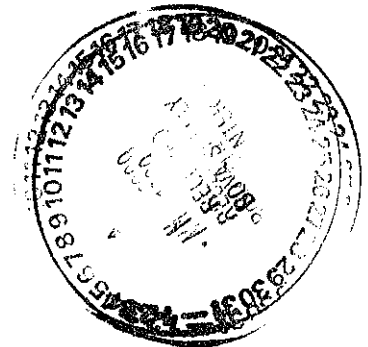


NORTON COMPANY



1 NEW BOND STREET
BOX NUMBER 15008
WORCESTER, MA 01615-0008
(508) 795-5000

February 1, 1989



Dear Valued Customer:

In compliance with the Federal Hazard Communications Standard 29.CFR.1910.1200 and Section 313 of the Superfund Amendments and Reauthorization Act of 1986 Title III, we enclose revised Material Safety Data Sheets for grinding wheels. The basic grinding wheel categories include:

- Vitrified Bonded Abrasive Products
- Rubber or Shellac Bonded Abrasive Products
- Resinoid Bonded Abrasive Products
- Diamond or Cubic Boron Nitride Abrasive Products

Section 313 of the Superfund Amendments and Reauthorization Act of 1986 Title III (SARA) requires suppliers of materials listed in Section 313 to notify customers and distributors of these materials and mixtures containing them. Aluminum oxide is currently listed as a Section 313 chemical. Norton Company, the Grinding Wheel Institute, the Abrasive Grain Association and other organizations are currently petitioning the EPA to delist aluminum oxide as it does not meet the criteria of a Section 313 material. It is hoped this material will be delisted in 1989.

The MSDS sheets contain complete generic information required by the Federal regulations. This does not mean all materials listed are present in all abrasives or bonds. Information will be provided for a designated specification upon request.

The MSDS sheets provided should be forwarded to the individual responsible for plant safety. Do not detach this from your MSDS packet.

Thomas Z. Richards
Thomas Z. Richards
Manager, Product Safety
Bonded Abrasives

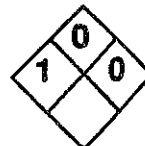
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300565

Health Rating

Rating



Reactivity Rating

HAZARD RATING

Please rate consistent with NFPA Code

MATERIAL SAFETY DATA SHEET

SECTION I NAME AND PRODUCT

MANUFACTURER'S NAME NORTON COMPANY	CONTACT THOMAS Z. RICHARDS
ADDRESS (STREET, CITY, STATE AND ZIP CODE) 1 NEW BOND STREET, WORCESTER, MA 01615-0008	EMERGENCY TELEPHONE NO. 508-795-2690
TRADE NAME, COMMON NAME OR SPECIFICATION RESINOID BONDED GRINDING WHEELS	APPROVED BY* <i>K. Marayanan</i> DATE <i>1/23/89</i>
CHEMICAL FAMILY OR PRODUCT TYPE ANY GRADE	

SECTION II COMPOSITION PER 29CFR 1910.1200 (G) (4)

CHEMICAL NAME	MAX %	COMMON NAME	REG* (Y/N)	CAS #	OSHA PERMISSIVE EXPOSURE LIMIT	ACGIH TLV	CARCINOGEN (Y/N)
Alpha-Alumina****	90	Alundum, Seeded Gel	Y	1344-28-1	15mg/m ³ (Total Dust)	10mg/m ³ (Total Dust)	N
Silicon Carbide	90	Crystolon	Y	409-21-2	15mg/m ³ (Total Dust)	10mg/m ³ (Total Dust)	N
Zirconia Alumina	90	NZ, ZF, ZS	Y	**NAIF	5mg/m ³ (as Zirconium)	5mg/m ³ (as Zirconium)	N

The grinding wheel may be comprised of 1 or more of the above abrasives. The chemicals listed below may be a part of the bond system.

Fluorides (as F)	3	***N/A	Y	***N/A	2.5mg/m ³	2.5mg/m ³	N
Calcium Oxide	3	Lime	Y	1305-78-8	5mg/m ³	2mg/m ³	N
Glass, Fibrous or Dust	10	Fiberglass	Y	**NAIF	**NAIF	10mg/m ³	N
Silicon Dioxide	<1	Crystalline Silica	Y	14808-60-7	15mg/m ³	0.1mg/m ³	Y

*Materials are regulated by OSHA 29 CFR 1910.1200, Hazard Communication Standard, and/or the Massachusetts General Law Chapter 111F, Right To Know Regulations.

