Material Safety Data Sheet (Component A)

GT Products Inc.
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Grapevine, Texas 76051

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Product Identification

Chemical family: Polyurethane Prepolymer
Product name: ButterOn 85 D
Formula: The specific chemical formula for this material is a trade secret of GT Products, Inc.

Composition Information / Ingredients

Ingredient Name / CAS Number	Exposure Limits	Concentration
4,4' – Diphenylmethane Diisocyanate (MDI) CAS number 101-68-8	OSHA: .02 ppm ceiling .20 mg/m3 ceiling ACGIH: .005 ppm TWA 0951 mg/m3 TWA	Upper bounds 22.5% by weight
Higher Oligomers of MDI CAS number 9016-87-9	OSHA: not established ACGIH: not established	22.5% by weight
Diphenylmethane Diisocyanate (MDI)	OSHA: not established ACGIH: not established	5% by weight
Toluene diisocyanate (TDI) CAS number 26471-62-5	OSHA: PEL 0.02 ppm ceiling ACGIH: .005 ppm TWA	Less that 1% by weight
Dicyclohexylmethane – 4,4 Diisocyanate CAS number 5124-30-1	OSHA: .01 ppm ceiling ACGIH: .005 ppm TWA	Less that 1% by weight

Hazardous Material Identification

Warning! May cause eye, skin and respiratory tract irritation. Harmful if inhaled, may cause allergic skin reaction, and may cause lung damage. Toxic gases/fumes are given off during burning or thermal decomposition.
Primary route(s) of entry: skin absorption, inhalation and ingestion.
Acute inhalation: MDI/TDI vapors or mist at concentrations above the TLV can irritate (burning sensation) the mucous membranes in the respiratory tract (nose, throat and lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with a preexisting, nonspecific bronchial hyperactivity can respond to concentrations below the TLV with similar symptoms as well as asthma attack. Exposure well above the TLV may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). These effects are usually reversible. Chemical or hypersensitive pneumonitis, with flu-like symptoms (fever and chills) has also been reported. These symptoms can be delayed up to several hours after exposure.
Chronic inhalation: as a result of previous repeated overexposure or a single large dose, certain individuals develop symptoms to isocyanates at levels well below the TLV. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthma attack, could be immediate or delayed (up to several hours after exposure), similar to many non-specific asthmatic responses. There are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Overexposure to isocyanates has also been reported to cause lung damage including decrease in lung function, which may be permanent. Sensitization can either be temporary or permanent.
Acute skin contact: isocyanates react with skin protein and moisture and can cause irritation, which may include the following symptoms, reddening, swelling, rash, scaling or blistering. Cured material is difficult to remove.
Chronic skin contact: prolonged contact can cause reddening, swelling, rash, scaling, blistering and in some cases skin sensitization. Individuals who have skin sensitization can develop these symptoms from contact with liquid vapors. Animal tests have indicated that respiratory sensitization can result from skin contact with MDI. This data reinforces the need to prevent skin contact with MDI (see Toxicological information).
Acute eye contact: liquid, aerosols or vapors are irritating and can cause tearing, reddening and swelling. If left untreated, corneal damage can occur and injury is slow to heal. However, damage is usually reversible (see Emergency and first aid procedure).
Acute ingestion: can result in irritation and corrosive action in the mouth, stomach tissue and digestive tract. Symptoms can include sore throat, abdominal pain, nausea, vomiting and diarrhea.
Carcinogenicity (MDI): neither MDI nor polymeric MDI are listed by the NTP, IARC or regulated by OSHA as carcinogens.
NTP: not listed
IARC: not listed
OSHA: not regulated
Medical conditions aggravated by exposure: asthma, other respiratory disorders (bronchitis, emphysema, bronchial hyperactivity), skin allergies and eczema.
Carcinogenicity (TDI): TDI is listed as a carcinogen by IARC (2B) and NTP. TDI has been shown to cause cancer in lab animals when administered orally. Carcinogenicity through inhalation (most likely route of industrial exposure) has not been proven.
Medical conditions aggravated by exposure: asthma, other respiratory disorders (bronchitis, emphysema and bronchial hyperactivity), skin allergies and eczema.

Emergency and first aid procedure

Eyes: flush with copious amounts of water, preferably lukewarm water for at least 15 minutes, holding eyelids open all the time. Refer individual to physician or ophthalmologist for immediate follow-up.
Skin: remove contaminated clothing. Wash affected skin thoroughly with soap and water. Wash contaminated clothing thoroughly before reuse. For severe exposure, get under safety shower after removing clothing, then get medical attention. For lesser exposures, seek medical attention if irritation develops or persists after the area is washed.
Inhalation: move to an area free from risk of further exposure. Administer oxygen or artificial respiration if needed. Obtain medical attention. Asthmatic-type symptoms may develop and may be immediate or delayed up to several hours. Consult physician should this occur.
Ingestion: **do not** induce vomiting. Give 1 to 2 cups of milk or water to drink. **Do not** give anything by mouth to an unconscious person. Consult physician.
Note for physician:
Eyes: stain for evidence of corneal injury. If cornea is burned, instill antibiotic steroid preparation frequently. Work place vapors have produced reversible corneal epithelial edema impairing vision.
Skin: this compound is a known skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burns. If burned, treat as thermal burn.
Ingestion: treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of this compound.
Respiratory: this compound is a known pulmonary sensitizer. Treatment is essentially symptomatic. An individual having a skin or pulmonary sensitization reaction to this material should be removed from exposure to any isocyanate.

Fire and explosion hazard data

Flash point: 390° F (198.8° C) Pensky-Martens Closed
Extinguishing media: dry chemical, carbon dioxide, foam and water spray for large fires.

Full emergency equipment with self contained breathing apparatus and full protective clothing should be worn by firefighters. During a fire, MDI vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion (see Stability and reactivity). At temperatures greater than 400° F (204° C) polymeric MDI can polymerize and decompose, which can cause pressure build up in closed containers. Explosive rupture is possible, therefore use cold water to cool fire-exposed containers.

Accidental release measures

GT Products, Inc. requires that Chemtrec be notified immediately when this product is unintentionally released from its container during its course of distribution, regardless of the amount released. Distribution includes transportation, storage incidental to transportation, loading and unloading. Such notification must be immediate and made by the person having knowledge of the release.
Evacuate and ventilate spill area. Dike spill to prevent entry into water system. Wear full protective equipment during clean up (see Personal protection).
Major spill: call GT Products, Inc. If transportation spill, call Chemtrec. If temporary control of isocyanate vapor is required, a blanket of protection foam (available at most fire departments) may be placed over the spill. Large quantities may be pumped into closed, but not sealed container for disposal.
Minor spill: absorb isocyanates with sawdust or other absorbents. Shovel into suitable unsealed containers, transport to well ventilated area (outside) and treat with neutralizing solution, a mixture of water (80%) with non-ionic surfactant Tergitol TMN-10 (20%), or water (90%), concentrated ammonia (3-8%) and detergent (2%). Add about 10 parts of neutralizer per part of isocyanate with mixing. Allow to stand uncovered for 48 hours to let CO_2 escape.
Clean up: decontaminate floor with decontamination solution letting stand for at least 15 minutes.

Special precautions and storage data

Storage temperature: 64° F (18° C) minimum, 86° F (30° C) maximum.
Shelf life: 6 months.
Special sensitivity: if container is exposed to high heat, 400° F (204° C) it can be pressurized and possibly rupture. MDI reacts slowly with water to form CO_2 gas. This gas can cause sealed containers to expand and possibly rupture.
Store in tightly closed containers to prevent moisture contamination. **Do not** reseal if contamination is suspected. Avoid contact with skin and eyes. Do not breathe aerosols or vapors. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent chronic overexposure from inhalation. This material can produce asthmatic sensitization upon repeated inhalation exposure to lower concentrations. Exposure to vapors of heated MDI can be extremely dangerous. Employee education and training in the safe use and handling of this compound are required under the OSHA Hazard Communication Standard.

Personal protection

Eye protection: liquid chemical goggles. Vapor resistant goggles should be worn when contact lenses are in use. In a splash hazard environment chemical goggles should be used in combination with a full-face shield.
Skin protection: permeation resistant gloves (butyl rubber, nitrile rubber and polyvinyl alcohol). However, please note that PVA degrades in water. Cover as much of the exposed skin area as possible with appropriate clothing. If skin creams are used, keep area covered by the cream to a minimum.
Ventilation: local exhaust should be used to maintain levels below the TLV whenever MDI is processed, heated or spray applied. Standard reference sources regarding industrial ventilation (ACGIH Industrial Ventilation) should be consulted for guidance about adequate ventilation.
Respirator: concentrations greater than the TLV can occur when MDI is sprayed, heated or used in a poorly ventilated area. In such cases, or whenever concentrations of MDI exceed the TLV or are not known, respiratory protection must be worn. A supplied air respirator (either positive pressure or continuous flow type) is required. In an emergency situation, a self-contained breathing apparatus may be used. MDI has poor warning properties, since the concentration at which MDI can be smelled is substantially higher than the maximum exposure limit. Observe OSHA regulations for respirator use (29 CFR 1910.134).
Monitoring: isocyanate exposure levels must be monitored. Monitoring of airborne isocyanates in the breathing zone of individuals should become part of the overall employee exposure characterization program. NIOSH and OSHA have developed monitoring techniques. Upon request, GT Products, Inc. can make available methods, which are modifications of these HIOSH, and OSHA methods.
Medical surveillance: medical supervision of all employees who handle or come in contact with isocyanates is recommended. These should include pre-employment and periodic medical examinations with pulmonary function tests (FEC, FVC as a minimum). Persons with asthmatic-type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent skin eczema or sensitization should be excluded from working with isocyanates. Once a person is diagnosed as sensitized to an isocyanate, no further exposure should be permitted.
Additional protective measures: safety showers and eyewash stations should be available. Educate and train employees in safe use of product. Follow all label instructions. For additional information, contact GT Products, Inc.

Physical properties

Physical form: liquid.
Color: clear.
Odor: slightly musty odor.
Odor threshold: not established.
pH: not established.
Boiling point: 406° F (208° C) at 5 mm Hg for MDI.
Melting/Freezing point: below 32° F (0° C) for MDI.
Viscosity: 1100 cps @ 77° F (25° C).
Solubility in water: not soluble, reacts slowly with water to liberate CO_2 gases.
Specific Gravity: 1.24 @ 77° F (25° C).
Bulk density: 9 lbs/gal.
% volatile by volume: negligible.
Vapor pressure: less than 10 – 5 mm Hg @ 77° F (25° C) for MDI.
Vapor density: 8.5 (MDI) (air = 1).

Stability and reactivity

Stability: this is a stable material.
Hazardous polymerization: may occur; contact with moisture, other materials that react with isocyanates or temperatures about 400° F (204° C) may cause polymerization.
Incompatibilities: water, amines, strong bases and alcohols will cause some corrosion to copper alloys and aluminum.
Instability conditions: contamination with water and high temperatures above 400° F (204° C).
Decomposition products: by high heat and fire, carbon monoxide, oxides of nitrogen, traces of HCN, MDI vapors or aerosols.

Toxicological information

Acute toxicity:
Oral LD50: greater than 15,800 mg/kg (rat).
Dermal LD50: greater than 5,010 but less than 7,940 mg/kg (rabbit).
Inhalation LC50: the 4-hour LC50 for polymeric MDI in rat's ranges from 370 to 490 mg/m3. The LC50 for monomeric MDI was estimated to be between 172 and 187 mg/m3.
Eye effects: slight to moderate irritation.
Skin effects: slight to moderate irritation.
Sensitization: MDI has been shown to produce dermal sensitization in laboratory animals. Evidence of respiratory sensitization has also been observed in guinea pigs. In addition, there is some evidence suggestive of cross-sensitization between different types of diisocyanates.

Chronic toxicity: In a combined chronic inhalation toxicity/oncogenicity study, rats were exposed to an aerosol of polymeric MDI for 6-hours per day, 5-days per week for one or two years. The exposure concentrations were 0, .02, 1.0 and 6.0 mg/m3. Microscopic examination of tissues revealed the effects of irritation to the nasal cavity and lungs in animals exposed to 1.0 and 6.0 mg/m3. The No Observable Effect Level (NOEL) was 0.2 mg/m3.
Carcinogenicity: In the study described above (Chronic Toxicity), the occurrence of pulmonary adenomas and a single pulmonary adenocarcinoma was considered to be related to MDI. These tumors were observed only in rats exposed to the high concentration of 6.0 mg/m3.
Mutagenicity: positive (Salmonella microsome test with metabolic activation, cell transformation assay) as well as negative (mouse lymphoma specific locus mutation test with or without metabolic activation) results have been observed "in vitro". However, MDI was negative in an "in vitro" (mouse micronucleus) assay.
Developmental toxicity: rats were exposed to polymeric MDI at air concentrations of 0, 1, 4 and 12 mg/m3 during days 6 through 15 of gestation. Maternal toxicity (including mortality) was observed at the highest concentration of 12 mg/m3 accompanied by embryo and fetal toxicity. However, no eratogenic effects were observed even at this lethal concentration.

Ecological information

Diphenylmethane Diisocyanate (Monomeric and Polymeric)
Aquatic toxicity: LC50 24-hours (static) – greater than 500 mg/liter for Daphnia magna, Limnea stagnalis and Zebra fish (Brachydanio rerio) for both polymeric and monomeric MDI.

Disposal considerations

Waste must be disposed of in accordance with local, state and federal environmental control regulations. Incineration is the preferred method.
Empty container precautions: empty containers must be handled with care due to product residue. Decontaminate containers prior to disposal. Empty decontaminated containers should be crushed to prevent reuse. **Do not** heat or cut empty container with electric or gas torch (Fire and explosion hazard data, and Stability and reactivity). Gases may be highly toxic.

Shipping information

Technical shipping name: Methylene diphenyl diisocyanate – DOT (Domestic Surface).
Proper shipping name: chemicals, N.O.I. (isocyanate, NMFC 60,000) – non-regulated.
Hazard class or division: none.
UN/NA number: none.
Freight class: 55.
Packaging group: none.
Hazardous substance: Methylene Diphenyl Diisocyanate.
DOT product RQ lbs: 5000 lbs.
Hazard panel(s): none.
Hazard placard(s): none.
When in individual containers of less than the product RQ, this material ships as non-regulated.
IMO/IMDG code (ocean) – Hazard class division number: non-regulated.
ICAO/IATA (air) – Hazard class division number: non-regulated.

Regulatory information

OSHA status: this product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.
Cercla reportable quantity: 5000 lbs. for 4,4' – Diphenylmethane Diisocyanate, CAS #101-68-8.
Sara title III:
Section 302 Extremely Hazardous Substances: none.
Section 311/312 Hazard Categories: immediate health hazard, delayed health hazard, reactive hazard.
Section 313 Toxic Chemicals: Polymeric Diphenylmethane Diisocyanate, CAS #9016-87-9, 100%. Contained in this polymeric MDI product is 4,4' – Diphenylmethane Diisocyanate, CAS #101-68-8, upper bound 45%, Toluene Diisocyanate less than 1%.
RCRA status: MDI is not listed as a hazardous waste. To the best of our knowledge, MDI does not meet the criteria of a hazardous waste if discarded in its purchased form. However, under RCRA, it is the responsibility of the user of products to determine, at the time of disposal, whether a product meets any of the criteria for a hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting material hazardous, under the criteria of ignitability, corrosive, reactivity and toxicity characteristics under the new Toxicity Characteristics Leaching Procedure (TCLP) 40 Code of Federal Regulations 261.20-24.
The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Component Name / CAS Number	Concentration	State Code
4,4' – Diphenylmethane Diisocyanate (MDI) CAS number 101-68-8	Upper bound 45%	PA1, FL, IL, MA, NJ1, NJ$, CN2
Higher Oligomers of MDI CAS number 9016-87-9	45% to 55%	PA3 NJ4
Diphenylmethane Diisocyanate (MDI) CAS number 26447-40-5	1% to 10%	PA3 NJ4
Phenyl isocyanate CAS number 103-71-9	Trace - ppm	MA

