Performance Criteria			4.01
COG			
Flow		26.	6mmscfd(D)
Temp. after secondary cooler		25	°C
BTX conc. to LBA No. 2		1,300	gr/100 scf
BTX conc. after LBA No. 1		125	gr/100 scf
Wash Oil			
Flow rate to LBA's		230	gpm
BTX conc. in benzolized WO (approx)		1.8	%
BTX conc. debenzolized WO (approx)		0.01	%
Temp. to LBA No. 1	(Summer)	26	°C
	(Winter)	20	°C
Make-up WO			
Type: Petroleum based aromatic wash oil			
Annual Consumption		24,000	gal
Cooling Mill Water			
Temp-in	(Summer)	22	°C
	(Winter)	5	°C
Temp-out		40	°C
Pressure-in		10	psig
Pressure after booster pump		45	psig
Additives			
Type: Calcium Sulfonate de-emulsifier			
Annual Consumption		55	gal

Emergency Shut-down 4.02

a. Power failure

b. Instrument air failure

c. Simultaneous mechanical damage of more than one pump

d. Major oil leaks

e. Major gas leaks

f. Plant fire

Normal Shut-down 4.03

a. Close hand steam valve to L.O. Still, T-201

b. Shut-down Cold W.O. Pump P-202A (or B), and close discharge valve i.e. LBA feed

c. Shut-down Hot W.O. Pump, P-203, and close the discharge valve

d. Shut-down Pump, P-101A (or C) and close discharge valve at LBA No. 1

e. Shut-down Pump P-101B (or C) and close discharge valve at LBA No. 2

f. Close discharge valves at LBA Pumps, P-101A, B (or C)

g. Disconnect all L.O Plant vessels from the BEC system and vent them to the atmosphere. Follow the benzene emission control operating procedures.

4.04

h. Observe and maintain the sump level in both LBA's at about 30" by pumping excess oil to Cold W.O. Decanter (Circulation Tank), using LBA Drain Pump, P-102 A & B

If needed, a small amount of wash oil can also be drained directly to Floor Sump, S-102

i. Transfer virtually all cold W.O. from Cold W.O. Circulation Tank, TK-202, to W.O. Storage Tanks,TK-302 A & B

j. Drain individual equipment as needed

k. Existing isolation valves make it possible to retain normal fluid levels and inventories in other equipment (decanters, circulation tanks, storage tanks, etc.)

Start-up Following Planned or Emergency Shut-down 4.05

a. Fill up to capacity, ColdW.O. Circulation Tank, TK-202, by pumping wash oil from W.O. Storage Tanks, TK-302 A & B, using L.O. Pumps, P-201 A & B

b. Start Cold Oil Pump, P-203, and open discharge valve

c. Check and adjust LBA sump level and maintain it between 45" - 55" in Sight Glasses LG-1470 and 1580. Avoid LBA Pump cavitation.

d. Start LBA No. 1 Pump, P-101A, and open discharge valve

e. Start LBA No. 2 Pump, P-101B, and open discharge valve

(continued)

4.06

f. Start Hot Oil Pump, P-202A (or B), and open discharge valve

g. Establish normal W.O. flows and levels at all vessels, tanks, LBA's, etc.

h. Introduce steam to L.O. Still, T-201

i. Reconnect all vented vessels back to the blanketing system. Follow the existing benzene emission control procedures.energy isolation. Anyone involved in the L.O. plant operation must be familiar with these Lock-out procedures.

Preparation for Vessel Entry 4.07

a. Positively isolate the vessel by closing all valves in incoming and outgoing piping, and set blanks at all inlet and outlet nozzles

b. Disconnect the vessel from the BEC system and vent it into the atmosphere

c. Drain all fluids contained in the vessel using appropriate drain piping or temporary hoses

d. Steam-out the vessel until the vent steam contains less than 1.0 ppm of BTX

e. Open additional vents (blind nozzles) and manways

4.08

f. Use intrinsically safe air fans and air eductors to ventilate the vessel until the BTX concentration is less than . . . ppm

g. Personnel assigned to the vessel entry must be aware of the material safety information contained in MSDS 3430-01, 02, 03, 04, and 05

h. Personnel assigned to enter the vessel must wear appropriate protective gear and clothing

i. Follow established fire watch procedures

j. Check telephone numbers of the fire department and of the medical emergency department

k. Assign a person responsible for observing vessel entry from beginning until te last person leaves. The same person should be responsible for filing a vessel entry report in the general foreman's office.

