

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: SM-8 Att A Marathon Hexavalent Chromium Work Planning Protocol	Doc Number: RSW-FORM-000081-GB	Rev No: 1

<b>Marathon Hexavalent Chromium Work Planning Protocol</b>			
Date	Area		Description
Unit	Equipment		
<b>Table 1: Hot Work Method (select only one)</b>			
	Score	Fume Level	Hot Work Process
<input type="checkbox"/>	9	Heavy Fume Production	Stick Welding, Arc Gouging, Torch Cutting, Flux Core Welding
<input type="checkbox"/>	3	Medium Fume Production	MIG Welding, Plasma Cutting, Grinding (Grinding means extensive prep work to prepare an item for welding, as opposed to grinding performed during the intermediate steps in completing a weld.)
<input type="checkbox"/>	1	Low Fume Production	TIG Welding
<b>Table 2: Chromium Content (refer to attached Cr Content Table) (select only one)</b>			
	Score	Chrome Content	Chromium Content in base metal or filler rod/wire, whichever is higher
<input type="checkbox"/>	9	High Chromium Content	17% or higher
<input type="checkbox"/>	3	Medium Chromium Content	9% - 17%
<input type="checkbox"/>	1	Low Chromium Content	0.5% - 9%
<input type="checkbox"/>	-5	Very Low Chromium Content	Less than 0.5% Chrome (Carbon Steel, Galvanized, Ductile Iron)
<b>Table 3: Work Area (select only one)</b>			
	Score	Type of Space	Description
<input type="checkbox"/>	9	Confined Space	Includes all small confined spaces. For large confined spaces, consult the IH for determination
<input type="checkbox"/>	3	Semi- Enclosed	Includes Weld Shops, Spark Enclosures, Hooches and indoor Shops without local exhaust ventilation
<input type="checkbox"/>	1	Open Air Location	Includes only open-air welding without any barriers (i.e., no fire blanket or weld screen that may block air flow)
<b>Table 4: Duration (Time spent actually performing hot work)</b>			
	Score	Task Duration	Time that hot work will take place in the area
<input type="checkbox"/>	4	Full Shift	More than ¾ of the work shift
<input type="checkbox"/>	2	Partial Shift	Between ½ and ¾ of the work shift
<input type="checkbox"/>	1	Short	Between ¼ and ½ of the work shift
<input type="checkbox"/>	-1	Very Short	Less than ¼ of the work shift
<b>Table 5: Ventilation</b>			
	Score	Type of Ventilation	Description
<input type="checkbox"/>	-8	Local Exhaust Ventilation	Capture hood used so that weld plume visibly enters hood
<input type="checkbox"/>	-4	Dilution Ventilation	Powered ventilation is in use, but weld plume does not visibly enter hood. Example: Coppus fan or air horn on manway
<input type="checkbox"/>	0	Natural or None	No other ventilation used
<b>Total Score</b>		<b>See Description of compliance method based on score.</b>	
The use of monitoring data may override this determination as it may provide additional data.			

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: SM-8 Att A Marathon Hexavalent Chromium Work Planning Protocol	Doc Number: RSW-FORM-000081-GB	Rev No: 1

### Attachment A (cont.)

#### **Cr<sup>+6</sup> Regulated Tasks or “Hot Zones”: 19 Points or Greater**

**Employee Awareness:** Establish a regulated area using Danger Tape, Cr<sup>+6</sup> warning tags and signs. All personnel inside the regulated area must wear the required PPE. Training required for all personnel participating in all work in the regulated area.

**Exposure Monitoring:** Representative sampling shall be performed on alloy work greater than 2 hours in length total fume-producing time.

**Respiratory Protection:** A minimum of a half-mask Air Purifying Respirator (APR) with N100, R100 or P100 (HEPA) rating. Filtering face-piece respirators are not considered acceptable. Higher protection factor respirators may be needed in some instances.

**Outer Clothing:** Workers performing hot work must wear an outer layer of clothing, or other protective suit, which is properly decontaminated or discarded after each shift, before taking a break or at the end of the job; whichever comes sooner.

**Hygiene:** Hand and face washing facilities are to be readily available. Workers shall not eat, drink, smoke or use smokeless tobacco until after decontaminating the outer layer of clothing and washing their hands and face.

#### **Decontamination:**

- All contaminated materials that are not cleaned shall be bagged and sealed and labeled with a “Hexavalent Chromium” warning label either for waste or laundry service.
- All surfaces should be maintained as free as practical of Cr<sup>+6</sup> accumulations. Wet or HEPA methods should be utilized for decontamination. Compressed air blowing shall not be used. Areas that do not need to be decontaminated include confined spaces that will return to process service and open-air locations such as pipe racks, gravel areas, etc.

#### **Cr<sup>+6</sup> Controlled Tasks: 10 to 18 Points**

**Employee Awareness:** Training required for all personnel participating in all work in the regulated area.

**Exposure Monitoring:** Representative sampling must be performed on alloy work greater than 2 hours in length total fume-producing time.

**Respiratory Protection:** A minimum of a half-mask Air Purifying Respirator (APR) with N100, R100 or P100 (HEPA) rating. Filtering face-piece respirators are not considered acceptable.

#### **Cr<sup>+6</sup> Conditional Tasks: 4 to 9 Points**

**Employee Awareness:** Training required for all personnel participating in all work in the regulated area.

**Exposure Monitoring:** Representative sampling should be performed on alloy work greater than 2 hours in length total fume-producing time. For carbon steel, monitoring should be considered for further evaluation. Contact the Refinery IH for guidance.

**Respiratory Protection:** A minimum of a half-mask Air Purifying Respirator (APR) with N100, R100 or P100 (HEPA) rating. Filtering face-piece respirators are not considered acceptable.

#### **Tasks Not Regulated: Less than or equal to 3 Points**

No additional control measures beyond standard hot work protocols and prudent personal hygiene methods.

Any person who performs hot work on any chromium alloy will wear, at least, a half-mask Air-Purifying Respirator (APR) equipped with N100, R100 or P100 (HEPA) filters or cartridges. Filtering face-piece respirators are not considered acceptable for this use.

Blanchard Refining Company LLC	Galveston Bay Refinery	
Title: SM-8 Att A Marathon Hexavalent Chromium Work Planning Protocol	Doc Number: RSW-FORM-000081-GB	Rev No: 1

**Attachment A (cont.)**

**Chrome Content Determination:**

Chrome content for welding operations is determined from the consumable/electrode. If not listed on the provided table, refer to the manufacturer's SDS.

Chrome content for gauging, grinding, and cutting can be either the base metal or consumable depending on where the work is being completed. Use the base metal as default.

<b>Low Chrome Content: 0.5 - 9%</b>	
<b>Material Type</b>	<b>Chrome Contents (%)</b>
1 Cr	0.8 - 1.25
1 1/4 Cr	1.0 - 1.5
2 1/4 Cr	1.9 - 2.6

<b>Medium Chrome Content: &gt; 9 - 17%</b>	
<b>Material Type</b>	<b>Chrome Contents (%)</b>
9 Cr	8.0 - 10.0
405 Stainless (ss)	11.5 - 14.5
410/410S (ss)	11.5 - 13.0
17-4 PH (ss)	15.5 - 17.5
Alloy 600	14.0 - 17.0
Alloy C-276	14.5 - 16.5

<b>Welding Filler Material Not Included Above</b>	
<b>Material Type</b>	<b>Chrome Contents (%)</b>
Inconel 117 Electrode	21.0 - 26.0
Inconel 617	20.0 - 24.0
Inconel 82	20.0 Average
Inconel 182	14.0 Average
Inconel A	15.0 Average
Inconel 112	21.5 Average

<b>High Chrome Content &gt; 17%</b>	
<b>Material Type</b>	<b>Chrome Contents (%)</b>
304/304L (ss)	18.0 - 20.0
308 (ss)	19.0 - 21.0
309 (ss)	22.0 - 24.0
310 (ss)	24.0 - 26.0
316/316L (ss)	16.0 - 18.0
317/317L (ss)	18.0 - 20.0
321 (ss)	17.0 - 19.0
347 (ss)	17.0 - 19.0
904L (ss)	19.0 - 23.0
Alloy 20	19.0 - 21.0
AL-6X (ss)	20.0 - 22.0
Nitronic 50	20.5 - 23.5
Nitronic 60	16.0 - 18.0
Duplex 2205 (ss)	21.0 - 23.0
Alloy 800/800H	19.0 - 23.0
Inconel 625	20.0 - 23.0
Alloy 825	19.5 - 23.0