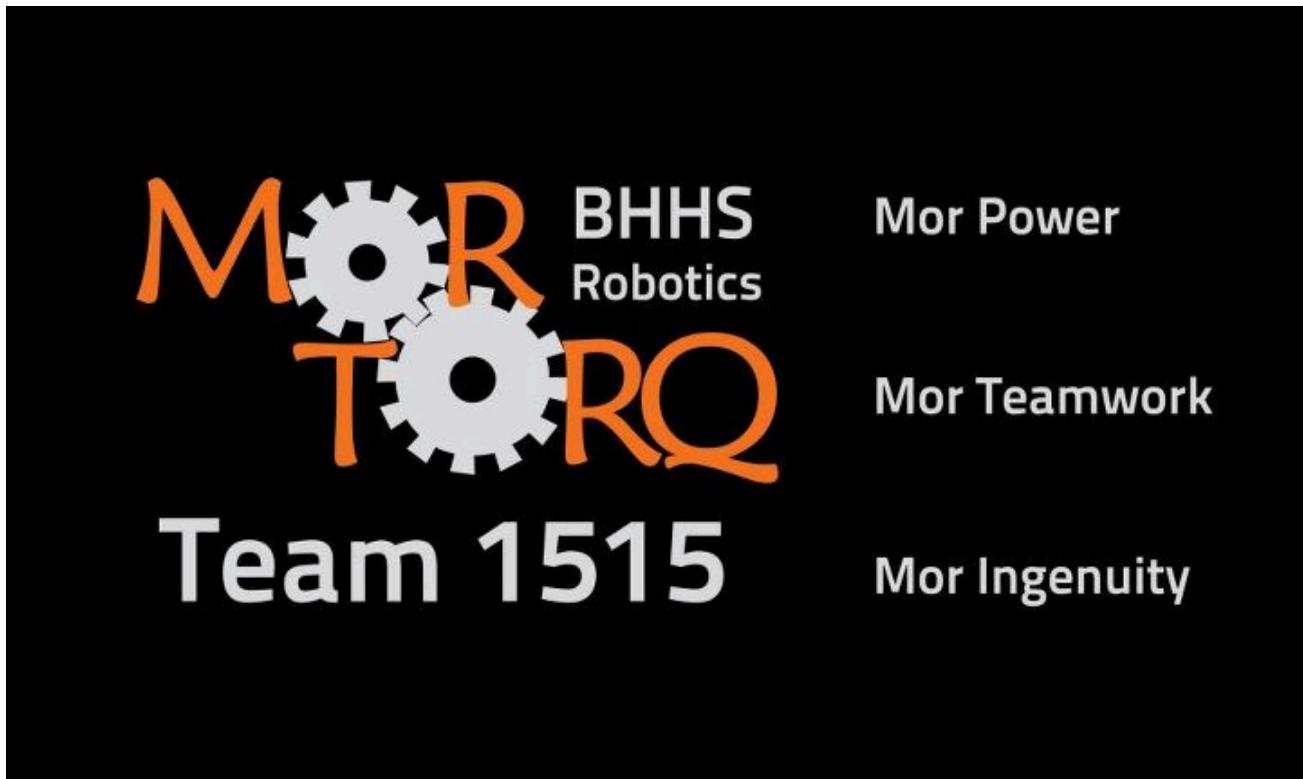


Beverly Hills High School Robotics

Team 1515



Building & Safety Manual



Preface

Team 1515 encourages you to fill the white spaces in this manual with notes and additions gained from collaboration and discussions with fellow team members and mentors alike.

5 Things I Want to Learn This Year:

1. _____
2. _____
3. _____
4. _____
5. _____

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Parts

Fasteners

- Bolts
- Nuts
- Standoffs (Male/Female & Female/Female)
- Threaded Rods
- Nails
- Screws
- Rivets

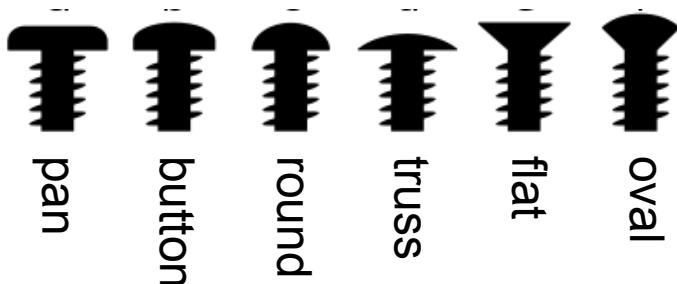


Bolt



- Standard male fastener

Heads



Screw Type

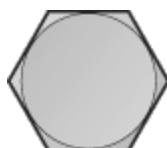


Material

Steel



Aluminum



Grade 2



Grade 5



Grade 8

Weak
Light

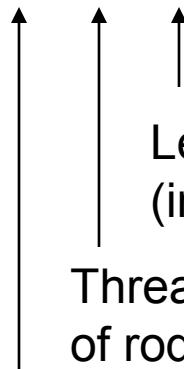
Strong
Heavy



Rod Threading Standards

Imperial

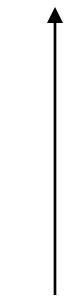
$\frac{1}{4}$ - 20 X 1"



Diameter of rod
(inch)

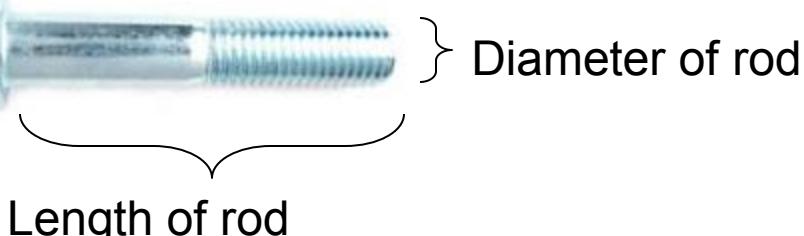
Metric

M6 X 20



Length of rod (mm)

Diameter of rod
(mm)





Nut



Hex – standard female fastener



Nylock – nylon helps lock nut in place



Keps – has a built in lock washer making fastening easier



Wing – can be manually installed



Cap – finished top



Tee – allows bolts to run through wood



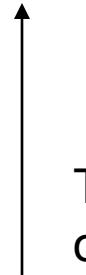
T Slot – allows bolting onto rails



Nut Threading Standards

Imperial

$\frac{1}{4}$ - 20

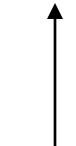


Threads per inch
of inner hole

Inner diameter
(inch)

Metric

M6



Inner diameter
(mm)



Inner diameter



Standoff

(Male/Female)

- Used to extend a threaded object and as a spacer



Standoff (Coupling Nut)

(Female/Female)

- Used to fasten two threaded rods together



Hex



Round

Threaded Rod

- Used to fasten two threaded objects together





Corner Connector

- Used to fasten two corners together using Andy Mark fabricated chassis



Nail

- Used to fasten objects to wood



Screw

- Used to fasten objects to wood or plastic
- More reliable than a nail because of threading



Rivet

- Used to permanently fasten objects to a surface







Parts

Spacers

- Washers
- Spacers
- Shims



Washers



Flat – distributes force from bolt when fastening



Fender – larger diameter than flat washer



Lock/Split – places tension on nut when fastening to prevent nut from moving

Spacer

- Helps distance objects on a rod



Shim

- Helps level surfaces
- Used for extremely precise spacing



Round Shim





Parts

Grips & Tightening

- Hose Clamp
- Plumber's Tape
- Zip Tie



Hose Clamp

- Used to hold objects together with a firm grip



Plumber's Tape

- Used to hold objects together or against a surface



Zip Tie

- Used to hold objects together





Parts

Gear Systems

- Gears
- Gear Systems
- Chain Drive
- Belt Drive
- Motors



Gear

- A wheel with teeth that meshes with another object with teeth to transmit motion

Mesh – when two objects with teeth rotate against each other

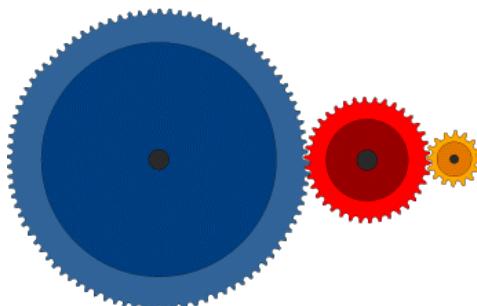


Spur Gear

Gear Ratio

- # teeth of driver : # teeth of driven
- Greater # of teeth to fewer # of teeth = more speed
- Fewer # of teeth to Greater# of teeth = more torque

(MorTorq)



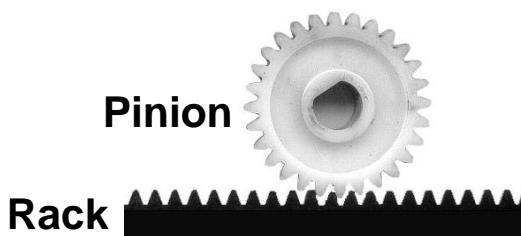


Gear Systems



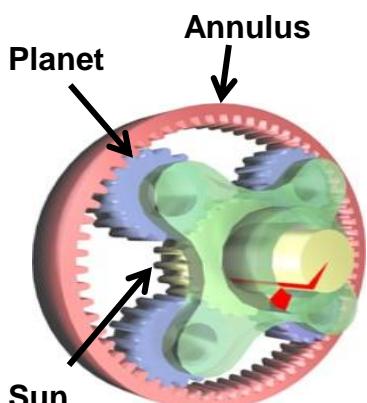
Worm drive

- Uses a threaded rod to drive a spur gear
- The axis of rotational motion is turned 90°
- Difficult to backdrive



Rack and Pinion

- Uses spur gear to transmit linear motion onto rack



Epicyclic (Planetary) Gear

- Uses sun gear to rotate annulus or vice versa
- Maintains rotational motion, but with a different gear ratio



Roller Chain

- Rolling links used to transfer mechanical power



Sprocket

- A gear designed to interface with chain



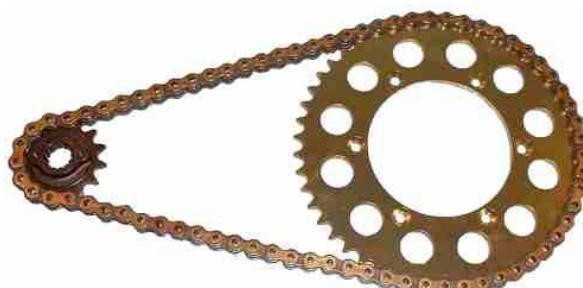
Master Link

- Used to link chains



Half (Offset) Link

- Used to extend chain by half a link



Chain Drive



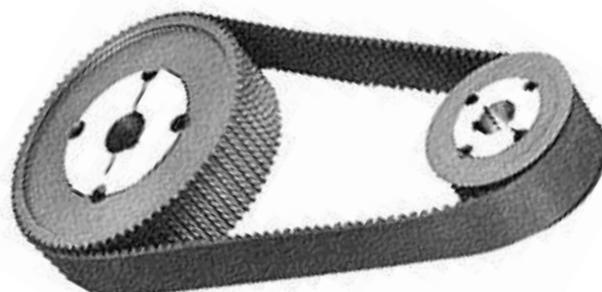
Transmission Belt

- More flexible than a chain
- Has a fixed length; cannot be broken like chain
- Used for speed rather than torque



Belt Sprocket

- A gear designed to propel a belt



Belt Drive



Motor

- Converts electrical energy into rotary mechanical energy for a shaft

RS Motor

- Highly adaptable motor



CIM Motor

- A high power motor generally used for drive trains



Window Motor

- A lower speed, high torque motor





Parts

Shafts

- Shaft
- Hub
- Shaft Collar
- Retaining Ring
- Bearing

Shaft

- A rod used to rotate objects or allow free rotation for an object

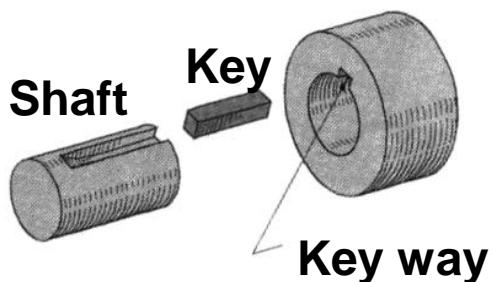
Round Shaft

- Shaft allows objects to rotate freely about the shaft



Keyed Shaft

- Shaft uses key to rotate a hub



Hub

- Binds to an object to allow rotation on a shaft



Shaft Collar

- Used to hold pieces on a shaft and the shaft in place

Set screw

Bolt locks shaft
in place



1 Piece Clamp

Bolt tightens
clamp to lock the
shaft in place



2 Piece Clamp

Bolts tighten
clamp from both
sides to lock the
shaft in place



Retaining Ring

- Acts as a stop on a shaft or rod





Bearings

- Fits around a shaft to allow rotation

Sleeve Bearing

- Standard economical bearing



Ball Bearing

- Lower friction than sleeve bearings



Mounted Bearing

- Bearings that are fastened onto a surface



Rod End Bearing

- Bearings that are threaded inside or outside for bolting





Parts

Pivot Joints

- Clevis Joint
- Slew Ring Bearing
- Hinge
- Ball and Socket



Clevis Joint

- Used for rotational pivoting
- Generally fastened to the end of a rod



Slew Ring Bearing

- A wheel used allows smooth rotational pivoting





Hinge

- Allows surfaces to pivot around a fixed axis



Ball and Socket

- Used for a multi-dimensional rotation







Parts

Pulley Systems

- Pulley
- Wire Rope
- Wire Drum
- Stop and Oval Sleeves
- Thimble
- Turnbuckle



Pulley

- A wheel used to change direction of wire rope path



Wire Rope

- A sturdy cable used to pull objects



Wire Drum

- Used to coil and release wire



Sleeves

Stop

- Used to create a stop in the rope



Oval

- Used to create a loop in the rope



Thimble

- Used to hold form in a rope loop
- Spreads tension on rope to provide structure and to prevent kinks in the rope





Turnbuckle

- Used to adjust distance between two points
- One side is threaded left and one side is threaded right which allows rotation in the middle to screw both end fittings in



End Fittings



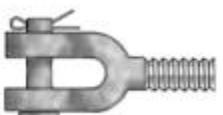
Round Eye



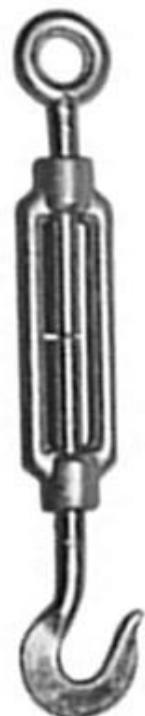
Oval Eye



Hook



Jaw





Parts

Rail & Carriage

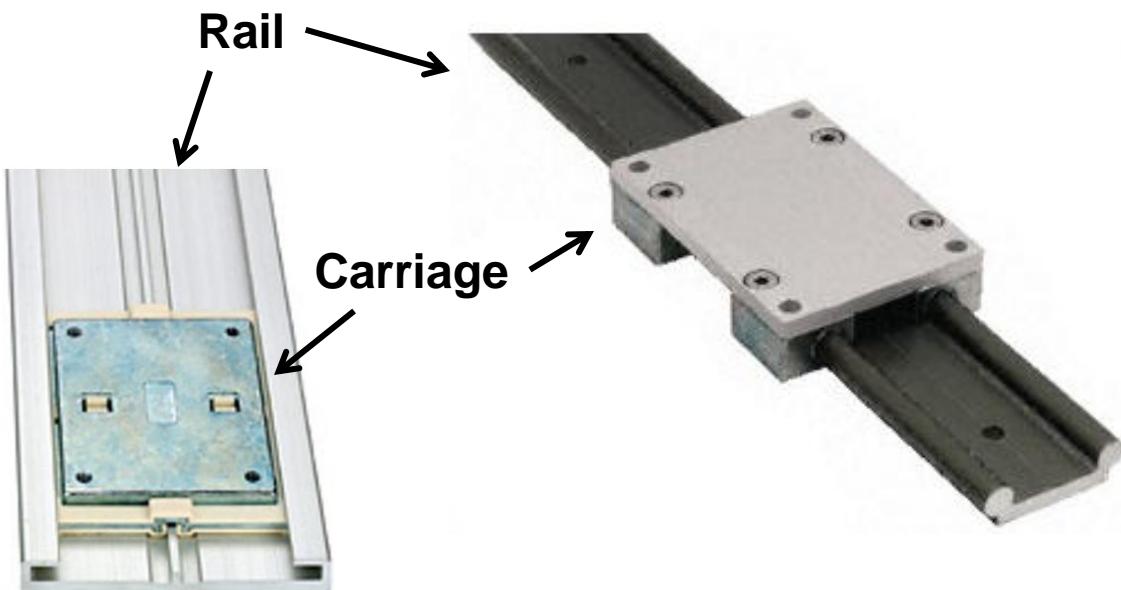
- Rail
- Carriage

Rail

- A linear path which allows objects to slide

Carriage

- A mounting linear bearing that slides with ease on a rail





Parts

Drive Train

- Slick Wheels
- Rubber Wheels
- Tank Treads
- Half Track
- Mecanum Wheels
- Omni Wheels
- Swerve Wheels



Slick Wheels

- Low friction wheels



Rubber Wheels

- High friction wheels used for traction



Tank Treads

- High friction system used for traction
- Distributes weight on multiple wheels
- If part of tread breaks, the system is dysfunctional



Half Track

- Uses tank treads and wheels
- Allows more maneuverability than tank treads





Mecanum Wheels

- Wheels contain rollers at 45° angles
- Can move in all directions rather than just forward and reverse
- Can rotate robot



Omni Wheels

- Wheels contain aligned rollers
- Can move in all directions rather than just forward and reverse
- Can rotate robot



Swerve Wheels

- Wheels rotate 360° on an axis
- Allows movement in all directions
- Can rotate robot







Parts

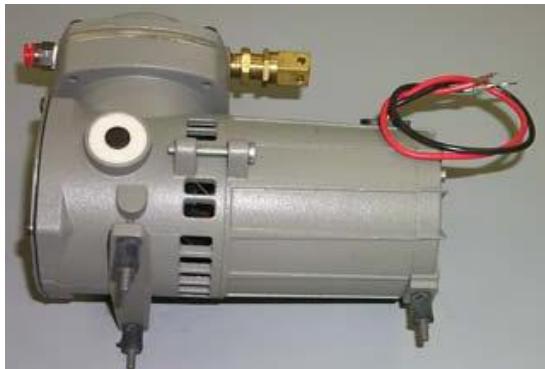
Pneumatics

- Air Compressor
- Pressure Relief Valve
- Volume Chamber
- Cylinder
- Tubing
- Brass Fittings
- Plastic Fittings
- Pressure Gauge
- Pressure Switch
- Regulator
- Solenoid
- Manifold
- Micro Valve



Air Compressor

- Used to compress air for pneumatic power



2010 Thomas
Compressor



2011 Compressor

Pressure Relief Valve

- Mechanically releases pressure from the compressor when the pressure exceeds the calibrated level





Volume Chamber

- Used to store air for a larger release of air



Cylinder

- Converts pneumatic pressure into powerful linear motion



Tubing

- Used to direct air flow





Brass Fittings

- Used to direct air flow in threaded components



Plug Valve

- Used to prevent air from escaping from an existing hole



Union Tee

- Used to distribute air flow



Union Cross

- Used to distribute air flow



Adapter

- Used to change connection sizes



Bushing

- Used to create a more accessible connection point



Hex Nipple

- Used to create a more accessible connection point



Plastic Fittings

- Used to direct air flow in tubing

Threaded to Tubing

- Used to create a connection between a threaded object and pneumatic tubing



Hex Straight



Male Y



Male Elbow



Male Tee

Tubing to Tubing

- Used to create a connection between a threaded object and pneumatic tubing



Union Straight



Union Y



Union Reducer



Union Elbow



Union Tee



Union Cross



Pressure Gauge

- Displays air pressure at the point of the gauge



Pressure Switch

- Used to monitor pressure and send signals to the compressor to start or stop pressurizing air



Regulator

- Used to set the pressure level of the pneumatic system



Main



Secondary

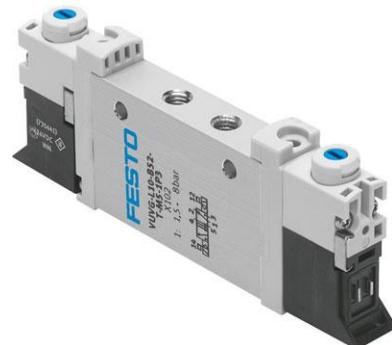


Solenoid

- Used to control airflow



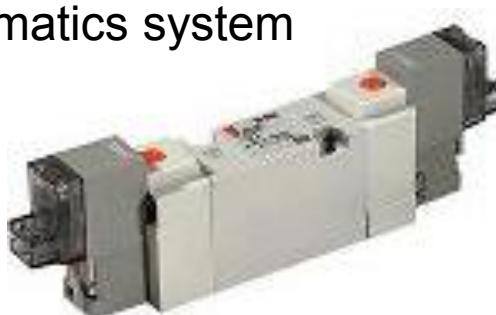
Single Solenoid



Double Solenoid

Manifold

- Used to interface multiple solenoids with the pneumatics system



Micro Valve

- Manually adjustable valve







Electrical Power

- Battery
- Battery Charger



Battery

- Powers a system

Genesis NP18-12B 12V

- Main battery for FRC robots



NiMh 3000mAH 12V

- Used for FTC robots



DeWalt 18V

- Used for power tools
(ex. drill, reciprocating saw, etc)





Battery Charger

- Charges batteries



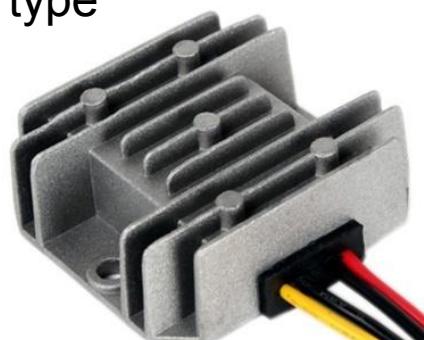
DeWalt Charger

- Charges DeWalt batteries



Power Converter

- Used to change voltage and/or type of current in the system







Electrical

Wires, Cables, Connectors

- Gauge Wire
- PWM
- Encoder Wire
- 2 Conductor Waterproof Connectors
- Anderson Battery Connectors
- Molex Connector
- DB – 37 Cable
- Ethernet Cable
- Wire Markers
- Alligator Clip, Terminal Wire Connectors, Butt Splices, & Wire Ferrules
- Jumper
- Solder & Solder Wick
- Terminal Block



Wire/Cable

- Used to conduct electricity to provide power or transmit data to components in a circuit

American Wire Gauge (AWG)

(Gauge Wire)

- Have different thickness for different levels of power flow capability



(Pulse-Width Modulation) PWM

- Sends command signals to digital controllers



Encoder Wire

- Used to transfer data from an encoder to a processing unit





Wire/Cable

(continued)

2 Conductor Waterproof Connector

- Gauge wire used for quick disconnects



Anderson Battery Connector

- Quick disconnect cables for large batteries



Molex Connector

- Quick disconnect cables for smaller batteries and other power sources





Wire/Cable

(continued)

DB-37

- Used to connect CompactRIO to the digital sidecar



Ribbon Cable

- Lighter yet more fragile version of DB-37



Ethernet Cable

- Used to transmit network data to devices such as routers



Wire Markers

- Used to label wires





Wire Connectors

- Connects wires to a surface or other wires to complete the circuit

Alligator Clip

- Easy connection and dismount



Spade Terminal

- Easy connection and dismount
- Can be removed if mounting screw is loosened



Ring Terminal

- Maintains reliable connection
- Can only be removed if mounting screw is removed



Terminal Lug

- Similar to a ring terminal but uses a set screw to hold down the wire rather than a permanent crimp





Wire Connectors

(continued)

Quick Disconnect Terminal

- Easy connection and dismount through male and female connection



Male



Female

Butt Splice

- Used to hold two wires together



Wire Ferrule

- Used to hold together wire strands for insertion into a terminal or slot





Jumper

- Used to skip part of circuit and “jump” to another part



Solder

- A metal alloy with a low melting point
- Melted around wires and other electrical conductors to make a reliable circuit connection



Solder Wick

- Used to undo soldered connections by absorbing heated liquid solder





Terminal Block

- A housing for wires connection

Screw Terminal

- Wire connections are made through ring terminals, spade terminals, or terminal lugs



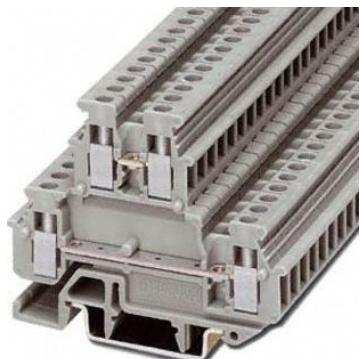
Terminal Strip

- Wire connections are made through wire ferrules or stripped wires



Wago Terminal Block

- Terminal blocks can easily be removed and added on for more or less wire connections
- Quick disconnection between large quantities of wires can be used via Wago to Wago connection





Electrical Components

- D-Link Router
- Digital Sidecar
- Power Distribution Board
- CompactRIO, Modules, & Breakouts
- Spike Relay Module
- Jaguar & Victor Speed Controllers
- Servo
- Bread Board



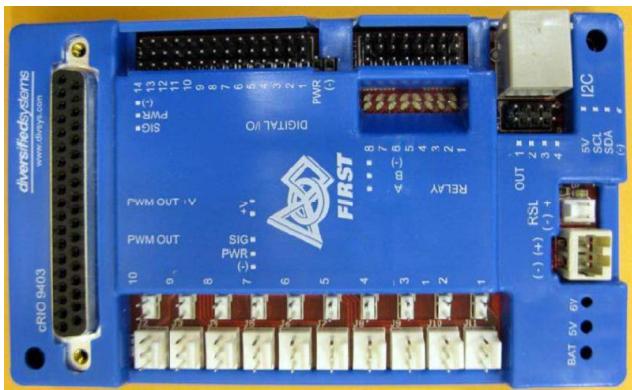
D-Link Router (Robot Radio)

- Used to connect the robot to the drive station



Digital Sidecar

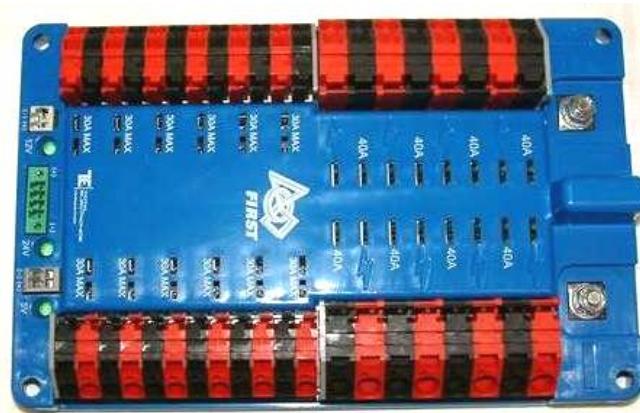
- Used for sending PWM and relay signals to digital controllers
- Receives signals from Digital I/O Module on CRO





Power Distribution (PD) Board

- Sends power to all components in the circuit from the main battery through terminal block and power connectors
- Has circuit breaker slots to prevent overloading the circuit



Power Connector

- Used to send power from the PD Board to the CRIo Controller



Power Connector

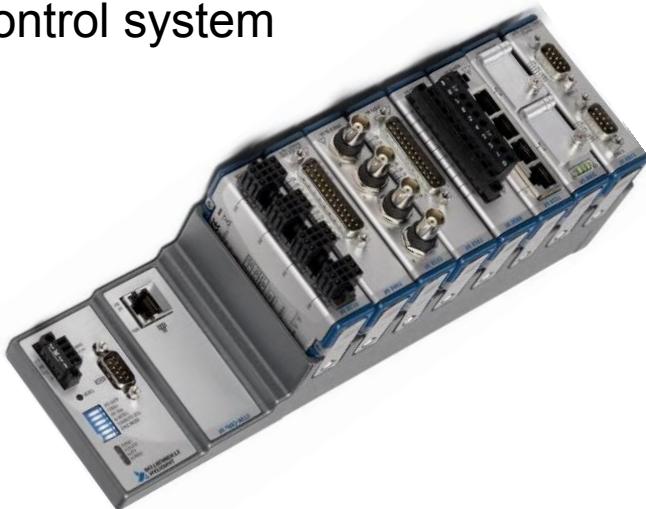
- Used to send power from PD Board to CRIo Modules





CompactRIO (CRIo)

- The core of the control system of the robot



Integrated Chassis and Controller

- Interprets modules and processes code



Controller

Chassis



CompactRIO (CRIo)

(continued)

Analog Input Module

- Used to interpret the Analog Breakout



Digital Sourcing Module

- Used to interpret the Solenoid Breakout



Digital I/O Module

- Used to send signals to Digital Sidecar



CompactRIO (CRIo)

(continued)

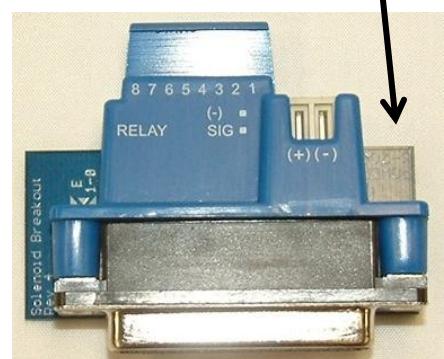
Analog Breakout

- Sends information to Analog Input Module
- Used to read variable values of robot such as battery life



Solenoid Breakout

- Sends information to Digital Sourcing Module to help control solenoid valves





Spike Relay Module

- Used to drive motors in forward, reverse, and off (no variable speeds)
- Used to turn on and off lights, solenoids, and air compressors
- Uses up to 40 Amps continuous



Jaguar

- Used to run and control a motor and its speed
- Has an internal fan to reduce heat



Victor

- Used to run and control a motor and its speed
- Has an internal fan to reduce heat
- Lighter than a jaguar





Servo

- Used to rotate objects through PWM signals
- Limited range of motion



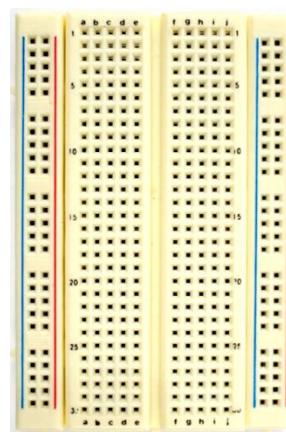
Servo Y Splitter

- Allows two servos to operate using only one servo control line



Bread Board

- A circuit board which does not require solders for wire connections
- Good for prototyping because of simple insertion of wires





Electrical Signal Input Devices

- Rotary Encoder
- Limit Switch
- Vision Camera
- Line Sensor



Rotary Encoder

- Used to convert angular position of a shaft into readable code



Limit Switch

- Used to trigger a command upon physical interaction with the switch





Vision Camera

- Used to view close-up angles around the robot



Line Sensors

- Used to track and follow lines on the field





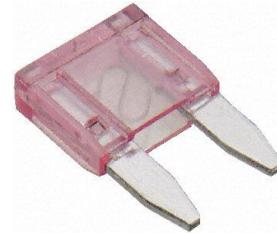


Electrical Power Limiters

- Fuse
- Circuit Breaker

Fuse

- Used to prevent an overload of electrical current
- Can only be used once



Circuit Breaker

- Used to prevent an overload of electrical current
- Can be used multiple times
- Slightly slower response time than fuses



**Snap Action
Circuit Breaker**





Electrical

Miscellaneous

- Wire Spool
- Chain Cable Carrier
- Insulated Cable Clamp
- Signal Light
- Fan

Wire Spool

- Used to hold long lengths of wire in an untangled roll



Chain Cable Carrier

- A chain-like case used to hold and protect wires



Insulated Cable Clamp

- Used to hold wires, cables, and tubes against a surface using the bolt holes





Signal Light

- Used to determine the on/off and operational state of the robot



Fan

- Used to cool down motors and processing units to prevent overheating
- Used to propel robots (REALLY!!!)







Electrical Operating Interface (OI)

- Clamshell
- Joystick
- Touch Screen
- Transformer
- PLC Controller
- Cypress Board



Clamshell (2go PC)

- Acts as a driver station to control the robot



Joystick

- Provides multiple axes inputs to OI



Touch Screen

- Controls the secondary functions of the robot





Transformer

- Changes type and voltage of electrical current
- Allows the batteries to charge while the OI is still running



PLC Controller

- Turns on digital outputs to send data from the touch screen to the OI



Cypress Board

- Sends inputs to the Clamshell







Tools

Fasteners

- Wrench
- Socket Wrench (Ratchet)
- Hex Wrench (Allen Key)
- Hammer & Mallet
- Punch
- Screwdriver
- Drill & Drill Bits
- Staple Gun



Wrench

- Used to fasten hex bolts and hex nuts



Crescent Wrench

- Adjustable wrench



Socket Wrench (Ratchet)

- Used to fasten hex bolts and hex nuts more efficiently than a standard wrench



Hex Wrench (Allen Key)

- Used to fasten allen head bolts



Hammers

- Used for nails and punches



Mallet

- Rubber coated hammer
- Prevents damaging the material



Punches

- A guide for drilling holes and hammering nails



Transfer Punch

- A punch that transfers the center of an existing hole to another surface





Screwdrivers

Phillips

- Used for phillips bolts and screws



Flathead

- Used for flathead bolts and screws



Socket

- Used for hex bolts and nuts



Precision Driver

- Used for small bolts and screws





Drill

- Rotates a drill bit with either speed or torque



Screw – used for screws/bolts

Drill – used for drilling holes

Hammer – used for masonry
(not used in robotics unless building an ancient robot)

Torque ← → Speed



Drill Press

- Stationary drill
- Used for more precise drilling





Drill Bits

Drill Bit

- Used to drill holes



Driver Bit

- Used to screw bolts and screws



Hole Saw Bit

- Used to drill holes and make dowels



Spade Bit

- Used to drill holes in wood





Staple Gun

- Staples materials onto wood



Air Staple Gun

- Uses air pressure to fasten longer staples than a standard staple gun







Tools

Measuring

- Ruler
- Measuring Tape
- Caliper
- Square Ruler
- Level



Ruler

- Measures length



Measuring Tape

- Measures length over longer distances



Caliper

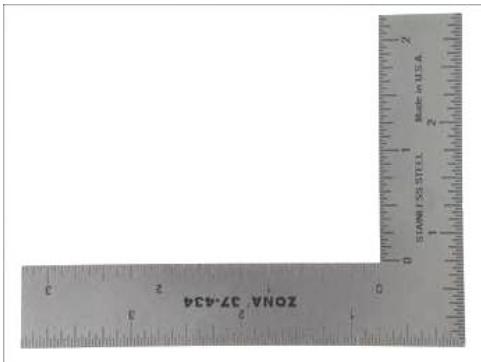
- Measures length with extreme precision





Square Ruler

- Measures length with a right angle



Level

- Used to confirm a surface is horizontal or vertical







Tools

Grips

- Pliers
- Vice Grip
- Clamp



Pliers

- Used to grab an object



Long-Nose Pliers

- Used to grab objects in narrow areas



Vice Grip

- Used to tightly hold an object





Clamp

- Used to tightly hold an object to another object



Quick Grip

- Quicker to set up than a standard clamp







MOR
TORQ
Tools
Cutting

- Box Cutter
- Shears
- Dykes
- Saws
- Angle Grinder and Cutting Wheels



Box Cutter

- Used for cutting materials
- Uses interchangeable blades



Shears

- Used for cutting dense materials



Dykes

- Used to cut wires or plastic



Saws

- Used for cutting

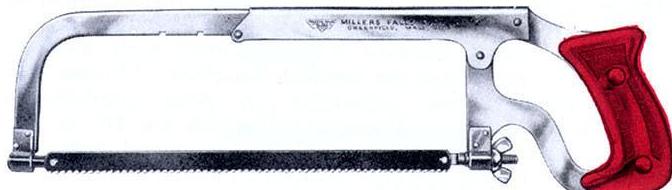
Handsaw

- Manual saw for wood



Hacksaw

- Manual saw for metal and plastic



Reciprocating Saw

- Electric saw that copies the motion of a hand saw
- Can be used for metal, wood, and plastic



Jigsaw

- Electric saw cuts through wood in precise pattern



Saws

(continued)

Circular Saw

- Electric saw that rotates a circular disk



Table Saw

- Stationary electric saw that rotates a circular disk



Band Saw

- Stationary electric saw that rotates a linear saw





Angle Grinder

- Electric handheld saw that rotates a circular disk



Cut-off Wheel

- Used for cutting through metal



Grinding Wheel

- Easier to cut flush than with standard cut-off wheel







Tools

Finishing

- Sand Paper
- Belt Sander
- Table Sander
- File
- Deburr
- Angle Grinder Finishing Wheels



Sand Paper

- Used to smoothen a surface



Belt Sander

- Hand held device used to smoothen a surface



Table Sander

- Stationary table used to smoothen a surface





File

- Used to take off rough edges or splinters
- Only one direction for filing



Debur

- Scrapes off rough areas inside holes





Angle Grinder Wheels

Wirebrush Wheel

- Used for finishing metal



Flap Wheel

- Used for polishing metal



Buffing Wheel

- Used for buffing metal





Tools

Electrical

- Crimpers
- Wire Strippers
- Soldering Iron and Gun

Crimper

- Used to compress connectors onto wires

Trapezoid Crimper

- Used to crimp wire connectors
- Makes trapezoidal crimps



Trapezoid Crimper (Ratcheting)

- Has better control than manual trapezoid crimper because of ratcheting mechanism
- Makes trapezoidal crimps



Square Crimper (Ratcheting)

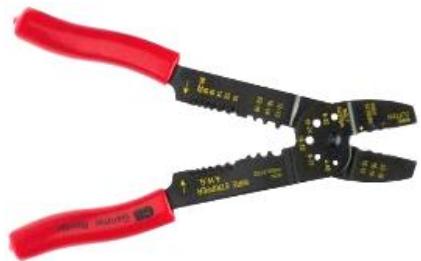
- Adjusts automatically to make correct size crimp
- Has ratcheting mechanism for control
- Makes square crimps





Wire Stripper

- Used to remove insulation around wire to form a connection



Automatic Wire Stripper

- Easier to use stripper than manual stripper
- Less precise than manual stripper



Soldering Iron

- Used to melt solder onto a wire
- Reaches and maintains a workable heat



Soldering Gun

- Used to melt solder onto a wire
- Trigger allows variable heat







Tools

Specialized

- Nicopress Crimper
- Chain Breaker and Holder
- Rivet Gun



Nicopress Crimper

Multidiameter

- Used to compress multiple sleeve sizes
- Used to cut wire rope



Single Diameter

- Only used for one sleeve size





Chain Breaker

- Used to break chains



Chain Holder

- Used to pre-tension and hold chain



Rivet Gun

- Fastens rivets into metal or plastic







Adhesives and Liquids

- Duct, Electrical, and Teflon Tape
- Glue Gun
- Wood Glue
- Acetone
- Loctite
- Torque Seal
- Lubrications (WD-40, Grease, Cutting Oil)

Tape

- An adhesive used to wrap around objects

Duct Tape

- Strong flexible tape



Electric Tape

- Used to insulate wires and other conductors



Teflon Tape

- Used to lock threads together





Glue Gun

- Used to glue to objects together



Wood Glue

- Used to glue wood together



Acetone

- Used to dissolve particles from surfaces to help clean surfaces





Loctite

- Used to hold nuts and bolts and other threaded items in place



Weak ← → Strong

Torque Seal

- Used to mark the positioning of fasteners and determine if fasteners have been loosened





Lubrication

- Used to lessen friction between objects

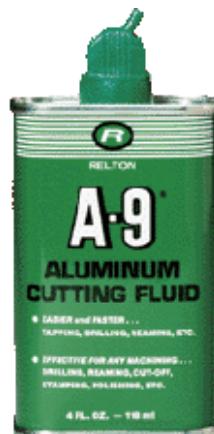
Grease

- Used to ease the rotation of bearings, chains, and meshing objects



Cutting oil

- Used to ease cutting and drilling of metal



WD-40

- All purpose rust and water displacement solvent







Glossary

- **Actuate** – to move or rotate an object via electric current or pneumatic pressure
- **Chassis** – the body of the robots
- **Drive train** – the system used to move the robot across the field
- **Manipulator** – mechanism used to control the game piece
- **Mesh** – when two objects with teeth rotate against each other
- **Herding** – maintaining control of the game piece





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Section 2

Safety

Manual





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General Safety

This Book is designed with the intent of being the training manual for being safe while in and around the team shop and any time when dealing with the MorTorq robot. Please always be aware of your surroundings and never just act always look, listen, think then act. This book can not cover every situation so if you ever have questions don't be afraid to ask. **There are no stupid questions.** Please take the time to read this book along with the basic robotic training manual so that you can understand the build side of the MorTorq team.

Before using any tool make sure you are trained in its usage and understand all of its hazards and feature thoroughly. Ask a fellow student or a mentor if you are unsure and never use a tool without proper supervision.

**Have a fun and accident free build season and remember
it is all about learning for the future.**

Personal Protection Equipment

A. Eye and Face Protection:

1. There are several forms of eye/face protection available to provide protection from hazards, including but not limited to safety glasses with side shields, goggles, and face shields.
2. Eye and face protection is required when there is a risk of exposure to the following:
 - a. Flying particles
 - b. Chemical exposure (such as splashes, splatters, and sprays)
 - c. Molten metal
 - d. Potentially Injurious Light Radiation
3. Wear non-shaded, ANSI-approved OSHA Compliant Z89.1 eye protection in the following areas:
4. Your team's "at home" work stations when doing any work on the robot including: grinding, drilling, soldering, cutting, welding, etc.
5. At *FIRST* events: Anywhere in the pit area, including walk ways and pit stations, on the Playing Field, on the Practice Field
6. Any area posted with signs requiring the use of eye and/ or protection.
7. Inspect equipment for damage each time it is worn. If you wear prescription glasses, and they are not approved safety glasses, you must wear approved safety goggles over them to achieve adequate protection.



B. Hand Protection:

1. Hand protection is designed to protect against heat, electrical, chemical and mechanical hazards. Use proper gloves and mechanical tool guards.
 - a. Gloves; FRC participants should work with a team mentor to ensure the selected glove is the correct one to use for the given project.
 - i. Chemical- or liquid-proof gloves essentially are coated gloves. To be completely chemical or liquid proof versus just chemical and liquid resistant, the gloves must be fully coated.
 - ii. Latex rubber is a low-tech glove that works. Although it is waterproof, it will blister and delaminate when in contact with petroleum-based products.
 - iii. Nitrile rubber (NBR) resists grease, oil and other petroleum-based products, and is water resistant or waterproof (if fully coated). The coating is applied to the glove either as a foam coating or a solid-finish coating.



- iv. Polyurethane gloves, due to the polymer strength, provide extra abrasion resistance and extended wear.
- v. Both PVC and neoprene offer excellent chemical-resistant properties. Polyvinyl-chloride gloves frequently are used in the petrochemical industry. Neoprene gloves provide excellent chemical resistance to a broad range of hazardous chemicals, including acids, alcohols, oils and inks. Although neoprene gloves can offer good grip, they generally are thicker and heavier.
- vi. Electrical hazard gloves should be used at all times when working on general electric equipment, elevators, moving walkways, swimming pools, fountains, branch circuits and switches, carnival rides, emergency power systems and solar photovoltaic systems, etc.
- vii. Heat-resistant gloves are an entity unto themselves. There are heat-resistant gloves that are flame resistant, high heat resistant, convection heat resistant or all three. The low end of heat-resistant gloves are terry cloth gloves similar in feel to thick towels or kitchen pot holders. Kevlar blends, as well as other similar fibers, are cut resistant as well as heat resistant.
- viii. Welding gloves are made of leather with heat-resistant panels. There are MIG and TIG models, as well as thinner gloves for working with different types of welding or small piece welding. These thinner gloves allow for a higher level of dexterity that is required when working with intricate or small items. A special feature of effective welding gloves is fully welted seams sewn with Kevlar fibers, which are five times stronger than steel and flame and heat resistant. These fibers protect the seams from degeneration due to exposure to abrasion, heat, sparks or flames.



- ix. Mechanics gloves (which are used by workers other than mechanics as well) are made of hybrid and composite materials, including leather, synthetic leather, waterproof materials, high-performance fibers or synthetic grip finishes. These gloves are thin, which allows for high dexterity, and are very durable. There are finger or fingerless versions and some offer additional grip layering or patterns for handling boxes or sheet metal. And because this is a generic catch-all name for an all-purpose glove, there is a variety of versions and different looks.
 - x. Check your gloves for proper size, absence of cracks and holes, and good flexibility and grip before you wear them.
- b. Mechanical Guards:**
- i. Provide safety guards for power tools where required.
 - ii. Never use any equipment without safety guards in place.
 - iii. Notify your Safety captain and mentor of any broken or defective equipment.
 - iv. Take it out of service until repairs are made.

C. Hearing Protection:

1. Make hearing protection devices available, such as earplugs and earmuffs, where there are objectionable/questionable sound levels. A team mentor can provide assistance in evaluating high-noise tasks and determining appropriate hearing protection devices.
2. At events, earplugs are available at the Pit Administration Station.
3. Types of Hearing Protection:
 - a. Ear Muffs - These devices fit against the head and enclose the entire external ears. The inside of the muff cup is lined with an acoustic foam which can reduce noise by as much as 15 to 30 decibels. Ear muffs are often used in conjunction with ear plugs to protect the employee from extremely load noises, usually at or above 105 decibels.
 - b. Ear Plugs - Preformed ear plugs come in different sizes to fit different sizes of ear canals. Form-able or foam ear plugs, if placed in the ear correctly, will expand to fill the ear canal and seal against the walls. This allows foam ear plugs to fit ear canals of different sizes.





- c. Canal Caps - As the name implies, these devices cap off the ear canal at its opening. They generally provide less protection than ear muffs or plugs. These devices are not recommended for use by the EHSC.

D. Foot Protection:

1. When engaged in *FIRST* activities, all FRC participants must wear shoes that completely cover the entire foot. Shoes must have closed-toes and heels to protect against foot injuries, regardless of work location. Flip-Flops, Sandals, Mules, Crocs, etc. are *not acceptable* when working on or near the robot or while attending *FIRST* competitions.
2. In some cases, safety shoes or toe guards are appropriate for areas where heavy objects can fall on your foot. Notify your team mentor if you encounter such situations, and determine the safest way to perform the task.



E. Back Safety:

1. Back disorders are listed in the "top ten" leading workplace injuries published by the National Institute of Occupational Safety and Health. They account for 27 percent of all nonfatal injuries and illnesses involving days away from work. It's no wonder. Your back is a sophisticated piece of machinery made up of numerous muscles, bones, nerves, and supporting tissues. It's a machine you use every day, probably in ways you don't even notice.



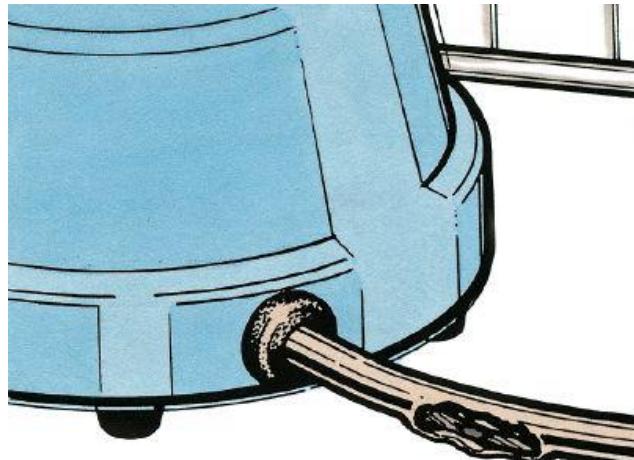
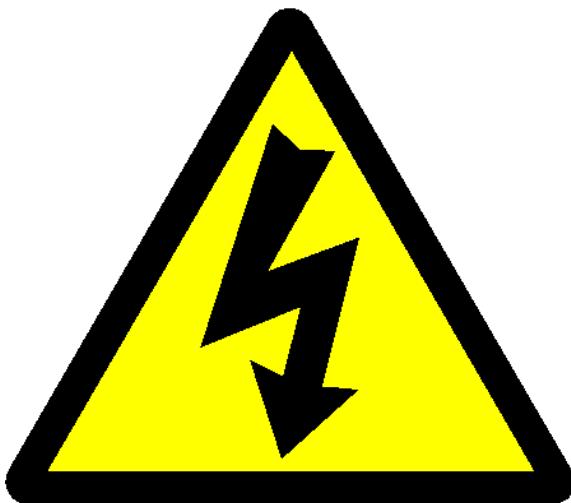


2. Just like the finest machinery, your back requires proper care to keep it working. If it's not working right, you'll suffer. An injured back affects your ability to move your limbs, your hips, your neck, and your head. Injuries to the back can be very debilitating, causing a lot of pain, time away from work, and often requiring physical therapy or even surgery. Everyone whose job involves stressful lifting or awkward postures is at risk for a back injury. Here are some tips to keep your back in optimum condition.
3. While Lifting:
 - a. Don't bend over an object you are lifting. Bend your knees, squatting in front of the object to reach it.
 - b. Lift the object slowly and carefully, using your leg and arm muscles to lift, not pulling with your back.
 - c. Keep your head up and look straight ahead while making the lift.
 - d. While lifting, keep the object as close to your body as possible.
 - e. Keep abdominal muscles tight while making the lift.
 - f. Use the same techniques when you put the object down.
 - g. If the object is too big or too heavy to lift using these techniques, use mechanical assistance or get someone else to help.
4. While Reaching for Objects:
 - a. Do not reach for an object unless you're sure you're strong enough to lift it.
 - b. Use a step ladder to reach objects above shoulder height.
 - c. Avoid awkward stretches while reaching. These stress your back and could cause you to lose your balance.
 - d. Don't depend on structures to support you (e.g., a shelf support, a storage rack, etc.). These could easily give way if you pull or tug on them. Always be alert for situations that could cause a back injury. Be kind to your back. Don't take unnecessary chances. By following proper lifting and reaching techniques and exercising properly, you'll help keep back problems behind you!



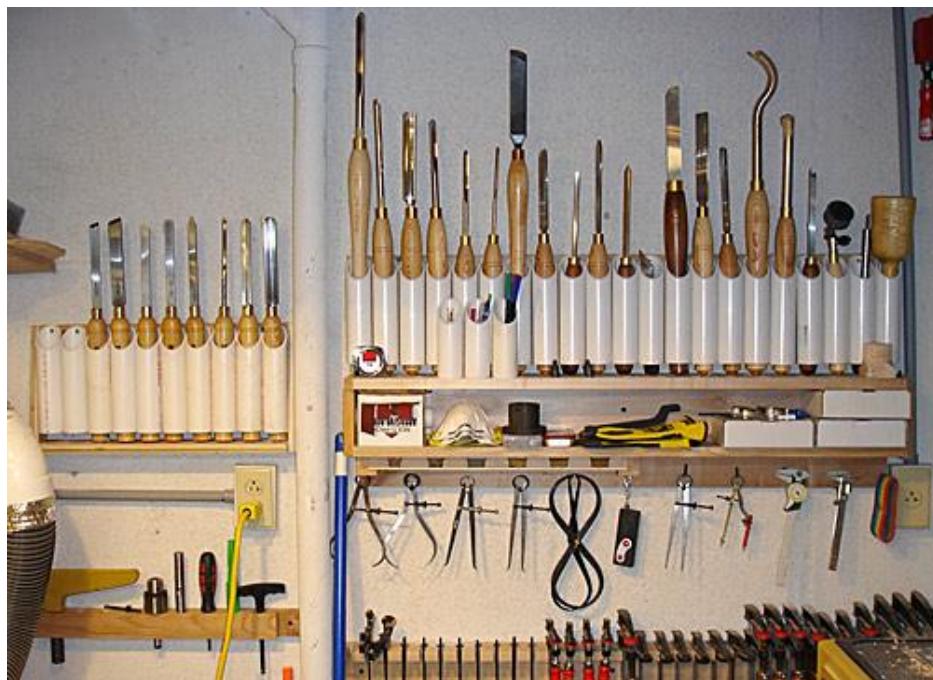
Electrical Safety

1. Inspect your equipment cords and extension cords routinely to ensure they are in good condition.
2. DO NOT turn on a piece of equipment that has been “locked out” or noted as damaged or “in service”
3. DO NOT overload electrical fixtures and/or receptacles.
4. The following are not acceptable
 - a. Power strip plugged into another power strip.
 - b. Extension cord plugged into another extension cord.
 - c. Extension cord plugged into a power strip.
 - d. Multi-device receptacle plugged into a power strip or extension cord.
5. Electrical tools must be equipped with a three-wire (grounded) power cable and a three pronged (grounded) plug.
 - a. Cords must be inspected for crushed, pinched, exposed points or any other signs of excessive wear.
 - b. Cords can make great door stops but do not let them become one
 - c. Never use a cord to “un plug” a tool or pull it closer to you
 - d. Cords can become a large tripping hazard in any environment if great care is not used in where you leave your cord
6. Note the environmental conditions that are present when working with electrical power tools. Some bad conditions can include:
 - a. Excessive moisture
 - b. Combustible gas or vapors are present
7. Never move power tools by pulling on the cord.
8. Electrically powered tools must not be used if arcing is noted.
9. Let people around know you know that you are using power tools



Tool Storage

1. Store sharp-edged or pointed tools in a safe place. When carrying, cover the point or edges with shields. NEVER carry unshielded tools in your pocket.
2. Don't leave tools on overhead work surfaces. They may fall and strike someone below.
3. Store equipment in a location where it will not create a safety hazard or get damaged.
4. If storing a battery-operated tool, remove the battery before storing it.
5. Inspection of tools and equipment upon check in or at completion of the job is essential. This should include cleaning the tools after use, reporting any problems you encountered with the tool or equipment in use.
6. Before storing any tools, ask yourself the following questions:
 - A. Did you inspect your tool when you checked it out?
 - B. Are the power cords damaged or frayed?
 - C. Are all the safety attachments such as shields or safety guards attached and in good condition?
 - D. Is there a established procedure to ensure that tools are stored properly and in a safe manner.
 - E. If the tool had been discovered to be damaged, has it be reported to maintenance services, tagged as damaged, and segregated from the rest of the tools available for use.





Hand Tool Safety

A. General Guidelines:

1. Choose the right tool for the job
2. Be sure the tool is in good condition
3. Use the tool correctly
4. Always turn in tools at the end of a job, it is your responsibility to identify defective tools and tag them accordingly.
5. When using saws, keep them sharp, clean and set them properly. Be careful when using your thumb as a guide.
6. When using a hammer, be sure it has a securely wedged handle suited to the type of head. If the handle is wooden or fiberglass, watch out for splinters.

B. Tool use

1. No tool shall be used for anything other than the purpose for which it was designed!
2. Always ask if unsure
3. Measure twice, cut once!

C. Hammer

1. Hammerheads must be securely mounted on handles, and hammer faces must be free of cracks or irregularities.
2. Hammer must not be used as prying tools, and must be used for their intended purpose.



D. Wrenches and Pliers

1. Wrench and pliers jaws must be in good condition. Excessively worn tools must be discarded.
2. Adjustable wrenches must be snugly fitted to the nut before applying pressure.
3. EXTENSION HANDLES (cheater bear) must not be used.

E. Screwdrivers

1. Do not use a screwdriver with a broken or bent blade.
2. DO not use screwdrivers as chisels or punches for prying.
3. Use screwdrivers with insulated handles for electrical work.

F. Files

1. Files must be equipped with handles.
2. Do not use files as punches or chisels, or for prying.

G. Staple Gun

1. Make sure hands are clear before stapling
2. Staple gun must be pressed flat against surface
3. Staple gun must be clean and clear of any residue

H. Punches

1. When using transfer punches, make sure the correct diameter punch is being used
2. Dull or chipped punches must be discarded
3. Do not use a hammer when using an auto-punch

I. Clamps

1. All clamps must be tight before proceeding to cut
2. No damaged clamps may be used
3. Keep hands and feet clear of clamps before tightening
4. Do not tighten clamp to the point of material damage



J. Cutters

1. Keep digits clear before cutting
2. Do not cut anything under load
3. Do not use dull or damaged blades



K. Crimpers

1. Keep digits clear before crimping
2. Do not crimp anything under load
3. Do not crimp anything under power

L. Chain tools

1. Power off device before proceeding to chain
2. Use the proper chain tools for the proper chain size.
3. Do not use any damaged chaining hardware or tools

M. Riveting Tools

1. When using pneumatic powered riveter, double check all connections and air tubes
2. Clean out rivet gun before use
3. Use the proper size rivet and rivet size



Power Tool Safety

A. General Guidelines

1. Know the application, limitation, and potential hazards of the tool. Operate according to the manufacturer's instructions.
2. Keep guards in place, in working order, and properly adjusted. Safety guards must never be removed when the tool is being used
3. Avoid accidental starting. Do not hold a finger on the switch button while carrying a plugged-in tool.
4. Safety switches must be kept in working order and must not be modified
5. Work areas should have adequate lighting and be free of clutter.
6. Observers should remain a safe distance away from the work area.
7. Be sure to keep good footing and maintain good balance.
8. When using a screwdriver or other tools, place the work on the bench or hard surface rather than in the palm of your hand.
9. When using knives/blades, direct your cutting strokes away from your hand and body, and be aware of those around you.
10. Never modify a tool to use for a job it's not intended to do.

B. Tool use

1. No tool shall be used for anything other than the purpose for which it was designed!
2. Always ask if unsure
3. Measure twice, cut once!

C. Angle Grinder

1. Make sure the abrasive disc is secured to the angle grinder before use.
2. Do not change discs when the grinder is plugged in.
3. Adjust guard to proper location. NEVER remove the guard!
4. When done grinding unplug the power tool.
5. The material you are cutting must be secured to a immovable surface and clamped in at least two points.
6. Place Grinder down with disc facing up after use.
7. If you are unsure of ANYTHING do not hesitate to ask your supervisor.





D. Hand Drill

1. If using a corded drill, clamp your material prior to plugging in the machine.
2. Punch every hole and if necessary, drill a guide hole.
3. Use the proper drill bit for your hole and do not use broken or bent bits.
4. When locking in bit, assure that it is center and does not wobble when under power.

E. Saws

1. Do not put your hands near the blade when powered.
2. Secure your material before cutting.
3. Always retract blade after use.
4. Wait for blade to reach maximum speed before cutting.
5. After cutting, always wait for blade to stop spinning.
6. Clear area around saw before powering machine.
7. Do not leave saw running in between cuts.

F. Soldering Iron/Hot Glue Guns

1. Make sure the tip is heated before feeding solder/glue.
2. Assure that the heated tip is not touching anything potentially flammable after use.
3. Wear PPE when soldering/gluing.
4. Do not operate gun if tip is cracked or broken.
5. Work in a well lit environment.
6. Assure there is proper ventilation and do not inhale fumes.



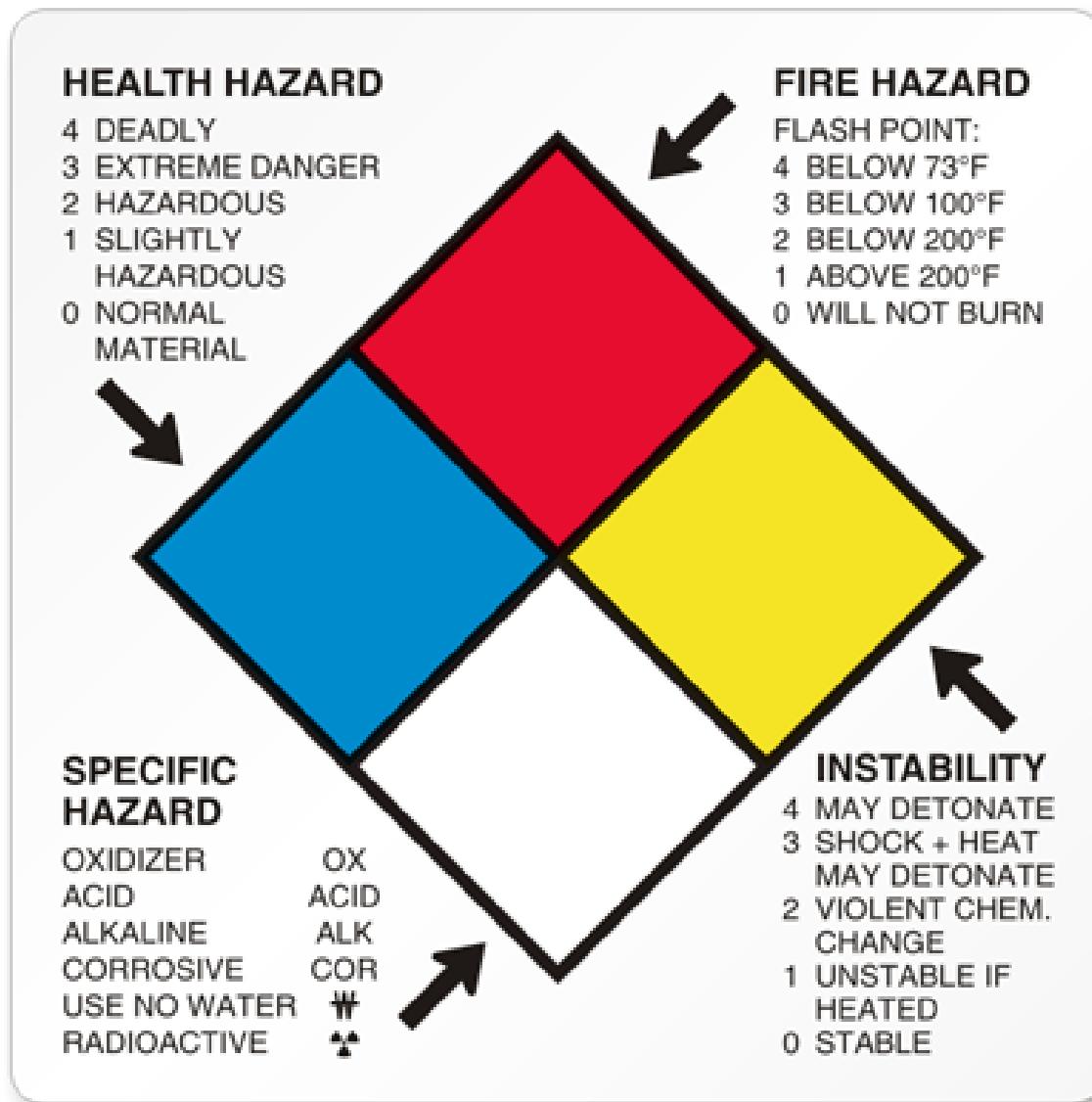
G. Dremel

1. Assure the Dremel bit is properly secured.
2. Make sure the depth guide is set to the correct depth.
3. Use the proper bit for the proper material.



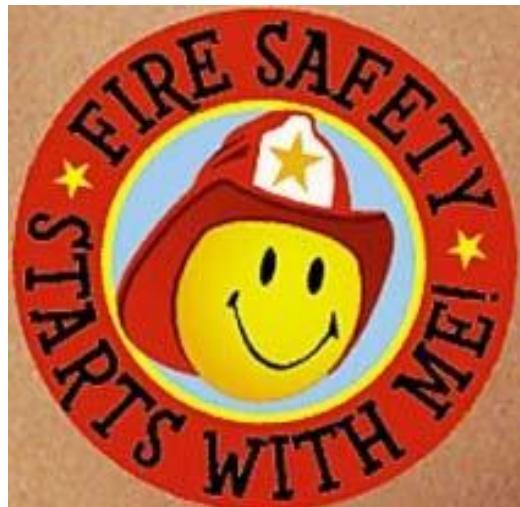
Chemical Safety

1. Keep chemical containers in good condition.
2. Before using a new chemical obtain and reference the MSDS
3. Make sure all chemical containers have labels placed by the manufacturer.
 - a. Ensure all labels are legible.
4. Use a properly rated respirator (listed in MSDS) when dealing with potentially toxic chemicals.
5. Store all chemicals in a fire rated cabinet that is clearly marked for chemical storage and remains locked when not in use
6. Ensure your area is and will remain spark and/or heat free when using flammable chemicals.
7. If you are exposed to a chemical, notify your safety captain and team mentor immediately and consult the MSDS for proper cleanup and exposure remediation techniques.



Fire Safety

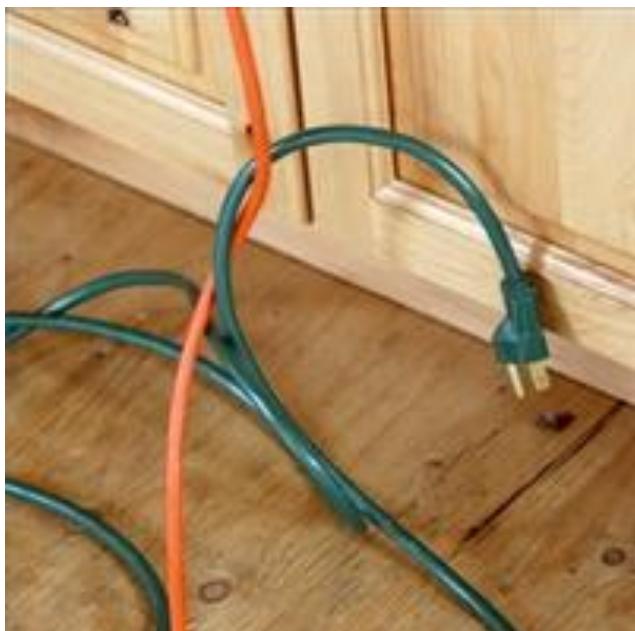
1. Fires can originate from many sources:
 - a. Open Flame
 - b. Sparks
 - c. Heat
 - d. Friction
2. Make sure to store all combustible liquids and solid in a fire rated cabinet that is properly marked and remains locked at all times
3. Make sure to check your work area for combustible materials such as sawdust or acetone before engaging in activities that generate sparks, heat, and or arcs (welding)
4. Make sure that the shop has the proper rated fire extinguishers for the type of work you are doing (A,B,C)
5. Know where the TWO nearest exits are to your work location at any time.
6. Know where the nearest fire extinguisher is to your work area is.
7. On a yearly basis inspect all fire extinguishers for the proper expiration dates.
8. When performing tasks that are especially prone to creating a possible fire make sure to have a fire watch standing by.
 - a. This person should have a fire extinguisher and/or fire blanket at the ready
 - b. They must also have the proper PPE in order to be able to respond in a reasonable amount of time to a fire
9. In the event of a fire
 - a. When using a fire extinguisher aim low (where the actual fire is) many people aim at the flames and/or smoke --- this will DO NOTHING
 - b. Make sure to alert the rest of the group to exit the building
 - c. Dial 911 and inform them that there is a FIRE and give the address along with the location of the shop you are in





Fall Safety

1. In the United States deaths due to falls rank second only to motor vehicle deaths. In addition, over 13 million people suffer injuries due to slipping, tripping and falling each year. In other words, that's about 250 injuries in the time it takes for this safety Tool Box Educational Session.
2. Everyone is aware that a person could be killed in a lot of different ways on a construction job, yet over fifty percent of construction related deaths are due to falls!
3. Falls from elevated areas are usually serious; in fact, there's a 50% chance of death in any fall of 11 feet or more to a hard surface. To avoid becoming the next victim of a fall from an elevated area, we must stay alert and obey all required safety regulations.
4. Avoid elevated falls by protecting floor, roof and wall openings with adequate covers or proper guard rails, netting, a safety belt or harness, as required by OSHA.
5. Same level falls are the most common--be extra cautious when walking on ice or snow, and floors that may be wet or slick from oil, grease, or chemical spills. Poor housekeeping on construction jobs is a major factor in fall accidents--keep scrap cleaned up daily--walkways and stairs swept clean and clear of power cords, hoses, cables, materials and tools.
6. Always dispose of used equipment oil properly--the Environmental Protection Agency monitors and fines companies who violate this law. Oil spills not only contaminate our environment, but it also creates an immediate slipping condition, plus a further slip-fall potential caused by oil soaked shoe bottoms.





Robotics Safety

A. General Guidelines:

1. Know the location of the on/off switch.
2. Know the location of the air pressure release valve.
3. Be aware of sharp corners and pinch points.
4. Warn and WAIT for a response from those around you that you are turning the robot on.
5. Do not lift the robot by one's self.
6. Make sure the robot is off before conducting any maintenance.
7. Never stand in range of the manipulators reach.
8. Do not carry or grab batteries by the leads, always grab at and carry batteries, with two hands, by the main housing.

B. Lifting the Robot

1. Pre-Lift

- a. Ensure all people involved in the lift are wearing their PPE.
- b. Make sure the robot is safe to move:
 - i. All parts of the robot are secure
 - ii. Make sure the power is off
 - iii. Make sure everyone is clear of the robot
- c. Make sure everyone knows at what speed and direction the robot is being moved
- d. Ensure the destination is clear of hazards and accessible.
- e. Make sure that there are enough people to lift the robot.

2. During the Lift

- a. Appoint a team member to watch out for pedestrian traffic.
- b. Make sure your footing is close to the robot in order to maintain a sturdy footing.
- c. Lift with legs --- NOT the back
- d. Do not twist your body to change orientation, move your feet.
- e. Make sure to maintain a strong grip on the robot frame.
- f. Make sure to use your knees in order to keep your back in a vertical orientation
- g. When setting down the robot on the cart, make sure the cart does not move or roll.

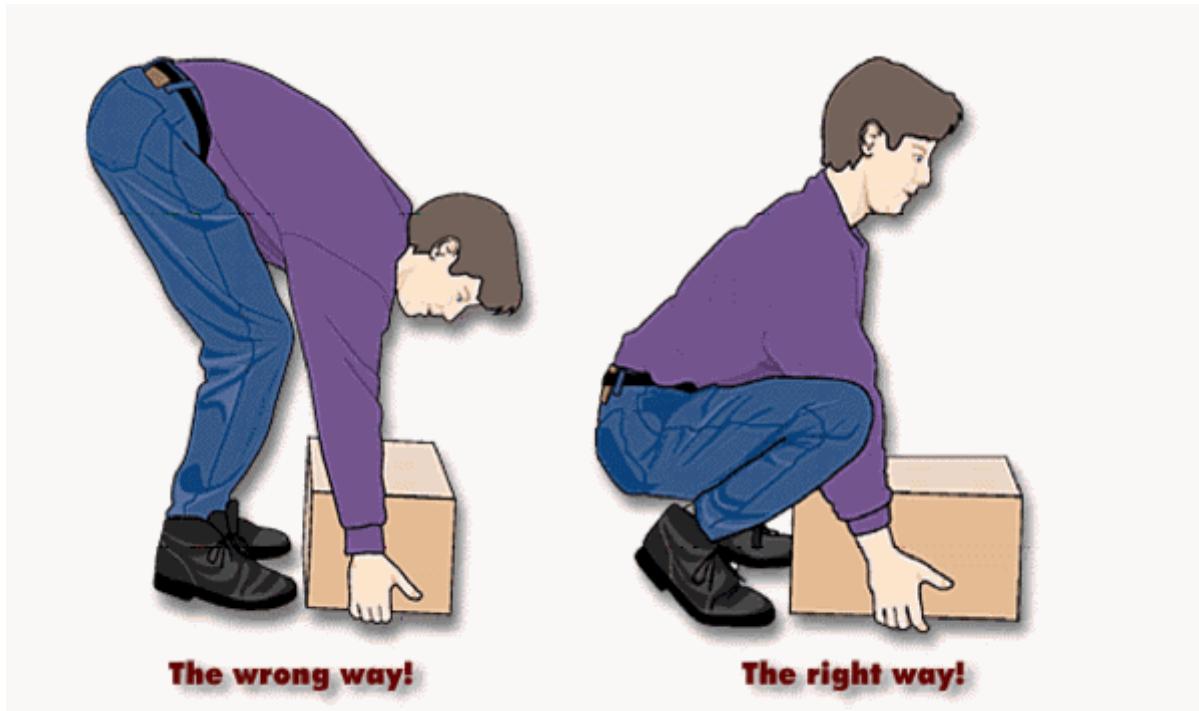


C. Transporting the Robot

1. Make sure the robot is secured to the cart.
2. Only move the cart at walking speed.
3. Make sure to maintain control over the direction of the cart at all times.
4. Exercise patience when moving the robot through the pits. They can often be crowded
5. Walk never run
6. Make sure to engage the cart brake whenever walking away from the cart

D. Competition Safety

1. Always wear safety glasses when in the pit area or field
2. No frayed edges, loose clothing, frayed hair or dangling objects are allowed in the pit area
3. Do not make any unnecessary noise or distractions
4. Do not carry unshielded tools in your pocket



Section 3

MSDS

Listings





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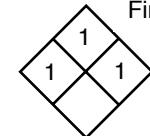
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A-9 ALUMINUM CUTTING FLUID

NFPA

Fire

Health



Reactivity

RELTON
 CORPORATION
**MATERIAL SAFETY DATA SHEET**Meets requirements of 29 CFR 1910.1200
(Federal Hazard Communication Standard)

HMIS	
Health	1
Fire	1
Reactivity	1

 SECTION I

PRODUCT NAME OR NUMBER	A-9® ALUMINUM CUTTING FLUID	
MANUFACTURER'S NAME	Relton Corporation	EMERGENCY TELEPHONE NO Chemtrec - (800) 424-9300
ADDRESS (Number, Street, City, State, and Zip Code)	317 Rodyn Place, Arcadia, CA 91007-2838	Non-Emergency Ph. No. (323) 681-2551 (800) 423-1505
HAZARDOUS MATERIALS DESCRIPTION AND PROPER SHIPPING NAME (49 CFR 172.101) NA NA		HAZARD CLASS (49 CFR 172.101) NA
CHEMICAL FAMILY	Mixture: predominately hydrocarbon base with bland additives.	Formula See Section II

<input type="checkbox"/> SECTION II - INGREDIENTS	TLV	PEL	STEL	C.A.S. NO.	%
Mineral Oil	NE	NE	NE	64742-58-1	> 70
Bland Additive	NE	NE	NE	Trade secret	< 25
Bland Additive	NE	NE	NE	Trade secret	< 16
Perfume	NE	NE	NE	---	< 1
Green dye, Pharmacy Grade	NE	NE	NE	---	trace

(See Section V for Health data)

Data is based on testing mixture as a whole. Neither the mixture nor any of its ingredients is on the carcinogen or suspected-carcinogen list of the NTP, the IARC, or OSHA. Contains no Calif. Prop. 65 substance. Not reportable under SARA. All components are listed on the TSCA inventory.

 SECTION III - PHYSICAL DATA

BOILING POINT (X°F) (C°)	400° F	SPECIFIC GRAVITY (H ₂ O=1) @ 25° C	0.883	Freezing Point	-20° F
VAPOR PRESSURE (mm Hg)	100° F: .1 mm	PERCENT VOLATILE BY VOLUME (%)	NA	VOC	NA
VAPOR DENSITY (AIR=1)	NA	EVAPORATION RATE (WATER=1)	NA		
SOLUBILITY IN WATER	Negligible	pH=	NA		
APPEARANCE AND ODOR	light green oil with slight,fatty odor.		MATERIAL IS GAS	LIQUID PASTE	SOLID POWDER

 SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (method used)	266° F CCC	FLAMMABLE LIMITS	LFL	UFL
		Non-Flammable	NA	NA
EXTINGUISHING MEDIA Use CO ₂ , dry chemicals , foam, water as a mist only.				
SPECIAL FIRE FIGHTING PROCEDURES Prefer CO ₂ or sand as with oil fire.				
UNUSUAL FIRE AND EXPLOSION HAZARDS No unusual hazards				
Exposing containers to intense heat could cause drums to rupture. Cool fire-exposed containers with water spray to prevent rupture.				

 SECTION V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE
Eyes and skin: may cause mild irritation. Inhalation: may cause mild upper respiratory irritation. Ingestion: possible nausea.
EMERGENCY AND FIRST AID PROCEDURES
Eyes: flush for 15 min. with water. Skin: wash with soap and water. Inhalation: remove to fresh air. Ingestion: do not induce vomiting; give lots of water to a conscious person. Call Doctor

A-9 ALUMINUM CUTTING FLUID **SECTION VI - REACTIVITY DATA**

STABILITY	UNSTABLE		CONDITIONS TO AVOID: Flame, heat, strong oxidizing agents
INCOMPATIBILITY (materials to avoid): Swells natural rubber and some plastics. Slight etching of light metals on prolonged exposure may occur.			
HAZARDOUS POLYMERIZATION	MAY OCCUR	X	CONDITIONS TO AVOID: NA

 SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED. Wear respirator and protective clothing .Treat as oil spill. Soak up on absorbent clay or sand and remove to containers.
WASTE DISPOSAL METHOD Transport in DOT-approved container to EPA-approved treatment, storage, and disposal facility. Follow local, State & Federal disposal regulations.

 SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type) Normally not needed. For oil-type mist, use NIOSH listed respirator.			
VENTILATION Local-mechanical to remove oil mist	LOCAL EXHAUST (Specify Rate) Adequate to avoid fumes and oil mists	SPECIAL	Not required normally
PROTECTIVE GLOVES Nitrile-type, oil resistant		EYE PROTECTION	Chemical goggles or full faceshield.
OTHER PROTECTIVE EQUIPMENT Clean clothes. Apron or chemical suit where splashing may occur.			

 SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING Avoid production of oil mist. Avoid excessive heat. Avoid repeated or prolonged skin or eye contact.
OTHER PRECAUTIONS While there is no TLV established for this product, airborne mist should be kept below the nuisance TLV for oil mist: 5Mg/meter ³ .

ADDITIONAL INFORMATION

DOT: No hazardous substance
No hazard class
No DOT ID# UN or NA#: Not applicable
Freight Classification: Petroleum oil, lubricating
It# 155250 Class 65

SARA: Not considered to be subject to Title III

TSCA: All components required to be listed on the inventory are listed.

IARC-NTP-OSHA: Neither the mixture nor any component is listed as a carcinogen or suspected carcinogen.

California Prop. 65 Material: None.

Prepared: 12-10-93 Updated: 10-23-97
 Updated: 12-6-94 Updated: 02-29-00
 Updated: 5-7-96 Updated: 03/10/03
 Updated: Updated: 07/22/05

by Dr. Robert E. Pratt,
consulting chemist

RELTON

CORPORATION



317 ROLYN PLACE ARCADIA CALIFORNIA 91007-2838
 Phone: (323) 681-2551 (800) 423-1505
 Emerg: Chemtrec - (800) 424-9300

MSDS Number: A0446 * * * * Effective Date: 09/01/09 * * * * Supercedes: 02/01/07

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc. | 222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

ACETONE

1. Product Identification

Synonyms: Dimethylketone; 2-propanone; dimethylketal

CAS No.: 67-64-1

Molecular Weight: 58.08

Chemical Formula: (CH₃)₂CO

Product Codes:

J.T. Baker: 5008, 5018, 5356, 5580, 5965, 5975, 9001, 9002, 9003, 9004, 9005, 9006, 9007, 9008, 9009, 9010, 9015, 9024, 9036, 9125, 9254, 9271, A134, V655

Mallinckrodt: 0018, 2432, 2435, 2437, 2438, 2440, 2443, 2850, H451, H580, H981

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Acetone	67-64-1	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate

Flammability Rating: 3 - Severe (Flammable)

Reactivity Rating: 0 - None

Contact Rating: 3 - Severe

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD;

PROPER GLOVES; CLASS B EXTINGUISHER

Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:

Inhalation of vapors irritates the respiratory tract. May cause coughing, dizziness, dullness, and headache. Higher concentrations can produce central nervous system depression, narcosis, and unconsciousness.

Ingestion:

Swallowing small amounts is not likely to produce harmful effects. Ingestion of larger amounts

may produce abdominal pain, nausea and vomiting. Aspiration into lungs can produce severe lung damage and is a medical emergency. Other symptoms are expected to parallel inhalation.

Skin Contact:

Irritating due to defatting action on skin. Causes redness, pain, drying and cracking of the skin.

Eye Contact:

Vapors are irritating to the eyes. Splashes may cause severe irritation, with stinging, tearing, redness and pain.

Chronic Exposure:

Prolonged or repeated skin contact may produce severe irritation or dermatitis.

Aggravation of Pre-existing Conditions:

Use of alcoholic beverages enhances toxic effects. Exposure may increase the toxic potential of chlorinated hydrocarbons, such as chloroform, trichloroethane.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention.

5. Fire Fighting Measures

Fire:

Flash point: -20C (-4F) CC

Autoignition temperature: 465C (869F)

Flammable limits in air % by volume:

lel: 2.5; uel: 12.8

Extremely Flammable Liquid and Vapor! Vapor may cause flash fire.

Explosion:

Above flash point, vapor-air mixtures are explosive within flammable limits noted above.

Vapors can flow along surfaces to distant ignition source and flash back. Contact with strong oxidizers may cause fire. Sealed containers may rupture when heated. This material may produce a floating fire hazard. Sensitive to static discharge.

Fire Extinguishing Media:

Dry chemical, alcohol foam or carbon dioxide. Water may be ineffective. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker SOLUSORB® solvent adsorbent is recommended for spills of this product.

7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatible materials. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

Acetone:

-OSHA Permissible Exposure Limit (PEL): 1000 ppm (TWA)

-ACGIH Threshold Limit Value (TLV): 500 ppm (TWA),

750 ppm (STEL) A4 - not classifiable as a human carcinogen

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a half-face organic vapor respirator may be worn for up to ten times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece organic vapor respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Clear, colorless, volatile liquid.

Odor:

Fragrant, mint-like

Solubility:

Miscible in all proportions in water.

Specific Gravity:

0.79 @ 20C/4C

pH:

No information found.

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

56.5C (133F) @ 760 mm Hg

Melting Point:

-95C (-139F)

Vapor Density (Air=1):

2.0

Vapor Pressure (mm Hg):

400 @ 39.5C (104F)

Evaporation Rate (BuAc=1):

ca. 7.7

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Concentrated nitric and sulfuric acid mixtures, oxidizing materials, chloroform, alkalis, chlorine compounds, acids, potassium t-butoxide.

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50: 5800 mg/kg; Inhalation rat LC50: 50,100mg/m³; Irritation eye rabbit, Standard Draize, 20 mg severe; investigated as a tumorigen, mutagen, reproductive effector.

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Acetone (67-64-1)	No	No	None

12. Ecological Information

Environmental Fate:

When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released into water, this material is expected to readily biodegrade. When released to water, this material is expected to quickly evaporate. This material has a log octanol-water partition coefficient of less than 3.0. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material may be moderately degraded by photolysis. When released into the air, this material is expected to be readily removed from the atmosphere by wet deposition.

Environmental Toxicity:

This material is not expected to be toxic to aquatic life. The LC50/96-hour values for fish are over 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility.

Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: ACETONE

Hazard Class: 3

UN/NA: UN1090

Packing Group: II

Information reported for product/size: 188L

International (Water, I.M.O.)

Proper Shipping Name: ACETONE

Hazard Class: 3

UN/NA: UN1090

Packing Group: II

Information reported for product/size: 188L

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Acetone (67-64-1)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----				
--	--	--	--	--

Ingredient	Korea	DSL	NDSL	Phil.
Acetone (67-64-1)	Yes	Yes	No	Yes

Federal, State & International Regulations - Part 1\			
	-SARA 302-	SARA 313	
Ingredient	RQ	TPQ	List Chemical Catg.
Acetone (67-64-1)	NO	NO	Yes

Federal, State & International Regulations - Part 2\			
	-RCRA-	TSCA-	
Ingredient	CERCLA	261.33	8(d)
Acetone (67-64-1)	5000	U002	NO

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
 SARA 311/312: Acute: Yes Chronic: No Fire: Yes Pressure: No
 Reactivity: No (Pure / Liquid)

Australian Hazchem Code: 2[Y]E

Poison Schedule: None allocated.

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 1 Flammability: 3 Reactivity: 0

Label Hazard Warning:

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM.

Label Precautions:

Keep away from heat, sparks and flame.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Avoid breathing vapor.

Avoid contact with eyes, skin and clothing.

Label First Aid:

Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

No Changes.

Disclaimer:

Mallinckrodt Baker, Inc. provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. MALLINCKRODT BAKER, INC. MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS. ACCORDINGLY, MALLINCKRODT BAKER, INC. WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

Prepared by: Environmental Health & Safety

Phone Number: (314) 654-1600 (U.S.A.)

GREASE MSDS

[PDF\(210KB\)](#)

The Ultra - Premium Extreme Pressure Multi - Purpose Lithium - Complex Grease

Material Safety Data Sheet - MILITEC-1 Grease

Revised 15 August 02

Section One: Chemical Product and Company Identification

Militec, Incorporated Phone: (301) 893-3910
11828 Pika Drive Fax: (301) 893-8354
Waldorf, Maryland 20602

Product Name: **MILITEC-1 Grease, NLGI Grade #2**

Chemical Name: petroleum grease CAS #: Mixture

Common Name: Grease

Section Two: Composition/Information on Ingredients

COMMON NAME	CHEMICAL NAME	CAS NO.	% (by volume)
Lithium Hydroxide		1310-66-3	<5
12-Hydroxystearic acid		106-14-9	<15
Hydrotreated heavy naphthenic distillate		64742-52-5	<53
Polybutene		9003-29-6	<10
Antimony dialkyldithiocarbamate		15890-25-2	<1
Dimethylbenzene (xylene)		1330-20-7	<1
MILITEC-1 Synthetic Ester			<15

Contains no other ingredients now known to be hazardous as defined by OSHA 29 CFR 1910.1000(z).

Section Three: Hazard Identification

Principle Hazards:

Prolonged or repeated skin contact may cause dermatitis.

See section 11 for complete health hazard information.

Threshold Limits:	The PEL (OSHA) and the TLV (ACGIH) is 5 mg/m ³ as an oil mist.
Primary Routes of Exposure:	
EYE	May cause eye irritation. No significant adverse effects expected.
SKIN	Repeated or prolonged contact with skin may cause irritation, which may lead to various skin disorders. Avoid prolonged skin contact.
INHALATION	No significant adverse health effects are expected to occur in short term exposure.
ORAL	Ingestion may cause nausea, diarrhea and stomach discomfort.

Section Four: First Aid Measures

ORAL	DO NOT INDUCE VOMITING. If conscious, give 2 glasses of water. Get immediate medical attention.
EYE	Flush with water for at least 15 minutes. Get medical attention if eye irritation develops or persists.
SKIN	Wash immediately with soap and water. Remove soiled clothing. Get medical attention if irritation develops. Launder contaminated clothing.
INHALATION	Remove exposed person to fresh air. If breathing is labored, administer oxygen and obtain immediate medical attention. If irritation persists or if toxic symptoms are observed, get medical attention.

Section Five: Fire Fighting Measures

FLASH POINT: >250°C (COC) >482° F

May release flammable vapors when heated above flash point.

EXTINGUISHING MEDIA	Carbon Dioxide, dry chemical, or foam. Avoid using water.
HAZARDOUS EXPOSURE	Carbon monoxide, hydrogen chloride and asphyxiants.
SPECIAL FIRE PROCEDURES	Recommend SCBA. Use water only for cooling container. Water may cause splattering, or transport the flame.

Section Six: Accidental Release Measures

Evacuate all non-essential personnel. Personal Protective Equipment must be worn, see PPE section 8 & 16. Remove sources of ignition. Prevent entry into sewers and waterways. Contain release, pick up for recycling or disposal. Residual liquid can be absorbed with inert material. Check DOT/CERCLA and other agencies

for reporting requirements.

Prevent contamination to soil, waterway and sewer systems.

Section Seven: Handling and Storage

HANDLING

Avoid prolonged skin contact, breathing vapors, and contaminated clothing. Use with adequate ventilation. Wear recommended protective equipment. Practice good personal hygiene after handling. Empty containers retain material residue. Do not cut, weld, braze, solder or expose containers to other ignition sources.

STORAGE

Store in closed containers of proper construction. Store away from ignition sources and in areas of good ventilation.

Section Eight: Exposure Controls – Personal Protection

EXPOSURE LIMITS

TLV = 5 mg/m³ as oil mist

VENTILATION

Use in areas of adequate ventilation

GLOVES

Nitrile or neoprene gloves are recommended.

EYE PROTECTION

Safety glasses, goggles, or face shield are recommended.

RESPIRATORY

Self contained breathing apparatus is recommended for confined space entry.

CLOTHING

Long sleeve shirt and apron when potential for skin contact. Wear neoprene or nitrite rubber boots when necessary to avoid contaminating shoes.

Section Nine: Physical and Chemical Properties

APPEARANCE:

Light Brown Grease

Ph: n/d

BOILING POINT:

>350° C

SOLUBILITY:

negligible

EVAPORATION POINT:

less than ether

SPECIFIC

.940

GRAVITY;

FLAMMABILITY:

N/A

VAPOR DENSITY:

heavier than air

FLASH POINT:

250° C

VAPOR

<0.01mm Hg

ODOR:

petroleum odor

PRESSURE:

@ 20° C

VOC. %:

nil

Section Ten: Stability and Reactivity

STABILITY

Material is normally stable at ambient temperature and pressure.

CONDITIONS TO AVOID

Oxidizing agents. Do not heat above the flash point.

POLYMERIZATION

Will not occur.

DECOMPOSITION

Carbon dioxide, carbon monoxide, hydrogen chloride.

Section Eleven: Toxicological Information

ORAL TOXICITY	Swallowing material may cause irritation of the gastrointestinal lining, nausea, vomiting, diarrhea, and abdominal pain.
EYE IRRITATION	Not expected to cause eye irritation.
SKIN IRRITATION	Not expected to be a primary skin irritant. Prolonged or repetitive contact may cause irritation.
CARCINOGENIC	This material has not been identified as a carcinogen by NTP, IARC, or OSHA. PCBs not detected at or above 2 PPM threshold limit of detection.

Section Twelve: Ecological Information

This material is expected to have adverse affects on marine and plant life. Spills may contaminate drinking water.

Section Thirteen: Disposal Considerations

DISPOSAL	Consult federal, state, and local regulations regarding disposal Methods. Recycle used oil. Do not contaminate used oil with solvents or other chemicals.
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Section Fourteen: Transportation Information

See 49 CFR part 171.8 through 178.510

DOT SHIPPING NAME:	Oil, n.o.s.
DOT HAZARD CLASS:	not regulated
UN/NA NUMBER:	NA 1270
GUIDE NUMBER:	27
IMDG CODE:	Materials classified as DOT Combustible Liquids (flash point > 141° F and < 200° F) are not regulated by DOT in containers of 110 gallons or less for domestic shipments.

Section Fifteen: Regulatory Information

TSCA	All components of this material are on the US TSCA Inventory.
SARA 311	
SARA 312	
SARA 313	contains <1 % xylene & <1 % antimony compounds
CAL PROP 65	not listed
RCRA	not listed
CERCLA	listed

Section 16: Other Information

	Health	Fire	Reactivity	PPE
HMIS CODE:	1	1	0	C
NFPA CODE:	1	1	1	
PRECAUTIONARY LABELS:	NA			

This information has been compiled from sources considered to be dependable and is accurate to the best of Militec, Inc. knowledge. Militec, Inc. makes no warranty whatsoever, expressed or implied, of MERCHANTABILITY OR FITNESS FOR THE PARTICULAR PURPOSE, regarding the accuracy of such data or the results to be obtained from the use thereof. Militec, Inc. assumes no responsibility for injury to recipient or third persons, or for any damage to any property and recipient assumes all such risks.

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Material Safety Data Sheet

Ad-Tech 962

MSDS No. 962-99

Date of Preparation: Mar. 26,1999

page 1 of 3

Section 1 - Chemical Product and Company Identification

Product/Chemical Name: Ad-Tech 962

Product Description: Hot melt adhesive

HMIS

H 0

F 0

R 0

PPE B

†Sec. 8

Manufacturer: Adhesive Technologies, Inc., 3 Merrill Industrial Drive, Hampton, N.H. 03842, and Taipei Hsien, Taiwan. Phone (603)-926-1616, FAX (603) 926-1780 (Open 8 a.m. to 4 p.m. EST).

☆☆☆☆☆ Emergency Overview ☆☆☆☆☆

Section 2 - Composition / Information on Ingredients

Ingredient Name	CAS Number	% wt or % vol
This product is not hazardous as defined in 29 CFR 1910.1200	N/A	N/A

Toxicity Data: Conforms to ASTM D-4236 as non-toxic.

Section 3 - Physical and Chemical Properties

Physical State: 100% Solids.

Appearance and Odor: Yellow color with slight odor.

Vapor Pressure: Not applicable

Vapor Density (Air=1): Not applicable

Specific Gravity (H₂O=1, at 4 °C): .98

PH: 7.1

Water Solubility: Nil

Boiling Point: Not applicable.

Melting Point: 208°F (98°C).

Viscosity: 5,500 centipoise @ 350°F

% Volatile: Nil.

Evaporation Rate: Not applicable.

Section 4 - Fire-Fighting Measures



Flash Point: >450°F (>232 °C).

Flash Point Method: CC.

Autoignition Temperature: >800°F (>427 °C)

Extinguishing Media: Carbon Dioxide, Foam

Unusual Fire or Explosion Hazards: None.

Special Fire-Fighting Instructions: None.

Fire-Fighting Equipment: Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode.

Section 5 - Stability and Reactivity

Stability: Stable

Polymerization: Hazardous polymerization will not occur.

Incompatibilities – Materials to avoid: Strong oxidizing agents.

Hazardous Decomposition Products: Thermal oxidative decomposition of Ad-Tech 962 can produce carbon monoxide and/or carbon dioxide.

Section 6 - Health Hazard Information

Potential Health Effects

Eyes: Vapors and fumes released at or above application temperature may cause irritation.

Inhalation: Vapors and fumes released at or above application temperature may cause irritation of the nose, throat and respiratory tract.

Skin: Hot molten adhesive will burn and blister skin tissue.

Ingestion: Ingestion is not a likely route of exposure. Small amounts are not anticipated to be harmful.

Carcinogenicity: IARC, NTP, and OSHA do not list Ad-Tech 962 as a carcinogen.

Medical Conditions Aggravated by Long-Term Exposure: No known effects on other illnesses.

Chronic Effects: No anticipated chronic effects.

Emergency and First Aid Procedures

Inhalation: If irritation occurs, remove to fresh air.

Eye Contact: hot molten adhesive will adhere to and burn eye and surrounding skin upon contact. Immediately flush affected area with cold water to cool adhesive. Do not pull solidified adhesive from eye. Seek medical attention.

Skin Contact: Hot molten adhesive will adhere to and burn skin upon contact. Immediately immerse affected area in ice water. Do not pull solidified adhesive from skin. Seek medical attention.

Ingestion: If ingested, seek medical attention.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Note to Physicians: This adhesive was determined by a toxicologist to be non-toxic.

Special Precautions/Procedures: None.

Section 7 - Spill, Leak, and Disposal Procedures

Cleanup: Normal housekeeping and clean up (no special procedures).

Regulatory Requirements: None.

Disposal: Follow applicable Federal, state, and local regulations for proper disposal procedures.

EPA Regulations:

RCRA Hazardous Waste Number: Not applicable.

RCRA Hazardous Waste Classification: Not applicable.

CERCLA Hazardous Substance (40 CFR 302.4): unlisted, specific per RCRA, Sec. 3001; CWA, Sec. 311 (b)(4); CWA, Sec. 307(a), CAA, Sec. 112

CERCLA Reportable Quantity (RQ), Not applicable.

SARA 311/312 Codes: Not applicable.

SARA Toxic Chemical (40 CFR 372.65): Not listed

SARA EHS (Extremely Hazardous Substance) (40 CFR 355): Not applicable, non-hazardous.

OSHA Regulations:

Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A): Not applicable.

OSHA Specifically Regulated Substance (29 CFR 1910). Not applicable.

State Regulations: None.

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: Local ventilation recommended.

Ventilation: Provide general or local exhaust ventilation to areas using this adhesive. Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

Administrative Controls: Not applicable.

Respiratory Protection: Not required under normal use.

Protective Clothing/Equipment: Wear protective gloves and long sleeved shirt to prevent skin contact. Wear protective eyeglasses or safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

Contaminated Equipment: Cooled adhesive may be removed from clothing by freezing affected area and picking off.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

Section 9 - Special Precautions and Comments

Handling Precautions: No special handling necessary.

Storage Requirements: Store in cool dark area.

Prepared By: Dennis Fitzmeyer.

Revision Notes: Revised 10/13/09

Disclaimer:

The information provided here represents our current data and best opinion as to the proper use in handling of this material under normal conditions. Any use of the material which is not in conformance with this data sheet or which involves using the material in combination with any other material or any other process is the responsibility of the user.

Cooper Hand Tools/Cheraw Plant MSDS for Lead-Free Solder

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer's Name: Bow Solder Products Co. 1 Crossman Road Sayreville, NJ 08872	Emergency Telephone Number: 800-535-5053 Information Phone: 732-316-2100 Origination Date: January 29, 1991 Revision Date: April 29, 1999	Distributor Name: CooperTools 3535 Glenwood Avenue Raleigh, NC 27612 Information: 919-783-2126
COMMON NAME: Lead Free Solder	PRODUCT CAS NO.: Mixture	

2. INGREDIENTS: COMPOSITION/INFORMATION*

INGREDIENT	% WEIGHT	PEL-OSHA	TLV-ACGIH	LD 50/LC 50 ROUTE/SPECIES
Tin CAS No.: 7440-31-5 RTECS: XP7320000	> 90	2 mg/m ³	2 mg/m ³	No Data
Copper CAS No.: 7440-50-8 RTECS: GL5325000	< 5	1 mg/m ³ (as Cu) 0.1 mg/m ³ (fume)	1 mg/m ³ (dusts and mists) 0.2 mg/m ³ (fume)	LD50: 3500 µg/kg intraperitoneal/ mouse
Silver CAS No.: 7440-22-4 RTECS: VW3500000	< 2	0.01 mg/m ³	0.1 mg/m ³	LD: > 10 gm/kg oral/mouse
Antimony CAS No.: 7440-36-0 RTECS: CC4025000	< 2	0.5 mg/m ³	0.05 mg/m ³	LD50: 7 gm/kg intraperitoneal/rat

* Product contains <0.20% lead. Releases in excess of the TLV/PEL are not anticipated under normal working conditions.

3. HAZARDS IDENTIFICATION

Revision Date: August 4, 1999

EMERGENCY OVERVIEW

Dusts, mists, and fumes from this silver-white odorless solder may produce skin eye and upper respiratory irritation. Contact with heated product can cause thermal burns. Repeated contact may cause dermatitis. Nonflammable. Contains < 0.20% lead.

POTENTIAL HEALTH EFFECTS

EYES: Contact with soldering fumes, dusts, or particles may cause eye irritation. Contact with heated solder can cause severe burns.

SKIN: Repeated contact may cause skin irritation. Sensitive individuals may develop dermatitis or eruptions resembling chicken pox (antimony spots). Contact with heated solder can cause severe burns.

INHALATION: Inhalation of dusts and fumes may cause irritation of the upper respiratory tract. Inhalation of freshly formed metal oxides may cause metal fume fever, a brief (24-48 H) flu-like illness. Inhalation of tin oxide may cause pneumonia.

INGESTION: Ingestion of sufficient quantities may cause nausea, vomiting and diarrhea.

SIGNS AND SYMPTOMS: Exposure may cause general eye, skin and upper respiratory irritation. Metal fume fever is characterized by chills, nausea, aching muscles, metallic taste, and fever.

CHRONIC: Repeated exposure to silver over a long period of time may result in argyria, a gray discoloration of the skin, conjunctiva and internal organs. Long-term exposure to copper may result in anemia. Long-term inhalation of tin and antimony may produce benign pneumoconiosis. Product contains < 0.20% lead. Although exposure to lead contained in this product is not anticipated under normal working conditions, if released in sufficient quantities over time, lead can have adverse health effects (see Section 11).

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with impaired pulmonary function (particularly obstructive airway disease) may experience an exacerbation of symptoms due to the irritant properties of copper and tin. Blonde people are generally more susceptible to argyria.

CARCINOGENICITY:

NTP: No

OSHA: No

IARC: 2B

IARC classifies lead and lead compounds as a group of agents which are possibly carcinogenic to humans.

TARGET ORGANS: Eyes, skin, respiratory system, cardiovascular system (antimony), liver, kidneys (copper), and nasal septum (silver).

WARNING: This product contains or produces a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

Revision Date: August 4, 1999

4. FIRST AID MEASURES

EYE CONTACT: Flush eyes with water for 15 minutes. If irritation persists, seek medical attention.

SKIN CONTACT: Remove contaminated clothing and wash affected area with soap and water. If irritation persists, seek medical attention.

INHALATION: For dusts or fumes: Remove to fresh air. If breathing is difficult administer oxygen. If breathing has stopped, give artificial respiration. Seek medical attention.

OTHER: If accidental ingestion occurs give 1 to 2 glasses of water. If ingestion is substantial or irritation persists, seek medical attention.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASHPOINT: NOT APPLICABLE

NFPA HAZARD CLASSIFICATION: Not Classified

FLAMMABLE LIMITS: LEL: Not Applicable UEL: Not Applicable

EXTINGUISHING MEDIA: Use media appropriate for surrounding fire. Do not use water on fire where molten metal is present.

FIRE AND EXPLOSION HAZARDS: Extremely high temperatures or contact with certain acids may produce toxic tin compounds. Noncombustible solid but flammable or combustible in dust and powder form.

FIRE FIGHTING EQUIPMENT: Firefighters should wear a NIOSH/MSHA-approved self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout gear or bunker gear.

6. ACCIDENTAL RELEASE MEASURES

Not applicable.

7. HANDLING AND STORAGE

Store in dry location away from incompatible materials.

Minimize dust accumulation. Clean dusts using method which does not scatter dust. Vacuuming is preferred. DO NOT USE compressed air to blow dust from work area.

Clean work clothing should be worn daily. Clothing which becomes dusty should be changed promptly. Wash hands thoroughly after handling and before eating, smoking, breaks, and using toilet facilities.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION: Under normal conditions (ambient temperature and pressure) and use none required. Above acceptable exposure guidelines, respiratory protection in accordance with 29 CFR Part 134 should be worn.

SKIN PROTECTION: Gloves to prevent skin contact with molten metal.

EYE PROTECTION: Safety glasses or goggles as necessary to prevent contact with dusts, fumes, particles or molten metal.

ENGINEERING CONTROLS: General ventilation used in combination with local exhaust in areas where dusts and/or fumes are produced from heating and machining processes.

PERSONAL CONTROL MEASURES: Air sampling for tin and antimony: Mixed cellulose ester filter, 0.8 µm (NIOSH 7300)

Air sampling for copper: Mixed cellulose ester filter, 0.8 µm (NIOSH 7029)

Air sampling for silver: Mixed cellulose ester filter, 0.8 µm (NIOSH 2(S2))

OTHER: Emergency eyewash stations

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Solid silver-white metal (various shapes and sizes)
ODOR:	Odorless
BOILING POINT:	< 4000 °F
VAPOR PRESSURE:	Not Applicable
VAPOR DENSITY:	Not Applicable
SOLUBILITY IN WATER:	Insoluble
SPECIFIC GRAVITY:	7.1 (approximate)
MELTING POINT:	430 °F (approximate)
pH:	Not Applicable
% VOLATILE:	0
VISCOSITY:	Not Applicable
SOLIDS CONTENT:	100%

10. STABILITY AND REACTIVITY

STABILITY: Stable.

INCOMPATIBILITY: Tin is incompatible with chlorine, turpentine, acids, and alkalis. Silver is

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incompatible with acetylene, ammonia, hydrogen peroxide, bromoazide, chlorine trifluoride, ethyleneimine, oxalic acid, and tartaric acid. Antimony is incompatible with strong oxidizers, acids, halogenated acids. Copper is incompatible with oxidizers, alkalis, sodium azide, and acetylene. Product as a whole is incompatible with strong acids, sulfur and chlorine

HAZARDOUS DECOMPOSITION PRODUCTS: Can form toxic metal oxides when involved in fire situation. Reaction with strong acids may produce toxic organic or inorganic tin compounds.

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

INGESTION: Tin, copper, antimony and silver have relatively low oral toxicity. Although product contains < 0.20% lead, repeated ingestion over time may cause lead poisoning (see chronic).

SKIN: Antimony spots consist of papules and pustules around sweat and sebaceous glands which resemble the chicken pox.

EYE: When the lens is directly entered or injured by a foreign body containing copper, dense cataract formation and yellow green discoloration of the lens may occur.

INHALATION: Antimony metal fume fever has been reported to occur from air concentrations below 5 mg/m³. Argyria has not resulted from air concentrations of silver which are less than 0.01 mg/m³.

CHRONIC: Repeated inhalation of antimony and tin can cause benign pneumoconiosis. Due to antimony's association with lead and arsenic in industry and silica in mining, it is difficult to adequately assess toxicity. Many cases of illness formerly attributed to copper are now believed to have been due to an admixture of other metals especially lead. Development of argyria through inhalation appears to be very slow and may require years.

Repeated exposure to lead over time can adversely affect the central nervous system (CNS), gastrointestinal (GI) tract, kidneys, reproductive system, and blood. Lead can adversely affect fetal development. Signs and symptoms of chronic lead poisoning are various and may include metallic taste, headache, weakness, insomnia, anorexia, constipation, abdominal pain, and anemia.

OTHER: High concentrations of tin (395 gm/kg and 840 gm/kg) produced tumors when implanted in experimental animals (rat and mouse respectively). Intrapleural administration of 100 mg/kg copper has caused focal fibrosis and tumors in rats. High doses of silver (> 2.5 gm/kg) have caused tumors in animal implantation studies. Rat inhalation of 50 mg/m³/7H/52W-I antimony produced tumors of the thorax.

12. ECOLOGICAL INFORMATION

No Data

13. DISPOSAL CONSIDERATIONS

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Dispose of in accordance with applicable local, state and federal regulations. Dispose per 40 CFR Part 261 and 262.

14. TRANSPORT INFORMATION

DOT: Not classified

15. REGULATORY INFORMATION

CANADIAN WHMIS: D2B

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200: Product is considered hazardous under the criteria of this rule.

CERCLA, 40 CFR Part 302(CERCLA): This product contains copper, antimony, and silver, CERCLA Reportable Quantity (RQ) Substances, and if 5,000 or more pounds of copper or antimony or 1,000 or more pounds of silver are released, notification to the National Response Center in Wash., D.C. (1-800-424-8802) is required.

SARA 313 INFORMATION:

This product contains copper (<5%), silver(<2%), and antimony(<2%) substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA Hazard Categories promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories: Acute Health Hazard

Chronic Health Hazard

CALIFORNIA PROPOSITION 65: This product contains lead (<0.20%), an ingredient known to the State of California to cause cancer and reproductive toxicity.

16. OTHER INFORMATION

KEY:

ACGIH:	American Conference of Governmental Industrial Hygienists
IARC:	International Agency for Research on Cancer
MSHA:	Mine Safety and Health Administration
NIOSH:	National Institute of Occupational Safety and Health
NTP:	National Toxicology Program

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OSHA:	Occupational Safety and Health Administration
PEL:	Permissible Exposure Limits
PNOC:	Particulate Not Otherwise Classified
PNOR:	Particulate Not Otherwise Regulated
TLV:	Threshold Limit Values

DISCLAIMER

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 material. This information has been prepared for the guidance of plant engineering, operations and management, and for persons working with or handling this material. Bow Electronics Solders believes this information to be reliable and up-to-date as of the date of publication, but makes no warranty that it is.

Revision Date: August 4, 1999

Material Safety Data Sheet



Revision Number: 000.0

Issue date: 11/23/2010

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Loctite Threadlocker Red 271
Product type: Anaerobic Sealant
Company address:
Henkel Corporation
One Henkel Way
Rocky Hill, Connecticut 06067
IDH number: 209741
Region: United States
Contact information:
Telephone: 800.624.7767
MEDICAL EMERGENCY Phone: Poison Control Center
1-877-671-4608 (toll free) or 1-303-592-1711
TRANSPORT EMERGENCY Phone: CHEMTREC
1-800-424-9300 (toll free) or 1-703-527-3887
Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HMIS:

Physical state:	Liquid	HEALTH:	*2
Color:	red	FLAMMABILITY:	1
Odor:	Mild	PHYSICAL HAZARD:	1
		Personal Protection:	See MSDS Section 8
WARNING:	CAUSES EYE IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY CAUSE SKIN IRRITATION. MAY CAUSE RESPIRATORY TRACT IRRITATION.		

Relevant routes of exposure: Skin, Inhalation, Eyes

Potential Health Effects

Inhalation:	May cause respiratory tract irritation.
Skin contact:	May cause skin irritation. May cause allergic skin reaction.
Eye contact:	Contact with eyes will cause irritation.
Ingestion:	Not expected to be harmful by ingestion.

Existing conditions aggravated by exposure: Eye, skin, and respiratory disorders.

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components	CAS NUMBER	%
Polyglycol dimethacrylate	25852-47-5	60 - 100
Bisphenol A fumarate resin	39382-25-7	10 - 30
Saccharin	81-07-2	1 - 5
Cumene hydroperoxide	80-15-9	1 - 5

4. FIRST AID MEASURES

Inhalation: Move to fresh air. If symptoms develop and persist, get medical attention.

Skin contact:	Remove contaminated clothing and footwear. Wash with soap and water. Wash clothing before reuse. If symptoms develop and persist, get medical attention.
Eye contact:	Flush with copious amounts of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time. Get medical attention.
Ingestion:	Do not induce vomiting. Keep individual calm. Get medical attention.

5. FIRE FIGHTING MEASURES

Flash point:	> 93.3 °C (> 199.94 °F) Tagliabue closed cup
Autoignition temperature:	Not available
Flammable/Explosive limits - lower:	Not available
Flammable/Explosive limits - upper:	Not available
Extinguishing media:	Foam, dry chemical or carbon dioxide.
Special firefighting procedures:	None
Unusual fire or explosion hazards:	None
Hazardous combustion products:	Oxides of carbon. Oxides of sulfur. Oxides of nitrogen. Irritating organic vapours.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions:	Do not allow product to enter sewer or waterways.
Clean-up methods:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Store in a partly filled, closed container until disposal.

7. HANDLING AND STORAGE

Handling:	Prevent contact with eyes, skin and clothing. Do not breathe vapor and mist. Wash thoroughly after handling.
Storage:	For safe storage, store at or below 38 °C (100.4 °F) Keep in a cool, well ventilated area away from heat, sparks and open flame. Keep container tightly closed until ready for use.

For information on product shelf life, please review labels on container or check the Technical Data Sheet.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous components	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Polyglycol dimethacrylate	None	None	None	None
Bisphenol A fumarate resin	None	None	None	None
Saccharin	None	None	None	None
Cumene hydroperoxide	None	None	1 ppm (6 mg/m ³) TWA (SKIN)	None

Engineering controls:	No specific ventilation requirements noted, but forced ventilation may still be required if concentrations exceed occupational exposure limits.
Respiratory protection:	If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection. Use a NIOSH approved air-purifying respirator with an organic vapor cartridge.
Eye/face protection:	Safety goggles or safety glasses with side shields.
Skin protection:	Use impermeable gloves and protective clothing as necessary to prevent skin contact. Butyl rubber gloves. Natural rubber gloves. Neoprene gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Color:	red
Odor:	Mild
Odor threshold:	Not available
pH:	Not applicable
Vapor pressure:	< 5 mm hg (26.7 °C (80.1 °F))
Boiling point/range:	> 148.9 °C (> 300°F)
Melting point/ range:	Not available
Specific gravity:	1.1
Vapor density:	Not available
Flash point:	> 93.3 °C (> 199.94 °F) Tagliabue closed cup
Flammable/Explosive limits - lower:	Not available
Flammable/Explosive limits - upper:	Not available
Autoignition temperature:	Not available
Evaporation rate:	Not available
Solubility in water:	Slight
Partition coefficient (n-octanol/water):	Not available
VOC content:	0.82 %; 7.81 g/l

10. STABILITY AND REACTIVITY

Stability:	Stable
Hazardous reactions:	Will not occur.
Hazardous decomposition products:	Phenolics. Oxides of sulfur. Oxides of carbon. Oxides of nitrogen. Irritating organic vapours.
Incompatible materials:	Strong oxidizing agents. Strong acids. Copper Iron. Strong reducing agents. Rust.
Conditions to avoid:	See "Handling and Storage" (Section 7) and "Incompatibility" (Section 10).

11. TOXICOLOGICAL INFORMATION

Acute oral product toxicity:	LD50 (rat) > 10,000 mg/kg
Acute dermal product toxicity:	LD50 (rabbit) > 5,000 mg/kg

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Polyglycol dimethacrylate	No	No	No
Bisphenol A fumarate resin	No	No	No
Saccharin	No	No	No
Cumene hydroperoxide	No	No	No

Hazardous components	Health Effects/Target Organs
Polyglycol dimethacrylate	Irritant, Allergen
Bisphenol A fumarate resin	No Target Organs
Saccharin	No Target Organs
Cumene hydroperoxide	Allergen, Central nervous system, Corrosive, Irritant, Mutagen

12. ECOLOGICAL INFORMATION

Ecological information: Not available

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Follow all local, state, federal and provincial regulations for disposal.

Hazardous waste number: Not a RCRA hazardous waste.

14. TRANSPORT INFORMATION

The shipping classifications in this sections are for non-bulk packaging only (unless otherwise specified). Shipping classification may be different for bulk packaging.

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

International Air Transportation (ICAO/IATA)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

Water Transportation (IMO/IMDG)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status: All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.

TSCA 12(b) Export Notification: None above reporting de minimus

CERCLA/SARA Section 302 EHS: None above reporting de minimus
Hydroquinone (CAS# 123-31-9).

CERCLA/SARA Section 311/312: Immediate Health, Delayed Health

CERCLA/SARA 313: This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). Cumene hydroperoxide (CAS# 80-15-9).

This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). Saccharin (CAS# 81-07-2). Cumene hydroperoxide (CAS# 80-15-9).

CERCLA Reportable quantity: Saccharin (CAS# 81-07-2) 100 lbs. (45.4 kg)
Cumene hydroperoxide (CAS# 80-15-9) 10 lbs. (4.54 kg)

California Proposition 65: This product contains a chemical known in the State of California to cause cancer.

Canada Regulatory Information

CEPA DSL/NDSL Status:	All components are listed on or are exempt from listing on the Canadian Domestic Substances List.
WHMIS hazard class:	D.2.B

16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: 8

Prepared by: Karim Nasr, Regulatory Affairs Specialist

DISCLAIMER: The data contained herein are furnished for information only and are believed to be reliable. However, Henkel Corporation does not assume responsibility for any results obtained by persons over whose methods Henkel Corporation has no control. It is the user's responsibility to determine the suitability of Henkel's products or any production methods mentioned herein for a particular purpose, and to adopt such precautions as may be advisable for the protection of property and persons against any hazards that may be involved in the handling and use of any of Henkel Corporation's products. In light of the foregoing, Henkel Corporation specifically disclaims all warranties, express or implied, including warranties of merchantability and fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation further disclaims any liability for consequential or incidental damages of any kind, including lost profits.



Material Safety Data Sheet

1 - Chemical Product and Company Identification

Manufacturer: WD-40 Company Address: 1061 Cudahy Place (92110) P.O. Box 80607 San Diego, California, USA 92138 -0607	Chemical Name: Organic Mixture Trade Name: WD-40 Aerosol Product Use: Lubricant, Penetrant, Drives Out Moisture, Removes and Protects Surfaces From Corrosion MSDS Date Of Preparation: 3/11/10
Telephone: Emergency only: 1-888-324-7596 (PROSAR) Information: 1-888-324-7596 Chemical Spills: 1-800-424-9300 (Chemtrec) 1-703-527-3887 (International Calls)	

2 – Hazards Identification

Emergency Overview:

DANGER! Flammable aerosol. Contents under pressure. Harmful or fatal if swallowed. If swallowed, may be aspirated and cause lung damage. May cause eye irritation. Avoid eye contact. Use with adequate ventilation. Keep away from heat, sparks and all other sources of ignition.

Symptoms of Overexposure:

Inhalation: High concentrations may cause nasal and respiratory irritation and central nervous system effects such as headache, dizziness and nausea. Intentional abuse may be harmful or fatal.

Skin Contact: Prolonged and/or repeated contact may produce mild irritation and defatting with possible dermatitis.

Eye Contact: Contact may be irritating to eyes. May cause redness and tearing.

Ingestion: This product has low oral toxicity. Swallowing may cause gastrointestinal irritation, nausea, vomiting and diarrhea. This product is an aspiration hazard. If swallowed, can enter the lungs and may cause chemical pneumonitis, severe lung damage and death.

Chronic Effects: None expected.

Medical Conditions Aggravated by Exposure: Preexisting eye, skin and respiratory conditions may be aggravated by exposure.

Suspected Cancer Agent:

Yes No X

3 - Composition/Information on Ingredients

Ingredient	CAS #	Weight Percent
Aliphatic Hydrocarbon	64742-47-8	45-50
Petroleum Base Oil	64742-58-1 64742-53-6 64742-56-9 64742-65-0	<25
LVP Aliphatic Hydrocarbon	64742-47-8	12-18
Carbon Dioxide	124-38-9	2-3
Surfactant	Proprietary	<2
Non-Hazardous Ingredients	Mixture	<10

4 – First Aid Measures

Ingestion (Swallowed): Aspiration Hazard. DO NOT induce vomiting. Call physician, poison control center or the WD-40 Safety Hotline at 1-888-324-7596 immediately.

Eye Contact: Flush thoroughly with water. Remove contact lenses if present after the first 5 minutes and continue flushing for several more minutes. Get medical attention if irritation persists.

Skin Contact: Wash with soap and water. If irritation develops and persists, get medical attention.
Inhalation (Breathing): If irritation is experienced, move to fresh air. Get medical attention if irritation or other symptoms develop and persist.

5 – Fire Fighting Measures

Extinguishing Media: Use water fog, dry chemical, carbon dioxide or foam. Do not use water jet or flooding amounts of water. Burning product will float on the surface and spread fire.

Special Fire Fighting Procedures: Firefighters should always wear positive pressure self-contained breathing apparatus and full protective clothing. Cool fire-exposed containers with water. Use shielding to protect against bursting containers.

Unusual Fire and Explosion Hazards: Contents under pressure. Keep away from ignition sources and open flames. Exposure of containers to extreme heat and flames can cause them to rupture often with violent force. Vapors are heavier than air and may travel along surfaces to remote ignition sources and flash back.

6 – Accidental Release Measures

Wear appropriate protective clothing (see Section 8). Eliminate all sources of ignition and ventilate area. Leaking cans should be placed in a plastic bag or open pail until the pressure has dissipated. Contain and collect liquid with an inert absorbent and place in a container for disposal. Clean spill area thoroughly. Report spills to authorities as required.

7 – Handling and Storage

Handling: Avoid contact with eyes. Avoid prolonged contact with skin. Avoid breathing vapors or aerosols. Use only with adequate ventilation. Keep away from heat, sparks, pilot lights, hot surfaces and open flames. Unplug electrical tools, motors and appliances before spraying or bringing the can near any source of electricity. Electricity can burn a hole in the can and cause contents to burst into flames. To avoid serious burn injury, do not let the can touch battery terminals, electrical connections on motors or appliances or any other source of electricity. Wash thoroughly with soap and water after handling. Keep containers closed when not in use. Keep out of the reach of children. Do not puncture, crush or incinerate containers, even when empty.

Storage: Store in a cool, well-ventilated area, away from incompatible materials. Do not store above 120°F or in direct sunlight. U.F.C (NFPA 30B) Level 3 Aerosol.

8 – Exposure Controls/Personal Protection

Chemical	Occupational Exposure Limits
Aliphatic Hydrocarbon	1200 mg/m ³ TWA (manufacturer recommended)
Petroleum Base Oil	5 mg/m ³ TWA, 10 mg/m ³ STEL ACGIH TLV 5 mg/m ³ TWA OSHA PEL
LVP Aliphatic Hydrocarbon	1200 mg/m ³ TWA (manufacturer recommended)
Carbon Dioxide	5000 ppm TWA (OSHA/ACGIH), 30,000 ppm STEL (ACGIH)
Surfactant	None Established
Non-Hazardous Ingredients	None Established

The Following Controls are Recommended for Normal Consumer Use of this Product

Engineering Controls: Use in a well-ventilated area.

Personal Protection:

Eye Protection: Avoid eye contact. Always spray away from your face.

Skin Protection: Avoid prolonged skin contact. Chemical resistant gloves recommended for operations where skin contact is likely.

Respiratory Protection: None needed for normal use with adequate ventilation.

For Bulk Processing or Workplace Use the Following Controls are Recommended

Engineering Controls: Use adequate general and local exhaust ventilation to maintain exposure levels below that occupational exposure limits.

Personal Protection:

Eye Protection: Safety goggles recommended where eye contact is possible.

Skin Protection: Wear chemical resistant gloves.

Respiratory Protection: None required if ventilation is adequate. If the occupational exposure limits are exceeded, wear a NIOSH approved respirator. Respirator selection and use should be based on contaminant type, form and concentration. Follow OSHA 1910.134, ANSI Z88.2 and good Industrial Hygiene practice.

Work/Hygiene Practices: Wash with soap and water after handling.

9 – Physical and Chemical Properties

Boiling Point:	361 - 369°F (183 - 187°C)	Specific Gravity:	0.8 – 0.82 @ 60°F
Solubility in Water:	Insoluble	pH:	Not Applicable
Vapor Pressure:	95-115 PSI @ 70°F	Vapor Density:	Greater than 1
Percent Volatile:	70-75%	VOC:	412 grams/liter (49.5%)
Coefficient of Water/Oil Distribution:	Not Determined	Appearance/Odor	Light amber liquid/mild odor
Flash Point:	122°F (49°C) Tag Open Cup (concentrate)	Flammable Limits: (Solvent Portion)	LEL: 0.6% UEL: 8.0%
Pour Point:	-63°C (-81.4°F) ASTM D-97	Kinematic Viscosity:	2.79-2.96cSt @ 100°F

10 – Stability and Reactivity

Stability: Stable

Hazardous Polymerization: Will not occur.

Conditions to Avoid: Avoid heat, sparks, flames and other sources of ignition. Do not puncture or incinerate containers.

Incompatibilities: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon monoxide and carbon dioxide.

11 – Toxicological Information

The oral toxicity of this product is estimated to be greater than 5,000 mg/kg based on an assessment of the ingredients. This product is not classified as toxic by established criteria. It is an aspiration hazard. None of the components of this product is listed as a carcinogen or suspected carcinogen or is considered a reproductive hazard.

12 – Ecological Information

No data is currently available.

13 - Disposal Considerations

If this product becomes a waste, it would be expected to meet the criteria of a RCRA ignitable hazardous waste (D001). However, it is the responsibility of the generator to determine at the time of disposal the proper classification and method of disposal. Dispose in accordance with federal, state, and local regulations.

14 – Transportation Information

DOT Surface Shipping Description: Consumer Commodity, ORM-D
IMDG Shipping Description: Un1950, Aerosols, 2.1, LTD QTY

15 – Regulatory Information**U.S. Federal Regulations:**

CERCLA 103 Reportable Quantity: This product is not subject to CERCLA reporting requirements, however, oil spills are reportable to the National Response Center under the Clean Water Act and many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.

SARA TITLE III:

Hazard Category For Section 311/312: Acute Health, Fire Hazard, Sudden Release of Pressure

Section 313 Toxic Chemicals: This product contains the following chemicals subject to SARA Title III

Section 313 Reporting requirements: None

Section 302 Extremely Hazardous Substances (TPQ): None

EPA Toxic Substances Control Act (TSCA) Status: All of the components of this product are listed on the TSCA inventory.

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65): This product does not contain chemicals regulated under California Proposition 65.

VOC Regulations: This product complies with the consumer product VOC limits of CARB, the US EPA and states adopting the OTC VOC rules.

Canadian Environmental Protection Act: One of the components is listed on the NDSL. All of the other ingredients are listed on the Canadian Domestic Substances List or exempt from notification.

Canadian WHMIS Classification: Class B-5 (Flammable Aerosol)

This MSDS has been prepared according to the criteria of the Controlled Products Regulation (CPR) and the MSDS contains all of the information required by the CPR.

16 – Other Information:

HMIS Hazard Rating:

Health – 1 (slight hazard), Fire Hazard – 4 (severe hazard), Reactivity – 0 (minimal hazard)

SIGNATURE: 

TITLE: Director of Global Quality Assurance

REVISION DATE: March 2010

SUPERSEDES: August 2009

CERRO METAL PRODUCTS -- 6061 ALUMINUM RODS & PARTS

MATERIAL SAFETY DATA SHEET

NSN: 343900F048903

Manufacturer's CAGE: 78764

Part No. Indicator: A

Part Number/Trade Name: 6061 ALUMINUM RODS & PARTS

=====

General Information

=====

Company's Name: CERRO METAL PRODUCTS

Company's P. O. Box: 388

Company's City: BELLEFONTE

Company's State: PA

Company's Country: US

Company's Zip Code: 16823-5000

Company's Emerg Ph #: 814-355-6370

Company's Info Ph #: 814-355-6370

Record No. For Safety Entry: 001

Tot Safety Entries This Stk#: 001

Status: SE

Date MSDS Prepared: 22NOV95

Safety Data Review Date: 01APR97

MSDS Preparer's Name: JAMES A VAIANA

Preparer's Company: CERRO METAL PRODUCTS

Preparer's City: BELLEFONTE

Preparer's State: PA

Preparer's Zip Code: 16823-5000

MSDS Serial Number: BZYCR

=====

Ingredients/Identity Information

=====

Proprietary: NO

Ingredient: ALUMINUM *96-4*

Ingredient Sequence Number: 01

Percent: 90.3-99

NIOSH (RTECS) Number: BD0330000

CAS Number: 7429-90-5

OSHA PEL: 15 MG/CUM

ACGIH TLV: 10 MG/CUM (DUST)

Proprietary: NO

Ingredient: SILICON * 96-4 *

Ingredient Sequence Number: 02

Percent: 0-1.2

NIOSH (RTECS) Number: VW0400000

CAS Number: 7440-21-3

ACGIH TLV: 10 MG/CUM

Proprietary: NO

Ingredient: IRON *96-4*

Ingredient Sequence Number: 03

Percent: 0-1

NIOSH (RTECS) Number: NO4565500

CAS Number: 7439-89-6

Proprietary: NO

Ingredient: COPPER (DUST & MIST), BRONZE POWDER *96-4*

Ingredient Sequence Number: 04

Percent: .15-4.5

NIOSH (RTECS) Number: GL5325000

CAS Number: 7440-50-8

OSHA PEL: 0.1 MG(CU)/M3 (FUME)

ACGIH TLV: 0.2 MG/M3 (FUME)
Other Recommended Limit: 1 MG(CU)/M3 (DUST)

Proprietary: NO
Ingredient: MANGANESE *96-4*
Ingredient Sequence Number: 05
Percent: 0-1.2
NIOSH (RTECS) Number: O09275000
CAS Number: 7439-96-5
OSHA PEL: 5 MG/CUM
ACGIH TLV: 5 MG/CUM (DUST)

Proprietary: NO
Ingredient: MAGNESIUM OXIDE, MAGNESIA
Ingredient Sequence Number: 06
Percent: 0-1.8
NIOSH (RTECS) Number: OM3850000
CAS Number: 1309-48-4
OSHA PEL: 15 MG/CUM
ACGIH TLV: 10 MG/CUM

Physical/Chemical Characteristics

Appearance And Odor: GREY SOLID AT ROOM TEMPERATURE & EXHIBITS NO ODOR.
Melting Point: 935-1205F
Specific Gravity: 2.7-2.8
Solubility In Water: INSOLUBLE

Fire and Explosion Hazard Data

Extinguishing Media: DRY POWDER/SAND.
Special Fire Fighting Proc: NEVER USE WATER/HALOGEN ON ALUMINUM DUST FIRES. NEVER USE WATER AS AN EXTINGUISHING AGENT AROUND MOLTEN METAL.
Unusual Fire And Expl Hazrds: WATER REACTS VIOLENTLY W/MOLTEN METAL. HARD ALLOYS MUST BE STRESS-RELIEVED TO PREVENT EXPLOSION WHEN SAWED. ALUMINUM DUST FORM EXPLOSIVE MIXTURES W/AIR. (SUPP)

Reactivity Data

Stability: YES
Cond To Avoid (Stability): WATER
Materials To Avoid: STRONG OXIDIZERS, HALOGEN.
Hazardous Decomp Products: HALOGEN ACIDS & SODIUM HYDROXIDE WILL REACT W/ALUMINUM GENERATING EXPLOSIVE MIXTURES OF HYDROGEN.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): WATER

Health Hazard Data

Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: CHRONIC EXPOSURE TO ALUMINUM, MANGNESE, COPPER & MANGANESE MAY CAUSE METAL FUME FEVER. INHALATION OF FINELY DIVIDED ALUMINUM POWDER MAY CAUSE PULMONARY FIBROSIS. PARTICULATES MAY CAUSE DERMATITIS DUE TO MECHANICAL IRRITATION.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms Of Overexp: FEVER, FATIGUE, DRYNESS OF THROAT, HEAD & BODY ACHE, CHILL, IRRITATION.

Emergency/First Aid Proc: INHALATION: REMOVE TO FRESH AIR. SKIN: WASH THOROUGHLY W/SOAP & WATER. EYES: FLUSH W/WATER FOR 15 MINS. OBTAIN MEDICAL ATTENTION IN ALL CASES.

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: PRODUCT IS A NON-HAZARDOUS SOLID. NO SPECIAL PRECAUTIONS ARE REQUIRED FOR BULK MATERIAL. SCRAP METAL CAN BE RECLAIMED FOR REUSE.

Waste Disposal Method: DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS. ALUMINUM POWDER MUST BE PACKAGED & SHIPPED AS FLAMMABLE SOLID, UN 1396. Precautions-Handling/Storing: WET MATERIAL SHOULD NEVER BE CHARGED INTO A MOLTEN BATH. EYE PROTECTION SHOULD BE USED W/PROCESS THAT GENERATES DUST, FUMES/CHIPS.

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Control Measures

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Respiratory Protection: WEAR NIOSH APPROVED RESPIRATORY PROTECTION.

Eye Protection: REQUIRED

Work Hygienic Practices: WASH THOROUGHLY AFTER USE & BEFORE EATING, DRINKING/SMOKING.

Suppl. Safety & Health Data: UNUSUAL FIRE CONT'D: DAMP ALUMINUM DUST MAY SPONTANEOUSLY HEAT W/LIBERATION OF HYDROGEN TO FORM EXPLOSIVE AIR MIXTURES. HALOGENATED HYDROCARBONS MAY REACT W/ALUMINUM DUSTS TO FORM EXPLOSIVE MIXTURES. REDUCTION OF IRON OXIDE, COPPER OXIDE & LEAD OXIDE BY ALUMINUM MAY OCCUR W/EXPLOSIVE FORCE.

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Transportation Data

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Disposal Data

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Label Data

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Label Required: YES

Label Status: G

Common Name: 6061 ALUMINUM RODS & PARTS

Special Hazard Precautions: CHRONIC EXPOSURE TO ALUMINUM, MANGNESE, COPPER & MANGANESE MAY CAUSE METAL FUME FEVER. INHALATION OF FINELY DIVIDED ALUMINUM POWDER MAY CAUSE PULMONARY FIBROSIS. PARTICULATES MAY CAUSE DERMATITIS DUE TO MECHANICAL IRRITATION. FEVER, FATIGUE, DRYNESS OF THROAT, HEAD & BODY ACHE, CHILL, IRRITATION.

Label Name: CERRO METAL PRODUCTS

Label P.O. Box: 388

Label City: BELLEFONTE

Label State: PA

Label Zip Code: 16823-5000

Label Country: US

Label Emergency Number: 814-355-6370



MATERIAL SAFETY DATA SHEET

Distributed by:
Machine & Welding Supply Co.
 P.O. Box 1708
 Hwy 301 South
 Dunn, NC 28335

MSDS:000004

Phone: (910) 892-4016
 Fax: (910) 892-3575
 Internet: www.mwsc.com

PRODUCT NAME: ARGON

1. Chemical Product and Company Identification

BOC Gases,
Division of
The BOC Group, Inc.
575 Mountain Avenue
Murray Hill, NJ 07974

BOC Gases
Division of
BOC Canada Limited
5975 Falbourne Street, Unit 2
Mississauga, Ontario L5R 3W6

TELEPHONE NUMBER: (908) 464-8100

24-HOUR EMERGENCY TELEPHONE NUMBER:
 CHEMTREC (800) 424-9300

TELEPHONE NUMBER: (905) 501-1700

24-HOUR EMERGENCY TELEPHONE NUMBER:
 (905) 501-0802
EMERGENCY RESPONSE PLAN NO: 20101

PRODUCT NAME: ARGON

CHEMICAL NAME: Argon

COMMON NAMES/SYNONYMS: Argon, compressed

TDG (Canada) CLASSIFICATION: 2.2

WHMIS CLASSIFICATION: A

PREPARED BY: Loss Control (908)464-8100/(905)501-1700

PREPARATION DATE: 6/1/95

REVIEW DATES: 6/7/96

2. Composition, Information on Ingredients

INGREDIENT	% VOLUME	PEL-OSHA ¹	TLV-ACGIH ²	LD ₅₀ or LC ₅₀ Route/Species
Argon FORMULA: Ar CAS: 7440-37-1 RTECS #: CF2300000	100.0	Simple Asphyxiant	Simple Asphyxiant	Not Available

¹ As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)

² As stated in the ACGIH 1994-95 Threshold Limit Values for Chemical Substances and Physical Agents

3. Hazards Identification

EMERGENCY OVERVIEW

Simple Asphyxiant - This product does not contain oxygen and may cause asphyxia if released in a confined area. Maintain oxygen levels above 19.5%. Nonflammable.

MSDS: G-6

Revised: 6/7/96

Page 1 of 6

PRODUCT NAME: ARGON

ROUTE OF ENTRY:

Skin Contact Yes	Skin Absorption No	Eye Contact Yes	Inhalation Yes	Ingestion No
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HEALTH EFFECTS:

Exposure Limits No	Irritant No	Sensitization No
Teratogen No	Reproductive Hazard No	Mutagen No
Synergistic Effects None reported		

Carcinogenicity: -- NTP: No IARC: No OSHA: No

EYE EFFECTS:

No adverse effects anticipated.

SKIN EFFECTS:

No adverse effects anticipated.

INGESTION EFFECTS:

No adverse effects anticipated.

INHALATION EFFECTS:

Product is a non-toxic simple asphyxiant. Effects of oxygen deficiency resulting from simple asphyxiants may include: rapid breathing, diminished mental alertness, impaired muscular coordination, faulty judgement, depression of all sensations, emotional instability, and fatigue. As asphyxiation progresses, nausea, vomiting, prostration, and loss of consciousness may result, eventually leading to convulsions, coma, and death.

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

NFPA HAZARD CODES

Health: 0
Flammability: 0
Reactivity: 0

HMIS HAZARD CODES

Health: 0
Flammability: 0
Reactivity: 0

RATINGS SYSTEM

0 = No Hazard
1 = Slight Hazard
2 = Moderate Hazard
3 = Serious Hazard
4 = Severe Hazard

4. First Aid Measures

EYES:

Never introduce ointment or oil into the eyes without medical advice! If pain is present, refer the victim to an ophthalmologist for treatment and follow up.

SKIN:

None anticipated.

INGESTION:

Ingestion is unlikely as product is a gas at room temperature.

INHALATION:

MSDS: G-6

Revised: 6/7/96

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PRODUCT NAME: ARGON

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, and if breathing has stopped, administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

5. Fire Fighting Measures

Conditions of Flammability: Nonflammable		
Flash point: None	Method: Not Applicable	Autoignition Temperature: None
LEL(%): None	UEL(%): None	
Hazardous combustion products: None		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: None		

FIRE AND EXPLOSION HAZARDS:

None. Nonflammable

EXTINGUISHING MEDIA:

None required. Use as appropriate for surrounding materials.

6. Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location.

7. Handling and Storage

Electrical classification:

Non-hazardous.

This gas mixture is noncorrosive and may be used with all common structural materials.

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve protection outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125 °F (52 °C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time.

For additional recommendations, consult Compressed Gas Association Pamphlets P-1, P-14, P-9, and Safety Bulletin SB-2.

MSDS: G-6

Revised: 6/7/96

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PRODUCT NAME: ARGON

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

8. Exposure Controls, Personal Protection

EXPOSURE LIMITS¹:

INGREDIENT	% VOLUME	PEL-Osha ²	TLV-ACGIH ³	LD ₅₀ or LC ₅₀ Route/Species
Argon FORMULA: Ar CAS: 7440-37-1 RTECS #: CF2300000	100.0	Simple Asphyxiant	Simple Asphyxiant	Not Available

¹ Refer to individual state or provincial regulations, as applicable, for limits which may be more stringent than those listed here.

² As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)

³ As stated in the ACGIH 1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents.

ENGINEERING CONTROLS:

Local exhaust to prevent accumulation of high concentrations so as to reduce the oxygen level in the air to less than 19.5%.

EYE/FACE PROTECTION:

Safety goggles or glasses as appropriate for the job.

SKIN PROTECTION:

Protective gloves of material appropriate for the job.

RESPIRATORY PROTECTION:

Positive pressure air line with full-face mask and escape bottle or self-contained breathing apparatus should be available for emergency use.

OTHER/GENERAL PROTECTION:

Safety shoes or other footwear as appropriate for the job.

PRODUCT NAME: ARGON

9. Physical and Chemical Properties

PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure	: Not Available	
Vapor density (Air = 1)	: 1.38	
Evaporation point	: Not Available	
Boiling point	: -302.6	°F
	: -185.9	°C
Freezing point	: -308.9	°F
	: -189.4	°C
pH	: Not Applicable	
Specific gravity	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H2O)	: Slight	
Odor threshold	: Not Applicable	
Odor and appearance	: Colorless, odorless gas	

10. Stability and Reactivity

STABILITY:

Stable

INCOMPATIBLE MATERIALS:

None

HAZARDOUS POLYMERIZATION:

Does not occur.

11. Toxicological Information

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

No data given in the Registry of Toxic Effects of Chemical Substances (RTECS) or Sax, Dangerous Properties of Industrial Materials, 7th ed.

12. Ecological Information

No data given.

13. Disposal Considerations

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to BOC Gases or authorized distributor for proper disposal.

MSDS: G-6

Revised: 6/7/96

Page 5 of 6

PRODUCT NAME: ARGON

14. Transport Information

PARAMETER	United States DOT	Canada TDG
PROPER SHIPPING NAME:	Argon, compressed	Argon, compressed
HAZARD CLASS:	2.2	2.2
IDENTIFICATION NUMBER:	UN 1006	UN 1006
SHIPPING LABEL:	NONFLAMMABLE GAS	NONFLAMMABLE GAS

15. Regulatory Information

SARA TITLE III NOTIFICATIONS AND INFORMATION

SARA TITLE III - HAZARD CLASSES:

Sudden Release of Pressure Hazard

16. Other Information

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).



NFPA 704 RATING

INFORMATION ONLY - Please read Section X

SECTION I - Product and Manufacturer Identity

Product Identity:	Revision Date: May 7, 2004 Supersedes: June 29, 2001
Sealed Lead Battery	
Cyclon®, Genesis®, SBS, SBS J, Hawker XE™ or Odyssey®	
Manufacturer's Name and Address: EnerSys Energy Products Inc. (formerly Hawker Energy Products Inc.) 617 North Ridgeview Drive Warrensburg, MO 64093-9301	Emergency Telephone Number: (660) 429-2165 Customer Service Telephone Number: 800-964-2837

SECTION II - Ingredients

Hazardous Components	CAS #	OSHA PEL-TWA	% (By weight)
Lead	7439-92-1	50µg/m³	45 - 60 %
Lead Dioxide	1309-60-0	50µg/m³	15 - 25 %
Sulfuric Acid Electrolyte	7664-93-9	1.0 mg/m³	15 - 20 %
Non-Hazardous Materials	N/A	N/A	5 - 10 %

SECTION III - Physical/Chemical Characteristics

Boiling Point - N/A	Specific Gravity (H ₂ O=1) - NA
Vapor Pressure (mm Hg.) - N/A	Melting Point - N/A
Solubility in Water - N/A	Appearance & Color - N/A

SECTION IV - Fire & Explosion Hazard Data

Flash Point (Method Used): N/A	Flammable Limits: N/A	LEL: N/A	UEL: N/A
Extinguishing Media: Multipurpose Dry chemical, CO ₂ or water spray.			
Special Fire Fighting Procedures: Cool Battery exterior to prevent rupture. Acid mists and vapors in a fire are toxic and corrosive.			
Unusual Fire and Explosion Hazards: Hydrogen gas may be produced and may explode if ignited. Remove all sources of ignition.			

SECTION V- Reactivity Data and Shipping/Handling Electrical Safety

Conditions to Avoid: Avoid shorting, high levels of short circuit current can be developed across the battery terminals. Do not rest tools or cables on the battery. Avoid over-charging. Use only approved charging methods. Do not charge in gas tight containers.

Requirements for Safe Shipping and Handling of Cyclon® Cells:

Warning – Electrical Fire Hazard – Protect Against Shorting

- Terminals can short and cause a fire if not insulated during shipping.

- Cyclon® product must be labeled "NONSPILLABLE" during shipping. Follow all federal shipping regulations. See section IX of this sheet and CFR 49 Parts 171 through 180, available anytime online at www.gpoaccess.gov.

Requirements for Shipping Cyclon® Product as Single Cells

- Protective caps or other durable inert material must be used to insulate each terminal of each cell unless cells are shipping in the original packaging from EnerSys, in full box quantities.
- Protective caps are available for all cell sizes by contacting EnerSys Customer Service at 1-800-964-2837.

Requirements for Shipping Cyclon® Product Assembled Into Multicell Batteries

- Assembled batteries must have short circuit protection during shipping.
- Exposed terminals, connectors, or lead wires must be insulated with a durable inert material to prevent exposure during shipping.

SECTION VI - Health Hazard Data

Routes of Entry: N/A Emergency & First Aid Procedures:	Health Hazards (Acute & Chronic): N/A Battery contains acid electrolyte which is absorbed in the separator material. If battery case is punctured, completely flush any released material from skin or eyes with water.
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SECTION VI - Health Hazard Data (Continued)

Proposition 65:	Warning: Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Batteries also contain other chemicals known to the State of California to cause cancer. Wash hands after handling.
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SECTION VII - Precautions for Safe Handling & Use

Steps to be taken in case material is released or spilled:	Avoid contact with acid materials. Use soda ash or lime to neutralize. Flush with water.
Waste Disposal Method:	Dispose of in accordance with Federal, State, & Local Regulations. Do not incinerate. Batteries should be shipped to a reclamation facility for recovery of the metal and plastic components as the proper method of waste management. Contact distributor for appropriate product return procedures.

SECTION VIII - Control Measures - Not Applicable

SECTION IX – Transportation, Shipping and Handling

EnerSys Energy Products Inc. batteries are starved electrolyte batteries which means the electrolyte is absorbed in the separator material. The batteries are also sealed. As of September 30, 1995, EnerSys Energy Products Inc. batteries were classified as "nonspillable batteries", and as such are not subject to the full requirements of 49 CFR § 173.159. The previous exempt classification, "Dry Batteries, Not Restricted" was discontinued effective September 30, 1995. "Nonspillable" batteries are excepted from the regulation's comprehensive packaging requirements if the following conditions are satisfied: (1) The battery is protected against short circuits and is securely packaged. (2) For batteries manufactured after September 30, 1995, the battery and outer packaging must be plainly and durably marked "NONSPILLABLE" or "NONSPILLABLE BATTERY". (3) The battery is capable of withstanding vibration and pressure differential tests specified in 49 CFR § 173.159(d). (4) At a temperature of 55 °C (131°F), the battery must not contain any unabsorbed free-flowing liquids, and is designed so that electrolyte will not flow from a ruptured or cracked case.

EnerSys Energy Products Inc. batteries have been tested by WYLE Scientific Services & Systems Laboratories Group and determined to be in compliance with the vibration and pressure differential tests contained in 49 CFR § 173.159(d), and therefore as of September 30, 1995, excepted from the DOT requirements set forth in 49 CFR § 173.159, other than paragraph (d).

Battery shipments from EnerSys Energy Products Inc. Warrensburg location, will be properly labeled in accordance with applicable DOT regulations.

Packaging changes performed at other locations may require additional labeling, since in addition to the battery itself containing the required marking, the outer packaging of the battery must also contain the required marking:

"NONSPILLABLE" OR "NONSPILLABLE BATTERY". Because the batteries are classified as "Nonspillable" and meet the three conditions above, [from § 173.159(d)] they do not have an assigned UN number nor do they require additional DOT hazard labeling.

The regulation change effective September, 1995, was to clarify and distinguish to shippers and transporters, all batteries that have been tested and determined to be in compliance with the DOT Hazardous Material Regulations, the International Civil Aeronautics Organization (ICAO), and the International Air Transport Association (IATA) Packing Instruction 806 and Special Provision A67, and therefore excepted from all other requirements of the regulations and classified as a "nonspillable battery".

Per 42 USC Section 14322 (US Code Title 42 – The Public Health and Welfare), packaging must be marked with the following: "Contains Sealed Lead Battery" and "Battery Must Be Recycled".

SECTION X - Additional Information

The EnerSys Energy Products Inc. sealed lead acid battery is determined to be an "article" according to the OSHA Hazard Communication Standard and is thereby excluded from any requirements of the standard. The Material Safety Data Sheet is therefore supplied for informational purposes only.

The information and recommendations contained herein have been compiled from sources believed to be reliable and represent current opinion on the subject. No warranty, guarantee, or representation is made by EnerSys Energy Products Inc., as to the absolute correctness or sufficiency of any representation contained herein and EnerSys Energy Products Inc. assumes no responsibility in connection therewith, nor can it be assumed that all acceptable safety measures are contained herein, or that additional measures may not be required under particular or exceptional conditions or circumstances.

N/A or Not Applicable - Not applicable for finished product used in normal conditions.

Informational MSDS Part Number 2602-0043 Rev. 1 (05/07/04)



Revision Number: 000.0

Issue date: 11/23/2010

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Loctite Threadlocker Blue 242 **IDH number:** 209728
Product type: Anaerobic Sealant

Company address:
 Henkel Corporation
 One Henkel Way
 Rocky Hill, Connecticut 06067

Region: United States
Contact information:
 Telephone: 800.624.7767
 MEDICAL EMERGENCY Phone: Poison Control Center
 1-877-671-4608 (toll free) or 1-303-592-1711
 TRANSPORT EMERGENCY Phone: CHEMTREC
 1-800-424-9300 (toll free) or 1-703-527-3887
 Internet: www.henkelna.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HMIS:

Physical state:	Liquid	HEALTH:	*2
Color:	Blue	FLAMMABILITY:	1
Odor:	Mild	PHYSICAL HAZARD:	1
		Personal Protection:	See MSDS Section 8
WARNING:	CAUSES EYE IRRITATION. MAY CAUSE SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY CAUSE RESPIRATORY TRACT IRRITATION.		

Relevant routes of exposure: Skin, Inhalation, Eyes

Potential Health Effects

Inhalation:	May cause respiratory tract irritation.
Skin contact:	May cause allergic skin reaction. May cause skin irritation.
Eye contact:	Contact with eyes will cause irritation.
Ingestion:	Not expected to be harmful by ingestion.

Existing conditions aggravated by exposure: Eye, skin, and respiratory disorders.

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

See Section 11 for additional toxicological information.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous components	CAS NUMBER	%
Polyglycol dimethacrylate	25852-47-5	60 - 100
Oleic acid 5.5EO	9004-96-0	10 - 30
Saccharin	81-07-2	1 - 5
Silica, amorphous, fumed, crystal-free	112945-52-5	1 - 5
Cumene hydroperoxide	80-15-9	1 - 5
Propanediol-1,2	57-55-6	1 - 5
Titanium dioxide	13463-67-7	0.1 - 1

4. FIRST AID MEASURES

Inhalation:	Move to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Keep warm and quiet. Get medical attention.
Skin contact:	Wash with soap and water. Remove contaminated clothing and footwear. Wash clothing before reuse. If symptoms develop and persist, get medical attention.
Eye contact:	Flush with copious amounts of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time. Get medical attention.
Ingestion:	Do not induce vomiting. Keep individual calm. Get medical attention.

5. FIRE FIGHTING MEASURES

Flash point:	> 93.3 °C (> 199.94 °F) Tagliabue closed cup
Flame projection:	Not applicable
Autoignition temperature:	Not determined
Flammable/Explosive limits - lower:	2.6 % (propylene glycol)
Flammable/Explosive limits - upper:	12.5 % (propylene glycol)
Extinguishing media:	Foam, dry chemical or carbon dioxide.
Special firefighting procedures:	None
Unusual fire or explosion hazards:	None
Hazardous combustion products:	Oxides of carbon. Oxides of sulfur. Oxides of nitrogen. Irritating organic vapours.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions:	Do not allow product to enter sewer or waterways.
Clean-up methods:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Store in a partly filled, closed container until disposal.

7. HANDLING AND STORAGE

Handling:	Prevent contact with eyes, skin and clothing. Do not breathe vapor and mist. Wash thoroughly after handling.
Storage:	For safe storage, store at or below 38 °C (100.4 °F) Keep in a cool, well ventilated area away from heat, sparks and open flame. Keep container tightly closed until ready for use.

For information on product shelf life, please review labels on container or check the Technical Data Sheet.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous components	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Polyglycol dimethacrylate	None	None	None	None
Oleic acid 5.5EO	None	None	None	None
Saccharin	None	None	None	None
Silica, amorphous, fumed, crystal-free	10 mg/m ³ TWA Inhalable dust. 3 mg/m ³ TWA Respirable fraction.	20 MPPCF TWA 0.8 mg/m ³ TWA	None	None
Cumene hydroperoxide	None	None	1 ppm (6 mg/m ³) TWA (SKIN)	None
Propanediol-1,2	None	None	10 mg/m ³ TWA Aerosol.	None
Titanium dioxide	10 mg/m ³ TWA	15 mg/m ³ TWA Total dust.	None	None

Engineering controls: No specific ventilation requirements noted, but forced ventilation may still be required if concentrations exceed occupational exposure limits.

Respiratory protection: Use NIOSH approved respirator if there is potential to exceed exposure limit(s).

Eye/face protection: Safety goggles or safety glasses with side shields.

Skin protection: Use impermeable gloves and protective clothing as necessary to prevent skin contact. Neoprene gloves. Butyl rubber gloves. Natural rubber gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Color:	Blue
Odor:	Mild
Odor threshold:	Not available
pH:	Not applicable
Vapor pressure:	< 5 mm hg (27 °C (80.6 °F))
Boiling point/range:	> 149 °C (> 300.2 °F)
Melting point/ range:	Not available
Specific gravity:	1.1 at 23.9 °C (75.02 °F)
Vapor density:	Not available
Flash point:	> 93.3 °C (> 199.94 °F) Tagliabue closed cup
Flame projection:	Not applicable
Flammable/Explosive limits - lower:	2.6 % (propylene glycol)
Flammable/Explosive limits - upper:	12.5 % (propylene glycol)
Autoignition temperature:	Not determined
Evaporation rate:	Not available
Solubility in water:	Slight
Partition coefficient (n-octanol/water):	Not available
VOC content:	4.48 %; 49.3 g/l EPA Method 24

10. STABILITY AND REACTIVITY

Stability:	Stable
Hazardous reactions:	Will not occur.
Hazardous decomposition products:	Oxides of carbon. Oxides of sulfur. Oxides of nitrogen. Irritating organic vapours.
Incompatible materials:	Strong oxidizing agents. Free radical initiators. Strong reducing agents. Alkalies. Oxygen scavengers. Other polymerization initiators. Copper. Iron. Zinc. Aluminum. Rust.
Conditions to avoid:	See "Handling and Storage" (Section 7) and "Incompatibility" (Section 10).

11. TOXICOLOGICAL INFORMATION

Acute oral product toxicity: LD50 (rat) > 10,000 mg/kg
Acute dermal product toxicity: LD50 (rabbit) > 5,000 mg/kg

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Polyglycol dimethacrylate	No	No	No
Oleic acid 5.5EO	No	No	No
Saccharin	No	No	No
Silica, amorphous, fumed, crystal-free	No	No	No
Cumene hydroperoxide	No	No	No
Propanediol-1,2	No	No	No
Titanium dioxide	No	Group 2B	No

Hazardous components	Health Effects/Target Organs
Polyglycol dimethacrylate	Irritant, Allergen
Oleic acid 5.5EO	Irritant
Saccharin	No Target Organs
Silica, amorphous, fumed, crystal-free	Nuisance dust
Cumene hydroperoxide	Allergen, Central nervous system, Corrosive, Irritant, Mutagen
Propanediol-1,2	Irritant
Titanium dioxide	Irritant, Respiratory, Some evidence of carcinogenicity

12. ECOLOGICAL INFORMATION

Ecological information: Not available

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Follow all local, state, federal and provincial regulations for disposal.

Hazardous waste number: Not a RCRA hazardous waste.

14. TRANSPORT INFORMATION

The shipping classifications in this sections are for non-bulk packaging only (unless otherwise specified). Shipping classification may be different for bulk packaging.

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

International Air Transportation (ICAO/IATA)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

Water Transportation (IMO/IMDG)

Proper shipping name:	Not regulated
Hazard class or division:	None
Identification number:	None
Packing group:	None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status:	All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12(b) Export Notification:	None above reporting de minimus
CERCLA/SARA Section 302 EHS:	None above reporting de minimus Hydroquinone (CAS# 123-31-9). Ethylene oxide (CAS# 75-21-8).
CERCLA/SARA Section 311/312:	Immediate Health, Delayed Health
CERCLA/SARA 313:	This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). Cumene hydroperoxide (CAS# 80-15-9). This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). Saccharin (CAS# 81-07-2). Cumene hydroperoxide (CAS# 80-15-9).
California Proposition 65:	This product contains a chemical known in the State of California to cause cancer. This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Canada Regulatory Information

CEPA DSL/NDSL Status:	All components are listed on or are exempt from listing on the Canadian Domestic Substances List.
WHMIS hazard class:	D.2.A, D.2.B

16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: New Material Safety Data Sheet format.

Prepared by: Karim Nasr, Regulatory Affairs Specialist

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1) PRODUCT AND COMPANY IDENTIFICATION

Company: Videolar S.A.
Address : 1616, Avenue Abiurana, Industrial District - Manaus-AM. IL: 69075-010
Telephone : (+55 0XX92) - 2101 - 7800
Emergency Telephone: (+55 0XX92) - 2101 - 7811 **Fax:** (+55 XX92) - 2101 - 7814

2) COMPOSITION AND INFORMATION ON INGREDIENTS

Chemical Name: Polystyrene
Chemical Formula: (C₈H₈)n
Synonym: General Purpose Polystyrene, GPPS
CAS#: 9003-53-6

3) HAZARDS IDENTIFICATION

Physical State and appearance Solid. Transparent Pellets

Emergency Overview Irritating vapors to respiratory system and eyes may form when polymer is processed at high temperatures. Molten or heated material in skin contact can cause severe burns.

Routes of Entry **FOR HOT MATERIAL:** Skin contact. Eye contact. Inhalation

This product is not known to cause eye irritation. However, as with any chemical, some sensitive individuals may experience eye irritation upon contact.

Eyes

Heated Polymer: Eye contact can cause serious thermal burns.

Vapors formed when polymer is heated may be irritating to the eye.

Skin

No known acute effects of this product resulting from skin contact. However, in light of good industrial hygiene, exposure to any chemical should be kept to a minimum.

Heated Polymer: Eye contact can cause serious thermal burns.

Inhalation

Negligible hazard at room temperature. Nuisance dusts can be irritation to the upper respiratory tract. Irritation vapors may form when polymer is processed at high temperatures.

Elaboration:	Section:	Revision:	Approval:	Date:
Irinaldo Lopes da Costa	Quality Control Laboratory	Adriane Ferreira da Silva	Helton dos Reis Barbosa	11.09.2008

Ingestion No effects are expected for ingestion of small amounts.

Potential Chronic Health Effects

CARCINOGENIC EFFECTS : Classified NONE by NTP, NONE by OSHA.
Not classification for human by IARC
MUTAGENIC EFFECTS : Not Available.
TERATOGENIC EFFECTS : Not Available

Medical Conditions Aggravated by Overexposure

There is no known effect from chronic exposure to this product. Repeated or prolonged exposure is not known to aggravate medical condition.

Overexposure / Signs / Symptoms Not available.

4) FIRST AID MEASURES

Inhalation Allow the victim to rest in a well ventilated area.

Skin Contact

Polymer: No know EFFECT on skin contact, rinse with water for a few minutes.

Heated Polymer: For serious burns from heated polymer, get medical attention.

Eye Contact Rinse with water for a few minutes. Seek medical attention if necessary.

Ingestion No first aid procedures are needed.

5) FIRE FIGHTING MEASURES

Flammability of the Product May be combustible at high temperature.

Auto-ignition Temperature 427°C (800.6°F)

Flash Points Not available.

Flammable Limits Not available.

Products of Combustion Carbon oxides (CO, CO₂) and soot.

Fire Hazards in Presence of Various Substances No specific information is available in our database regarding the flammability of this product in presence of various materials.