Prevention of Exposure

4.09

1. During a period necessary to implement feasible engineering and work practice controls
2. In situations where engineering controls are not feasible (maintenance repairs, vessel cleaning, etc.)
3. In emergencies

Protective gear normally consists of, but is not limited to: 4.10

a. Hard hat

b. Safety glasses with side shields or goggles

c. Half face respirator with chemical cartridge (optional)

d. Protective clothes (greens)

e. Steel toe work boots

f. Chemical gloves

g. Full face splash shield made of Lexan or similar material

h. Self contained breathing apparatus with full face piece, or an escape kit must be available for emergencies in the L.O. building, L.O. Pump House, or other suitable location

4.11

Plant Occupation	Training Categories					
	General Process	General Safety	Specific Process	Safe Work Practice	PSM	Emergency Response
Area Manager	–	–	–	–	–	–
Assistant Area Manager	–	–	–	–	–	–
Shift Foreman	–	–	–	–	–	–
Light Oil Operator	–	–	–	–	–	–
Assistant Light Oil Operator	–	–		–		
Plant Engineer	–	–		–	–	–
Maintenance Area Manager	–	–				
Maintenance Foreman	–	–				
Maintenance Personnel	–	–				
Laboratory Personnel	–	–	–		–	

4.12

Confirmation Categories for Pre-start-up Safety Review	Plant Engineer		Area Manager	
	Name	Date	Name	Date
A. Design and Specifications			===	===
Vessel Specification			===	===
Pump Specification			===	===
ASTM (UPV) Code			===	===
NEMA			===	===
State Code(s)			===	===
Federal Code(s)			===	===
Instrument Specifications			===	===
B. Installation			===	===
Foundations			===	===
Steel Structure (Grounding)			===	===
Piping (Vents, Drains, Valves)			===	===
Process Equipment			===	===
Pump Alignment (Guards)			===	===
Insulation			===	===
Electrical (Positive Disconnects)			===	===
Instrumentation				
Pressure Testing				
FunctionTesting				

4.13

C.	Management of Change				
	Health Impact Reviewed	===	===		
	Safety Impact Reviewed	===	===		
	Operating Procedures Modified	===	===		
	Maintenance Procedures Modified				
	Spare Parts Management Updated				
	SARA Reporting Reviewed	===	===		
	Access & Escape Routes Reviewed				
	Ventilation System Reviewed				
	Adequate Lighting In Place				
	Flame Arresters Checked & Refurbished				
	PSV's Checked & Refurbished				
	Fire Protection Equipment Reviewed				
	Warning & Information Signs In Place				

4.14

D.	Operating Procedures				
	Flow Diagram Reviewed				
	P&ID'sReviewed				
	Operating Manual Revised				
	MSDS Revised				
	Operator Training Performed	===	===		
	Maintenance Training Performed				
	Emergency Procedures Reviewed				
	Fire Fighting Procedures Reviewed				
E.	PHA Team Response				
	Comments Resolved				
	RecommendationsImplemented				

CHEMICAL PRODUCT AND COMPANY IDENTIFICATION 4.15

Product Code:
Product Name: CRUDE LIGHT OIL
CASRN: 65996-78-3

ACME Metals, Inc.
13500 S. Perry Ave.
Riverdale, IL 60627
Hazard Communication Telephone No.:
Product Information Telephone No.:
National Response Center Telephone No.: 1-800-424-8802

Other used trade names:

Aromatic Hydrocarbons
Raw Benzol
Primary Light Oil
Carbon Oil
Coal Naptha
Crude BTX

CRUDE LIGHT OIL is an article of commerce and generally used for the production of high purity benzene, toluene, and xylene by third parties. Its composition varies according to the operating conditions of a coke plant, i.e. the individual components may vary in wide range. Crude light oils produced at different coke plants are not of identical composition, but for purposes of the MSDS, they exhibit very similar features.

COMPOSITION AND INFORMATION ON INGREDIENTS 4.16

Component	CAS No.	% by wt	Permissible Exposure Limits (PEL)			
			OSHA		ACGIH	NIOSH
			TWA	STEL	TLV	TWA
Benzene	71-43-2	60 - 90	1 ppm/8H	5 ppm/10M	10 ppm	1 ppm/60M
Toluene	108-88-3	6 - 20	100 ppm	150 ppm	100 ppm	100 ppm
Xylene	1330-20-7	1 - 4	100 ppm	150 ppm	100 ppm	100 ppm
Ethyl Benzene	100-41-4	3 - 6	100 ppm	125 ppm	100 ppm	100 ppm
Styrene	100-42-5	<1	50 ppm	100 ppm	50 ppm	100 ppm
Indene	95-13-6	<1	N/Est	N/Est	10 ppm	N/Est
Naphthalene	91-20-3	1 - 7	10 ppm	15 ppm	10 ppm	10 ppm
Carbon Disulfide	75-15-0	<1	1 ppm	10 ppm	10 ppm	1 ppm
Misc. (*)	N/Apl	<1	N/Apl	N/Apl	N/Apl	N/Apl

4.17

EMERGENCYOVERVIEW

Clear to light brownish liquid with strong aromatic sulfurous odor. Extremely flammable liquid. Vapors form invisible explosive mixture with air.

Cancer hazard.

Causes eye irritation. Can cause severe respiratory irritation. Can cause severe central nervous system depression (including unconsciousness). Mildly toxic to fish.

Crude light oil can become electrostatically charged during loading or pumping which may result in induced sparks and self-ignition. Loading and pumping equipment must be grounded or bonded.

Potential Health Effects 4.18

EYE: May cause severe irritation (tears, blurred vision and redness). May result in permanent damage to cornea, vision impairment.

SKIN: Short-term overexposure may cause: Irritation with itching, burning, redness, swelling, or rash. Repeated and/or prolonged exposure may cause: Defatting of the skin with itching, redness, or rash. Skin permeation may occur in amounts capable of producing the effects of systemic toxicity.

INGESTION: Small amounts (tablespoonful) swallowed are not likely to cause injury. Short-term overexposure may cause: Irritation of the digestive tract with stomach pain, heartburn, nausea, vomiting, or diarrhea; however, there may be no symptoms at all. Non-specific effects such as headaches, nausea, and weakness. Central nervous system depression with dizziness, confusion, incoordination, drowsiness, or unconsciousness. The major ingestion hazard is aspiration (liquid entering the lungs during ingestion or vomiting) which may result in "chemical pneumonia". Symptoms include coughing, gasping, choking, shortness of breath, bluish discoloration of the skin, rapid breathing and heart rate, and fever. Pulmonary edema or bleeding, drowsiness, confusion, coma and seizures may occur in more serious cases. Symptoms may develop immediately or as late as 24 hours after exposure, depending on how much chemical entered the lungs.

PHYSICAL AND CHEMICAL PROPERTIES 4.19

Boiling Point	67.0 - 95.0	^{o}C
Melting Point	N/Avl	
Vapor Pressure (Max @ 20^{o}C)	8.5	mmHG
Vapor Density (Air = 1.0)	2.9	-
Specific Gravity (Liquid)	0.84 - 0.95	kg/l
Liquid Density (@ 20^{o}C)	7.24	lb/gal
Solubility in Water	<0.06	%
Percent Volatile	100	%
Evap Rate (N - Butyl - Ether = 1.0)	3.3	-
pH	7.0	-
Odor	Aromatic, sulfurous	
Appearance	Clear to brownish liquid	

STABILITY AND REACTIVITY 4.20

CHEMICAL STABILITY: (CONDITIONS TO AVOID) Keep away from flames and spark-producing equipment. Not dangerously unstable.

INCOMPATIBILITY: Strong oxidants, sparks, open flame.

HAZARDOUS DECOMPOSITION PRODUCTS: CO, CO_2, carbon black

HAZARDOUS CHEMICAL REACTIONS:

CHLORINE (GAS)	LO vapor and chlorine gas can form explosive mixture which can ignite by impact of visible light radiation.

HAZARDOUS POLYMERIZATION: Will not occur.

