





# Stelform

WPS

## WELDING PROCEDURE SPECIFICATION

PROCESSES: G.T.A.W-ROOT HOT PASS - FCAW-GS-FILL AND CAP

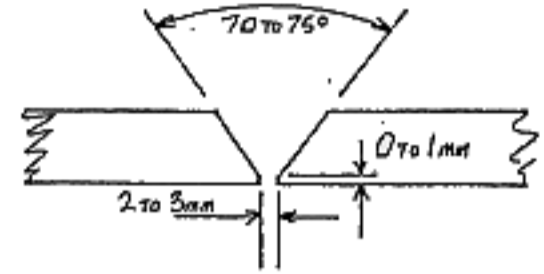
MATERIAL SPEC: ASTM A240 MATERIAL SPEC: ASTM A240

GRADE: 316L GRADE: 316L

GROUP NO: P8-GR1 GROUP NO: P8-GR1

COVERING RANGE:

TEST MATERIAL SIZE: 10 mm t THICKNESS QUALIFIED: 5-20 mm t  
 IMPACTS-AS3992 10-20 mm  
 JOINT PREP QUALIFIED: SINGLE VEE BUTT ASME IX 10 - 20 mm



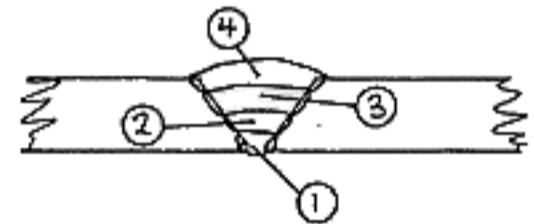
JOINT PREPARATION

WELDING CONSUMABLES

ELECT SPEC: AWS A5.22 E316Lt.1T/NAME: ALLOY RODS SHIELD BRIGHT 316L SIZE: 1.2mm

FILLER SPEC: AWS A5.9 ER316L T/NAME: AVESTA 316L SIZE: 1.6 + 2.4

FLUX SPEC: - T/NAME: - SIZE: -



WELD SEQUENCE

GAS:	GTAW	FCAW	GTAW	FCAW	
SHIELDING:	TYPE ARGON	Corgon 18	COMP 99.992% Ar, Ar+18%Co <sub>2</sub>	FLOW 10-15	L/MIN
BACKING:	TYPE ARGON		COMP 99.99% AR	FLOW 10	L/MIN

GAS CUP: TYPE GAS LENS SIZE 12mm TUNGSTEN: TYPE 2% THORIATED SIZE 2.4mm DIA

WELDING POSITION IG DOWNHAND WELD DIRECTION PULL METHOD

WELD PREHEAT TEMP MIN AMBIENT 10 °C INTERRUN TEMP 200 °C MAX MAINTAINED h

WELDING DETAILS

PASS NOS.	METHOD	WIRE/ELECT DIAMETER	AC OR DC POLARITY	AMPS RANGE	VOLTS RANGE	SPEED MM/MIN RANGE	HEAT INPUT KJ/MM RANGE
1	GTAW	1.6	DC-	63 TO 115	9 TO 11	47 TO 75	0.45 TO 1.63
2	GTAW	2.4	DC-	96 TO 160	8.5 TO 11.5	73 TO 115	0.42 TO 1.52
3	FCAW-GS	1.2	DC+	140 TO 260	26 TO 31	290 TO 468	0.48 TO 1.68
4	FCAW-GS	1.2	DC+	140 TO 270	26 TO 31	245 TO 377	0.58 TO 2.09

INTERRUN CLEANING METHOD: CHIP, S/S WIRE BRUSH, GRIND BACK GOUGING: NOT REQUIRED

POSTWELD HEAT TREATMENT: HEATING RATE: N/R °C/h TEMP RANGE: - °C  
 TIME: - h COOLING RATE: - C/h

COMMENTS: FLUX CORED WIRE TO BE STORED IN DRYING CUPBOARD BEFORE USE

NOTE: FOR QUALIFICATION RECORDS

APPROVED BY: *B. POLE* DATE: 16/12/95  
 CERTIFICATE OF EXEMPTION TO AS 3920-1  
 ORGANISATION: No. 01/QA/94 QUALITY ASSURANCE OFFICER

