

MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT IDENTIFICATION AND USE

Product Identifier	TARGET TUF-KUT ABRASIVE		
Product Use	Abrasive grit		
Manufacturer	Supplier		
RDM Multi-Enterprises Inc.	Target Products Ltd.		
P.O. Box 179	7550 Conrad Street		
Anaconda MT 59711	Burnaby BC V5A 2H7		
Emergency Telephone Number	Emergency Telephone Number		
(406) 563-3433 or (613) 996-6666	(613) 996-6666 (Canutec)		

SECTION 2 - HAZARDOUS INGREDIENTS

This product is a copper smelter slag containing a complex mixture of iron, silicon, calcium, aluminum and magnesium oxides as its major components. These are tightly bound in the glassy slag matrix. Other elements including arsenic and zinc are also present in the glassy matrix, but at individual concentrations of less than 0.1%. Exposure limits for dust are:

OSHA PEL 15 mg/m³ ACGIH TLV 10 mg/m³

See Section 7 for notes concerning waste disposal.

SECTION 3 - PHYSICAL DATA

Physical State	Solid
Odour/Appearance	No odour / black slag particles
Vapour Pressure	N/A
Evaporation Rate	N/A
Freezing Point	>2000 F (>1095 C)
Specific Gravity	3.26

SECTION 4 - FIRE AND EXPLOSION DATA

Flammability	Not flammable	Means of Extinction	N/A
Flashpoint	N/A	Upper/Lower Flam. Limit	N/A
Autoignition Temp.	N/A	Hazardous Combustion Products	None
Explosion Data			
Sensitivity to Impact		None	
Sensitivity to Static Discharge		None	

SECTION 5 - REACTIVITY DATA

Chemical Stability	
Incompatibility with Other Substances	Hydrofluoric acid
Reactivity, and under what conditions	Will dissolve in hydrofluoric acid and strong mineral acids.

NOTE: N/A = Not Applicable

Product Identifier

TARGET TUF-KUT ABRASIVE**SECTION 6 - TOXICOLOGICAL PROPERTIES**

Route of Entry					
Skin Contact	No	Skin Absorption	No	Eye Contact	No
Inhalation	Yes	Ingestion	Yes		
Effects of Acute or Chronic Exposure to Product					
None known for material in an unused state. Dust is non-fibrogenic and contains no respirable silica. Lead and arsenic levels in product will not cause toxicity at prescribed maximum dust exposure levels.					
Exposure Limits					
OSHA PEL	15 mg/m ³	ACGIH TLV	10 mg/m ³		
Irritancy of Product					
Nuisance dust; may irritate skin, eyes, nose and respiratory tract.					
Sensitization to Product					
None known.					
Carcinogenicity					
Not listed as suspected carcinogen by NTP or IARC.					
Teratogenicity	None known	Reproductive Toxicity		None known	
Mutagenicity	None known	Synergistic Products		None known	

SECTION 7 - PREVENTIVE MEASURES**Personal Protective Equipment**

Use conventional NIOSH approved or equivalent respiratory protective equipment based on considerations of airborne concentration and duration of exposure. In industrial applications, use appropriate eye protection to eliminate contact with dust or particles. Wear appropriate clothing and footwear.

Engineering Controls

For blast cleaning operations, use adequate ventilation and dust collection. Do not permit dust to accumulate in work area.

Leak and Spill Procedure

If uncontaminated, collect for reuse. If contaminated, collect for disposal as noted in Waste Disposal below.

Disposal Procedure

Before use, this product is not classified as a "Hazardous Waste". Using the definitions given in Table A-2 of CCME EPC-CS34 "Interim Canadian Environmental Quality Criteria for Contaminated Sites", and in Table 1 of the B.C. Ministry of Environment "Criteria for Managing Contaminated Sites in British Columbia", it is regarded as a special waste and may not be discarded in landfill sites which are not authorized to receive Special Waste.