SECTION III PHYSICAL AND CHEMICAL DATA

BOILING POINT **NAIF	MELTING POINT **NAIF	SPECIFIC GRAVITY 2-4
VAPOR PRESSURE **NAIF	PERCENT VOLATILE BY VOL **NAIF	VAPOR DENSITY **NAIF
EVAPORATION RATE **NAIF	SOLUBILITY IN WATER Slight	SOLUBILITY IN ALCOHOL **NAIF
SOLUBILITY IN OTHER SOLVENT **NAIF	APPEARANCE AND ODOR SOLID PRODUCT: MAY GIVE OFF ODOR IN USE.	

SECTION IV SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE - NONE.
OTHER PRECAUTIONS: **NAIF

SECTION V CORROSIVITY AND REACTIVITY DATA

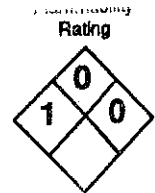
STABILITY <input type="checkbox"/> UNSTABLE <input checked="" type="checkbox"/> STABLE	POLYMERIZATION <input type="checkbox"/> MAY OCCUR <input checked="" type="checkbox"/> WILL NOT OCCUR
INCOMPATIBILITY (MATERIALS TO AVOID) **NAIF	
DECOMPOSITION PRODUCTS In use, dust and decomposing organic fumes are generated. In most cases, the material removed from the workpiece will be significantly greater than the grinding wheel components. Coolants may produce other decomposition products.	
CONDITIONS TO BE AVOIDED **NAIF	

**NAIF = NO APPLICABLE INFORMATION FOUND

***N/A = NOT APPLICABLE

****SUBJECT TO EPA SECTION 313 REPORTING UNDER SARA 40CFR PART 372. A PETITION HAS BEEN SUBMITTED TO THE EPA TO DELIST IT.

000566

Health
RatingReactivity
Rating

HAZARD RATING

Please rate consistent with NFPA Code

MATERIAL SAFETY DATA SHEET

SECTION I NAME AND PRODUCT

MANUFACTURER'S NAME NORTON COMPANY	CONTACT THOMAS Z. RICHARDS
ADDRESS (STREET, CITY, STATE AND ZIP CODE) 1 NEW BOND STREET, WORCESTER, MA 01615-0008	EMERGENCY TELEPHONE NO. 508-795-2690
TRADE NAME, COMMON NAME OR SPECIFICATION RUBBER & SHELLAC BONDED GRINDING WHEELS	APPROVED BY <i>K. Marayan</i> DATE 1/23/89
CHEMICAL FAMILY OR PRODUCT TYPE ANY GRADE	

SECTION II COMPOSITION PER 29CFR 1910.1200 (G) (4)

CHEMICAL NAME	MAX %	COMMON NAME	REG* (Y/N)	CAS #	OSHA PERMISSIVE EXPOSURE LIMIT	ACGIH TLV	CARCINOGEN (Y/N)
Amorphous Silica	2	Silica Gel	Y	63231-67-4	20 mppcf	10mg/m ³	N
Sulfur	8	Sulfur	Y	7704-34-9	**NAIF	**NAIF	N
Fluorides (as F)	2	***N/A	Y	***N/A	2.5mg/m ³	2.5mg/m ³	N
Carbon Black	11	***N/A	Y	1333-86-4	3.5mg/m ³	3.5mg/m ³	N
Dibutyl Phthalate****	1	***N/A	Y	84-74-2	5mg/m ³	5mg/m ³	N
Thiram	1	Methyl Tuads	Y	137-26-8	5mg/m ³	5mg/m ³	N

The chemicals listed above may be a part of the bond system. The grinding wheel may be comprised of one or more of the following abrasives.

Alpha Alumina****	90	Alundum	Y	1344-28-1	15mg/m ³ (Total Dust)	10mg/m ³ (Total Dust)	N
Silicon Carbide	90	Crystolon	Y	409-21-1	15mg/m ³ (Total Dust)	10mg/m ³ (Total Dust)	N
Zirconia Alumina	90	NZ, ZS, ZF	Y	**NAIF	5mg/m ³ (as Zirconium)	5mg/m ³ (as Zirconium)	N
Silicon Dioxide	<1	Crystalline Silica	Y	14808-60-7	15mg/m ³	0.1mg/m ³	Y

*Materials are regulated by OSHA 29 CFR 1910.1200, Hazard Communication Standard, and/or the Massachusetts General Law Chapter 111F, Right To Know Regulations.

SECTION III PHYSICAL AND CHEMICAL DATA

BOILING POINT **NAIF	MELTING POINT **NAIF	SPECIFIC GRAVITY 2-4
VAPOR PRESSURE **NAIF	PERCENT VOLATILE BY VOL **NAIF	VAPOR DENSITY **NAIF
EVAPORATION RATE **NAIF	SOLUBILITY IN WATER Slight	SOLUBILITY IN ALCOHOL **NAIF
SOLUBILITY IN OTHER SOLVENT **NAIF		APPEARANCE AND ODOR SOLID PRODUCT: MAY GIVE OFF ODOR IN USE.