REFER TO PQR NO: 715/J

STELFORM SIGNATURE: *Garry Poole*  
 DATE: 15/12/95

QUALIFICATION STANDARD  
 AS 3992 & ASME IX

W.P.S. NO: 715/J

REVISION NO: A

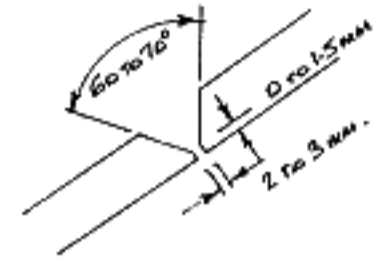




**WELDING PROCEDURE SPECIFICATION**

**PROCESSES:** GTAW (TIG)  
**MATERIAL SPEC:** ASTM A312  
**GRADE:** 321  
**GROUP NO:** P8-Gr1  
**COVERING RANGE:**  
**DIAMETER QUALIFIED:** ALL DIAMETERS  
**JOINT PREP QUALIFIED:** SINGLE VEE BUTTS

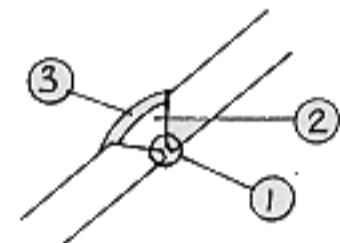
**MATERIAL SPEC:** ASTM A312  
**GRADE:** 321  
**GROUP NO:** P8-Gr1  
**THICKNESS QUALIFIED:** 1.5 to 11mmt



JOINT PREPARATION

**WELDING CONSUMABLES**

**ELECT SPEC:** - **T/NAME:** - **SIZE:** -  
**FILLER SPEC:** AS1167.2.1986 R347 **T/NAME:** BRITISH INTERNATIONAL **SIZE:** 2.4  
**FLUX SPEC:** - **T/NAME:** - **SIZE:** -



WELD SEQUENCE

**GAS:**  
**SHIELDING:** TYPE ARGON COMP 99% FLOW 10-15 L/MIN  
**BACKING:** TYPE ARGON COMP 99% FLOW 5-10 L/MIN

**WELDING POSITION:** PIPE AXIS INCLINED 45° 6G **WELD DIRECTION:** UPWARDS

**WELD PREHEAT:** TEMP MIN/MAX 20 °C **INTERRUN TEMP:** 300 °C **MAINTAINED:** - **h:** -

**WELDING DETAILS**

PASS NOS.	METHOD	WIRE Ø <del>ELECTRODE</del> DIAMETER	AC OR DC POLARITY	AMPS RANGE	VOLTS RANGE	SPEED MM/MIN RANGE	HEAT INPUT KJ/MM RANGE
1	GTAW	2.4	DC-	75-90	8-12	55-70	.35 to 1.3
2	"	"	"	80-100	8-12	"	.38 to 1.4
3	"	"	"	70-90	8-12	30-40	.65 to 2.3

**INTERRUN CLEANING METHOD:** S/S WIRE BRUSH **BACK GOUGING:** NOT REQUIRED

**POSTWELD HEAT TREATMENT:** HEATING RATE: °C/h **TEMP RANGE:** °C  
 NOT REQUIRED **TIME:** h **COOLING RATE:** C/h

**N.D.E. RESULTS:**

**REPORTS/CERTS:** VISUAL M93-214V, RADIOGRAPHIC CORR446/1 AND DPI M93-214DPI ALL COMPLY

**MECHANICAL TESTING RESULTS:** TENSILE M93-214/214A-1&2 \_ BENDS M93-214/214A-3,4,5,6,9,10 ALL COMPLY

**REPORTS/CERTS:** MACRO M93-214-7&8 COMPLIES, HARDNESS M93-214H-7 AND FERRITE M39-214F EVALUATION ONLY

**NOTE: FOR QUALIFICATION RECORDS**

REFER TO PQR NO: 607

**APPROVED BY:** *J. Donnell*  
**ORGANISATION:** WCA. NSW  
**DATE:** 20/4/93

**STELFORM SIGNATURE:** *[Signature]*  
**DATE:** 20-4-93

**QUALIFICATION STANDARD**  
 ANSI B31.3 - ASME 1X  
 AS4041 - AS3992

**W.P.S. NO:** 607

**REVISION NO:** 0