FL Florida Substance List.
IL Illinois Toxic Substance List.
MA Massachusetts Hazardous Substance List.
NJ1 New Jersey Hazardous Substance List.
NJ4 New Jersey Other – included in 5 predominant ingredients > 1%.
PA1 Pennsylvania Hazardous Substance List.
PA3 Pennsylvania Non-hazardous present at 3% or greater.
RI Rhode Island List of Designated Substances.
CN2 Canada WHMIS Ingredient Disclosure List over 0.1%.

California Proposition 65:
Component A for this product contains the following chemicals that are know to cause cancer, and are listed under California Proposition 65.

Ingredient Name / CAS Number	Exposure Limits	Concentration
Toluene diisocyanate (TDI) CAS number 26471-62-5	OSHA: PEL 0.02 ppm ceiling ACGIH: .005 ppm TWA	Less that 1% by weight

Other information

NFPA 704M Ratings:	Health	Flammability	Reactivity	Other
	3	1	1	

0 – Insignificant
1 – Slight
2 – Moderate
3 – High
4 – Extreme

HMIS Ratings:	Health	Flammability	Reactivity	Other
	3*	1	1	

0 – Minimal
1 – Slight
2 – Moderate
3 – Serious
4 – Severe
* Chronic Health Hazard

Material Safety Data Sheet (Component B)

Product Identification

Chemical family: Hydroxy terminated poly (oxyalkylene) polyol.
Product name: ButterOn 85 D
Formula: The specific chemical formula for this material is a trade secret of GT Products, Inc.
Chemical name: blend of Polyol and Aromatic Diamine.
CAS number: 9082-00-2.
Percent range: 80% to 90%.

Composition Information / Ingredients

Ingredient Name / CAS Number	Exposure Limits	Concentration
Proprietary aryl mercury compound	OSHA: PEL 0.1 mg/m3 – ceiling ACGIH: TLV 0.1 mg/m3 TWA	0.083% by weight
Aromatic Diamine	OSHA: not established ACGIH: not established	1% to 3%

Hazardous Material Identification

Primary route(s) of entry: skin absorption, inhalation and ingestion.
Eyes: eye irritant, flush eyes with water. Seek medical attention if irritation persists.
Skin: skin irritant, wash any substance off skin with water. Seek medical attention if irritation persists.
Ingestion: immediately drink water to dilute. Induce vomiting. Consult a physician. **Do not take internally.**
Inhalation: this product is not a inhalation hazard at room temperature. Vapors or aerosol can be generated from heating or spraying and may cause respiratory irritation.
Odor threshold: there is no data for odor threshold.
Irritation threshold: there is no data for irritation threshold.
Chronic: this product contains an extremely small amount of an aryl mercury compound (0.083%). In general, long-term exposure to mercury compounds has been found to cause adverse reproductive, central nervous system and kidney effects.
Carcinogenicity: not designated as a carcinogen by NPT, IARC of OSHA.

Emergency and first aid procedure

Fire and explosion hazard data

Flammable: no.
Combustible: no.
Pyrophoric: no.
Flash point: 300° - 500° F (150° - 260° C), test method – Cleveland Open Cup.
Auto ignition temperature: no data.
Flammable limits at normal atmospheric temperature and pressure (percent volume in air): LEL – no data, UEL – no data.
NFPA ratings: not established.

HMIS ratings:	Health	Flammability	Reactivity
	1	1	0

Extinguishing media: carbon dioxide, dry chemical and water spray.
Use water to cool containers exposed to fire. Water may cause frothing if it gets below the surface of the liquid and turns to steam. Water fog gently applied to the surface may cause frothing, which may extinguish the fire.