Because the product is normally used in blast cleaning processes, the composition of the spent material after use is beyond our control, and must be evaluated by the user to determine the waste classification and appropriate disposal procedures. Target Products Ltd. is not responsible in any way for the evaluation and disposal of our products after use.

Based on data published in "Guidelines for the Protection of Fish and Fish Habitat During Bridge Maintenance Operations in British Columbia (Canadian Technical Report of Fisheries and Aquatic Sciences No. 1692, January 1991), and on data obtained in a 1995 test program, Target Tuf-Kut Abrasive should not be permitted to enter fish habitat waters.

NOTE:

N/A = Not Applicable

Product Identifier

TARGET TUF-KUT ABRASIVE

Section 7, continued.**Handling Procedures and Equipment**

Avoid creation of respirable dust if possible. Use adequate personal protection, ventilation dust collection where dust levels exceed the prescribed limits.

Storage Requirements

Store in a dry place.

Special Shipping Information

No special shipping procedures are required for Target Tuf-Kut before use as a sandblast material. See notes in Disposal Procedure on Page 2 of this MSDS for shipping requirements after use.

SECTION 8 - FIRST AID MEASURES

Eyes Flush with running water. Obtain medical attention if irritation persists.

Gross Inhalation Remove to fresh air. Give oxygen and artificial respiration as needed. Obtain medical attention for treatment, observation and support as needed.

SECTION 9 - PREPARATION DATE OF MSDS

Prepared By Target Products Ltd., Quality Control Department
Phone Number (604) 420-3620
Date September 9, 1999

The information in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. The information given is based on technical data that we believe to be reliable at the time of issue of the MSDS. Because conditions of use are beyond our control, it is the responsibility of the user to verify safety data for combinations with other materials, or for use in specific processes, and to verify local waste disposal requirements.

TUF-KUT

Copper Slag

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PRODUCT

Target Tuf-Kut is an abrasive grit prepared by selective screening of copper slag to give a series of clean, sharp abrasives meeting the needs of the abrasive blast cleaning industry. The product is approved by the California Air Resources Board for use in dry, unconfined blasting operations.

USES AND ADVANTAGES

- Target Tuf-Kut is suitable for most grit blasting operations on metal surfaces. The angular shapes of individual particles of Tuf-Kut make this product ideal for the efficient removal of mill scale, rust or existing coatings from steel and other metals in preparation for painting. The hardness and particle shape of Tuf-Kut also permit its recycling and reuse in blast cleaning processes.
- The low crystalline silica content (less than 0.2% free silica) of Tuf-Kut is a significant factor in situations where the use of silica sand blasting abrasives is not acceptable for environmental or safety reasons.

PHYSICAL PROPERTIES

Colour	Black
Grain Shape	Angular
Hardness, Moh	6 - 7
Bulk Density	104 lb/ft ³ (1666 kg/m ³)
Specific Gravity	3.19
Moisture Content	<0.01% weight

PACKAGING

All grades of Tuf-Kut are available in 22.7 kg (50 lb), 36.3 kg (80 lb) or 45.4 kg (100 lb) paper bags, bulk bags of approximately 1770 kg (3900 lb), or in pneumatic tanker loads.

CAUTION

- Although Tuf-Kut is suitable for blasting of concrete or wood surfaces, a test section should be done before proceeding with a project to ensure that the particles of abrasive do not become embedded in the work, causing a darkening of the exposed surfaces. Target silica sand or industrial sand abrasives are usually more suitable for such applications.
- The sharpness of Tuf-Kut particles can be detrimental to certain fish species. The use of Tuf-Kut in situations where it can enter waterways is therefore not recommended. Other Target abrasive products are suitable for use in situations where Tuf-Kut might not be appropriate.

PRINTED IN CANADA

Product performance is affected by many factors, including storage, method and conditions of application and use. User testing is ESSENTIAL to determine suitability of product for intended method of application and use. Target's SOLE WARRANTY is that the product has been manufactured to specifications. No oral or written information or advice shall increase this warranty or create new warranties. Target's SOLE LIABILITY is to replace product proved defective. In no event shall Target be liable for any consequential, indirect or other damages whether arising from negligence or otherwise.

