	0.125
Layer number	All	All
Position of groove	All	All
Weld progression	Uphill	Uphill
Current/polarity	DCSP	DCRP
Amperes	90-100	110-125
Volts	12	24
Travel speed (in./min)	2-3.5	5-6
Maximum heat input (kJ/in.)	32.4	36.0
DC pulsing current	None	-
Shielding: Gas type	Argon	-
Flow rate (cfh)	20	-
Trailing: Gas type	None	-
Flow rate (cfh)	-	-
Backing: Gas type	None	-
Flow rate (cfh)	-	-
String or weave	Stringer and Weave	Stringer and Weave
Orifice/gas cup size	#5	-
Multi/Single pass per side	Multiple passes	Multiple passes
Maximum pass thickness (in.)	-	0.25
Weld deposit chemistry	-	-
Notes		



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JOINTS (QW -402) Typical joint(s). See actual production drawings and engineering specifications for details.



PREHEAT TABLE

Applicable standard	
ASME Section VIII Div. 1	175 (°F) for thickness over 1 (in.) and specified maximum carbon content over 0.30%. 50 (°F) for all other materials.
ASME Section III Div. 1-NG	250 (°F) for thickness over 1 (in.) and specified maximum carbon content over 0.30%. 200 (°F) for thickness over 1.5 (in.) and maximum carbon content of 0.30% or less. 50 (°F) for fillet welds 1/2 (in.) and less used to attach parts not carrying loadings due to internal pressure. 50 (°F) for all other materials.
ASME B31.1	175 (°F) for thickness over 1 (in.) and specified maximum carbon content over 0.30%. 50 (°F) for all other materials.
ASME B31.3	50 (°F) for thickness less than 1 (in.) and specified minimum tensile strength not over 71000 (psi). 175 (°F) for 1 (in.) and greater thickness, or if specified minimum tensile strength is over 71000 (psi).

POST WELD HEAT TREATMENT (QW -407)

Temperature (°F)	1100-1250	Time (hrs)	<2 in. = 1hr/(in.) , >2in.	Type	Below lower transf. temp.
Heating rate (°F/hr)	300	Method	Furnace		
Cooling rate (°F/hr)	300	Method	Still air		
Notes					

TECHNIQUE (QW -410)

Peening	Not used
Surface preparation	Sandblasting
Initial/interpass cleaning	Brushing and Grinding
Back gouging method	None

NOTES

NOTES:
For Non-impacted test applications only, the following AWS/SFA classifications can be used with this procedure:
GTAW: ER 70S-2, ER 70S-3, ER 70S-4, ER 70S-5
SMAW: E7015, E7016, E7018, E7018M, E7048

Welding Engineer

QA Manager

Name	Signature	Name	Signature
N.G. Neer	<i>N.G. Neer</i>	Q. M. Anager	<i>Q.M. Anager</i>
Date		Date	
11/28/2000		11/28/2000	



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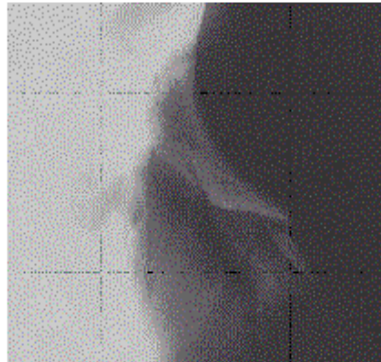
This "**Additional information**" page can be used to provide additional instructions in the form of **formatted text**,

Tables (Cut and paste from Excel spreadsheets)

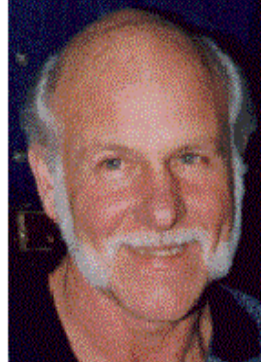
	Sound	Video
instructions	listen	watch
short-circuiting arc transfer	listen	watch
globular transfer	listen	watch
spray transfer	listen	watch

Instructions can include video or sound. Click on any of the above selections.

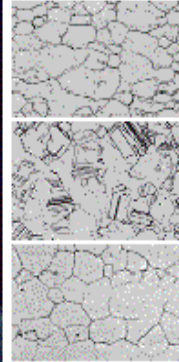
Radiographs



Pictures



Micrographs



Graphics:

