A4	This design is the property of BlueScope Steel (AIS) Pty Ltd A.B.N. 19 000 019 625

BLUESCOPE STEEL

STEELWORKS COGENERATION PLANT PROJECT

ENGINEERING DOCUMENT

Port Kembla Steelworks BlueScope Steel BlueScope Steel	Aconex No	Order No.

Aconex Document Number.	REV No.
TR-12-025-Management of Liquid Waste Streams.doc	0

Title:	ILLAWARRA COGENERATION PLANT (ICP) PROJECT
	Management of Liquid Waste Streams

INDEX CODE NUMBERS		REFERENCE DRAWINGS	

	NAME	POSITION / COMPANY	SIGNATURE	DATE
PREPARED:	S. Flannery	Engineering Manager		28/05/2008
	NAME	POSITION / COMPANY	SIGNATURE	DATE
CHECKED:				
	NAME	POSITION / COMPANY	SIGNATURE	DATE
APPROVED:				

Rev No	Date	Task	Change Number	Revision Description	Rev By	Registration Approval

BlueScope Steel has investigated opportunities to beneficially re-use liquid waste streams produced in the various processes associated with the ICP Project. These waste streams are listed in Table 1, with a description and an estimate of the quantity of each stream. They include by-product fuel condensates, waste water from the Power Plant Demineralisation Plant, boiler blowdown streams, various drains and stormwater. The sources of those streams are shown schematically on Figure 1 and Figure 2. The identifying numbers presented on the figures correspond to the "Stream No." in Table 1. Note that continuous salt water cooling streams, such as the new ICP turbine condenser cooling and the cooling of the Recirculated Cooling Water system (described below) heat exchangers, are not considered in this document – refer to "Illawarra Cogeneration Plant Project – Salt Water Cooling" for an evaluation of the environmental impacts of those streams.

As part of the Port Kembla Steelworks' goal of reaching zero dam water use, the ICP project scope of work includes collection systems incorporating tanks, pumps, pipework and instrumentation to re-use suitable water streams in various nearby operating departments (including an on-site contractor – Australian Steel Mill Services), where it is practical to do so.

A number of the liquid waste streams (Streams 1-7) are either salt water or potentially contaminated with salt water. The presence of high levels of chlorides in those streams makes them unsuitable for re-use in iron or steelmaking processes. Those streams would be discharged into the Salt Water Inlet Channel, indicated as the "Primary Destination" in Table 1. The potentially contaminated condensate streams may contain trace levels of the chemicals added to the boiler feedwater. Material Safety Data Sheets (MSDS) for those chemicals are provided in Appendix A. Table 1 also contains the typical concentration of boiler chemicals present in the condensate streams, and the minimum toxic concentration reported in the MSDSs, based on ecotoxicology testing. The concentrations of toxicants in all of those streams can be seen to be lower than that necessary to cause harm to aquatic species, prior to discharge into the No. 2 Blower Station Drain. The pH and temperature of the No.2 Blower Station Drain discharge would still comply with licence conditions.

The quality of "fresh" water streams has been reviewed and their suitability confirmed for re-use in the "Primary Destination" systems specified in Table 1. For example, "Steam Condensate Drains" (Stream 9 in Table 1 and Figure 1) would be directed to the ICP Process Clean Water Pit, shown on Figure 2, and then pumped to the No. 6 Blast Furnace Gas Cleaning water circuit.

It should be noted that a recirculated fresh water system (Recirculated Cooling Water, or RCW System) would be installed to provide cooling to small boiler and turbine components such as pump and fan bearings, hydraulic systems, etc. This closed system would be dosed with a biocide and a corrosion inhibitor. It may be necessary to drain sections of this system to carry out maintenance (Stream 8). The quality of that water would be suitable for re-use in the No. 6 Blast Furnace Gas Cleaning water circuit. Once-through fresh water would be used as a back-up for this recirculated system to allow critical steam generation and safe shutdown of turbine equipment in the event of emergencies. The once-through flow rate would be up to approximately 80 m3/hr, depending on the nature of the emergency. Some of this water would be re-used in the No. 6 Blast Furnace Gas Cleaning water circuit up to it's acceptance capacity, with any excess directed to the Ironmaking East Drain.

On infrequent occasions (eg maintenance down days), when the destination systems could not accept the ICP waste flows, and collection and transfer tanks were full, the streams would be re-directed into either the Ironmaking East Drain or the No.2 Blower Station Drain (as specified in Table 1). The concentrations of toxicants in all of those streams can be seen to be lower than that necessary to cause harm to aquatic species, prior to discharge from the relevant drain. The pH and temperature of the relevant drain discharge would also still comply with licence conditions.

The ICP Water Treatment Plant uses Ultra Filtration (UF) and Reverse Osmosis (RO) to remove minerals in Industrial Water to make it suitable as boiler feedwater. The minerals removed are concentrated in a reject stream (Stream 14), which is considered suitable for re-use in the No. 5 Blast Furnace Gas Cleaning water circuit (post furnace reline). The membranes associated with those demineralisation processes require periodic cleaning. The cleaning chemicals are shown in Table 1. If the No. 5 Blast Furnace Gas Cleaning water circuit was unable to accept the stream, it would be discharged to the No. 2 Blower Station Drain. The concentrations of toxicants can

be seen to be lower than that necessary to cause harm to aquatic species, prior to discharge from the No. 2 Blower Station Drain.

By-product fuel gases are saturated with water from scrubbing processes at their source. As the gases pass through the interworks distribution systems, their temperature drops and water condenses. Drain points, fitted with "seal pots" (U-shaped water seals which allow drainage of water without the escape of gas) are positioned along the gas mains. Large quantities of LDG condensate will be collected close to the BOS and at the LDG gas holder area (Stream 15), with lower quantities produced further from the source.

It is not practical to collect the relatively small quantity of condensate drained from the SCP boiler LDG supply main midway between the BOS and No 6 Blast Furnace (Streams 16 &17), due to difficulties in providing power supplies to pumping systems in that area and the significant length of pipework required to transport the water to No 6 Blast Furnace. This condensate would be directed to the No 2 Blower Station Drain, which would continue to satisfy current licence requirements.

The only BFG and COG condensate associated with the ICP is that collected at the new boiler connections from the adjacent existing interworks distribution mains. No additional BFG or COG condensate would be produced, with some of the current quantities collected at new locations. COG condensate (Stream 20) would be collected and treated at the Coke Ovens Biological Waste Water Treatment Plant, as is currently the case. Due to the pre-mixing of BFG, COG and LDG prior to firing in the new boilers, there may be a small quantity of mixed condensate collected (Stream 21). The location of the "enriched BFG" pipework, adjacent to the hot boilers, may prevent the formation of any condensate. Since any condensate formed would contain some components from the COG, it would not be suitable for re-use or discharge. It is intended to direct this stream to the COG collection system, from where it would be transported to the Coke Ovens Biological Waste Water Treatment Plant. If the mixed condensate is determined to be unsuitable for biological treatment, it may be injected into the boiler combustion chamber, or treated by some other method agreed with the DECC.

BFG condensate (Stream 19) would normally be used in the No. 6 Blast Furnace Gas Cleaning water circuit, as indicated in Table 1. Table 2 shows the predicted analysis for BFG condensate and the worst case concentration of species in the condensate if that stream was discharged at the Ironmaking East Drain. It is recognised that PRP151 (report due November 2009) will investigate the management of BFG condensate across the Port Kembla Steelworks site.

In summary, BlueScope Steel intend to beneficially re-use suitable (non-chloride contaminated) liquid waste streams in existing iron and steelmaking processes whenever possible and practical, thereby reducing the consumption of industrial water in those applications. Chloride contaminated liquid waste streams will be discharged to the salt water inlet channel as the level of toxicants is lower than that necessary to cause harm to aquatic species.

If other, more cost effective methods of reducing dam water consumption are identified before construction of the collection / transportation systems are commenced, BlueScope Steel would consult with DECC on the implementation of the relatively high cost options discussed above.

Table 1 – ICP Liquid Waste Streams - Sources and Destinations

Stream No.	Stream	Ref	Description	Quantity (m3/hr avg)	Primary Destination	Contingency Destination	pH	Temp (°C)	Chemical Additive	Stream Conc (mg/L)	Licence Pt Conc (mg/L)	Toxic Conc (mg/L)[1]
1	Existing Blower Station return condensate dump	Figure 2	Condensed Steam plus Salt Water (only if salt water leak in condenser)	Rare - 270 for 1 hr	Salt Water Inlet Channel	n/a	8.8-9.2	40-45	Steamate NA0560	< 2		8 (NOEC)
2	ICP condensate dump	Figure 2	Condensed Steam plus Salt Water (only if salt water leak in condenser)	Batch (rare)	Salt Water Inlet Channel	n/a	8.8-9.2	40-45	Steamate NA0560	< 2		8 (NOEC)
3	31 STA Condenser Hotwell drain	Figure 2	Condensed Steam plus Salt Water (only if salt water leak in condenser)	Batch (rare)	Salt Water Inlet Channel	n/a	8.8-9.2	40-45	Steamate NA0560	< 2		8 (NOEC)
4	31 STA Condenser salt water drain	Figure 2	Salt Water	Batch (rare)	Salt Water Inlet Channel	n/a						
5	RCW saltwater side drains	Figure 2	Salt Water	Batch (rare)	Salt Water Inlet Channel	n/a						
6	Main condensate tanks overflow and drain	Figure 2	Demin Water plus Condensed Steam (most likely during tank maintenance)(potential salt water if leak in condenser)	Rare - 100	Salt Water Inlet Channel	n/a	8.8-9.2	40-45	Steamate NA0560	< 1.7		8 (NOEC)
7	Condensate Polishing plant regen and drain	Figure 2	Polisher Regeneration water	0.5	Salt Water Inlet Channel	n/a	6.5-7.5	Ambient	Steamate NA0560 (Amines) Cortrol OS5613 (Oxy Scavenger)	4400 < 1	4.4[2]	8 (NOEC) 52 (5% mortality level)

Stream No.	Stream	Ref	Description	Quantity (m3/hr avg)	Primary Destination	Contingency Destination	pH	Temp (°C)	Chemical Additive	Stream Conc (mg/L)	Licence Pt Conc (mg/L)	Toxic Conc (mg/L)[1]
8	RCW closed side drains	Figure 2	Demin Water (max flow during emergency)	<80	BF6 Recirc system	Ironmaking East Drain	6.5-8.5	Ambient	Corrshield MD4100	2400-3000	< 1[3]	500 (NOEC)
									Spectrus NX1100	50	<0.012[3]	0.02 (LC50)
9	Steam Condensate drains	Figure 2	Steam Condensate (during maintenance)	Batch (rare)	BF6 Recirc system	Ironmaking East Drain	8.8-9.2	40-45	Steamate NA0560 (Amines)	< 2		8 (NOEC)
									Cortrol OS5613 (Oxy Scavenger)	< 1		52 (5% mortality level)
10	Boiler Blowdown & drains	Figure 2	Demin Water plus Steam Condensate (feedwater - during maintenance)	10	BF6 Recirc system	Ironmaking East Drain	8.8-9.2	40-45	Steamate NA0560 (Amines)	1		8 (NOEC)
									Cortrol OS5613 (Oxy Scavenger)	< 1		52 (5% mortality level)
									Optisperse HTP 73303 / Optisperse HTP 73613	< 10		810 (NOEC)

Stream No.	Stream	Ref	Description	Quantity (m3/hr avg)	Primary Destination	Contingency Destination	pH	Temp (°C)	Chemical Additive	Stream Conc (mg/L)	Licence Pt Conc (mg/L)	Toxic Conc (mg/L)[1]
11	Deaerator drains	Figure 2	Demin Water plus Steam Condensate (feedwater - during maintenance)	Batch (rare)	BF6 Recirc system	Ironmaking East Drain	8.8-9.2	40-45	Steamate NA0560 (Amines)	< 2		8 (NOEC)
									Cortrol OS5613 (Oxygen Scavenger)	< 1		52 (5% mortality level)
12	Condensate and feedwater pipework drains	Figure 2	Demin Water plus Steam Condensate (feedwater)	Batch (rare)	BF6 Recirc system	Ironmaking East Drain	8.8-9.2	40-45	Steamate NA0560 (Amines)	< 2		8 (NOEC)
									Cortrol OS5613 (Oxygen Scavenger)	1		52 (5% mortality level)
13	Roads and Building storm water drains	Figure 2	Storm Water	0 - 4	BF6 Recirc system	Ironmaking East Drain						
14	SCP Water Treatment Plant water	Figure 1	UF & RO plant waste water	40-55	BF5 Recirc system	No.2 Blower Station Drain	6.5-8.5	Ambient	Kleen MCT103	325	< 0.6[4]	1060 (NOEC)
									Kleen MCT511	325	< 0.6[4]	25 (NOEC)
									BetzDearborn DCL 30	20	< 0.04[4]	100 (NOEC)
									Hypersperse MDC200	20	< 0.04[4]	2000 (NOEC)
15	LDG Gas Holder Area condensate	Figure 1	LDG condensate plus BOS fines (approx 150mg/L TSS)	10-30	ASMS slag washing	No.2 Blower Station Drain	5.8-5.9	30-70				

Stream No.	Stream	Ref	Description	Quantity (m3/hr avg)	Primary Destination	Contingency Destination	pH	Temp (°C)	Chemical Additive	Stream Conc (mg/L)	Licence Pt Conc (mg/L)	Toxic Conc (mg/L)[1]
16	Mainteck Building Area LDG condensate	Figure 1	LDG condensate plus BOS fines (approx 150mg/L TSS)	3-6	No 2 Blower Station Drain	n/a	5.8-5.9	30-70				
17	No.6 BF Area LDG condensate	Figure 1	LDG condensate plus BOS fines (approx 150mg/L TSS)	0.5-1.5	Ironmaking East Drain	n/a	5.8-5.9	30-70				
18	LDG Condensate (ICP waterseal area)	Figure 1	LDG condensate plus BOS fines (approx 150mg/L TSS)	2 - 4	BF6 Recirc system	Ironmaking East Drain	5.8-5.9	30-70				
19	BFG Condensate (ICP waterseal area)	Figure 1	BFG Condensate	2 - 4	BF6 Recirc system	Ironmaking East Drain		25-40				
20	COG Condensate (ICP waterseal area)	Figure 1	COG Condensate	1 - 2	Coke Oven Biological Treatment "Bug" Plant	n/a		25-40				
21	EBFG Condensate (ICP waterseal area)	Figure 1	Condensate from the mixture of BFG, COG & LDG	0 - 1	Coke Oven Biological Treatment "Bug" Plant	n/a		25-40				

Notes:

1. Quoted toxicity data are from MSDSs (see Appendix A) and are either the No Effect Concentration (NOEC), where available, for the most sensitive organism, or where a NOEC could not be defined, the 5% mortality level for the most sensitive organism.
2. The 120m3 regeneration volume will be collected and discharged over a 4 hr period. The concentration at the drain discharge is based on the minimum No. 2 Blower Station Drain flow of 30,000m3/hr.
3. Calculated from the volume of RCW displaced in an emergency (0.5m3), mixing with other water in the100m3 Process Clean Water Pit, before overflowing to the Ironmaking East Drain at 80m3/hr, with minimum IED flow of 1700m3/hr.
4. Calculated from maximum stream concentration and maximum stream flow, discharged into minimum No. 2 Blower Station Drain flow of 30,000m3/hr.

Table 2 – BFG Condensate Analysis (Stream No. 18) and Predicted Concentration in Ironmaking East Drain (IMED) if Discharge was Required

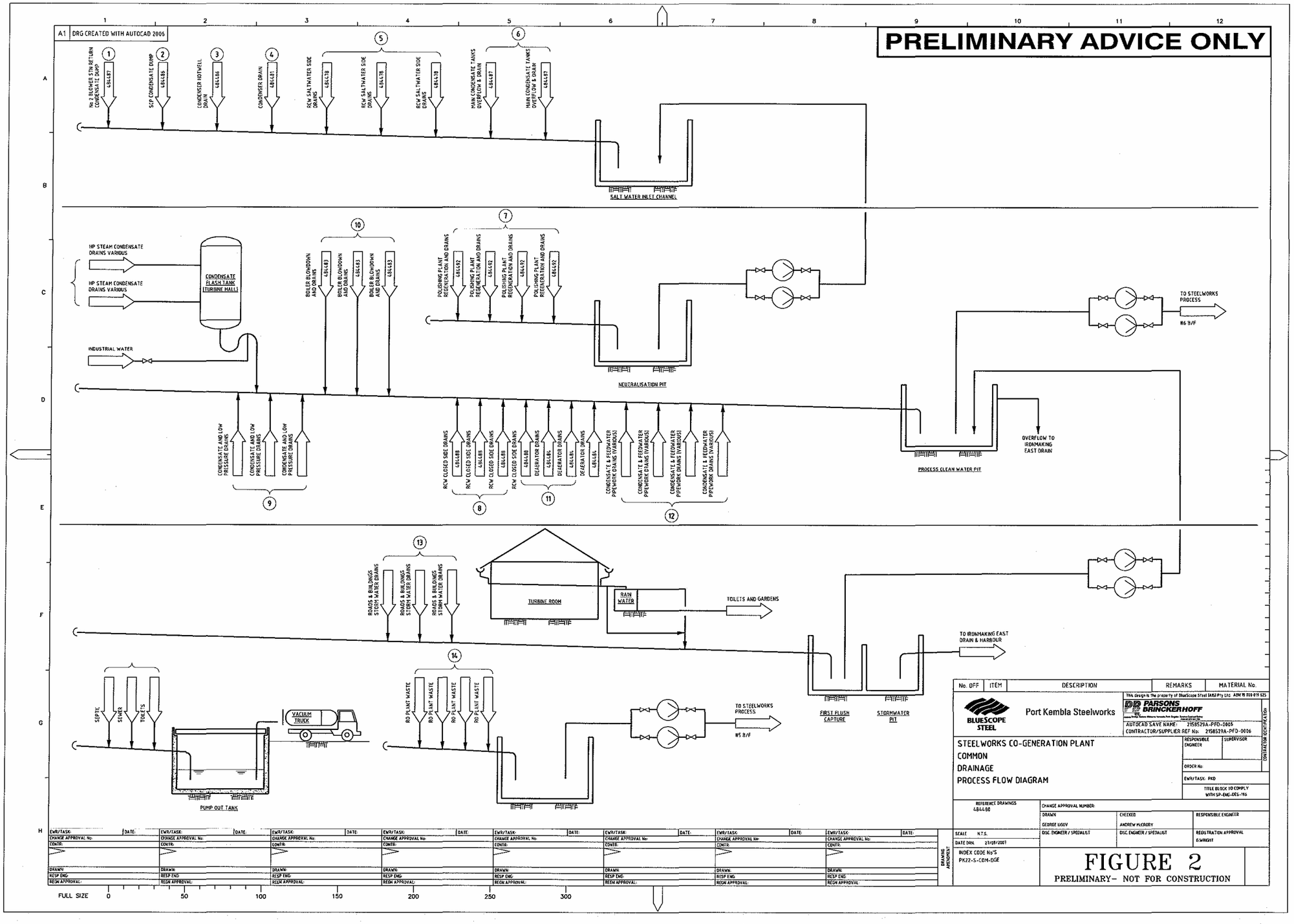
	BFG Condensate (mg/l)	Concentration in IMED (mg/l)
Fe	**50 - 150**	**< 9**
Mn	**0.4**	**< 0.06**
Ca	**10-300**	**< 18**
Mg	**5 - 40**	**< 2.5**
K	**5 - 200**	**< 12**
Na	**50 - 300**	**< 18**
Si	**1.2**	**< 0.07**
SiO2	**2.6**	**< 0.2**
P	**0.1**	**< 0.006**
Fl	**3.9**	**< 0.2**
Cl	**50 – 2,000**	**< 120**
SO4	**5 - 200**	**< 12**
Br	**50**	**< 3**
SCN	**0 - 1**	**< 0.06**

Traces of arsenic, cadmium, lead, mercury, nickel, selenium, molybdenum, polycyclic aromatic hydrocarbons, petroleum hydrocarbons and phenols….which are below detection limits

Basis: IMED flow is 1700 – 20000 kl/day due to variable plant configuration

IMED concentrations are calculated for maximum BFG condensate concentration and minimum IMED flow


FROM TINMILL
EXISTING
ASMS SLAG WASHING
No 5 BF RECIRC SYSTEM
BFG RECIRC SYSTEM
SCP PROCESS CLEAN WATER PIT
FIGURE 1
SCP LIQUID WASTE
RE-USE SCHEMATIC
SEAL POTS


PRELIMINARY ADVICE ONLY
A1 DRG CREATED WITH AUTOCAD 2005
No 2 BLOWER STM RETURN CONDENSATE DUMP
S/P CONDENSATE DUMP
CONDENSER HOTWELL DRAIN
CONDENSER DRAIN
RCW SALTWATER SIDE DRAINS
MAIN CONDENSATE TANKS OVERFLOW & DRAIN
SALT WATER INLET CHANNEL
HP STEAM CONDENSATE DRAINS VARIOUS
CONDENSATE FLASH TANK (TURBINE HALL)
INDUSTRIAL WATER
BOILER BLOWDOWN AND DRAINS
POLISHING PLANT REGENERATION AND DRAINS
NEUTRALISATION PIT
CONDENSATE AND LOW PRESSURE DRAINS
RCW CLOSED SIDE DRAINS
DEGERATOR DRAINS
CONDENSATE & FEEDWATER PIPEWORK DRAINS (VARIOUS)
PROCESS CLEAN WATER PIT
TO STEELWORKS PROCESS
#6 B/F
OVERFLOW TO IRONMAKING EAST DRAIN
ROADS & BUILDINGS STORM WATER DRAINS
TURBINE ROOM
RAIN WATER
TOILETS AND GARDENS
FIRST FLUSH CAPTURE
STORMWATER PIT
TO IRONMAKING EAST DRAIN & HARBOUR
SEPTIC
SEWER
TOILETS
VACUUM TRUCK
PUMP OUT TANK
RO PLANT WASTE
TO STEELWORKS PROCESS
#5 B/F
No. OFF
ITEM
DESCRIPTION
REMARKS
MATERIAL No.
BLUESCOPE STEEL
Port Kembla Steelworks
This design is the property of BlueScope Steel (AIS) Pty Ltd ABN 19 000 011 058
PARSONS BRINCKERHOFF
AUTOCAD SAVE NAME: 2158529A-PFD-0005
CONTRACTOR/SUPPLIER REF No: 2158529A-PFD-0006
STEELWORKS CO-GENERATION PLANT
COMMON
DRAINAGE
PROCESS FLOW DIAGRAM
RESPONSIBLE ENGINEER
SUPERVISOR
CONTRACTOR IDENTIFICATION
ORDER No:
EWR/TASK: PKD
TITLE BLOCK TO COMPLY WITH SP-ENG-DES-1145
REFERENCE DRAWINGS 4844-00
CHANGE APPROVAL NUMBER:
DRAWN
GEORGE UGOV
CHECKED
ANDREW MCCARTY
RESPONSIBLE ENGINEER
DISC ENGINEER / SPECIALIST
DISC ENGINEER / SPECIALIST
REGISTRATION APPROVAL
SCALE N.T.S.
DATE DRN 27/09/2007
INDEX CODE No'S
PK22-S-COM-DGE
DRAWING AMENDMENT
EWR/TASK:
DATE:
CHANGE APPROVAL No:
CONTR:
DRAWN:
RESP ENG:
RESN APPROVAL:
FULL SIZE 0 50 100 150 200 250 300
FIGURE 2
PRELIMINARY- NOT FOR CONSTRUCTION

Appendix – Material Safety Data Sheets

Steamate NA0560

Cortrol OS5613

Corrshield MD4100

Spectrus NX1100

Optisperse HTP73303

Optisperse HTP73613

Kleen MCT103

Kleen MCT511

BetzDearborn DCL30

Hypersperse MDC200

Material Safety Data Sheet

Uncontrolled Copy

Steamate NA0560

Infosafe™ No. GBZPV **Issue Date** August 2002 **Status** ISSUED by GEBETZ BS: 1.9.11

Classified as hazardous

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name Steamate NA0560

Product Code 1-Boiler

Company Name GE Betz Pty Limited (ABN 84 001 221 941)

Address 69-77 Williamson Road Ingleburn
NSW 2565

Emergency Tel. 1800 808 674 (Aus)

Telephone/Fax Number Tel: +61 2 9827 6100
Fax: +61 2 9827 6150

Recommended Use Neutralizing amine

Other Names Not Available

Other Information NEW ZEALAND EMERGENCY PHONE No.
24H 0800 442259

Off line MSDS are uncontrolled documents, GE Betz most up to date MSDS can be accessed via internet on www.msdsonline.com.au/gebetz/
The information herein is to the best of our knowledge, correct and complete. It describes the safety requirements for this product and should not be construed as guaranteeing specific properties. Since methods and conditions are beyond our control we do not accept liability for any damages resulting from the use of, or reliance on, this information in inappropriate contexts.

2. HAZARDS IDENTIFICATION

Hazard Classification

HAZARDOUS SUBSTANCE.
DANGEROUS GOODS.

Hazard classification according to the criteria of NOHSC.
Dangerous goods classification according to the Australia Dangerous Goods Code.

Risk Phrase(s)

R10 Flammable.
R35 Causes severe burns.
R41 Risk of serious damage to eyes.
R43 May cause sensitization by skin contact.
R20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

Safety Phrase(s) S1/2 Keep locked up and out of reach of children.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S24/25 Avoid contact with skin and eyes.
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

Irritancy of Product Corrosive to skin. Absorbed by skin. Potential skin sensitizer. Corrosive to the eyes. Irritation of the upper respiratory tract. Prolonged exposure may cause dizziness and headache.