Elaboration: Irinaldo Lopes da Costa	Section: Quality Control Laboratory	Revision: Adriane Ferreira da Silva	Approval: Helton dos Reis Barbosa	Date: 11.09.2008
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Explosion Hazards in Presence of Various Substances

Risks of explosion of the product in presence of mechanical impact: Not expected.
Risks of explosion of the product in presence of static discharge: Possible.
No specific information is available in our database regarding the product's risks of explosion in the presence of various materials.

**Fire Fighting Media and Instructions
Protective Clothing (Fire)**

Small Fire: Use DRY chemicals, CO₂, water spray, halon or foam.
Large Fire: Use water spray, fog or foam. **DO NOT** use water jet.
Wear MSHA/NIOSH approved self-contained breathing apparatus or equivalent and full protective gear.

Fire may produce irritating gases and dense smoke. Flowing material may produce static discharge, ignition dust accumulations.

Special Remarks on Fire Hazards**Special Remarks on Explosion Hazards**

No additional remark.

6) ACCIDENTAL RELEASE MEASURES**Small Spill and Leak**

Pellets on the floor could present a serious slipping problem. Good housekeeping must be maintained at all times to avoid this hazard. Sweep, shovel or vacuum material into clean containers.

Large Spill and Leak

Use a shovel to put the material into a convenient waste disposal container. Do not allow any potentially contaminated water with pellets to enter any waterway, sewer or drain.

7) HANDLING AND STOREGE**Handling**

Avoid Temperatures of 600°F (316°C) or above. Handling of plastic may form nuisance dust.

Protect personnel. Pneumatic transport of material may produce dust. Use filters in pneumatic transport lines to reduce dust. If dusting is a problem, care should be taken to dissipate potential static electricity build-up. Normal precautions for finely divided powders should be made.

Storage

Keep container dry. Keep in a cool place. Ground all equipment containing material. Keep container tightly closed. Keep in a cool, well-ventilated place. Combustible materials should be stored away from extreme heat and away from strong oxidizing agents.

Elaboration:	Section:	Revision:	Approval:	Date:
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8) EXPOSURE CONTROLS/PERSONAL PROTECTION**Engineering Controls**

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Eyes: Safety Glasses.

Body: Coveralls.

Personal Protection

Respiratory: Ventilation is normally required when handling this product at high temperatures. Wear appropriate respirator when ventilation is inadequate.

Hands: Thermally insulated gloves required when handling hot material.

Feet: Safety slip proof shoes in areas where spills or leaks can occur.

**Personal Protection in Case
of a Large Spill**

Safety glasses. Gloves. Coveralls.

9) PHYSICAL AND CHEMICAL PROPERTIES**Physical State and
Appearance**

Solid. Transparent Pellets.

Molecular Weight

Not available.

Molecular Formula

(-CH (C₆H₅)-CH₂-)x

pH (1% Soln/Water)

Not applicable.

Boiling/Condensation Point

Not applicable.

Melting/Freezing Point

>132.22°C (270°F)

Critical Temperature

Not available.

Specific Gravity

1.04 (Water = 1)

Vapor Pressure

Not available.

Elaboration:	Section:	Revision:	Approval:	Date:
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Vapor Density	Not available.
Volatility	Negligible.
Odor Threshold	Not available.
Evaporation Rate	Not available.
VOC	0 (%).
Viscosity	Not available.
LogKow	Not available.
Ionicity (in Water)	Not available.
Dispersion Properties	Not available.
Solubility in Water	Insoluble in Water.
Physical Chemical Comments	No additional remark.
Exclusivity Limit	Not available.
Flash Point	Not available.
Auto-ignition Temperature	420 °C
Decomposition Temperature	> 250 °C
Odor	Odorless
Taste	Not available.
Color	Polystyrene is a colorless, transparent, glassy solid or a soft colorless form.

10) STABILITY AND REACTIVITY

Stability and Reactivity	The product is stable. Avoid temperatures of 600 deg F (316 ° C)or above.
Conditions of Instability	No additional remark.

Elaboration:	Section:	Revision:	Approval:	Date:
Irinaldo Lopes da Costa	Quality Control Laboratory	Adriane Ferreira da Silva	Helton dos Reis Barbosa	11.09.2008

Hazardous Decomposition Products

Hazardous decomposition products are carbon monoxide, carbon dioxide, dense smoke and hydrocarbons. Exposure of polystyrene to extremely high temperatures (600 deg F or higher) may cause partial decomposition. Chemicals that may be released include styrene monomer, benzene and other hydrocarbons.

11) TOXICOLOGICAL INFORMATION**Toxicity Animals**

LD50: Not available.
LC50: Not available.

Chronic Effects on Humans

Carcinogenic Effects: Classified none by NTP, none by OSHA. 3 (Not classifiable for human) by IARC.

Other Toxic Effects on Humans

Not considered to be dangerous for humans according to our database.

Special Remarks on Toxicity to Animals

No additional remark.

Special Remarks on Chronic Effects on Humans

No additional remark.

Special Remarks on Other Toxic Effects on Humans

No additional remark.

12) ECOLOGICAL INFORMATION**Ecotoxicity**

Not available.

BOD5 and COD

Not available.

Biodegradable/OECD

Not available.

Mobility

Not available.

Toxicity of the Products of Biodegradable

Not available.

Special Remarks on the Products of Biodegradation

Not available.

Elaboration:	Section:	Revision:	Approval:	Date:
Irinaldo Lopes da Costa	Quality Control Laboratory	Adriane Ferreira da Silva	Helton dos Reis Barbosa	11.09.2008

13) DISPOSAL CONSIDERATIONS

Waste Information Transfer to an approved disposal area in accordance with federal, state and local regulations.

Waste Stream Not available.

Consult your local or regional authorities

14) TRANSPORT INFORMATION

DOT Classification or bulk shipments (non bulk shipments May differ) Not a DOT controlled material (United States)

DOT Proper Shipping Name Not applicable.

UN Number Not Established.

Packaging Group Not available.

USCG Proper Shipping Name Not available.

Marine Pollutant Not available.

Hazards Substances Reportable Quantity Not available.

Special Provisions for Transport Not additional remark.

TDG Classification Not controlled under TDG (Canada).

ADR/RID Classification Not controlled under ADR (Europe).

IMO/IMDG Classification Not controlled under IMDG.

ICAO/IATA Classification Not controlled under IATA.

15) REGULATORY INFORMATION

HCS Classification Not controlled under the HCS (United States).

TSCA (Toxic Substance Control Act): This product is listed on the TSCA Inventory.

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: No products were found.

SARA 311/312 MSDS distribution - chemical inventory - hazard

Elaboration: Irinaldo Lopes da Costa	Section: Quality Control Laboratory	Revision: Adriane Ferreira da Silva	Approval: Helton dos Reis Barbosa	Date: 11.09.2008
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identification: No products were found.

Clean water act (CWA) 307: No products were found.
Clean water act (CWA) 311: No products were found.
Clean air act (CAA) 112 accidental release prevention: No products were found.
Clean air act (CAA) 112 regulated flammable substances: No products were found
Clean air act (CAA) 112 regulated toxic substances: No products were found.

International Regulations

International Regulations

WHMIS (CANADA) Not controlled under WHMIS (Canada)

EINECS Not available

DSCL (EEC) Not controlled under DSCL (Europe)

International Lists No products were found

State Regulations California prop. 65: There are no Proposition 65 chemicals present in our polystyrene resins at levels that would required a warning under the California Safe Drinking Water and Toxic Enforcement Act.

16) OTHER INFORMATION

Label Requirements Irritating vapors to respiratory system and eyes may form when polymer is processed at high temperatures.
Molten or heated material in skin contact can cause severe burns.

References HSDB – Hazardous Substances Data Bank.
RTECS – Registry of Toxic Effects of Chemicals Substances

Other Special Considerations This MSDS covers all Polystyrene grades made by Videolar: GPPS-500, GPPS- 535 and GPPS-585.

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Elaboration: Irinaldo Lopes da Costa	Section: Quality Control Laboratory	Revision: Adriane Ferreira da Silva	Approval: Helton dos Reis Barbosa	Date: 11.09.2008
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MATERIAL SAFETY DATA SHEET

01405-2506

Section 1 -- PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

1318

HMIS CODES

Health	2
Flammability	4
Reactivity	0

PRODUCT NAME

KRYLON* Sandable Primer, Gray

MANUFACTURER'S NAME

THE SHERWIN-WILLIAMS COMPANY
KRYLON Products Group
Cleveland, OH 44115EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION

24-MAY-04

INFORMATION TELEPHONE NO.
(800) 832-2541

Section 2 -- COMPOSITION/INFORMATION ON INGREDIENTS

% by WT	CAS No.	INGREDIENT	ACGIH TLV	OSHA PEL	UNITS	VAPOR PRESSUR
14	74-98-6	Propane	ACGIH TLV	2500	ppm	760 m
			OSHA PEL	1000	ppm	
6	106-97-8	Butane	ACGIH TLV	800	ppm	760 m
			OSHA PEL	800	ppm	
3	64742-89-8	V. M. & P. Naphtha	ACGIH TLV	300	ppm	12 m
			OSHA PEL	300	ppm	
			OSHA PEL	400	ppm STEL	
19	108-88-3	Toluene	ACGIH TLV	50	ppm (Skin)	22 m
			OSHA PEL	100	ppm (Skin)	
			OSHA PEL	150	ppm (Skin) STEL	
2	78-83-1	2-Methyl-1-propanol	ACGIH TLV	50	ppm	8.7 m
			OSHA PEL	50	ppm	
38	67-64-1	Acetone	ACGIH TLV	500	ppm	180 m
			ACGIH TLV	750	ppm STEL	
			OSHA PEL	1000	ppm	
7	14807-96-6	Talc	ACGIH TLV	2	mg/m ³ as Resp. Dust	
			OSHA PEL	2	mg/m ³ as Resp. Dust	
1	471-34-1	Calcium Carbonate	ACGIH TLV	10	mg/m ³ as Dust	
			OSHA PEL	15	mg/m ³ Total Dust	
			OSHA PEL	5	mg/m ³ Respirable Fraction	
1	13463-67-7	Titanium Dioxide	ACGIH TLV	10	mg/m ³ as Dust	
			OSHA PEL	10	mg/m ³ Total Dust	
			OSHA PEL	5	mg/m ³ Respirable Fraction	

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Section 3 -- HAZARDS IDENTIFICATION**ROUTES OF EXPOSURE****INHALATION** of vapor or spray mist.**EYE or SKIN** contact with the product, vapor or spray mist.**EFFECTS OF OVEREXPOSURE****EYES:** Irritation.**SKIN:** Prolonged or repeated exposure may cause irritation.**INHALATION:** Irritation of the upper respiratory system.

May cause nervous system depression. Extreme overexposure may result in unconsciousness and possibly death.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Headache, dizziness, nausea, and loss of coordination are indications of excessive exposure to vapors or spray mists.

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

CANCER INFORMATION

For complete discussion of toxicology data refer to Section 11.

Section 4 -- FIRST AID MEASURES**EYES:** Flush eyes with large amounts of water for 15 minutes.
Get medical attention.**SKIN:** Wash affected area thoroughly with soap and water.
Remove contaminated clothing and launder before re-use.**INHALATION:** If affected, remove from exposure. Restore breathing.
Keep warm and quiet.**INGESTION:** Do not induce vomiting.
Get medical attention immediately.**Section 5 -- FIRE FIGHTING MEASURES**

FLASH POINT	LEL	UEL
Propellant < 0 F	0.9	12.8

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Containers may explode when exposed to extreme heat.

Application to hot surfaces requires special precautions.

During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent. Obtain medical attention.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used.

Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

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Section 6 -- ACCIDENTAL RELEASE MEASURES**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Remove all sources of ignition. Ventilate the area.

Remove with inert absorbent.

Section 7 -- HANDLING AND STORAGE**STORAGE CATEGORY**

Not Available

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep away from heat, sparks, and open flame. Vapors will accumulate readily and may ignite explosively.

During use and until all vapors are gone: Keep area ventilated - Do not smoke - Extinguish all flames, pilot lights, and heaters - Turn off stoves, electric tools and appliances, and any other sources of ignition.

Consult NFPA Code. Use approved Bonding and Grounding procedures.

Contents under pressure. Do not puncture, incinerate, or expose to temperature above 120F. Heat from sunlight, radiators, stoves, hot water, and other heat sources could cause container to burst. Do not take internally. Keep out of the reach of children.

Section 8 -- EXPOSURE CONTROLS/PERSONAL PROTECTION**PRECAUTIONS TO BE TAKEN IN USE**

Use only with adequate ventilation.

Avoid contact with skin and eyes. Avoid breathing vapor and spray mist.

Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m³ (total dust), 3 mg/m³ (respirable fraction), OSHA PEL 15 mg/m³ (total dust), 5 mg/m³ (respirable fraction).

Removal of old paint by sanding, scraping or other means may generate dust or fumes that contain lead. Exposure to lead dust or fumes may cause brain damage or other adverse health effects, especially in children or pregnant women. Controlling exposure to lead or other hazardous substances requires the use of proper protective equipment, such as a properly fitted respirator (NIOSH approved) and proper containment and cleanup. For more information, call the National Lead Information Center at 1-800-424-LEAD (in US) or contact your local health authority.

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

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PROTECTIVE GLOVES

None required for normal application of aerosol products where minimal skin contact is expected. For long or repeated contact, wear chemical resistant gloves.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PRECAUTIONS

Intentional misuse by deliberately concentrating and inhaling the contents can be harmful or fatal.

Section 9 -- PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT WEIGHT	6.66	lb/gal	797 g/l
SPECIFIC GRAVITY	0.80		
BOILING POINT	<0	- 325 F	<-18 - 162 C
MELTING POINT		Not Available	
VOLATILE VOLUME	92	%	
EVAPORATION RATE		Faster than ether	
VAPOR DENSITY		Heavier than air	
SOLUBILITY IN WATER		N.A.	
PH	7.0		
VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)			
Volatile Weight	44.40 %	Less Water and Federally Exempt Solvents	

Section 10 -- STABILITY AND REACTIVITY**STABILITY -- Stable****CONDITIONS TO AVOID**

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide

HAZARDOUS POLYMERIZATION

Will not occur

Section 11 -- TOXICOLOGICAL INFORMATION**CHRONIC HEALTH HAZARDS**

No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.

Prolonged overexposure to solvent ingredients in Section 2 may cause adverse effects to the liver, urinary, cardiovascular and reproductive systems.

Rats exposed to titanium dioxide dust at 250 mg./m³ developed lung cancer, however, such exposure levels are not attainable in the workplace.

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

TOXICOLOGY DATA

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CAS No.	Ingredient Name
---------	-----------------

74-98-6	Propane	LC50 LD50	RAT RAT	4HR	Not Available Not Available
106-97-8	Butane	LC50 LD50	RAT RAT	4HR	Not Available Not Available
64742-89-8	V. M. & P. Naphtha	LC50 LD50	RAT RAT	4HR	Not Available Not Available
108-88-3	Toluene	LC50 LD50	RAT RAT	4HR	4000 ppm 5000 mg/kg
78-83-1	2-Methyl-1-propanol	LC50 LD50	RAT RAT	4HR	Not Available 2460 mg/kg
67-64-1	Acetone	LC50 LD50	RAT RAT	4HR	Not Available 5800 mg/kg
14807-96-6	Talc	LC50 LD50	RAT RAT	4HR	Not Available Not Available
471-34-1	Calcium Carbonate	LC50 LD50	RAT RAT	4HR	Not Available Not Available
13463-67-7	Titanium Dioxide	LC50 LD50	RAT RAT	4HR	Not Available Not Available

Section 12 -- ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

No data available.

Section 13 -- DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Waste from this product may be hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Waste must be tested for ignitability to determine the applicable EPA hazardous waste numbers.

Do not incinerate. Depressurize container. Dispose of in accordance with Federal, State/Provincial, and Local regulations regarding pollution.

Section 14 -- TRANSPORT INFORMATION

No data available.

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Section 15 -- REGULATORY INFORMATION**SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION**

CAS No.	CHEMICAL/COMPOUND	% by WT	% Elemen
108-88-3	Toluene	19	

CALIFORNIA PROPOSITION 65

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

Section 16 -- OTHER INFORMATION

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contain all of the information required by the CPR.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

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NATIONAL DISTRIBUTOR OF QUALITY
MAINTENANCE SUPPLIES SINCE 1958

1-800-558-2808

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MSDS 71665

[71665](#): PTFE Tape 1/2 [4]

[71699](#): PTFE Tape 3/4 [2]

[72710](#): PTFE Tape 1/4 [4]

MSDS Last updated: 05/07/2010

*** SECTION I, IDENTIFICATION***

PRODUCT SEARCH

GO

[Advanced Search »](#)

- All Products
- Fasteners
 - » Grade 8
 - » Grade 5
 - » Threaded Fasteners
- Hardware
- Rivet & Rivet Guns
- Vehicle Lighting
 - » Cross Reference
- Electrical Products
- Tubing & Tube Fittings
- Air Brake Products
- Hose & Hose Ends
- Cutting Tools
- Abrasives
- Safety Products & Welding Supplies
- Chemicals & Paint
 - » MSDS Information
 - » CA/OTC Information
- Shop Supplies
- Vehicle Parts & Accessories
- Assortments & Steel Equipment
 - » Assortment Listing

PRODUCT NAME: PTFE TAPE

IMPERIAL PART NUMBER: 71665, 71699, and 72710

MANUFACTURES NAME: AA THREAD SEAL TAPE, INC
 MANUFACTURES ADDRESS: 1275 KYLE CT
 CITY/STATE/ZIP: WAUCONDA, IL 60084
 PHONE NUMBER: 847-526-2120

DATE PREPARED: 2/14/00

DATE UPDATED: 1/18/02

DISTRIBUTORS NAME: Imperial Supplies LLC
 DISTRIBUTORS ADDRESS: 789 PACKER DR
 CITY/STATE/ZIP: GREEN BAY, WI 54307
 PHONE NUMBER: 800-558-2808
 EMERGENCY CONTACT NUMBER: 800-255-3924 (CHEM-TEL)

*** SECTION II, HAZARDOUS INGREDIENTS/IDENTITY***

HARZARDOUS COMPONENTS	OSHA PEL	ACGIH TLV	OTHER EXPOSURE LIMITS	%	CAS. NO.
<hr/>					
POLYTETRAFLUOROETHYLENE	N/A	N/A		100%	9002-84-0

PTFE TAPE, AS SUCH IS NOT A HAZARDOUS MATERIAL, IT IS A PROCESSED SOLID POLYMER.
 TEMPERATURE RANGE -450 DEGREES F TO +500 DEGREES F

Printer-Friendly View

*** SECTION III, PHYSICAL & CHEMICAL CHARACTERISTICS***

BOILING POINT:	N/A
SPECIFIC GRAVITY:	2.1-2.2
VAPOR PRESSURE:	N/A
VAPOR DENSITY:	N/A
SOLUBILITY IN WATER:	INSOLUBE
REACTIVITY IN WATER:	NONE
APPEARANCE IN ODOR:	WHITE
MELTING POINT:	341 DEGREES C (642 DEGREES F)

*** SECTION IV. FIRE & EXPLOSION DATA***

FLASH POINT: N/A

METHOD USED: ----

FLAMMABLE LIMITS IN AIR
% BY VOLUME: LEL LOWER - N/A UEL UPPER - N/A

AUTO IGNITION TEMPERATURE: N/A

EXTINGUISHER MEDIA: N/A USE MEDIA SUITABLE FOR SURROUNDING FIRE

SPECIAL FIRE FIGHTING PROCEDURES: SELF CONTAINED BREATHING APPARATUS WITH FULL FACE PIECE AND PROTECTIVE CLOTHING IF INVOLVED WITH OTHER MATERIALS

UNUSUAL FIRE AND EXPLOSION HAZARDS: PRODUCT WILL EMIT TOXIC FUMES AT HIGH TEMPERATURES
ABOVE 800 DEGREES F - TETRAFLUOROETHYLENE
ABOVE 825 DEGREES F - HEXAFLUOROETHYLENE
ABOVE 885 DEGREES F - PERFLUOROBUTYLENE
ABOVE 930 DEGREES F - CARBONYL FLUORIDE

*** SECTION V, PHYSICAL HAZARDS (REACTIVITY DATA) ***

STABILITY: STABLE

CONDITIONS TO AVOID: HEATING ABOVE 750 DEGREES F FOR A PRELONGED PERIOD

INCOMPATABILITY MATERIAL TO AVOID: MOLTEN ALKALI METALS: INTERHALOGEN COMPOUNDS

HAZARDOUS DECOMPOSITION PRODUCTS: SEE SECTION IV

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

*** SECTION VI, HEALTH HAZARDS ***

ACUTE: FLU LIKE TRANSIENT SICKNESS

CHRONIC: COULD BE FATAL

SIGNS AND SYMPTOMES OF EXPOSURE: FLU LIKE FEVER

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: RESPIRATORY INFLAMMATION

CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN: NATIONAL TOXICOLOGY PROGRAM - NO
IARC MONOGRAPHS - NO
OSHA - NO

EMERGENCY AND FIRST AID PROCEDURES: MOVE TO FRESH AIR. REFER TO PHYSICIAN

ROUTES OF ENTRY: INHALATION - NO TOXIC EFFECT FROM DUST
EYES - MECHANICAL IRRITATION
SKIN - PROBABLY NON-IRRITATING AND NON-ABSORBING
INGESTION - PTFE HAS BEEN SHOWN TO BE INERT WHEN INGESTED BY RATS

*** SECTION VII, SPECIAL PRECAUTIONS AND SPILL/LEAK PROCEDURES ***

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:	NO UNUSUAL PRECAUTIONS
OTHER PRECAUTIONS:	NONE
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:	SWEET UP TO PREVENT SLIPPAGE ON TAPE
WASTE DISPOSAL METHODS:	CONFIRMING TO ALL APPLICATION REGULATIONS

*** SECTION VIII, SPECIAL PROTECTION INFORMATIONS/CONTROL MEASURES ***

RESPIRATORY PROTECTION:	N/A - EXCEPT AS IN SECTION IV
VENTILATION:	N/A
LOCAL EXHAUST:	N/A
MECHANICAL:	N/A
SPECIAL:	N/A
OTHER:	N/A
PROTECTIVE GLOVES:	N/A
EYE PROTECTION:	N/A
OTHER PROTECTIVE CLOTHING OR EQUIPMENT:	N/A
WORK HYGIENIC PRACTICES:	NO SMOKING WHILE HANDLING MATERIAL

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ORGANIC PRODUCTS CO. -- F-900 TORQUE SEAL

=====

MSDS Safety Information

=====

FSC: 8030

NIIN: 01-077-7674

MSDS Date: 01/01/1995

MSDS Num: CGXPC

Product ID: F-900 TORQUE SEAL

MFN: 02

Responsible Party

Cage: 01195

Name: ORGANIC PRODUCTS CO.

Address: 1963 IRVING BOULEVARD

Box: 428

City: IRVING TX 75060-4555

Info Phone Number: 214-438-7321

Emergency Phone Number: 214-438-7321

Review Ind: Y

Published: Y

=====

Contractor Summary

=====

Cage: 01195

Name: ORGANIC PRODUCTS CO.

Address: 1963 E. IRVING BOULEVARD

Box: 428

City: IRVING TX 75060-4555

Phone: 214-438-7321

=====

Item Description Information

=====

Item Manager: GSA

Item Name: SEALING COMPOUND

Unit of Issue: TU

Quantitative Expression: 1000000005OZ

UI Container Qty: 0

=====

Ingredients

=====

Cas: 67-56-1

RTECS #: PC1400000

Name: METHANOL (SARA 313) (CERCLA)

% Wt: 30-60

Other REC Limits: NONE RECOMMENDED

OSHA PEL: NOT ESTABLISHED

ACGIH TLV: 200 PPM

EPA Rpt Qty: 5000 LBS

DOT Rpt Qty: 5000 LBS

Cas: 64-17-5

RTECS #: KQ6300000

Name: ETHYL ALCOHOL (ETHANOL)

% Wt: 10-40

Other REC Limits: NONE RECOMMENDED

OSHA PEL: NOT ESTABLISHED

ACGIH TLV: 1000 PPM

=====
Health Hazards Data
=====

Route Of Entry Inds - Inhalation: YES

Skin: YES

Ingestion: YES

Carcinogenicity Inds - NTP: NO

IARC: NO

OSHA: NO

Effects of Exposure: EYE: IRRIT. SKIN: IRRIT. INHAL: IRRIT. INGEST: NAUSEA,
VOMIT.

First Aid: EYE: FLUSH W/WATER. SKIN: FLUSH W/WATER. INHAL: REMOVE TO FRESH AIR.
INGEST: INDUCE VOMIT. IN ALL CASES, GET MED AID.

=====
Handling and Disposal
=====

Spill Release Procedures: ABSORB LIQUID W/ABSORBENT MATERIAL & TRANSFER TO
HOOD. ELIMINATE IGNIT SOURCES. DESTROY REMAINING MATERIAL BY INCINERATION.

Waste Disposal Methods: INCINERATE IN FURNACE OR BY LIQUID INCINERATION.

DEPOSIT IN TOXIC LANDFILL IN ACCORDANCE W/FEDERAL, STATE & LOCAL
REGULATIONS.

=====
Fire and Explosion Hazard Information
=====

Flash Point Method: TOC

Flash Point Text: ABOUT 119F

Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL FOR SMALL FIRES. ALCOHOL FOAM
FOR LARGE FIRE.

Fire Fighting Procedures: USE SCBA W/FULL-FACE PIECE W/PRESSURE DEMAND.

Unusual Fire/Explosion Hazard: VAPORS >AIR, KEEP AWAY FROM PILOT LIGHTS,
LIGHTS, FLAMES, SPARKS, HEATERS, SMOKERS.

=====
Control Measures
=====

Protective Gloves: NEOPRENE

Eye Protection: CHEMICAL SPLASH GOGGLES

Other Protective Equipment: SAFETY SHOWER AND EYE BATH, PROTECTIVE EQUIPMENT TO
PREVENT PROLONGED SKIN CONTACT.

=====
Physical/Chemical Properties
=====

B.P. Text: ABOUT 150F

Vapor Pres: 42.0

Solubility in Water: NONE

Appearance and Odor: HEAVY THICK PASTE, ALCOHOL ODOR.

Percent Volatiles by Volume: 50.0

=====
Reactivity Data
=====

Stability Indicator: YES

Stability Condition To Avoid: HEAT, SPARKS & FIRES.

Hazardous Decomposition Products: THERMAL DECOMPOSITION MAY PRODUCE CARBON
MONOXIDE AND/OR CARBON DIOXIDE.