SECTION IV SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE - NONE.

OTHER PRECAUTIONS:

**NAIF

SECTION V CORROSIVITY AND REACTIVITY DATA

STABILITY <input type="checkbox"/> UNSTABLE <input checked="" type="checkbox"/> STABLE	POLYMERIZATION <input type="checkbox"/> MAY OCCUR <input checked="" type="checkbox"/> WILL NOT OCCUR
INCOMPATIBILITY (MATERIALS TO AVOID) **NAIF	
DECOMPOSITION PRODUCTS In use, dust and decomposing resin system fumes are generated. In most cases, the material removed from the workpiece will be significantly greater than the grinding wheel components. Coolants may produce other decomposition products.	
CONDITIONS TO BE AVOIDED **NAIF	

**NAIF = NO APPLICABLE INFORMATION FOUND

***N/A = NOT APPLICABLE

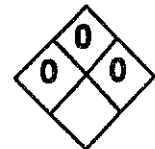
****SUBJECT TO EPA SECTION 313 REPORTING 40CFR PART 372



600567

Health Rating

Rating



Reactivity Rating

HAZARD RATING

Please: rate consistent with NFPA Code

MATERIAL SAFETY DATA SHEET

SECTION I NAME AND PRODUCT

MANUFACTURER'S NAME NORTON COMPANY	CONTACT THOMAS Z. RICHARDS
ADDRESS (STREET, CITY, STATE AND ZIP CODE) 1 NEW BOND STREET, WORCESTER, MA 01615-0008	EMERGENCY TELEPHONE NO. 508-795-2690
TRADE NAME, COMMON NAME OR SPECIFICATION VITRIFIED BONDED - ABRASIVE PRODUCTS	APPROVED BY <i>W. Sheldon</i> DATE 12-16-88
CHEMICAL FAMILY OR PRODUCT TYPE ANY GRADE	

SECTION II COMPOSITION PER 29CFR 1910.1200 (G) (4)

CHEMICAL NAME	MAX %	COMMON NAME	REG* (Y/N)	CAS #	OSHA PERMISSIVE EXPOSURE LIMIT	ACGIH TLV	CARCINOGEN (Y/N)
Alpha-Alumina**** OR	96	Alundum, Seeded Gel	Y	1344-28-1	15mg/m ³ (Total Dust)	10mg/m ³ (Total Dust)	N
Silicon Carbide	96	Crystolon	Y	409-21-2	15mg/m ³ (Total Dust)	10mg/m ³ (Total Dust)	N
Sulfur Treatment	41	No. 22 Treat	Y	7704-34-9	**NAIF	**NAIF	N

Note: Wheel Treatment ranges from 21 to 41% concentration based on wheel weight.

*Materials are regulated by OSHA 29 CFR 1910.1200, Hazard Communication Standard, and/or the Massachusetts General Law Chapter 111F, Right To Know Regulations.

SECTION III PHYSICAL AND CHEMICAL DATA

BOILING POINT **NAIF	MELTING POINT **NAIF	SPECIFIC GRAVITY 2-4
VAPOR PRESSURE **NAIF	PERCENT VOLATILE BY VOL **NAIF	VAPOR DENSITY **NAIF
EVAPORATION RATE **NAIF	SOLUBILITY IN WATER Slight	SOLUBILITY IN ALCOHOL **NAIF
SOLUBILITY IN OTHER SOLVENT **NAIF	APPEARANCE AND ODOR SOLID PRODUCT: MAY GIVE OFF ODOR IN USE.	

SECTION IV SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE - NONE.

OTHER PRECAUTIONS:

**NAIF

SECTION V CORROSIVITY AND REACTIVITY DATA

STABILITY <input type="checkbox"/> UNSTABLE <input checked="" type="checkbox"/> STABLE	POLYMERIZATION <input type="checkbox"/> MAY OCCUR <input checked="" type="checkbox"/> WILL NOT OCCUR
INCOMPATIBILITY (MATERIALS TO AVOID) Avoid acids of all types with a PH <= 4.0	
DECOMPOSITION PRODUCTS In use, dusts are generated. In most cases, the airborne material removed from the workpiece will be significantly greater than the grinding wheel components. Coolants may produce other decomposition products.	
CONDITIONS TO BE AVOIDED **NAIF	

**NAIF = NO APPLICABLE INFORMATION FOUND

**NA = NOT APPLICABLE

****SUBJECT TO EPA SECTION 313 REPORTING UNDER SARA 40CFR PART 372. A PETITION HAS BEEN SUBMITTED TO THE EPA TO DELIST IT.