Signs and Symptoms of Exposure Inhalation may cause lightheadedness, slurred speech, nausea, and/or vomiting (pulmonary edema may result). Skin contact can cause severe irritation or burns.

Medical Conditions Generally Aggravated by Exposure Pre-existing skin disorders.

Other Information Prolonged or repeated exposures may cause tissue necrosis and/or toxicity to the liver and kidney.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Characterization Liquid

Information on Composition An aqueous solution of a cycloaliphatic amine and an amino ether.

Ingredients

Name	CAS	Proportion

Morpholine	110-91-8	30 to 60 %
Cyclohexylamine	108-91-8	10 to 30 %
Water and other non hazardous substances	Mixture	30 to 60 %

4. FIRST AID MEASURES

Inhalation Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get immediate medical attention.

Ingestion Give water or milk to drink. DO NOT induce vomiting. Seek medical attention. Do not feed anything by mouth to an unconscious or convulsive victim.

Skin Immediately remove contaminated clothing and wash affected area with soap and water. Ensure contaminated clothing is washed before re-use.Seek immediate medical advice.

Eye Remove contact lenses. Wash with large amounts of water for approximately 15 minutes, holding eyelids open. Seek immediate medical advice.

First Aid Facilities Eye wash station, safety shower and normal washroom facilities.

Advice to Doctor Treat symptomatically.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media Dry chemical, carbon dioxide, or foam--Water spray should be used only to cool fire-exposed containers and disperse vapors.

Hazards from Combustion Products Thermal decomposition (destructive fires) yields elemental oxides.

Specific Methods Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

Hazchem Code 3W

6. ACCIDENTAL RELEASE MEASURES

Spills & Disposal	CLEAN-UP METHODS - SMALL SPILLAGE: Absorb or contain liquid with sand, earth or spill control material. Shovel up using non sparking tools and place in a labelled, sealable container for subsequent safe disposal. Put leaking containers in a labelled drum or overdrum. Put leaking containers in a labelled drum or overdrum. Scrub contaminated surfaces with detergent solution. Retain washings as contaminated waste. CLEAN-UP METHODS - LARGE SPILLAGE: Transfer to a labelled, sealable container for product recovery or safe disposal. Treat residues as for small spillage.

7. HANDLING AND STORAGE

Corrosiveness	Combustible. Do not use around sparks or flames. Bond containers during filling or discharge when performed at temperatures at or above the product flash point.
Other Information	Keep containers closed when not in use. Store in cool ventilated location. Store away from oxidizers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

National Exposure Standards	MORPHOLINE PEL (OSHA): 20 PPM-SKIN(30PPM-STEL) TLV (ACGIH): 20 PPM-SKIN(30PPM-STEL) CYCLOHEXYLAMINE PEL (OSHA): 10 PPM TLV (ACGIH): 10 PPM
Engineering Controls	Use with adequate ventilation. Maintain concentration below recommended exposure limit.
Respiratory Protection	Avoid breathing of vapours, mists or spray. Select and use respirators in accordance with AS/NZS 1715/1716.
Eye Protection	Splash proof chemical goggles, face shield
Hand Protection	Gauntlet-type rubber gloves, chemical resistant apron-- Wash off after each use. Replace as necessary.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	Liquid
Appearance	Colourless to yellow

Odour	Amine
Solubility in Water	100%
Specific Gravity	0.988 @21CC
pH Value	13.1 (approx)
Vapour Pressure	18 mmHg
Vapour Density (Air=1)	< 1.00
Evaporation Rate	< 1.00
Physical State	Liquid
Viscosity	22 cps @21 CC
Flash Point	56C P-M(CC)

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under normal storage conditions.
Incompatible Materials	May react with acids.
Hazardous Decomposition Products	Thermal decomposition (destructive fires) yields elemental oxides.
Hazardous Polymerization	Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicology Information	Oral LD50 RAT: 450 mg/kg NOTE - Estimated value Dermal LD50 RABBIT: 595 mg/kg NOTE - Estimated value Skin Irritation Score RABBIT: >6.3 NOTE - Based on similar product; EPA# I:corrosive; DOT corrosive:60 minutes, not 3 min. Eye Irritation Score RABBIT: CORROSIVE

NOTE - 15% Cyclohexylamine score:101, +/-rinsing, constant irritation, nonreversible

Inhalation Primary route of exposure;Irritation of the upper respiratory tract. Prolonged exposure may cause dizziness and headache.

Ingestion Toxic;
May cause severe irritation or burning of mouth, throat, and gastrointestinal tract with severe chest and abdominal pain, nausea, vomiting, diarrhea, lethargy and collapse. Possible death when ingested in very large doses.

Skin Primary route of exposure; Toxic; Corrosive to skin. Absorbed by skin. Potential skin sensitizer.

Eye Corrosive to eyes.

12. ECOLOGICAL INFORMATION

Other Information
AQUATIC TOXICOLOGY
Daphnia magna 48 Hour Static Renewal Bioassay (pH adjusted)
LC50= 54; No Effect Level= 8 mg/L
Fathead Minnow 96 Hour Static Renewal Bioassay (pH adjusted)
LC50= 104; No Effect Level= 50 mg/L
BIODEGRADATION
BOD-28 (mg/g): 296
BOD-5 (mg/g): 1
COD (mg/g): 1443
TOC (mg/g): 354

13. DISPOSAL CONSIDERATIONS

Waste Disposal Refer to appropriate authority in your State. Dispose of material through a licensed waste contractor. Normally suitable for disposal by approved waste disposal agent.

14. TRANSPORT INFORMATION

U.N. Number 2734

Proper Shipping Name POLYAMINES, LIQUID, CORROSIVE, FLAMMABLE, N.O.S. - (Contains: Morpholine & Cyclohexylamine)

DG Class 8

Sub.Risk 3

Hazchem Code 3W

Packaging Method	3.8.8
Packing Group	II
IERG Number	18

15. REGULATORY INFORMATION

Hazard Category Harmful,Corrosive

16. OTHER INFORMATION

Other Information Disclaimer:
The information herein is to the best of our knowledge, correct and complete. It describes the safety requirements for this product and should not be construed as guaranteeing specific properties. Since methods and conditions are beyond our control we do not accept liability for any damages resulting from the use of, or reliance on, this information in inappropriate contexts.

End of MSDS

Print Date: 12/05/2008 BS: 1.9.11

Material Safety Data Sheet

Uncontrolled Copy

Cortrol OS5613

Infosafe™ No. GBZDC **Issue Date** July 2007 **Status** ISSUED by GEBETZ BS: 1.9.11

Classified as hazardous

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name Cortrol OS5613

Product Code 1-Boiler

Company Name GE Betz Pty Limited (ABN 84 001 221 941)

Address 69-77 Williamson Road Ingleburn
NSW 2565

Emergency Tel. 1800 808 674 (Aus)

Telephone/Fax Number Tel: +61 2 9827 6100
Fax: +61 2 9827 6150

Product Safety Guide This product should only be used in accordance to the procedures GE Betz has established for a specific application. For a technical advice contact GE Betz.

Recommended Use Water based dissolved oxygen scavenger / metal passivator.

Other Names None Listed

Other Information NEW ZEALAND EMERGENCY PHONE No.
24H 0800 442259

Off line MSDS are uncontrolled documents, GE Betz most up to date MSDS can be accessed via internet on www.msdsonline.com.au/gebetz/
The information herein is to the best of our knowledge, correct and complete. It describes the safety requirements for this product and should not be construed as guaranteeing specific properties. Since methods and conditions are beyond our control we do not accept liability for any damages resulting from the use of, or reliance on, this information in inappropriate

contexts.

2. HAZARDS IDENTIFICATION

Hazard Classification

HAZARDOUS SUBSTANCE.
NON-DANGEROUS GOODS.

Hazard classification according to the criteria of NOHSC. Dangerous goods classification according to the Australia Dangerous Goods Code.

Risk Phrase(s)

R36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrase(s) S1/2 Keep locked up and out of reach of children.
S24/25 Avoid contact with skin and eyes.
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

Irritancy of Product May cause slight irritation to the skin. May cause moderate irritation to the eyes. Vapors, gases, mists and/or aerosols may cause irritation to upper respiratory tract.

Signs and Symptoms of Exposure May cause redness or itching of skin.

Medical Conditions Generally Aggravated by Exposure Not known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Characterization Liquid

Information on Composition Solution contains Hydrazide and water.

Ingredients

Name	CAS	Proportion
Hydrazide		10-20 %
Water and other non hazardous substances	Mixture	80-90 %

Other Information	R36/37/38 Irritating to eyes, respiratory system and skin.

4. FIRST AID MEASURES

Inhalation	If nasal, throat or lung irritation develops, remove to fresh air and seek medical attention.
Ingestion	Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately seek medical attention. Dilute contents of stomach using 3-4 glasses milk or water.
Skin	Wash thoroughly with soap and water. Remove contaminated clothing. Seek medical attention if irritation develops or persists. Thoroughly wash contaminated clothing before re-use.
Eye	Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Seek immediate medical attention.
First Aid Facilities	Eye wash station, safety shower and normal washroom facilities.
Advice to Doctor	No special instructions. Treat symptomatically.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	Dry Chemical, Carbon dioxide, foam or water
Hazards from Combustion Products	Thermal decomposition (destructive fires) yields elemental oxides.
Specific Methods	Fire fighters should wear positive pressure self-contained breathing apparatus (full face type).

6. ACCIDENTAL RELEASE MEASURES

Spills & Disposal	Increase ventilation. Avoid breathing dust or vapours and contact with skin and eyes. Wear appropriate protective clothing. CLEAN-UP METHODS - SMALL SPILLAGE: Absorb or contain

liquid with sand, earth or spill control material. Shovel and place in a labelled, sealable container for subsequent safe disposal. Put leaking containers in a labelled drum or overdrum. Scrub contaminated surfaces with detergent solution. Retain washings as contaminated waste.
CLEAN-UP METHODS - LARGE SPILLAGE: Transfer to a labelled, sealable container for product recovery or safe disposal. Treat residues as for small spillage.

7. HANDLING AND STORAGE

Precautions for Safe Handling Ventilate workplace in such a way that the Occupational Exposure Limit (OEL) is not exceeded. Prevent spills and avoid operations which contaminate clothing and work areas. Ensure the appropriate personal protective equipment is used when handling this material. Contact with oxidizers, peroxide and metal oxide may result in a violent reaction. Contamination with low pH products and low grade metal accelerate decomposition to hydrazine.

Conditions for Safe Storage Keep containers closed when not in use. Store in a manner that minimizes potential contamination. Store only in vented containers. Protect from freezing.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Other Exposure Information EXPOSURE LIMITS
CHEMICAL NAME

CARBONIC DIHYDRAZIDE
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED

Engineering Controls Use with adequate ventilation.

Respiratory Protection Avoid breathing of vapours, mists or spray. Select and use respirators in accordance with AS/NZS 1715/1716. When mists or vapours exceed the exposure standards then the use of the following is recommended: Half face-piece respirator with organic vapour (Type A) and dust/mist (Type P1) filters. Filter capacity and respirator type depends on exposure levels.

Eye Protection Splash proof chemical goggles.

Hand Protection Neoprene gloves. Wash off after each use. Replace as necessary.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	Liquid
Appearance	Colourless to light yellow
Odour	Slight
Freezing Point	0oC
Solubility in Water	100%
Specific Gravity	1.041 @21OC
pH Value	9.0 (approx)
Vapour Pressure	~18.0 mmHg
Vapour Density (Air=1)	< 1.00
Evaporation Rate	< 1.00 (Ether = 1)
Physical State	Liquid
Viscosity	12 cps @21oC
Flash Point	> 93oC P-M(CC)

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under normal storage conditions.
Conditions to Avoid	Avoid contact with low grade metals (LCS, AL, Cu), mineral acids and oxidizers to avoid accelerated actives degradation.
Incompatible Materials	May react with strong oxidizers.
Hazardous Decomposition Products	Thermal decomposition (destructive fires) yields elemental oxides.
Hazardous Polymerization	Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicology Information
Oral LD50 RAT: >2,000 mg/kg
NOTE - Estimated value
Dermal LD50 RABBIT: >2,000 mg/kg
NOTE - Estimated value

Inhalation
Vapors, gases, mists and/or aerosols may cause irritation to upper respiratory tract.

Ingestion
May cause gastrointestinal irritation.

Skin
Primary route of exposure; May cause slight irritation to the skin.

Eye
May cause moderate irritation to the eyes.

Chronic Effects
No evidence of potential chronic effects.