Hazardous Polymerization Indicator: NO

=====
Toxicological Information

=====

Ecological Information

MSDS Transport Information

Regulatory Information

Other Information

Transportation Information

Responsible Party Cage: 01195

Trans ID NO: 105565

Product ID: F-900 TORQUE SEAL

MSDS Prepared Date: 01/01/1995

Review Date: 04/28/1998

MFN: 2

Multiple KIT Number: 0

Review IND: Y

Unit Of Issue: TU

Container QTY: 0

Detail DOT Information

DOT PSN Code: ZZZ

DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

Detail IMO Information

IMO PSN Code: ZZZ

IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION

Detail IATA Information

IATA PSN Code: ZZZ

IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

Detail AFI Information

AFI PSN Code: ZZZ

AFI Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

HAZCOM Label

Product ID: F-900 TORQUE SEAL

Cage: 01195

Company Name: ORGANIC PRODUCTS CO.

Street: 1963 E. IRVING BOULEVARD

PO Box: 428

City: IRVING TX

Zipcode: 75060-4555

Health Emergency Phone: 214-438-7321

Label Required IND: Y

Date Of Label Review: 10/12/1999

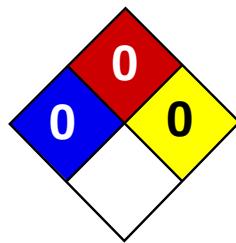
Status Code: A

Origination Code: G

Hazard And Precautions: EYE: IRRIT. SKIN: IRRIT. INHAL: IRRIT. INGEST: NAUSEA,
VOMIT.

=====

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Health	0
Fire	0
Reactivity	0
Personal Protection	A

Material Safety Data Sheet Water MSDS

Section 1: Chemical Product and Company Identification

Product Name: Water

Catalog Codes: SLW1063

CAS#: 7732-18-5

RTECS: ZC0110000

TSCA: TSCA 8(b) inventory: Water

CI#: Not available.

Synonym: Dihydrogen oxide

Chemical Name: Water

Chemical Formula: H₂O

Contact Information:

Scienclab.com, Inc.

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:

1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Water	7732-18-5	100

Toxicological Data on Ingredients: Not applicable.

Section 3: Hazards Identification

Potential Acute Health Effects:

Non-corrosive for skin. Non-irritant for skin. Non-sensitizer for skin. Non-permeator by skin. Non-irritating to the eyes. Non-hazardous in case of ingestion. Non-hazardous in case of inhalation. Non-irritant for lungs. Non-sensitizer for lungs. Non-corrosive to the eyes. Non-corrosive for lungs.

Potential Chronic Health Effects:

Non-corrosive for skin. Non-irritant for skin. Non-sensitizer for skin. Non-permeator by skin. Non-irritating to the eyes. Non-hazardous in case of ingestion. Non-hazardous in case of inhalation. Non-irritant for lungs. Non-sensitizer for lungs. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available.

Section 4: First Aid Measures

Eye Contact: Not applicable.

Skin Contact: Not applicable.

Serious Skin Contact: Not available.

Inhalation: Not applicable.

Serious Inhalation: Not available.

Ingestion: Not Applicable

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances: Not Applicable

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill: Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Section 7: Handling and Storage

Precautions: No specific safety phrase has been found applicable for this product.

Storage: Not applicable.

Section 8: Exposure Controls/Personal Protection

Engineering Controls: Not Applicable

Personal Protection: Safety glasses. Lab coat.

Personal Protection in Case of a Large Spill: Not Applicable

Exposure Limits: Not available.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Odorless.

Taste: Not available.

Molecular Weight: 18.02 g/mole

Color: Colorless.

pH (1% soln/water): 7 [Neutral.]

Boiling Point: 100°C (212°F)

Melting Point: Not available.

Critical Temperature: Not available.

Specific Gravity: 1 (Water = 1)

Vapor Pressure: 2.3 kPa (@ 20°C)

Vapor Density: 0.62 (Air = 1)

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not applicable

Solubility: Not Applicable

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Not available.

Corrosivity: Not available.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact.

Toxicity to Animals:

LD50: [Rat] - Route: oral; Dose: > 90 ml/kg LC50: Not available.

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans:

Non-corrosive for skin. Non-irritant for skin. Non-sensitizer for skin. Non-permeator by skin. Non-hazardous in case of ingestion. Non-hazardous in case of inhalation. Non-irritant for lungs. Non-sensitizer for lungs. Non-corrosive to the eyes. Non-corrosive for lungs.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations: TSCA 8(b) inventory: Water

Other Regulations: EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): Not controlled under WHMIS (Canada).

DSCL (EEC):

This product is not classified according to the EU regulations. Not applicable.

HMIS (U.S.A.):

Health Hazard: 0

Fire Hazard: 0

Reactivity: 0

Personal Protection: a

National Fire Protection Association (U.S.A.):

Health: 0

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:

Not applicable. Lab coat. Not applicable. Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:33 PM

Last Updated: 11/01/2010 12:00 PM

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Windex Powerized Glass Cleaner (RTU)

HMIS		NFPA	Personal protective equipment
Health	0	0	
Fire Hazard	1	1	
Reactivity	0	0	

Version Number: 3

Preparation date: 2005-05-20

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Windex Powerized Glass Cleaner (RTU)

MSDS #: 126011004

Product code: 90122, 90135, 90139, 90940, CB006722, CB807701, 3694044, 3694052

Recommended use: Cleaning product.

Manufacturer, importer, supplier:

Consumer Branded Professional Products, Div.

JohnsonDiversey, Inc.

8310 16th Street

Sturtevant, Wisconsin 53177-0902

Phone: (888) 352-2249

Emergency telephone number: 1-800-851-7145 (Prosar); 1-651-917-6133 (Int'l Prosar); 01-800-710-3400 (México)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

The product contains no substances which at their given concentration, are considered to be hazardous to health

Principle routes of exposure: Eyes. Skin. Inhalation. Ingestion.

Eye contact: None known.

Skin contact: None known.

Inhalation: None known.

Ingestion: None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS

Ingredient(s)	CAS #	Weight %	LD50 Oral	LD50 Dermal	LC50 Inhalation
Isopropyl alcohol	67-63-0	1 - 5%	5000 mg/kg (rat)	12800 mg/kg (rabbit)	16000 ppm/8H (rat)

4. FIRST AID MEASURES

Eye contact: Rinse with plenty of water.

Skin contact: Rinse with plenty of water.

Inhalation: No specific first aid measures are required.

Ingestion: No specific first aid measures are required.

Aggravated Medical Conditions: None known.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media: Dry chemical, water spray, foam, carbon dioxide.

Specific hazards: Although this product has a flash point below 200 Deg. F, it is an aqueous solution containing an alcohol and does not sustain combustion.

Unusual hazards: None known

Specific methods: No special methods required

Special protective equipment for firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

Extinguishing media which must not be used for safety reasons: None.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Use personal protective equipment

Windex Powerized Glass Cleaner (RTU)

1 of 3

Environmental precautions and clean-up methods:

Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container.

7. HANDLING AND STORAGE**Handling:**

Avoid contact with eyes. COMBUSTIBLE LIQUID AND VAPOR. Keep away from open flames, hot surfaces and sources of ignition. Handle in accordance with good industrial hygiene and safety practice. FOR COMMERCIAL AND INDUSTRIAL USE ONLY.

Storage:

Keep tightly closed in a dry, cool and well-ventilated place. Protect from freezing. Keep out of the reach of children.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**Engineering measures to reduce exposure:**

No special ventilation requirements. General room ventilation is adequate.

Personal Protective Equipment

Eye protection:	No special requirements under normal use conditions
Hand protection:	No special requirements under normal use conditions
Skin and body protection:	No special requirements under normal use conditions
Respiratory protection:	No special requirements under normal use conditions
Hygiene measures:	Handle in accordance with good industrial hygiene and safety practice

Ingredient(s)	CAS #	ACGIH	OSHA	Mexico
Isopropyl alcohol	67-63-0	400 ppm (STEL) 200 ppm (TWA)	980 mg/m ³ 400 ppm	1225 mg/m ³ (STEL) 980 mg/m ³ (TWA)

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid	Bulk density:	No information available
pH:	11.45	Dilution pH:	No information available.
Appearance:	Liquid	Vapor density:	No information available
Color:	Blue	Evaporation rate:	No information available
Odor:	Ammoniacal	Boiling point/range:	Not determined
Specific gravity:	0.996	Melting point/range:	Not determined
Density:	0.996	Decomposition temperature:	Not determined
VOC:	3.8	Autoignition temperature:	No information available
Flash point:	131 (°F) 55 (°C)	Viscosity:	No information available
Solubility:	Soluble	Partition coefficient (n-octanol/water):	No information available
		Solubility in other solvents:	No information available

10. STABILITY AND REACTIVITY

Stability:	The product is stable
Polymerization:	Hazardous polymerization does not occur.
Hazardous decomposition products:	None reasonably foreseeable.
Conditions to avoid:	Do not freeze.

11. TOXICOLOGICAL INFORMATION

Acute toxicity	Oral LD50 estimated to be greater than 5000 mg/kg. Dermal LD50 estimated to be > 2000 mg/kg.
Component Information:	See Section 3
Chronic toxicity:	None known
Specific effects	
Carcinogenic effects:	None known
Mutagenic effects:	None known
Reproductive toxicity:	None known
Target organ effects:	None known

12. ECOLOGICAL INFORMATION

Environmental Information: When used for its intended purpose this product should not cause adverse effects in the environment

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:

Dispose of according to all federal, state and local applicable regulations

14. TRANSPORT INFORMATION

DOT/TDG: Please refer to the Bill of Lading/receiving documents for up to date shipping information

15. REGULATORY INFORMATION**International Inventories**

All components of this product are listed on the following inventories: U.S.A. (TSCA).

U.S. Regulations

California Proposition 65: This product is not subject to the reporting requirements under California's Proposition 65

STATE RIGHT TO KNOW

Ingredient(s)	CAS #	MARTK:	NJRTK:	PARTK:	RIRTK:	ILRTK:	CTRKT:
Hexyloxyethanol	112-25-4	-	Listed	Listed	-	-	-
Ammonium hydroxide	1336-21-6	Listed	Listed	Listed	-	Listed	Listed
Water	7732-18-5	-	-	-	-	-	-
Isopropyl alcohol	67-63-0	Listed	Listed	Listed	Listed	Listed	Listed

CERCLA / SARA

Ingredient(s)	CAS #	Weight %	CERCLA/SARA RQ (lbs)	Section 302 TPQ (lbs)	Section 313
Hexyloxyethanol	112-25-4	0.1 - 1.5%			Listed.
Ammonium hydroxide	1336-21-6	0.1 - 1.5%	1000		Listed.
Isopropyl alcohol	67-63-0	1 - 5%	100		Listed.

SARA 311/312 Hazard Categories

Immediate:	N
Delayed:	N
Fire:	Y
Reactivity:	N
Sudden Release of Pressure:	N

Canada

WHMIS hazard class: Not for sale in Canada.

Ingredient(s)	CAS #	NPRI
Isopropyl alcohol	67-63-0	Listed

16. OTHER INFORMATION

Reason for revision: Not applicable

Prepared by: NAPRAC

Additional advice: None

Notice to Reader: This document has been prepared using data from sources considered technically reliable. It does not constitute a warranty, express or implied, as to the accuracy of the information contained within. Actual conditions of use and handling are beyond seller's control. User is responsible to evaluate all available information when using product for any particular use and to comply with all Federal, State, Provincial and Local laws and regulations.

MSDS 005
Revised 11/2010

MATERIAL SAFETY DATA SHEET

MWS Wire Industries
31200 Cedar Valley Drive
Westlake Village, CA 91362
(818) 991-8553

Trade Name: Insulated Beryllium Copper Alloy (or Alloy 10, Alloy 25, CDA 17200)

Chemical Family: Copper-Beryllium-Cobalt mixture

Chemical Formula: NA

HAZARDOUS INGREDIENTS

<u>Ingredient</u>	<u>CAS No.</u>	<u>TLV</u>	<u>PEL</u>	<u>STEL</u>
Copper	7440-50-8	1 (D) / 0.2 (F)	1 (D) / 0.1 (F)	2
Beryllium	7440-41-7	.002	.002 (.005*)	.01
Cobalt	7440-48-4	.02	.10	
Enamel coating	N/A	(see Health Hazard Data and Insulation Guide)		

Product composition: 89.3-97.0% Copper; 1-8% insulation; 1.5-2.0% Beryllium; 0.2-0.35% Cobalt

Note: TLV - American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (mg/m³)

PEL - OSHA Permissible Exposure Level (mg/m³), 8 hour time weighted average

STEL - ACGIH Short Term Exposure Limit (mg/m³), 15 minutes maximum

* Ceiling Level (Not to be exceeded) D = Dust F = Fume NS = Not Specified

PHYSICAL DATA

Boiling Point °C: NA

Vapor Pressure: NA

Vapor Density: NA

% Volatile: NA

Evaporation Rate: NA

Solubility in H₂O: Insoluble

Specific Gravity: 8.36

Melting Temperature: 866°C

Appearance & Odor: Solid with no odor to mild phenol odor. Color varies with coating type. Basic colors are red, green and amber (natural).

FIRE & EXPLOSION HAZARD DATA

HMIS Flammability Rating: 0 Beryllium copper alloy is non-combustible. Use extinguishing media appropriate for the surrounding fire. Self-contained breathing apparatus must be worn if there is any risk of exposure to metal fumes or dust released during or after a fire.

HEALTH HAZARD DATA

HMIS Health Hazard Rating: 3 (This rating is based on heating or burning the film insulation which may evolve combustion by-products that are toxic. Refer to the information in this section).

Fine powders, granules and fumes from welding or abrasive operations are a health hazard. When burned, soldered or hot-staked, insulation coatings may give off hazardous decomposition products that may include isocyanates such as Toluene Diisocyanate. Some individuals can develop sensitivity to isocyanates. Use with adequate local exhaust to prevent irritation and maintain isocyanates concentration below the OSHA ceiling limit of 20 parts per billion (20 ppb).

Short Term Exposure: Dust and fumes irritate the eyes, nose and throat. Symptoms may include cough, metallic taste in mouth, fever, fatigue and nausea.

Long Term Exposure: Watering of the eyes, headaches, difficulty breathing, coughing, severe chest pains and may cause Chronic Beryllium Disease, a serious chronic lung disease.

. Emergency First Aid Procedure:

- In case of fume inhalation, remove from exposure and consult a physician.
- In case of eye contact, flush with large amounts of water for at least fifteen minutes. Seek medical attention.
- In case of ingestion, seek immediate medical attention.

The International Agency for Research on Cancer (IARC) lists beryllium as a Group I – Known Human Carcinogen. The IARC lists cobalt as a Group 2B – Possibly Carcinogenic to Humans. The National Toxicology Program (NTP) lists beryllium as reasonably anticipated to be a human carcinogen.

REACTIVITY DATA

HMIS Reactivity Rating: 0

Stability: Stable. Beryllium copper reacts with some acids and caustic solutions to produce hydrogen gas. Hydrogen gas can be an explosion hazard. Powdered aluminum and chlorinated hydrocarbons may react with explosive violence.

Hazardous decomposition products: When subjected to temperature in excess of 200°C toxic fumes may be evolved from insulation coatings. Refer to Health Hazard Data.

Hazardous Polymerization: Will not occur.

SPILL, LEAK, DISPOSAL PROCEDURES

Scrap metal may have reclamation value. Where this is not practical, it may be disposed in accordance with state and federal regulations. In solid wire form, beryllium copper alloys pose no special clean up problems. If material is in powder or dust form, clean up should be conducted to minimize generation of airborne powder and dust and to avoid contamination of air and water. If greater than one pound of metal dust or powder is released into the environment report the spill immediately to the National Response Center at (800) 424-8802.

SARA TITLE III SECTION 313

Copper, beryllium and cobalt are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372 of the Federal Register. Additional information can be obtained from the Emergency Planning and Community Right-To-Know Information Hot Line, US EPA, at (800) 535-0202.

CALIFORNIA PROPOSITION 65 WARNING

Beryllium, cobalt metal powder and cobalt oxide are known by the State of California to cause cancer. The Safe Harbor No Significant Risk Level (NSRL) for beryllium is 0.1 μ g/day. Cobalt does not have an NSRL assigned at this time.

EC RoHS DIRECTIVE COMPLIANCE

Insulated beryllium copper wire complies with Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

ECHA REACH COMPLIANCE

Insulated beryllium copper wire meets the definition of an article under REACH and does not contain SVHC listed as of the revision date of this MSDS. For more information about MWS Wire products and REACH, see http://www.mswire.com/pdf_files/reach.pdf

SPECIAL PROTECTION

Wear safety glasses when risk of eye injury is present, particularly during machining, grinding, welding, powder handling, etc. Gloves and other protective equipment may be required during handling operations as appropriate to the circumstances of exposure.

Use with adequate ventilation to meet the exposure limits, to prevent irritation and to maintain isocyanates exposure below 20 ppb. If these limits are exceeded use NIOSH approved respiratory protection based on airborne contaminants present.

Burning, soldering or hot-staking should be done under a fume hood with adequate exhaust that pulls fumes away from the individual.

SPECIAL PRECAUTIONS

When welding, melting, casting, grinding, sanding, polishing or otherwise abrading the surface of beryllium copper in a manner which generates finely divided particles, an exposure to metallic copper, beryllium and cobalt in excess of the occupational standard can occur. Use with adequate ventilation to meet listed exposure limits. Processes generating airborne beryllium copper alloy must be air sampled to determine exposure levels. Where exposure data indicate, medical surveillance should be conducted.

PACKAGING & LABELING REQUIREMENTS

D.O.T. Shipping Name: Not regulated

Hazard Class: NA

MWS Wire Industries (MWS) has attempted to provide current and accurate information in this data sheet, however MWS makes no representations regarding the accuracy or completeness of the information. Information is supplied upon the condition that the persons receiving it will make their own determinations as to its suitability prior to use. MWS assumes no liability for any loss, damage or injury of any kind which may arise out of the use or reliance on the information by any person. No warranties, either express or implied, of merchantability, fitness for a particular purpose or of any other nature are made with respect to the foregoing information or the product to which the information refers. Contact person: Ken Goss at (818) 991-8553.

INSULATION GUIDE

Name	NEMA Temperature Class	Description
Formvar ¹	105 C	Polyvinyl Formal
Polyurethane	155 / 180 C	Modified Polyurethane
Polyurethane Nylon	155 / 180 C	Modified Polyurethane with Polyamide overcoat
Solderable Polyesterimide	180 C	Polyesterimide
Polyester 200	200 C	Modified Polyester
Armored Polyester	200 C	Modified Polyester or Polyesterimide with Amide-Imide overcoat
ML ²	240 C	Polyimide
All insulations may be supplied with a bondable overcoat.		
Butvar Bond		Polyvinyl Butyral
Polyester Bond		Polyester
Epoxy Bond		Epoxy
Polyamide Bond		Aromatic Polyamide

¹ Chisso Corp. Registered Trademark

² IST (USA) Corp. Registered Trademark



Material Safety Data Sheet

F

1. Chemical Product and Company Identification

DESCRIPTION: ELMER'S CARPENTERS WOOD GLUE
PRODUCT TYPE: PVAC BASED ADHESIVE
APPLICATION: FOR PRODUCT CODES SEE SECTION 16

Manufacturer/Supplier Information

MSDS Prepared by:
Elmer's Products, Inc. Emergency Phone Number
1 Easton Oval Poison Control Center
Columbus, OH 43219 1-888-516-2502
For additional health, safety or regulatory information, call 1-888-435-6377
Call 1-800-848-9400 to place an order or request additional MSDSs.

2. Composition, Information on Ingredients

No hazardous ingredients known to company.

3. Hazards Identification

3.1 Emergency Overview

Appearance	Light yellow liquid
Odor	Mild acetic aroma
Not an immediate health hazard.	

· HMIS Rating

HEALTH = 0 (minimal)
FLAMMABILITY = 0 (minimal)
REACTIVITY = 0 (minimal)

3.2 Potential Health Effects

· Immediate Hazards

INGESTION: No hazards known to company.
INHALATION: No hazards known to company.
SKIN: No hazards known to company.
EYES: No hazards known to company.

· Delayed Hazards

None of the components present in this product at concentrations equal to or greater than 0.1% have been listed by NTP, classified by IARC, nor regulated by OSHA as a carcinogen.

4. First Aid Measures

INGESTION: If accidentally swallowed, dilute by drinking large quantities of water. Immediately contact poison control center or hospital emergency room for any other additional treatment directions.
EYES: Immediately flush eyes with plenty of water. Call a physician if irritation persists.

5. Fire Fighting Measures

Autoignition Temperature	Not available
Upper/Lower Flammable Limits	Not applicable
Up/Lower Explosive Limits, % by Vol	Not applicable
Flash Point	Not applicable
Will not burn unless water has evaporated. Dried material may burn.	
In case of fire, water should be used to keep fire-exposed containers cool.	

6. Accidental Release Measures

Soak up with absorbent material and remove to a chemical disposal area. Prevent entry into natural bodies of water.

7. Handling and Storage

7.1 Handling

Handle in accordance with good industrial hygiene and safety practices.

7.2 Storage

Keep from freezing.
Store in a cool, dry place.
Keep containers tightly closed.

8. Exposure Controls/Personal Protection

8.1 Exposure Controls

No special control measures necessary under normal conditions of use.

8.2 Personal Protection

No special protection necessary.

8.3 Exposure Guidelines

None established

9. Physical and Chemical Properties

Percent Volatiles	54.5
pH @ 25 C	5.0
Specific Gravity	1.08
Appearance	Light yellow liquid
Autoignition Temperature	Not available
Boiling Point	100°C (212°F)
Vapor Density (Air=1)	<1
Vapor Pressure, mm Hg @ 20 C	17.5
Evaporation Rate (Butyl Acetate=1)	<1
Upper/Lower Flammable Limits	Not applicable
Up/Lower Explosive Limits, % by Vol	Not applicable
Flash Point	Not applicable
Freezing Point	0°C (32°F)
Odor	Mild acetic aroma
Odor Threshold, ppm	Not available
Solubility in Water	Dispersible
Coefficient of Water/Oil Distrib.	Not available

10. Stability and Reactivity

Normally stable as defined in NFPA 704-12(4-3.1).

- Incompatibilities:**

Strong acids and alkaline materials.

- Decomposition products may include:**

CO, CO₂.

- Hazardous polymerization:**

Will not occur.

- Other Hazards:**

None known to company.

11. Toxicological Information

INGESTION: A similar product was found to be non-toxic orally when tested as described in 16 CFR Part 1500.3(c)(1) and (2).

INHALATION: A similar product was found to be non-toxic by inhalation when tested as described in 16 CFR Part 1500.3 (c)(1) and (2).

SKIN ABSORPTION: A similar product was found to be non-toxic dermally when tested as described in 16 CFR Part 1500.3 (c)(1) and (2).

SKIN: A similar product was not an irritant when tested as described in 16 CFR Part 1500.41.

EYES: A similar product was not an irritant when tested as described in 16 CFR Part 1500.42.

12. Ecological Information

Not determined.

13. Disposal Considerations

Recover free liquid. Absorb residue and dispose of according to local, state/provincial, and federal requirements.

14. Transport Information

14.1 U.S. Department of Transportation (DOT)

The data provided in this section is for information only and may not be specific to your package size. You will need to apply the appropriate regulations to properly classify your shipment for transportation.

Non-Regulated.

14.2 Canadian Transportation of Dangerous Goods (TDG)

Non-Regulated.

15. Regulatory Information (Selected Regulations)

15.1 U.S. Federal Regulations

· OSHA Hazard Communication Standard 29CFR1910.1200

This material is not a "health hazard" or a "physical hazard" as determined when reviewed according to the requirements of the Occupational Safety and Health Administration 29 CFR Part 1910.1200 "Hazard Communication" Standard.

· SARA Title III: Section 311/312

Does not meet any hazard category

· SARA Title III Section 313 and 40 CFR Part 372

This product contains the following toxic chemical(s) subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986, and Subpart C-Supplier Notification Requirement of 40 CFR Part 372.
None required per SARA TITLE III SECTION 313.

· TSCA Section 8(b) Inventory

All reportable chemical substances are listed on the TSCA Inventory. We rely on certifications of compliance from our suppliers for chemical substances not manufactured by us.

15.2 Canadian Regulations

· Workplace Hazardous Materials Information System (WHMIS)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulation (CPR) and the MSDS contains all the information required by the CPR.

Not a controlled product

• **Canadian Environmental Protection Act (CEPA)**

All reportable chemical substances are listed on the Domestic Substances List (DSL) or otherwise comply with CEPA new substance notification requirements.

• **National Pollutant Release Inventory (NPRI)**

This product contains the following chemical(s) subject to the reporting requirements of the Canadian Environmental Protection Act (CEPA) subsection 16(1), National Pollutant Release Inventory.
None required.

16. Other Information

AP (Non-Toxic): Products bearing the AP (Non-Toxic) Product Seal of The Art & Creative Materials Institute, Inc. (ACMI) are certified in a program of toxicological evaluation by a medical expert to contain no materials in sufficient quantities to be toxic or injurious to humans or to cause acute or chronic health problems. This program is reviewed by ACMI's Toxicological Advisory Board. These products are certified by ACMI to be labeled in accordance with the chronic hazard labeling standard, ASTM D-4236 and Federal Law, P.L. 100-695. In addition, there is no physical hazard as defined within 29 CFR Part 1910.1200(c).

MSDS covers items:

U.S.: E614, E700, E701, E702, E704, E705, E706, E970, E980,

E1367, E1825, E1850, E7000, E7010, E7020, E7040, E7050

Canada: 60613, 60614, 60615, 60616, 60617, 60618, 60619, 61367

• **User's Responsibility**

The OSHA Hazard Communication Standard 29CFR 1910.1200 and the Workplace Hazardous Materials Information System (WHMIS) require that the information contained on these sheets be made available to your workers. Educate and train your workers regarding OSHA and WHMIS precautions. Instruct your workers to handle this product properly. Consult with appropriate experts to guard against hazards associated with use of this product and its ingredients.

• **Disclaimer**

SELLER MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE, except that the product shall conform to contracted specifications, and that the product does not infringe any valid United States or Canadian patent. No claim of any kind shall be greater in amount than the purchase price of the quantity of product in respect of which damages are claimed. In no event shall Seller be liable for incidental or consequential damages, whether Buyer's claim is based on contract, breach of warranty, negligence or otherwise.

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