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TUF-KUT
June, 98 Page 3 of 3**TOTAL METALS AND LEACHATES, ppm**

ELEMENT	TUF-KUT 16-36 TOTAL METALS mg/kg	LEACHABLE METALS mg/L	CCME 1996 Maximum Limit Commercial/Industrial
Arsenic	16.1	< 0.5	50
Barium	380	< 0.05	2000
Cadmium	< 2.0	< 0.05	20
Chromium	3	< 0.05	800
Cobalt	13	< 0.015	300
Copper	2720	2.48	500
Lead	311	< 0.5	1000
Mercury	< 0.005	< 0.0003	10
Molybdenum	<4.0	< 0.030	40
Nickel	<2.0	< 0.02	500
Selenium	< 0.1	< 0.2	10
Silver	3	< 0.05	40
Tin	< 30	< 0.30	300
Zinc	5720	0.19	1500

Leachable metals determined by SWEF test.

SAFETY

Target Tuf-Kut does not contain any ingredients that require classification under WHMIS regulations. Because of the hazardous nature of abrasive blast cleaning operations and the toxicity of the dusts that can be created when removing certain coatings, all appropriate safety precautions must be followed when using Tuf-Kut or any other abrasive. Consult your local Industrial Health & Safety Regulations, NIOSH or other requirements for guidance on the necessary safety procedures and equipment.

WASTE DISPOSAL

Before use, Target Tuf-Kut is not classified as a hazardous waste. The leachable metals contents, when determined by the recognized standard test procedures, are below the published CCME limits. During use, however, the product can become contaminated with paints or other materials that would require classification of the waste material as a hazardous or special waste. It is the responsibility of the user to undertake any necessary evaluation, classification and disposal of the material after use. Consult local authorities for information on the disposal requirements and procedures applicable to spent abrasive in your area.

TYPICAL SIEVE ANALYSES

Sieve Size		Cumulative % Passing				
ASTM E 11	Metric	Extra Coarse #8-12	Coarse #8-20	Medium #16-36	Fine #36	Superfine #30-60
No. 8	2.36 mm	85 - 95	90 - 95			
No. 10	2.00 mm	65 - 80	80 - 85	100		
No. 12	1.70 mm	65 - 60	45 - 65	90 - 98	100	
No. 16	1.18 mm	0 - 5	10 - 20	50 - 75	95 - 100	100
No. 20	0.85 mm	0 - 1	0 - 8	15 - 35	60 - 80	80 - 90
No. 30	0.60 mm	Trace	0 - 2	0 - 10	15 - 35	50 - 65
No. 40	0.42 mm		0 - 1	0 - 2	0 - 10	20 - 30
No. 50	0.30 mm		Trace	Trace	0 - 5	10 - 15
No. 60	0.21 mm				Trace	Trace

Sieve Size		Individual % Retained				
ASTM E 11	Metric	Extra Coarse #8-12	Coarse #8-20	Medium #16-36	Fine #36	Superfine #30-60
No. 8	2.36 mm	5 - 15	5 - 10	0 - 1		
No. 10	2.00 mm	15 - 25	10 - 20	0 - 1		
No. 12	1.70 mm	25 - 35	15 - 30	2 - 10	0	
No. 16	1.18 mm	40 - 60	30 - 50	25 - 40	0 - 5	0
No. 20	0.85 mm	0 - 5	1 - 15	30 - 45	20 - 40	10 - 20
No. 30	0.60 mm	0 - 1	0 - 5	10 - 30	40 - 60	25 - 40
No. 40	0.42 mm	Trace	0 - 1	0 - 10	12 - 30	25 - 45
No. 50	0.30 mm	Trace	0 - 1	0 - 2	0 - 10	10 - 15
No. 60	0.21 mm				0 - 5	10 - 15
Pan		Trace	Trace	Trace	Trace	Trace