12. ECOLOGICAL INFORMATION

Other Information
AQUATIC TOXICOLOGY
Daphnia magna 48 Hour Static Renewal Bioassay
LC50: 460 mg/L
No Effect Level: 100 mg/L
Fathead Minnow 96 Hour Static Renewal Bioassay
Mortality was observed in lowest concentration tested. A no effect level cannot be defined.
LC50: 140 mg/L
5% Mortality: 52 mg/L
Ceriodaphnia 48 Hour Static Renewal Bioassay
Mortality was observed in lowest concentration tested. A no effect level cannot be defined.
LC50: 92 mg/L
10% Mortality: 52 mg/L

BIODEGRADATION
No Data Available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal
Refer to appropriate authority in your State. Dispose of material through a licensed waste contractor. Normally suitable for disposal by approved waste disposal agent.

14. TRANSPORT INFORMATION

Transport Information
Not classified as Dangerous Goods, according to the Australian Code for the Transport of Dangerous Goods by Road and Rail.

15. REGULATORY INFORMATION

Hazard Category Irritant

16. OTHER INFORMATION

Other Information Disclaimer:
The information herein is to the best of our knowledge, correct and complete. It describes the safety requirements for this product and should not be construed as guaranteeing specific properties. Since methods and conditions are beyond our control we do not accept liability for any damages resulting from the use of, or reliance on, this information in inappropriate contexts.

End of MSDS

Print Date: 20/05/2008 BS: 1.9.11

Material Safety Data Sheet

Uncontrolled Copy

Spectrus NX1100

Infosafe™ No. GBZ98 **Issue Date** January 2007 **Status** ISSUED by GEBETZ BS: 1.9.11

Classified as hazardous

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name Spectrus NX1100

Product Code 3-Cooling

Company Name GE Betz Pty Limited (ABN 84 001 221 941)

Address 69-77 Williamson Road Ingleburn
NSW 2565

Emergency Tel. 1800 808 674 (Aus)

Telephone/Fax Number Tel: +61 2 9827 6100
Fax: +61 2 9827 6150

Product Safety Guide This product should only be used in accordance to the procedures GE Betz has established for a specific application. For a technical advice contact GE Betz.

Recommended Use Microbiological slime control agent.

Other Names Not Available

Other Information NEW ZEALAND EMERGENCY PHONE No.
24H 0800 442259

Off line MSDS are uncontrolled documents, GE Betz most up to date MSDS can be accessed via internet on www.msdsonline.com.au/gebetz/
The information herein is to the best of our knowledge, correct and complete. It describes the safety requirements for this product and should not be construed as guaranteeing specific properties. Since methods and conditions are beyond our control we do not accept liability for any damages resulting from the use of, or reliance on, this information in inappropriate

contexts.

2. HAZARDS IDENTIFICATION

Hazard Classification

HAZARDOUS SUBSTANCE.
DANGEROUS GOODS.

Hazard classification according to the criteria of NOHSC.
Dangerous goods classification according to the Australia Dangerous Goods Code.

Risk Phrase(s)

R34 Causes burns.
R43 May cause sensitization by skin contact.
R50 Very toxic to aquatic organisms.
R53 May cause long term adverse effects in the aquatic environment.
R23/25 Toxic by inhalation and if swallowed.

Safety Phrase(s) S1/2 Keep locked up and out of reach of children.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

Irritancy of Product Corrosive to skin. Skin sensitizer with delayed onset of symptoms.Corrosive to the eyes. Mists/aerosols cause irritation to the upper respiratory tract.

Signs and Symptoms of Exposure Direct contact with skin will cause severe delayed skin reactions or burns if not washed off immediately- follow first aid instructions.

Medical Conditions Generally Aggravated by Exposure Pre-existing skin disorders.

Other Information Prolonged or repeated exposures may cause tissue necrosis and/or skin sensitization.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Characterization Liquid

Information on Composition An aqueous solution containing pesticide ingredients, inorganic salts, and an inorganic acid.

Ingredients

Name	CAS	Proportion
Water and other non hazardous solution of Potassium Salts	Mixture	>60 %
Bronopol	52-51-7	<10 %
Sulphuric acid	7664-93-9	< 1%
Magnesium Nitrate	10377-60-3	< 10%
5-Chloro-2-Methyl-4-Isothiazolin-3-one	26172-55-4	< 10%
Magnesium Chloride	7786-30-3	<10%

4. FIRST AID MEASURES

Inhalation Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get immediate medical attention.

Ingestion Give water or milk to drink. DO NOT induce vomiting. Seek medical attention. Do not feed anything by mouth to an unconscious or convulsive victim.

Skin URGENT! Immediately remove contaminated clothing and wash affected area with soap and water. Ensure contaminated clothing is washed before re-use
Seek immediate medical advice.

Eye URGENT! Immediately flush eyes with plenty of low pressure water for at least 20 minutes while removing contact lenses. Hold eyelids open.
Seek immediate medical advice.

First Aid Facilities Eye wash station, safety shower and normal washroom facilities.

Advice to Doctor Treat symptomatically. Material is corrosive. It may not be advisable to induce vomiting. Possible mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock and convulsions may be necessary.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing

Media	Dry chemical, carbon dioxide, foam or water
Hazards from Combustion Products	Thermal decomposition (destructive fires) yields elemental oxides.
Specific Methods	Fire fighters to wear self-contained breathing apparatus if risk of exposure to products of decomposition.
Hazchem Code	2X
Other Information	Special Exposure Hazards: Hydrogen bromide, bromine gas, hydrogen chloride, chlorine gas, oxides of carbon and nitrogen evolved in fire. UN3265 Corrosive to skin/steel

6. ACCIDENTAL RELEASE MEASURES

Spills & Disposal	CLEAN-UP METHODS - SMALL SPILLAGE: Absorb or contain liquid with sand, earth or spill control material. Shovel up using non sparking tools and place in a labelled, sealable container for subsequent safe disposal. Put leaking containers in a labelled drum or overdrum. Put leaking containers in a labelled drum or overdrum. Scrub contaminated surfaces with detergent solution. Retain washings as contaminated waste. CLEAN-UP METHODS - LARGE SPILLAGE: Transfer to a labelled, sealable container for product recovery or safe disposal. Treat residues as for small spillage. . Increase ventilation. Wear an appropriate respirator. Wear appropriate protective clothing. Decontaminate spill area with a solution of 5% sodium bicarbonate and 5% sodium hypochlorite in water. Use 10 parts to 1 part product. Let stand for 30 minutes. The biocidal effect of this product will be deactivated by this procedure.

7. HANDLING AND STORAGE

Precautions for Safe Handling	When using do not eat or drink. When opening containers, avoid inhalation of headspace gases. Only use in well-ventilated areas. Prevent spills and avoid operations which contaminate clothing and work areas. Ensure the appropriate personal protective equipment is used when handling this material. Contains an oxidizer. Avoid all contact with reducing agents. Corrosive to skin and/or eyes.
Conditions for Safe Storage	Keep containers closed when not in use. If frozen, thaw cmpletely and mix completely prior to use.
Other Information	

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

National Exposure Standards	Name	STEL (mgm3)	STEL (ppm)	TWA (mgm3)	TWA (ppm)	FootNote
	Sulphuric acid	3		1		

Other Exposure Information

EXPOSURE LIMITS
CHEMICAL NAME

2-BROMO-2-NITROPROPANE-1,3-DIOL
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED

MAGNESIUM NITRATE
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED

MAGNESIUM CHLORIDE
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED
Mixture of 5-CHLORO-2-METHYL-2H-ISOTHIAZOL-3-ONE and 2-METHYL-2H-ISOTHIAZOLE-3-ONE
TWA: 0.076mg/m (Chloro methyl isothiazol)
STEL: 0.23mg/m3 (Chloro methyl isothiazol)
TWA: 1.5mg/m3 (Methyl isothiazol)
STEL: 4.5mg/m3 (Methyl isothiazol)

Engineering Controls Use with adequate ventilation. Maintain concentration below recommended exposure limit.

Respiratory Protection Avoid breathing of vapours, mists or spray. Select and use respirators in accordance with AS/NZS 1715/1716. When mists or vapours exceed the exposure standards then the use of the following is recommended: Half facepiece respirator with organic vapour (Type A) and dust/mist (Type P1) filters. Filter capacity and respirator type depends on exposure levels." .

Eye Protection Splash proof chemical goggles and faceshield.

Hand Protection Gauntlet-type butyl gloves, chemical resistant apro.
Wash off after each use. Replace as necessary.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form Liquid

Appearance Yellow to Yellow Green

Odour None

Solubility in Water	100%
Specific Gravity	1.107 @21CC
pH Value	3.0 (approx)
Vapour Pressure	18 mmHg
Vapour Density (Air=1)	< 1.00
Evaporation Rate	< 1.00
Physical State	Liquid
Viscosity	10 cps @21 CC
Flash Point	> 93C P-M(CC)
Other Information	Freeze Point: -4oC

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under normal storage conditions.
Incompatible Materials	May react with strong reducing agents.
Hazardous Decomposition Products	Thermal decomposition (destructive fires) yields elemental oxides. Hydrogen bromide, bromine gas, hydrogen chloride, chlorine gas, oxides of carbon and nitrogen evolved in fire.
Hazardous Polymerization	Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicology Information	Oral LD50 RAT: 1,030 mg/kg Dermal LD50 RABBIT: >2,000 mg/kg Skin Irritation Score RABBIT: CORROSIVE Eye Irritation Score RABBIT: CORROSIVE Skin Sensitization G.PIG: NEGATIVE
Inhalation	Inhalation of mists or vapours will result in respiratory

	irritation.
Ingestion	May cause severe irritation or burning of the gastrointestinal tract.
Skin	Primary route of exposure; Corrosive to skin. Skin sensitizer with delayed onset of symptoms.
Eye	Corrosive to eyes.
Chronic Effects	Prolonged or repeated exposures may cause tissue necrosis and/or skin sensitization

12. ECOLOGICAL INFORMATION

Bioaccumulative Potential	Not bioaccumulating (Refers to active component: 2-Bromo-2-nitropropane-1,3-diol) Partition coefficient: (Refers to active component: 2-Bromo-2-nitropropane-1,3-diol): 0.18 (Pow) (Refers to active component: 5-chloro-2-methyl-4-isothiazolin-3-one): 0.401 (Refers to active component: 2-Methyl-4-isothiazolin-3-one): 0.486
Other Adverse Effects	Nutrients: N=8.03mg/g
Short Summary of Assessment of Environmental Impact	Very toxic to aquatic organisms. Toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment.
Other Information	AQUATIC TOXICOLOGY Fathead Minnow 96 Hour Static Renewal Bioassay LC50: 3.5 mg/L No Effect Level: 1.8 mg/L Daphnia magna 48 Hour Static Renewal Bioassay LC50: 5 mg/L No Effect Level: 2.5 mg/L Daphnia Magna 48 Hour Acute Toxicity EC50: 1.4mg/L (Refers to active component: 2-Bromo-2-nitropropane-1,3-diol) Mysid Shrimp 48 Hour Static Renewal Bioassay LC50: 40.5 mg/L No Effect Level: 18 mg/L Sheepshead Minnow 96 Hour Static Renewal Bioassay LC50: 26.7 mg/L No Effect Level: 15.5 mg/L

Ceriodaphnia 48 Hour Static Renewal Bioassay
LC50: 4.7 mg/L
No Effect Level: .63 mg/L

Rainbow Trout 96 Hour Acute Toxicity
LC50: 41mg/L (Refers to active component: 2-Bromo-2-nitropropane-1,3-diol)
Algae Inhibition (72h, Scenedesmus Sp)
LC50: 0.02mg/L (Refers to active component: 2-Bromo-2-nitropropane-1,3-diol)

BIODEGRADATION
COD (mg/gm): 78 Calculated
TOC (mg/gm): 29 Calculated
BOD-5 (mg/gm): 2 Calculated
BOD-28 (mg/gm): 4 Calculated
Zahn-Wellens Test: 8 Calculated
(% Degradation in 28 days)
Closed Bottle Test: 2 Calculated
(% Degradation in 28 days)
Biodegradation (%): Biodegrades slowly. DT50: 45days (Refers to active component: 2-Bromo-2-nitropropane-1,3-diol)
Hydrolysis (T1/2): (Refers to active component: 2-Bromo-2-nitropropane-1,3-diol):540d (pH6, 20oC)
(Refers to active component: 2-Bromo-2-nitropropane-1,3-diol):60d (pH8, 20oC)

13. DISPOSAL CONSIDERATIONS

Waste Disposal Refer to appropriate authority in your State. Dispose of material through a licensed waste contractor. Normally suitable for disposal by approved waste disposal agent.

14. TRANSPORT INFORMATION

U.N. Number 3265

Proper Shipping Name CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. - (Contains: Bronopol and Magnesium Nitrate)

DG Class 8

Hazchem Code 2X

Packaging Method 3.8.8

Packing Group II

EPG Number 8A1

IERG Number 36

15. REGULATORY INFORMATION

Hazard Category Toxic,Corrosive,Dangerous for the environment

16. OTHER INFORMATION

Other Information Disclaimer:
The information herein is to the best of our knowledge, correct and complete. It describes the safety requirements for this product and should not be construed as guaranteeing specific properties. Since methods and conditions are beyond our control we do not accept liability for any damages resulting from the use of, or reliance on, this information in inappropriate contexts.

End of MSDS

Print Date: 07/04/2008 BS: 1.9.11

Material Safety Data Sheet

Uncontrolled Copy

Optisperse HTP73303

Infosafe™ No. GBZDU **Issue Date** August 2002 **Status** ISSUED by GEBETZ BS: 1.9.11

Not classified as hazardous

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name Optisperse HTP73303

Product Code 1-Boiler

Company Name GE Betz Pty Limited (ABN 84 001 221 941)

Address 69-77 Williamson Road Ingleburn
NSW 2565

Emergency Tel. 1800 808 674 (Aus)

Telephone/Fax Number Tel: +61 2 9827 6100
Fax: +61 2 9827 6150

Recommended Use A water based internal boiler treatment.

Other Names None Listed

Other Information NEW ZEALAND EMERGENCY PHONE No.
24H 0800 442259

Off line MSDS are uncontrolled documents, GE Betz most up to date MSDS can be accessed via internet on www.msdsonline.com.au/gebetz/
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2. HAZARDS IDENTIFICATION

Hazard Classification

NON-HAZARDOUS SUBSTANCE.
NON-DANGEROUS GOODS.

Hazard classification according to the criteria of NOHSC. Dangerous goods classification according to the Australia Dangerous Goods Code.

Risk Phrase(s)

None Allocated

Safety Phrase(s) S37/39 Wear suitable gloves and eye/face protection.

Irritancy of Product May cause slight irritation to the skin. May cause slight irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

Signs and Symptoms of Exposure May cause redness or itching of skin.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Characterization Liquid

Information on Composition An aqueous solution an anionic polymer and an inorganic base and salt.

Ingredients

Name	CAS	Proportion
Sodium Molybdate	7631-95-0	< 10 %
Water and other non hazadous substance	Mixture	> 60 %

4. FIRST AID MEASURES

Inhalation If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

Ingestion Give water or milk to drink. DO NOT induce vomiting. Seek medical attention. Do not feed anything by mouth to an unconscious or convulsive victim.

Skin Immediately remove contaminated clothing and wash affected area

	with soap and water. Ensure contaminated clothing is washed before re-use. If irritation persists seek immediate medical attention.
Eye	Remove contact lenses. Wash with large amounts of water for approximately 15 minutes, holding eyelids open. Seek medical attention if irritation develops or persist.
First Aid Facilities	Eye wash station, safety shower and normal washroom facilities.
Advice to Doctor	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	Dry chemical, carbon dioxide, foam or water
Hazards from Combustion Products	Thermal decomposition (destructive fires) yields elemental oxides.
Specific Methods	Fire fighters to wear self-contained breathing apparatus if risk of exposure to products of decomposition.
Hazchem Code	2[T]

6. ACCIDENTAL RELEASE MEASURES

Spills & Disposal	CLEAN-UP METHODS - SMALL SPILLAGE: Absorb or contain liquid with sand, earth or spill control material. Shovel up using non sparking tools and place in a labelled, sealable container for subsequent safe disposal. Put leaking containers in a labelled drum or overdrum. Put leaking containers in a labelled drum or overdrum. Scrub contaminated surfaces with detergent solution. Retain washings as contaminated waste. CLEAN-UP METHODS - LARGE SPILLAGE: Transfer to a labelled, sealable container for product recovery or safe disposal. Treat residues as for small spillage. .

7. HANDLING AND STORAGE

Other Information	Keep containers closed when not in use. Protect from freezing. If frozen, thaw and mix completely prior to use. Store below 38C. Shelf life 180 days.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls	Use with adequate ventilation.
Respiratory Protection	Avoid breathing of vapours, mists or spray. Select and use respirators in accordance with AS/NZS 1715/1716. When mists or vapours exceed the exposure standards then the use of the following is recommended: Half facepiece respirator with organic vapour (Type A) and dust/mist (Type P1) filters. Filter capacity and respirator type depends on exposure levels." .
Eye Protection	Suitable chemical glasses.
Hand Protection	Neoprene gloves-- Wash off after each use. Replace as necessary.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	Liquid
Appearance	Yellow to Amber
Odour	Slight
Solubility in Water	100%
Specific Gravity	1.066 @21CC
pH Value	8.6 (approx)
Vapour Pressure	18 mmHg
Vapour Density (Air=1)	< 1.00
Evaporation Rate	< 1.00
Physical State	Liquid
Viscosity	6 cps @21 CC
Flash Point	> 93C P-M(CC)
Other Information	Flash Point P-M(CC) > 93C

10. STABILITY AND REACTIVITY

Chemical Stability Stable under normal storage conditions.

Incompatible Materials May react with strong oxidizers.

Hazardous Decomposition Products Thermal decomposition (destructive fires) yields elemental oxides.

Hazardous Polymerization Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicology Information
Oral LD50 RAT: >2,000 mg/kg
NOTE - Estimated value
Dermal LD50 RABBIT: >2,000 mg/kg
NOTE - Estimated value

Inhalation Inhalation of mists or aerosols may produce respiratory irritation.

Ingestion May cause gastric irritation.

Skin Repeated or prolonged skin contact may lead to irritation.

Eye Product may cause slight to moderate irritation to the eyes.

Chronic Effects No evidence of potential chronic effects.

12. ECOLOGICAL INFORMATION

Other Information
AQUATIC TOXICOLOGY
Fathead Minnow 96 Hour Acute Toxicity
Product toxicity determined from bioassays conducted on individual components.
LC50 Greater Than: 5000 mg/L
No Effect Level: 2310 mg/L
Daphnia magna 48 Hour Acute Toxicity
Product toxicity determined from bioassays conducted on individual components.
LC50: 3120 mg/L
No Effect Level: 810 mg/L
BIODEGRADATION
COD (mg/gm): 57 Calculated

TOC (mg/gm): 15 Calculated
BOD-5 (mg/gm): 6 Calculated
BOD-28 (mg/gm): 6 Calculated

13. DISPOSAL CONSIDERATIONS

Waste Disposal Refer to appropriate authority in your State. Dispose of material through a licensed waste contractor. Normally suitable for disposal by approved waste disposal agent.

14. TRANSPORT INFORMATION

Transport Information Not classified as Dangerous Goods, according to the Australian Code for the Transport of Dangerous Goods by Road and Rail.

Hazchem Code 2[T]

15. REGULATORY INFORMATION

16. OTHER INFORMATION

Other Information Disclaimer:
The information herein is to the best of our knowledge, correct and complete. It describes the safety requirements for this product and should not be construed as guaranteeing specific properties. Since methods and conditions are beyond our control we do not accept liability for any damages resulting from the use of, or reliance on, this information in inappropriate contexts.

End of MSDS

Print Date: 20/05/2008 BS: 1.9.11

Material Safety Data Sheet

Uncontrolled Copy

Optisperse HTP73613

Infosafe℠ No. GBZOO **Issue Date** October 2004 **Status** ISSUED by GEBE

Classified as hazardous

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIE

Product Name	Optisperse HTP73613
Product Code	1 - Boiler
Company Name	GE Betz Pty Limited (ABN 84 001 221 941)
Address	69-77 Williamson Road Ingleburn NSW 2565
Emergency Tel.	1800 808 674 (Aus)
Telephone/Fax Number	Tel: +61 2 9827 6100 Fax: +61 2 9827 6150
Product Safety Guide	This product should only be used in accordance to the procedu has established for a specific application. For a technical a contact GE Betz.
Recommended Use	A water based internal boiler treatment chemical.
Other Names	Not Available
Other Information	NEW ZEALAND EMERGENCY PHONE No. 24H 0800 442259 Off line MSDS are uncontrolled documents, GE Betz most up to can be accessed via internet on www.msdsonline.com.au/gebetz/ The information herein is to the best of our knowledge, corre complete. It describes the safety requirements for this produ should not be construed as guaranteeing specific properties. methods and conditions are beyond our control we do not accep for any damages resulting from the use of, or reliance on, th information in inappropriate contexts.

2. HAZARDS IDENTIFICATION

Hazard Classification

HAZARDOUS SUBSTANCE.
DANGEROUS GOODS.

Hazard classification according to the criteria of NOHSC.
Dangerous goods classification according to the Australia Dan
Code.

Risk Phrase(s)

R35 Causes severe burns.

Safety Phrase(s) S1/2 Keep locked up and out of reach of children.
S36 Wear suitable protective clothing.
S24/25 Avoid contact with skin and eyes.

Irritancy of Product May cause moderate irritation to the skin. Corrosive to the e
Mists/aerosols may cause irritation to upper respiratory trac

Signs and Symptoms of Exposure May cause redness or itching of skin, irritation, and/or tear
(direct contact).

Medical Conditions Generally Aggravated by Exposure Not known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Information on Composition An aqueous solution containing inorganic base and salt.

Ingredients

Name	CAS	Proportion
Sodium Molybdate	7631-95-0	0 - 10%
Sodium hydroxide	1310-73-2	0 - 10%
Water and other non hazardous substances	Mixture	>60%

4. FIRST AID MEASURES

Inhalation If nasal, throat or lung irritation develops - remove to fres
seek medical attention.

Ingestion Give water or milk to drink. DO NOT induce vomiting. Do not f

	by mouth to an unconscious or convulsive victim.
Skin	Wash thoroughly with soap and water. Remove contaminated clot Thoroughly wash clothing before reuse. Seek medical attention if irritation develops or persists.
Eye	URGENT! Immediately flush eyes with plenty of low-pressure wa least 20 minutes while removing contact lenses. Hold eyelids immediate medical attention.
First Aid Facilities	Normal washroom facilities are generally suitable. Ensure an station and safety shower are available and ready for use.
Advice to Doctor	No special instructions. Treat symptomatically.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	Dry chemical, carbon dioxide, foam or water. Slippery conditi sand/grit.
Hazards from Combustion Products	Thermal decomposition (destructive fires) yields elemental ox
Specific Methods	Fire fighters should wear positive pressure self-contained br apparatus (full face-piece type).
Hazchem Code	2X

6. ACCIDENTAL RELEASE MEASURES

Spills & Disposal	CLEAN-UP METHODS - SMALL SPILLAGE: Absorb or contain liquid w earth or spill control material. Shovel and place in a labell container for subsequent safe disposal. Put leaking container labelled drum or overdrum. Put leaking containers in a labell overdrum. Scrub contaminated surfaces with detergent solution washings as contaminated waste. CLEAN-UP METHODS - LARGE SPILLAGE: Transfer to a labelled, se container for product recovery or safe disposal. Treat residu small spillage.

7. HANDLING AND STORAGE

Precautions for Safe Handling	Prevent spillages. Ensure the appropriate personal protective is used when handling this material. Alkaline. Corrosive. Do acidic material.

Conditions for Safe Storage Keep containers closed when not in use. Protect from freezing thaw and mix completely prior to use. Store below 38C.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

National Exposure Standards

Name	STEL (mgm3)	STEL (ppm)	TWA (mgm3)	TWA (ppm
Sodium hydroxide			2	

Other Exposure Information

EXPOSURE LIMITS
CHEMICAL NAME

SODIUM HYDROXIDE (CAUSTIC SODA)
PEL (OSHA): 2 MG/M3
TLV (ACGIH): 2 MG/M3(CEILING)

SODIUM MOLYBDATE (MOLYBDIC ACID,DISODIUM SALT)
PEL (OSHA): 5 MG/M3(AS Mo)
TLV (ACGIH): 0.5 MG/M3(AS Mo) RESPIRABLE FRACTION

Engineering Controls Adequate ventilation to maintain air contaminants below expos

Respiratory Protection Avoid breathing of vapours, mists or spray. Select and use re accordance with AS/NZS 1715/1716. When mists or vapours excee exposure standards then the use of the following is recommend face-piece respirator with organic vapour (Type A) and dust/m P1) filters. Filter capacity and respirator type depends on e levels.

Eye Protection Splash proof chemical goggles.

