

**BHARAT HEAVY ELECTRICALS LIMITED**  
**Ramachandrapuram, Hyderabad – 502 032.**

**QW – 482 WELDING PROCEDURE SPECIFICATION (WPS)**

Welding Procedure Specification No.: WE 042    Date: 02-04-84    Supporting PQR No.: 258

Revision No.: 03

Date: 14-08-2004

Welding Process (es) : SMAW

Type (s) : MANUAL

**JOINTS (QW 402)**

Joint Design : As per manufacturing drawing ( groove / fillet)

Backing (Yes) : for double side and backing strip groove welds

(No) : for single side groove welds

Backing Material (Type) : Base metal / Weld metal

Metal : Yes

Non-Fusing Metal : No

Retainer : No

**BASE METALS (QW – 403)**

P. No. : 8    Group No. : 1    TO    P. No.: 8    Group No.: 1

**OR**

Specification type & grade : --- to Specification type & grade : ----

**OR**

Chemical Analysis & Mechanical Properties : --- to Chemical Analysis & Mechanical Properties : ----

**Thickness Range :**

Base Metal :    Groove: 4.8 mm to 200 mm    Fillet : all sizes

Pipe Dia. Range : Groove: all dia    Fillet : : all sizes

Other : Root spacing for backing strip joints : 8 - 10 mm

For others : 2 ± 1 mm

403.13 : not applicable

**Filler Metals (QW – 404)**

Spec. No. (SFA)    5.4

AWS NO ( CLASS)    E308L-15

F. No.    5

A. No.    8

Size of Filler Metals    Dia 2.5 to 5.0 mm

**Deposited Weld Metal**

Thickness Range: Groove: 200 mm Max

Fillet : ALL

Electrode Flux (Class)    Basic

Consumable Insert    No

Max. Bead Thickness    5 mm

**Rev 03: Changes in non essential variables**

<b>POSITIONS (QW-405)</b> Position(s) : ALL POSITIONS Welding Progression : UP for Vertical Down --- Position (s) Fillet : ALL				<b>POSTWELD HEAT TREATMENT (QW-407)</b> Temperature Range : Nil Time Range :			
<b>PREHEAT (QW-406)</b> Preheat Temp Min : 10° C Interpass Temp Max : 200 ° C Preheat Maintenance : Nil				<b>GAS (QW-408)</b>  NOT APPLICABLE			
<b>ELECTRICAL CHARACTERISTICS (QW-409)</b> Current AC or DC : <u>DIRECT CURRENT</u> Polarity : <u>POSITIVE</u> Amps [Range] : <u>60 to 180 A</u> Volts Range : 22-30							
<b>TECHNIQUE (QW-410)</b>  String or Weave Bead : <u>string and weave ( max 2D for vertical)</u> Initial and Interpass Cleaning : <u>chipping ; brushing ; grinding</u> (Use stainless steel tools) Method of Back Gouging: <u>by grinding</u> Multiple or Single Pass : <u>multiple pass / single pass</u> Multiple or Single Electrodes : <u>single electrode</u> Peening : <u>no</u>  Clean weld area to remove oil, rust, grease, etc. prior to welding.							
Weld Layer (s)	Process	Filler Metal		Current		Volt Range	Other
		Class	Dia mm	Type Polar	Amp Range		
1	SMAW	E 308L-15	2.5	DC+	60-80	22-24	String
2	SMAW	E 308L-15	3.15	DC +	90-110	22-26	„
3	SMAW	E 308L-15	4.0	DC +	120-140	22-28	„
4	SMAW	E 308L-15	5.0	DC +	140-180	22-30	„

HEAD / WELDING ENGG