600568

Health
RatingHAZARD RATING
Please rate consistent with NFPA Code

MATERIAL SAFETY DATA SHEET

SECTION I NAME AND PRODUCT

MANUFACTURER'S NAME NORTON COMPANY	CONTACT THOMAS Z. RICHARDS
ADDRESS (STREET, CITY, STATE AND ZIP CODE) 1 NEW BOND STREET, WORCESTER, MA 01615-0008	EMERGENCY TELEPHONE NO. 508-795-2690
TRADE NAME, COMMON NAME OR SPECIFICATION DIAMOND OR CUBIC BORON NITRIDE GRINDING WHEELS	APPROVED BY <i>[Signature]</i> DATE <i>1/23/89</i>
CHEMICAL FAMILY OR PRODUCT TYPE ANY GRADE	

SECTION II COMPOSITION PER 29CFR 1910.1200 (G) (4)

CHEMICAL NAME	MAX %	COMMON NAME	REG* (Y/N)	CAS #	OSHA PERMISSIVE EXPOSURE LIMIT	ACGIH TLV	CARCINOGEN (Y/N)
Silver ****	85	Silver	Y	7440-22-4	.01mg/m ³	.1mg/m ³	N
Cobalt ****	60	Cobalt	Y	7440-48-4	.1mg/m ³	.1mg/m ³	N
Copper ****	85	Copper	Y	7440-50-8	1mg/m ³	1mg/m ³	N
Tin	25	Tin	Y	7440-31-5	2mg/m ³	2mg/m ³	N
Graphite	5	Graphite	Y	7782-42-5	15MPPCF	5mg/m ³ (Respirable Dust)	N
Silicon Carbide **	73	Crystolon	Y	409-21-2	15mg/m ³	10mg/m ³	N
Alpha-Alumina ****	81	Alundum	Y	1344-28-1	(Total Dust)	(Total Dust)	
Nickel ****	82	Nickel	Y	7440-02-0	1mg/m ³	1mg/m ³	Y*
Phosphorus ****	1	Phosphorus	Y	7723-14-0	0.1mg/m ³	0.1mg/m ³	N
Manganese	3	Manganese	Y	7439-96-5	5mg/m ³	5mg/m ³	N
Molybdenum	1	Molybdenum	Y	7439-98-7	15mg/m ³	10mg/m ³	N
Silicon Powder	5	Silicon Powder	Y	7440-21-3	**NAIF	10mg/m ³	N
Silicon Dioxide	<1	Crystalline Silica	Y	14808-80-7	15mg/m ³	0.1mg/m ³	Y

*Materials are regulated by OSHA 29 CFR 1910.1200, Hazard Communication Standard, and/or the Massachusetts General Law Chapter 111F, Right To Know Regulations. *Listed by NTP as a Carcinogen. Other studies are not in agreement with IRAC that nickel is a probable human carcinogen.

SECTION III PHYSICAL AND CHEMICAL DATA

BOILING POINT **NAIF	MELTING POINT >220°C	SPECIFIC GRAVITY 2-4
VAPOR PRESSURE **NAIF	PERCENT VOLATILE BY VOL **NAIF	VAPOR DENSITY **NAIF
EVAPORATION RATE **NAIF	SOLUBILITY IN WATER Slight	SOLUBILITY IN ALCOHOL **NAIF
SOLUBILITY IN OTHER SOLVENT **NAIF	APPEARANCE AND ODOR SOLID PRODUCT: MAY GIVE OFF ODOR IN USE.	

SECTION IV SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE - NONE.
OTHER PRECAUTIONS:

**NAIF

SECTION V CORROSIVITY AND REACTIVITY DATA

STABILITY <input type="checkbox"/> UNSTABLE <input checked="" type="checkbox"/> STABLE	POLYMERIZATION <input type="checkbox"/> MAY OCCUR <input checked="" type="checkbox"/> WILL NOT OCCUR
INCOMPATIBILITY (MATERIALS TO AVOID) **NAIF	
DECOMPOSITION PRODUCTS In use, dust and decomposing organic fumes are generated. In most cases, the material removed from the workpiece will be significantly greater than the grinding wheel components. Coolants may produce other decomposition products.	
CONDITIONS TO BE AVOIDED **NAIF	

**NAIF = NO APPLICABLE INFORMATION FOUND

*** N/A = NOT APPLICABLE

**** SUBJECT TO EPA SECTION 313 REPORTING 400CFR PART 372