Hand Protection Neoprene gloves. Wash off after each use. Replace as necessar

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance Yellow to amber

Odour Slight

Solubility in Water 100%

Specific Gravity 1.125 @ 21oC

pH Value >13.0 approx

Vapour Pressure ~18.0mm Hg

Vapour Density

(Air=1)	<1.00
Evaporation Rate	<1.00 (Ether = 1)
Physical State	Liquid
Viscosity	8cps @ 21oC
Flash Point	>93oC
Other Information	Freeze Point = -6oC

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under normal storage conditions.
Incompatible Materials	May react with strong oxidisers.
Hazardous Decomposition Products	Thermal decomposition (destructive fires) yields elemental ox
Hazardous Polymerization	Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicology Information	Oral LD50 RAT: >2,000 mg/kg NOTE - Estimated value Dermal LD50 RABBIT: >2,000 mg/kg NOTE - Estimated value
Inhalation	Mists/aerosols may cause irritation to upper respiratory trac
Ingestion	May cause gastrointestinal irritation.
Skin	May cause moderate irritation to the skin.
Eye	Corrosive to the eyes.
Chronic Effects	Prolonged or repeated exposures may cause toxicity to the lun

12. ECOLOGICAL INFORMATION

Other Information	AQUATIC TOXICOLOGY Daphnia magna 48 Hour Acute Toxicity (Estimated)

LC50 Greater Than= 5000; No Effect Level= 2030 mg/L
Fathead Minnow 96 Hour Acute Toxicity (Estimated)
LC50 Greater Than= 5000; No Effect Level= 3970 mg/L
BIODEGRADATION
BOD-28 (mg/g): 6
BOD-5 (mg/g): 6
COD (mg/g): 56
TOC (mg/g): 15

13. DISPOSAL CONSIDERATIONS

Waste Disposal Refer to appropriate authority in your State. Dispose of mate
a licensed waste contractor. Normally suitable for disposal b
waste disposal agent.

14. TRANSPORT INFORMATION

U.N. Number 3266

Proper Shipping Name CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. - (Contains: Sodiu

DG Class 8

Hazchem Code 2X

Packaging Method 3.8.8

Packing Group III

IERG Number 37

15. REGULATORY INFORMATION

Hazard Category Corrosive

16. OTHER INFORMATION

Other Information Disclaimer:
The information herein is to the best of our knowledge, corre
complete. It describes the safety requirements for this produ
should not be construed as guaranteeing specific properties.
methods and conditions are beyond our control we do not accep
for any damages resulting from the use of, or reliance on , t
information in appropriate contexts.

End of MSDS

Print Date: 20/05/2008 B

Material Safety Data Sheet

Uncontrolled Copy

Kleen MCT103

Infosafe™ No. GBZ5M **Issue Date** August 2006 **Status** RE-ISSUED by GEBETZ BS: 1.9.11

Classified as hazardous

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name	Kleen MCT103
Product Code	2-GCP
Company Name	GE Betz Pty Limited (ABN 84 001 221 941)
Address	69-77 Williamson Road Ingleburn NSW 2565
Emergency Tel.	1800 808 674 (Aus)
Telephone/Fax Number	Tel: +61 2 9827 6100 Fax: +61 2 9827 6150
Product Safety Guide	This product should only be used in accordance to the procedures GE Betz has established for a specific application. For a technical advice contact GE Betz.
Recommended Use	Reverse osmosis membrane cleaner
Other Names	None Listed
Other Information	NEW ZEALAND EMERGENCY PHONE No. 24H 0800 442259 Off line MSDS are uncontrolled documents, GE Betz most up to date MSDS can be accessed via internet on www.msdsonline.com.au/gebetz/ The information herein is to the best of our knowledge, correct and complete. It describes the safety requirements for this product and should not be construed as guaranteeing specific properties. Since methods and conditions are beyond our control we do not accept liability for any damages resulting from the use of, or reliance on, this information in inappropriate

contexts.

2. HAZARDS IDENTIFICATION

Hazard Classification

HAZARDOUS SUBSTANCE.
NON-DANGEROUS GOODS.

Hazard classification according to the criteria of NOHSC.
Dangerous goods classification according to the Australia Dangerous Goods Code.

Risk Phrase(s)

R20 Harmful by inhalation.
R40 Limited evidence of a carcinogenic effect.
R41 Risk of serious damage to eyes.
R37/38 Irritating to respiratory system and skin.

Safety Phrase(s) S1/2 Keep locked up and out of reach of children.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S7/9 Keep container tightly closed in a well ventilated place.
S24/25 Avoid contact with skin and eyes.
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

Irritancy of Product Severe irritant to the skin. Severe irritant to the eyes, possibly corrosive. Mists/aerosols cause irritation to the upper respiratory tract.

Signs and Symptoms of Exposure Causes irritation of the skin, eyes, and/or respiratory system.

Medical Conditions Generally Aggravated by Exposure Pre-existing skin disorders.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Characterization Liquid

Information on Composition A solution containing inorganic acid, carboxylic acid, organic chelant and water.

Ingredients	Name	CAS	Proportion
	Phosphoric acid	7664-38-2	10 to 30%
	Glycolic Acid (Hydroxyacetic acid)	79-14-1	10 to 30%
	N-Hydroxyethylenediamine Triacetic Acid Trisodium Salt	139-89-9	10 to 30 %
	Water and other non hazadous substance	Mixture	10 to 30%
	Nitrilotriacetic SaltAcid, Trisodium Salt	5064-31-3	< 1 %

4. FIRST AID MEASURES

Inhalation If nasal, throat or lung irritation develops, remove to fresh air and seek medical attention.

Ingestion Give water or milk to drink. DO NOT induce vomiting. Seek medical attention. Do not feed anything by mouth to an unconscious or convulsive victim.

Skin Immediately remove contaminated clothing and wash affected area with soap and water. Ensure contaminated clothing is washed before re-use.
Seek immediate medical attention if irritation develops or persists.

Eye URGENT! Immediately flush eyes with large amounts of low pressure water for at least 20 minutes while removing contact lenses. Hold eyelids apart. Seek immediate medical attention.

First Aid Facilities Eye wash station, safety shower and normal washroom facilities.

Advice to Doctor Treat symptomatically. No special instructions.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media Dry chemical, carbon dioxide, foam or water.

Hazards from Combustion Products Thermal decomposition (destructive fires) yields elemental oxides.

Specific Methods Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

6. ACCIDENTAL RELEASE MEASURES

Spills & Disposal Increase ventilation. Wear appropriate protective clothing.
CLEAN-UP METHODS - SMALL SPILLAGE: Absorb or contain liquid with sand, earth or spill control material. Shovel and place in a labelled, sealable container for subsequent safe disposal. Put leaking containers in a labelled drum or overdrum. Scrub contaminated surfaces with detergent solution. Retain washings as contaminated waste.
CLEAN-UP METHODS - LARGE SPILLAGE: Transfer to a labelled, sealable container for product recovery or safe disposal. Treat residues as for small spillage.

7. HANDLING AND STORAGE

Precautions for Safe Handling Ventilate workplace in such a way that the Occupational Exposure Limit (OEL) is not exceeded. Prevent spills and avoid operations which contaminate clothing and work areas. Avoid breathing vapour, spray or mists. Ensure the appropriate personal protective equipment is used when handling this material. Avoid contact with skin and eyes.

Conditions for Safe Storage Keep out of reach of children. Keep in a well-ventilated place. Keep containers closed when not in use. Do not freeze. If frozen, thaw and mix completely prior to use.

Other Information

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

National Exposure Standards

Name	STEL (mgm3)	STEL (ppm)	TWA (mgm3)	TWA (ppm)	FootNote
Phosphoric acid	3		1		

Other Exposure Information EXPOSURE LIMITS

CHEMICAL NAME

NITRILOTRIACETIC ACID,TRISODIUM SALT (NTA.3NA)
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED

TRADE SECRET INGREDIENT(E055);TSRN 125438 - 5040P
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED

TRADE SECRET INGREDIENT(E038);;TSRN 125438 - 5026P
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED
MISC: Note- manufacturer's recommended exposure limit: 10 mg/m3.

PHOSPHORIC ACID
PEL (OSHA): 1 MG/M3
TLV (ACGIH): 1 MG/M3

Engineering Controls Use with adequate ventilation. Maintain concentration below recommended exposure limit.

Respiratory Protection Avoid breathing of vapours, mists or spray. Select and use respirators in accordance with AS/NZS 1715/1716. When mists or vapours exceed the exposure standards then the use of the following is recommended: Half facepiece respirator with organic vapour (Type A) and dust/mist (Type P1) filters. Filter capacity and respirator type depends on exposure levels." .

Eye Protection Splash proof chemical goggles. Face shield.

Hand Protection Neoprene gloves. Wash off after each use. Replace as necessary. Chemical resistant apron.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form Liquid

Appearance Colourless to amber

Odour Slight

Melting Point -20oC

Boiling Point 98oC

Solubility in Water 100%

Specific Gravity 1.350 @21CC

pH Value 3.4 (approx)

Vapour Pressure ~18 mmHg

Vapour Density (Air=1)	>1.00
Evaporation Rate	<1.00 (Ether = 1)
Physical State	Liquid
Viscosity	50 cps @21 CC
Pour Point	-17oC
Flash Point	> 93C P-M(CC)
Other Information	Freeze Point = -21oC

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under normal storage conditions.
Conditions to Avoid	Protect from freezing.
Incompatible Materials	May react with strong oxidizers.
Hazardous Decomposition Products	Thermal decomposition (destructive fires) yields elemental oxides.
Hazardous Polymerization	Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicology Information	Oral LD50 RAT: >2,000 mg/kg NOTE - Estimated value Dermal LD50 RABBIT: >2,000 mg/kg NOTE - Estimated value
Inhalation	Inhalation of mists or vapours will result in respiratory irritation. Prolonged exposure may cause diziness and headache.
Ingestion	May cause gastrointestinal irritation with possible nausea, vomiting, abdominal discomfort and diarrhea.
Skin	Contact with skin will result in severe irritation.

Eye A severe eye irritant. Possible corrosive.

Chronic Effects Prolonged or repeated exposures may cause primary irritant dermatitis and / or toxicity to the kidney and reproductive system.
Product or product component may increase risk of cancer.

Carcinogenicity A small amount of trisodium salt or nitriloacetic acid (trisodium nitrilotriacetate) is present in the product. The IARC categorizes NTA as a possible carcinogen. NTA has cause urinary tumours in laboratory animals but there is little likehood that the substance would cause cancer in human especially at sub-toxic doses (approx. 1.0L).

12. ECOLOGICAL INFORMATION

Persistence / Degradability Closed Bottle Test(% Degradation in 28 days):
23 (calculated data)
Zahn-Wellens Test (% Degradation in 28 days):
27 ((calculated data)

Other Information AQUATIC TOXICOLOGY
Fathead Minnow 96 Hour Static Bioassay with 48-Hour Renewal (pH adjusted)
0% Mortality: 2000 mg/L
Daphnia magna 48 Hour Static Renewal Bioassay (pH adjusted)
LC50: 1890 mg/L
No Effect Level: 1060 mg/L
BIODEGRADATION
COD (mg/gm): 335 Calculated
TOC (mg/gm): 150 Calculated
BOD-5 (mg/gm): 70 Calculated
BOD-28 (mg/gm): 105 Calculated

13. DISPOSAL CONSIDERATIONS

Waste Disposal Refer to appropriate authority in your State. Dispose of material through a licensed waste contractor. Normally suitable for disposal by approved waste disposal agent.

14. TRANSPORT INFORMATION

Transport Information Not classified as Dangerous Goods, according to the Australian Code for the Transport of Dangerous Goods by Road and Rail.

15. REGULATORY INFORMATION

TSCA Inventory Status	All components of this product are listed in the TSCA inventory.
SARA Section 302	No regulated constituent present at OSHA thresholds
SARA (311,312) Hazard Class	Immediate(acute);Delayed(Chronic)
SARA (313) Chemicals	No regulated constituent present at OSHA thresholds
Hazard Category	Harmful,Irritant

16. OTHER INFORMATION

Other Information	Disclaimer: The information herein is to the best of our knowledge, correct and complete. It describes the safety requirements for this product and should not be construed as guaranteeing specific properties. Since methods and conditions are beyond our control we do not accept liability for any damages resulting from the use of, or reliance on, this information in inappropriate contexts.

End of MSDS

Print Date: 20/05/2008 BS: 1.9.11

Material Safety Data Sheet

Uncontrolled Copy

Kleen MCT511

Infosafe℠ No. GBZHL **Issue Date** August 2006 **Status** ISSUED by GE

Classified as hazardous

1. IDENTIFICATION OF THE MATERIAL AND SUPPLI

Product Name	Kleen MCT511
Product Code	2-GCP
Company Name	GE Betz Pty Limited (ABN 84 001 221 941)
Address	69-77 Williamson Road Ingleburn NSW 2565
Emergency Tel.	1800 808 674 (Aus)
Telephone/Fax Number	Tel: +61 2 9827 6100 Fax: +61 2 9827 6150
Product Safety Guide	This product should only be used in accordance to the procedu has established for a specific application. For a technical a GE Betz.
Recommended Use	Membrane cleaner for reverse osmosis systems.
Other Names	None Listed
Other Information	NEW ZEALAND EMERGENCY PHONE No. 24H 0800 442259 Off line MSDS are uncontrolled documents, GE Betz most up to be accessed via internet on www.msdsonline.com.au/gebetz/ The information herein is to the best of our knowledge, corre complete. It describes the safety requirements for this produ not be construed as guaranteeing specific properties. Since n conditions are beyond our control we do not accept liability damages resulting from the use of, or reliance on, this infor inappropriate contexts.