Accidental release measures

Reportable quantity: not applicable (per 40 CFR 300.4).
Spill mitigation procedures: stop source of spill as soon as possible and notify appropriate personnel.
Air release: not applicable.
Water release: this material is slightly soluble in water and may be subject to emulsification. Divert flow of water and contain that which is contaminated. Remove as a liquid utilizing a vacuum or pumping system as possible.
Land spill: dike spill area and begin to remove as a liquid. If unable to do so, then absorb in clay, sand or a commercial absorbent and containerize for disposal.
Spill residues: dispose of per guidelines under Section XII – Waste Disposal.

Special precautions and storage data

Shelf life: minimum 1 year (closed container).
Incompatible materials for packaging: use glass of vinyl lined containers. Recommend lined steel (Amercoat #23 vinyl coating 5-coat system), 304SS.

Incompatible materials for storage on transport: strong oxidizers.
Do not store at temperatures above 120° F (49° C). Product is hygroscopic, protect with padding of dry air –40° F (-40° C) dew point or dry nitrogen. Calcium chloride drying system with silica gel on the vents can also be used.

Personal protection

Ventilation: local exhaust ventilation is recommended if vapors, mists or aerosols are generated. Otherwise, use general exhaust ventilation.
Eye protection: use safety glasses with side shields.
Respiratory protection: not normally required at room temperature. In the absence of good ventilation, or vapor or mist generated through heating or spray applications use supplied air respirator or respirator equipped with organic vapor cartridges.
Protective clothing: this includes gloves, apron and safety glasses.

Physical properties

Appearance: blue
Freezing point: no data.
Boiling point: no data.
Decomposition temperature: no data.
Specific gravity: 0.9 – 1.1.
Bulk density: not applicable.
pH @ 25° C: 4 – 8 in. 10/6 isopropanol/water.
Vapor pressure @ 25° C: 0.01 + 3.5 mm Hg.
Solubility in water: soluble to slightly soluble.
Volatiles, percent by volume: 0.
Evaporation rate: not applicable.
Vapor density: no data.
Molecular weight: not applicable – mixture.
Odor: slightly musty to odorless.
Coefficient of oil/water distribution: no data.

Stability and reactivity

Stability: this is a stable material.
Hazardous polymerization: will not occur.
Incompatibility: strong oxidizers.
Hazardous decomposition products: carbon monoxide, carbon dioxide and other fragments, which have not been identified.

Toxicological information

No data

Ecological information

No data

Disposal considerations

If this product becomes a waste (uncured form, component B only), it does meet the criteria of a hazardous waste as defined under 40 CFR 261, (D009) of Subpart C. As a hazardous liquid waste, it should be disposed of in accordance with local, state and federal regulations by incineration. Care must be taken to prevent environmental contamination from the use of this material. The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and non-hazardous wastes.

Shipping information

This material is not regulated as a DOT hazardous material.

Technical shipping name: Propylene Glycol – DOT (Domestic Surface).
Proper shipping name: Liquid Resin (non-regulated).
Hazard class or division: none.
UN/NA number: none.
Freight Class: 65.
Packaging group: none.
DOT product RQ lbs: none.

Regulatory information

Toxic substances control act: this substance is listed on the Toxic Substances Control Act inventory.
Superfund Amendments and Reauthorization Act Title III: Hazard Categories – per 40 CFR 370.2.
Emergency planning and community right to know, per 40 CFR Appendix A: extremely hazardous substance – threshold planning quantity: none established.
Supplier notification requirements, per 40 CFR 372.45: none established.
California Proposition 65:
Component B for this product does not contain any chemicals that are listed under California Proposition 65.

Other information

The information in this material safety data sheet should be provided to all who will use, handle, store, transport or otherwise be exposed to this product. This information has been prepared for the guidance of plant engineering, operations and management and for persons working with or handling this product. GT Products believes this information to be reliable and up to date as of the date of publication, but makes no warranty that it is. Additionally, if this material safety data sheet is more than three years old, you should contact GT Products, Inc. at the number listed above to make sure this sheet is current.

Prepared by: C. Mellema
Approval date: 01/02
Supercedes 01/01