PRODUCT DEGRADATION: Light gumming by polymerization of styrene and other olefins.

ELECTROSTATIC CHARGING: Crude light oil, if dry, can be a non-conductor of electricity and can become electrostatically charged during loading, transferring, or pumping at high flowrates. Such a charge can induce sparks and eventually ignition. Loading and pumping equipment must be grounded or bonded.

TOXICOLOGICAL INFORMATION 4.21

EYE:	Irritation, Human	3,000 ppm/0.1 - 1.0H.
SKIN:	Irritation, Rabbit	15 mg/24H MILD 200 mg/24H MOD
INGESTION:	Oral, Human	TDLo: 13 mg/kg (CNS, GIT)
	Oral, Rat	TD: 10-52g/kg/1Y (CAR)
INHALATION:	Irritation, Human respiratory tract: 3,000 ppm 0.5 - 1.0H	
	Human, toxic	TC 150 ppm/15M/8Y (CAR, BLD)
	Human, toxic	TC 150 ppm/11Y (CAR, BLD)
	Human, lethal	LCLo 2 pph/5M
	Human, lethal	LCLo 65 mg/m^3/5M

TC: Reported Toxic Concentration
LCLo: Lowest Reported Lethal Concentration

SUBCHRONIC: Skin dryness.

CHRONIC/CARCINOGENICITY: By chronic exposure, recognized leukemogen. There is no specific blood picture occurring in cases of chronic benzol poisoning. The bone marrow may be hypo-plastic, normal, or hyperplastic, the changes reflected in the peripheral blood. Anemia, leucopenia, macrocytosis, reticulocytosis, thrombocytopenia, high color index, and prolonged bleeding time may be present. Cases of myeloid leukemia have been reported. For the worker, repeated blood examinations are necessary, including hemoglobin determinations, white and red cell counts and differential smears. Where a worker shows a progressive drop in either red or white cells, or where the white count remains low, 5,000/mm_3 or the red count <40 million/mm_3, on two successive monthly examinations, he should be removed from benzene exposure.

There is great individual variation in the signs and symptoms of chronic benzene poisoning.

TERATOLOGY: No sufficient data.

REPRODUCTION: No sufficient data.

MUTAGENICITY: No sufficient data.

SARA HAZARD CATEGORY: 4.23

An immediate health hazard
A fire hazard
A chronic health hazard

SECTION 313 REPORTING: This product contains substances subject to the reporting requirements of Section 313 of EPCRA

SECTION 302 (a) REPORTING: This product may constitute a hazardous sub-stance by 40 CFR, part 302, or hazardous waste by 40 CFR, part 261.3. In case of an accidental spill, leak, emission, or otherwise discharge into the environment, any amount equal to larger or then the reportable quantity (RQ) must be communicated to the National Response Center (1-800-424-8802).

RQ for crude light oil: 12 lbs (Calculated) or 1.6 gal

CAS	Name	De Minimis Conc (%bw)	% bw	RQ lbs
71-43-2	Benzene	0.1	40 - 65	10
100-41-4	EthylBenzene	1.0	3 - 6	1,000
91-20-3	Naphthalene	1.0	1 - 7	100
100-42-5	Styrene	0.1	1 - 3	1,000
108-88-3	Toluene	1.0	15 - 25	1,000
1330-20-7	Xylene	1.0	1 - 5	1,000

4.25

WARNING!

FLAMMABLE LIQUID AND VAPOR

MAY CAUSE RESPIRATORY TRACT AND SKIN IRRITATION

ATTENTION! CONTAINS " BENZENE" WHICH CAN CAUSE CANCER.

Risk of cancer depends on duration and level of exposure.

Keep away from heat, sparks, and flame.

Avoid breathing vapor or mist.

Avoid contact with skin and clothing.

Use with adequate ventilation.

Keep container closed.

FIRST AID: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician. In case of contact, flush skin with plenty of water. Remove contaminated clothing. Get medical attention if irritation persists. In case of fire, use water spray (fog), foam, dry chemical or CO_2.

SIGNS AT REGULATED AREA 4.26

DANGER

BENZENE

CANCER HAZARD

FLAMMABLE - NO SMOKING

AUTHORIZED PERSONNEL ONLY

RESPIRATOR REQUIRED