2. HAZARDS IDENTIFICATION

Hazard Classification

HAZARDOUS SUBSTANCE.
NON-DANGEROUS GOODS.

Hazard classification according to the criteria of NOHSC.
Dangerous goods classification according to the Australia Dar
Code.

Risk Phrase(s)

R20 Harmful by inhalation.
R40 Limited evidence of a carcinogenic effect.
R41 Risk of serious damage to eyes.
R37/38 Irritating to respiratory system and skin.

Safety Phrase(s)

S1/2 Keep locked up and out of reach of children.
S26 In case of contact with eyes, rinse immediately with pler
and seek medical advice.
S45 In case of accident or if you feel unwell seek medical ac
immediately
S7/9 Keep container tightly closed in a well ventilated place
S24/25 Avoid contact with skin and eyes.
S36/37/39 Wear suitable protective clothing, gloves and eye/f
protection.

Irritancy of Product

Severe irritant to the skin. Severe irritant to the eyes, pos
corrosive. Irritation of the upper respiratory tract. Prolong
may cause dizziness and headache.

Signs and Symptoms of Exposure

Causes irritation of the skin, eyes, and/or respiratory syste

Medical Conditions Generally Aggravated by Exposure

Pre-existing skin disorders and chronic respiratory disease.

Other Information

Prolonged or repeated exposures may cause primary irritant de
and/or toxicity to the liver and kidney. Product or product c
increase the risk of cancer based on limited animal data.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Characterization

Liquid

Information on Composition

Solution contains Amino alcohol, inogranic base, organic chel

Ingredients	Name	CAS	Proportion
	Nitrilotriacetic SaltAcid, Trisodium Salt	5064-31-3	<1 %
	N-Hydroxyethylenediamine Triacetic Acid Trisodium Salt	139-89-9	10 to 30%
	Triethanolamine	102-71-6	10 to 30 %
	Sodium hydroxide	1310-73-2	<1 %
	Diethanolamine	111-42-2	< 10.0 %
	Ethanolamine	141-43-5	< 10.0 %
	Water and other non hazadous substance	Mixture	>30%

4. FIRST AID MEASURES

Inhalation If nasal, throat or lung irritation develops, remove to fresh medical attention.

Ingestion Give water or milk to drink. DO NOT induce vomiting. Seek med attention. Do not feed anything by mouth to an unconscious or victim.

Skin Immediately remove contaminated clothing and wash affected ar and water. Ensure contaminated clothing is washed before re-u Seek immediate medical attention if irritation develpos or pe

Eye URGENT! Immediately flush eyes with plenty of low pressure wa least 20 minutes whilst removing contact lenses. Hold eyelids See immediate medical attention.

First Aid Facilities Eye wash station, safety shower and normal washroom facilitie

Advice to Doctor Treat symptomatically. No special instructions.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media Dry chemical, carbon dioxide, foam or water.

Hazards from Combustion Products Thermal decomposition (destructive fires) yields elemental ox

Specific Methods Fire fighters shoul wear positive pressure self-contained bre apparatus (full face-piece type).

6. ACCIDENTAL RELEASE MEASURES

Spills & Disposal CLEAN-UP METHODS - SMALL SPILLAGE: Absorb or contain liquid w earth or spill control material. Shovel up using non sparking place in a labelled, sealable container for subsequent safe d leaking containers in a labelled drum or overdrum. Put leakir in a labelled drum or overdrum. Scrub contaminated surfaces w solution. Retain washings as contaminated waste. CLEAN-UP MET SPILLAGE: Transfer to a labelled, sealable container for proc or safe disposal. Treat residues as for small spillage. . Inc ventilation. Wear appropriate protective clothing.

7. HANDLING AND STORAGE

Precautions for Safe Handling Ventilate workplace in such a way that the Occupational Expos (OEL) is not exceeded. Prevent spills and avoid operations wh contaminate clothing and work areas. Ensure the appropriate p protective equipment is used when handling this material.

Conditions for Safe Storage Keep containers closed when not in use. Do not freeze. If fro mix completely prior to use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

National Exposure Standards

Name	STEL (mgm3)	STEL (ppm)	TWA (mgm3)	TWA
Sodium hydroxide			2	
Ethanolamine	15	6	7.5	3

Other Exposure Information

EXPOSURE LIMITS
CHEMICAL NAME

DIETHANOLAMINE (ETHANOL,2,2'-IMINODI-)
PEL (OSHA): 3 PPM
TLV (ACGIH): 2 MG/M3-(SKIN)

NITRILOTRIACETIC ACID,TRISODIUM SALT (NTA.3NA)
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED

N-HYDROXYETHYLENEDIAMINE TRIACETIC ACID TRISODIUM SALT
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED

TRIETHANOLAMINE
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): 5 MG/M3

MONOETHANOLAMINE (ETHANOLAMINE)
PEL (OSHA): 3 PPM(6PPM-STEL)
TLV (ACGIH): 3 PPM(6PPM-STEL)

BENZENE, 1,1'-OXYBIS-,TETRAPROPYLENE DERIVATIVES, SULFONATED,
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED

Engineering Controls	Use with adequate ventilation. Maintain concentration below r exposure limit.
Respiratory Protection	Avoid breathing of vapours, mists or spray. Select and use re accordance with AS/NZS 1715/1716. When mists or vapours excee standards then the use of the following is recommended: Half respirator with organic vapour (Type A) and dust/mist (Type P Filter capacity and respirator type depends on exposure level
Eye Protection	Splash proof chemical goggles.
Hand Protection	Neoprene gloves. Wash off after each use. Replace as necessar

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	Liquid
Appearance	Colourless to amber
Odour	Slight
Solubility in Water	100%
Specific Gravity	1.197 @21CC
pH Value	10.9 (approx)
Vapour Pressure	~18 mmHg
Vapour Density (Air=1)	~5.00
Evaporation Rate	<1.00 (Ether = 1)
Physical State	Liquid
Viscosity	99 cps @21 CC
Flash Point	> 93C P-M(CC)

Other Information Freeze Point = -5oC

10. STABILITY AND REACTIVITY

Chemical Stability Stable under normal storage conditions.

Incompatible Materials May react with strong oxidizers.

Hazardous Decomposition Products Thermal decomposition (destructive fires) yields elemental ox

Hazardous Polymerization Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicology Information Oral LD50 RAT: >2,000 mg/kg
NOTE - Estimated value
Dermal LD50 RABBIT: >2,000 mg/kg
NOTE - Estimated value

Inhalation Inhalation of mists or vapours will result in respiratory irr
Prolonged exposure may cause diziness and headache.

Ingestion May cause irritation of gastrointestinal tract with possible vomiting, abdominal discomfort and diarrhea.

Skin Contact with skin will result in severe irritation.

Eye A severe eye irritant. Possible corrosive to eyes.

Chronic Effects Prolonged or repeated exposure may cause primary irritant der or toxicity to the liver, kidney, nervous system and blood.
May increase the risk of cancer based on limited animal data.

Carcinogenicity A small amount of trisodium salt or nitriloacetic acid (trisc nitrilotriacetate) is present in the product. The IARC categc possible carcinogen. NTA has cause urinary tumours in laborat but there is little likehood that the substance would cause c especially at sub-toxic doses (approx. 1.0L).

12. ECOLOGICAL INFORMATION

Other Information AQUATIC TOXICOLOGY
Daphnia magna 48 Hour Static Renewal Bioassay (pH adjusted)

LC50= 342; No Effect Level= 250 mg/L
Fathead Minnow 96 Hour Static Renewal Bioassay (pH adjusted)
LC50= 61.6; No Effect Level= 25 mg/L
BIODEGRADATION
BOD-28 (mg/g): 142
BOD-5 (mg/g): 130
COD (mg/g): 805
TOC (mg/g): 242

13. DISPOSAL CONSIDERATIONS

Waste Disposal Refer to appropriate authority in your State. Dispose of mate licensed waste contractor. Normally suitable for disposal by disposal agent.

14. TRANSPORT INFORMATION

Transport Information Not classified as Dangerous Goods, according to the Australis Transport of Dangerous Goods by Road and Rail.

15. REGULATORY INFORMATION

TSCA Inventory Status All components of this product are listed in the TSCA invento

SARA Section 302 No regulated constituent present at OSHA thresholds

SARA (311,312) Hazard Class Immediate(acute);Delayed(Chronic)

SARA (313) Chemicals No regulated constituent present at OSHA thresholds

Hazard Category Harmful,Irritant

16. OTHER INFORMATION

Other Information Disclaimer:
The information herein is to the best of our knowledge, corre complete. It describes the safety requirements for this produ not be construed as guaranteeing specific properties. Since n conditions are beyond our control we do not accept liability damages resulting from the use of, or reliance on, this infor inappropriate contexts.

End of MSDS

Print Date: 20/05/2008

Material Safety Data Sheet

Uncontrolled Copy

Betzdearborn DCL30

Infosafe™ No. GBZ6O **Issue Date** December 2007 **Status** ISSUED by GEBETZ BS: 1.9.11

Classified as hazardous

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name Betzdearborn DCL30

Product Code 2-GCP

Company Name GE Betz Pty Limited (ABN 84 001 221 941)

Address 69-77 Williamson Road Ingleburn
NSW 2565

Emergency Tel. 1800 808 674 (Aus)

Telephone/Fax Number Tel: +61 2 9827 6100
Fax: +61 2 9827 6150

Product Safety Guide This product should only be used in accordance to the procedures GE Betz has established for a specific application. For a technical advice contact GE Betz.

Recommended Use Dechlorination Agent.

Other Names Not Available

Other Information NEW ZEALAND EMERGENCY PHONE No.
24H 0800 442259

Off line MSDS are uncontrolled documents, GE Betz most up to date MSDS can be accessed via internet on www.msdsonline.com.au/gebetz/
The information herein is to the best of our knowledge, correct and complete. It describes the safety requirements for this product and should not be construed as guaranteeing specific properties. Since methods and conditions are beyond our control we do not accept liability for any damages resulting from the use of, or reliance on, this information in inappropriate

contexts.

2. HAZARDS IDENTIFICATION

Hazard Classification

HAZARDOUS SUBSTANCE.
DANGEROUS GOODS.

Hazard classification according to the criteria of NOHSC.
Dangerous goods classification according to the Australia Dangerous Goods Code.

Risk Phrase(s)

R22 Harmful if swallowed.
R31 Contact with acids liberates toxic gas.
R41 Risk of serious damage to eyes.
R42/43 May cause sensitisation by inhalation and skin contact
R36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrase(s) S1/2 Keep locked up and out of reach of children.
S20 When using do not eat or drink.
S23 Do not breathe gas/fumes/vapour/spray
S24/25 Avoid contact with skin and eyes.
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

Irritancy of Product May cause slight irritation to the skin. Skin sensitiser. Severe irritant to the eyes. Mists/aerosols may cause irritation to mucous membrances. Repeated exposure may result in respiratory sensitisation.

Signs and Symptoms of Exposure May cause local irritation or a sensitization reaction upon direct contact with skin or respiratory tract.

Medical Conditions Generally Aggravated by Exposure Asthma

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Characterization Liquid

Information on Composition Solution contains inorganic salts and water.

Ingredients	Name	CAS	Proportion
	Sodium metabisulphite	7681-57-4	20-40 %
	Water and other non hazadous substance	Mixture	60-80 %

Other Information

R22 Harmful if swallowed.
R31 Contact with acids liberates toxic gas.
R36/37/38 Irritating to eyes, respiratory system and skin.
R41 Risk of serious damage to eyes.
R42/43 May cause sensitisation by inhalation and skin contact

4. FIRST AID MEASURES

Inhalation

Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration.
Seek immediate medical attention.

Ingestion

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting.
Immediately seek medical attention.
Dilute contents of stomach using 3-4 glasses milk or water.

Skin

Wash thoroughly with soap and water. Remove contaminated clothing.
Thoroughly wash clothing before reuse.
Seek medical attention if irritation develops or persists.

Eye

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes.
Seek immediate medical attention.

First Aid Facilities

Eye wash station, safety shower and normal washroom facilities.

Advice to Doctor

No special instructions. Treat symptomatically.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media

Dry chemical, carbon dioxide, foam or water.

Hazards from Combustion Products

Thermal decomposition (destructive fires) yields elemental oxides.

Specific Methods Fire fighters should wear positive pressure self-contained breathing apparatus (full face type).

Hazchem Code 2X

Other Information UN3082

6. ACCIDENTAL RELEASE MEASURES

Spills & Disposal Increase ventilation. Avoid breathing dust or vapours and contact with skin and eyes. Wear appropriate protective clothing. CLEAN-UP METHODS - SMALL SPILLAGE: Absorb or contain liquid with sand, earth or spill control material. Shovel and place in a labelled, sealable container for subsequent safe disposal. Put leaking containers in a labelled drum or overdrum. Scrub contaminated surfaces with detergent solution. Retain washings as contaminated waste.
CLEAN-UP METHODS - LARGE SPILLAGE: Transfer to a labelled, sealable container for product recovery or safe disposal. Treat residues as for small spillage.
Wet area may be slippery. Spread sand / grit.

7. HANDLING AND STORAGE

Precautions for Safe Handling When using do not eat or drink. When opening containers, avoid inhalation of headspace gases. Ventilate workplace in such a way that the Occupational Exposure Limit (OEL) is not exceeded. Prevent spills and avoid operations which contaminate clothing and work areas. Ensure the appropriate personal protective equipment is used when handling this material. Vent carefully before opening. Sulfur dioxide can be formed during the normal use and handling of this product.

Conditions for Safe Storage Keep containers closed when not in use. Protect from freezing. If frozen, thaw and mix completely prior to use.
Do not store at elevated temperatures.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

National Exposure Standards

Name	STEL (mgm3)	STEL (ppm)	TWA (mgm3)	TWA (ppm)	FootNote
Sodium metabisulphite			5		

Engineering Controls Use with adequate ventilation. Maintain concentration below recommended exposure limit.

Respiratory Protection	Avoid breathing of vapours, mists or spray. Select and use respirators in accordance with AS/NZS 1715/1716. When mists or vapours exceed the exposure standards then the use of the following is recommended: Half face-piece respirator with organic vapour (Type A) and dust/mist (Type P1) filters. Filter capacity and respirator type depends on exposure levels.
Eye Protection	Splash proof chemical goggles, face shield.
Hand Protection	Gauntlet-type neoprene gloves. Chemical resistant apron. Wash off after each use. Replace as necessary.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	Liquid
Appearance	Colourless to light yellow
Odour	Strong
Freezing Point	-8oC
Solubility in Water	100%
Specific Gravity	1.268 @ 21oC
pH Value	4.5 (approx)
Vapour Pressure	~18mm Hg
Vapour Density (Air=1)	<1.00
Evaporation Rate	<1.00 (Ether = 1)
Physical State	Liquid
Viscosity	6cps @ 21oC
Pour Point	-5oC
Flash Point	>93oC SETA(CC)
Other Information	Percent VOC: 0.0

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under normal storage conditions.
Conditions to Avoid	Protect from freezing. Keep away from heat.
Incompatible Materials	Avoid contact with strong acids and oxidisers
Hazardous Decomposition Products	Thermal decomposition (destructive fires) yields elemental oxides.
Hazardous Polymerization	Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicology Information	Oral LD50 RAT: >2,000 mg/kg Dermal LD50 RABBIT: >2,000 mg/kg NOTE - Estimated value Skin Irritation Score RABBIT: 0 NOTE - NO ERYTHEMA OR EDEMA WAS OBSERVED IN TEST OF SIMILAR PRODUCT
Inhalation	May cause irritation to mucous membranes. Repeated exposure may result in respiratory sensitization.
Ingestion	May cause gastrointestinal irritation. Very large doses may cause diarrhea, depression, colic and death. May also cause severe allergic reactions in sensitive individuals.
Skin	Primary route of exposure; May cause slight irritation to the skin. Skin sensitizer.
Eye	Severe irritant to the eyes.
Chronic Effects	Prolonged or repeated exposures may cause primary irritant dermatitis, skin sensitization, and/or allergic respiratory reactions.

12. ECOLOGICAL INFORMATION

Other Information	AQUATIC TOXICOLOGY Daphnia magna 48 Hour Static Renewal Bioassay LC50= 225; No Effect Level= 160 mg/L Fathead Minnow 96 Hour Static Renewal Bioassay

LC50= 225; No Effect Level= 160 mg/L
Menidia beryllina (Silversides) 96 Hour Static Acute Bioassay (pH adjusted) LC50= 930; No Effect Level= 156 mg/L
Mysid Shrimp 48 Hour Static Acute Bioassay (pH adjusted) LC50= 370; No Effect Level= 156 mg/L
Rainbow Trout 48 Hour Static Screen
100% Mortality= 500; 0% Mortality= 100 mg/L

BIODEGRADATION
Product contains only inorganics that are not subject to typical biological degradation. Assimilation by microbes may occur in waste treatment or the environment.

COD (mg/g): 49

13. DISPOSAL CONSIDERATIONS

Waste Disposal Refer to appropriate authority in your State. Dispose of material through a licensed waste contractor. Normally suitable for disposal by approved waste disposal agent.

14. TRANSPORT INFORMATION

U.N. Number 3082

Proper Shipping Name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. - (Contains Sodium metabisulphite)

DG Class 9

Hazchem Code 2X

Packaging Method 3.8.9

Packing Group III

EPG Number 9C1

IERG Number 47

15. REGULATORY INFORMATION

TSCA Inventory Status All components of this product are listed in the TSCA inventory.

SARA Section

302	No regulated constituent present at OSHA thresholds
SARA (311,312) Hazard Class	Immediate(acute);Delayed(Chronic)
SARA (313) Chemicals	No regulated constituent present at OSHA thresholds
Hazard Category	Harmful,Irritant

16. OTHER INFORMATION

Other Information	Disclaimer: The information herein is to the best of our knowledge, correct and complete. It describes the safety requirements for this product and should not be construed as guaranteeing specific properties. Since methods and conditions are beyond our control we do not accept liability for any damages resulting from the use of, or reliance on, this information in inappropriate contexts.

End of MSDS

Print Date: 20/05/2008 BS: 1.9.11

Material Safety Data Sheet

Uncontrolled Copy

Hypersperse MDC200

Infosafe™ No. GBZ5G **Issue Date** July 2007 **Status** ISSUED by GEBETZ BS: 1.9.11

Not classified as hazardous

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name Hypersperse MDC200

Product Code 2-GCP

Company Name GE Betz Pty Limited (ABN 84 001 221 941)

Address 69-77 Williamson Road Ingleburn
NSW 2565

Emergency Tel. 1800 808 674 (Aus)

Telephone/Fax Number Tel: +61 2 9827 6100
Fax: +61 2 9827 6150

Product Safety Guide This product should only be used in accordance to the procedures GE Betz has established for a specific application. For a technical advice contact GE Betz.

Recommended Use Reverse osmosis antiscalant.

Other Names None Listed

Other Information NEW ZEALAND EMERGENCY PHONE No.
24H 0800 442259

Off line MSDS are uncontrolled documents, GE Betz most up to date MSDS can be accessed via internet on www.msdsonline.com.au/gebetz/
The information herein is to the best of our knowledge, correct and complete. It describes the safety requirements for this product and should not be construed as guaranteeing specific properties. Since methods and conditions are beyond our control we do not accept liability for any damages resulting from the use of, or reliance on, this information in inappropriate

contexts.

2. HAZARDS IDENTIFICATION

Hazard Classification

NON-HAZARDOUS SUBSTANCE.
NON-DANGEROUS GOODS.

Hazard classification according to the criteria of NOHSC. Dangerous goods classification according to the Australia Dangerous Goods Code.

Risk Phrase(s)

None Allocated

Safety Phrase(s) S1/2 Keep locked up and out of reach of children.
S36/37 Wear suitable protective clothing and gloves.

Irritancy of Product May cause slight irritation to the skin. May cause slight irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

Signs and Symptoms of Exposure May cause redness or itching of skin.

Medical Conditions Generally Aggravated by Exposure Not known.

Environmental Hazards The product is not classified as dangerous for the environment.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Characterization Liquid

Information on Composition A solution of water,an organic salt, a phosphonic acid derivative and analkenyl polymer.

Ingredients

Name	CAS	Proportion
Non Hazardous solution of Water, Organic Salts,	Mixture	100%

	Phosphoric Acid Derivative and Alkenyl Polymer
Other Information	This product is classified as NON HAZARDOUS according to the criteria of NOHSC.

4. FIRST AID MEASURES

Inhalation	If nasal, throat or lung irritation develops, remove to fresh air and seek medical attention.
Ingestion	Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately seek medical attention. Dilute contents of stomach using 3-4 glasses milk or water.
Skin	Wash thoroughly with soap and water. Remove contaminated clothing. Seek medical attention if irritation develops or persists. Thoroughly was contaminated clothing before re-use.
Eye	Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Seek medical attention if irritation persists after flushing.
First Aid Facilities	Eye wash station, safety shower and normal washroom facilities.
Advice to Doctor	No special instructions. Treat symptomatically.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media	Dry chemical, carbon dioxide, foam or water.
Hazards from Combustion Products	Thermal decomposition (destructive fires) yields elemental oxides.
Specific Methods	Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

6. ACCIDENTAL RELEASE MEASURES

Spills & Disposal	Increase ventilation. Avoid breathing dust or vapours and contact with skin and eyes. Wear appropriate protective clothing. CLEAN-UP METHODS - SMALL SPILLAGE: Absorb or contain liquid with sand, earth or spill control material. Shovel and place in a labelled, sealable container for subsequent safe disposal. Put leaking containers in a labelled drum or overdrum. Scrub contaminated surfaces with detergent solution. Retain washings as contaminated waste. CLEAN-UP METHODS - LARGE SPILLAGE: Transfer to a labelled, sealable container for product recovery or safe disposal. Treat residues as for small spillage. Wet area may be slippery. Spread sand / grit.

7. HANDLING AND STORAGE

Precautions for Safe Handling	When using do not eat or drink. Only use in well-ventilated areas. Prevent spills and avoid operations which contaminate clothing and work areas. Ensure the appropriate personal protective equipment is used when handling this material. Maintain general industrial hygiene practices when using this product.
Conditions for Safe Storage	Keep containers closed when not in use. Do not freeze. If frozen, thaw and mix completely prior to use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Other Exposure Information	This product is classified as NON HAZARDOUS according to the criteria of NOHSC.
Engineering Controls	Use with adequate ventilation.
Respiratory Protection	Avoid breathing of vapours, mists or spray. Select and use respirators in accordance with AS/NZS 1715/1716. When mists or vapours exceed the exposure standards then the use of the following is recommended: Half face-piece respirator with organic vapour (Type A) and dust/mist (Type P1) filters. Filter capacity and respirator type depends on exposure levels.
Eye Protection	Splash proof chemical goggles.
Hand Protection	Neoprene gloves. Wash off after each use. Replace as necessary.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form	Liquid

Appearance	Light Amber
Odour	Mild
Freezing Point	-8oC
Solubility in Water	100%
Specific Gravity	1.142 @21oC
pH Value	5.0 (approx)
Vapour Pressure	~18 mmHg
Vapour Density (Air=1)	<1.00
Evaporation Rate	<1.00 (Ether = 1)
Physical State	Liquid
Viscosity	16 cps @21oC
Pour Point	-5oC
Flash Point	> 93C P-M(CC)

10. STABILITY AND REACTIVITY

Chemical Stability	Stable under normal storage conditions.
Conditions to Avoid	Keep away from heat.
Incompatible Materials	May react with strong oxidizers.
Hazardous Decomposition Products	Thermal decomposition (destructive fires) yields elemental oxides.
Hazardous Polymerization	Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicology Information
Oral LD50 RAT: >2,000 mg/kg
NOTE - Estimated value
Dermal LD50 RABBIT: >2,000 mg/kg
NOTE - Estimated value

Inhalation Mists/aerosols may cause irritation to upper respiratory tract.

Ingestion May cause slight gastrointestinal irritation.

Skin Primary route of exposure; May cause slight irritation to the skin.

Eye May cause slight irritation to the eyes.

Chronic Effects No evidence of potential chronic effects.

12. ECOLOGICAL INFORMATION

Other Information
AQUATIC TOXICOLOGY
Daphnia magna 48 Hour Static Acute Bioassay
0% Mortality= 2000 mg/L
Fathead Minnow 96 Hour Static Bioassay with 48-Hour Renewal
0% Mortality= 2000 mg/L
Rainbow Trout 96 Hour Static Bioassay with 48-Hour Renewal
0% Mortality= 2000 mg/L
Sheepshead minnow (mg/l) LC50 : 2180 96 hour static bioassay

BIODEGRADATION
COD (mgO2/g) 172

13. DISPOSAL CONSIDERATIONS

Waste Disposal Refer to appropriate authority in your State. Dispose of material through a licensed waste contractor. Normally suitable for disposal by approved waste disposal agent.

14. TRANSPORT INFORMATION

Transport Information Not classified as Dangerous Goods, according to the Australian Code for the Transport of Dangerous Goods by Road and Rail.

15. REGULATORY INFORMATION

Regulatory Information Maximum Concentration is 10mg/L. (NSF requirement).

16. OTHER INFORMATION

Other Information

Disclaimer:
The information herein is to the best of our knowledge, correct and complete. It describes the safety requirements for this product and should not be construed as guaranteeing specific properties. Since methods and conditions are beyond our control we do not accept liability for any damages resulting from the use of, or reliance on, this information in inappropriate contexts.

End of MSDS

Print Date: 20/05/2008 BS: 1.9.11