

BARTON



**World
Class
Garnet
Abrasives**

www.barton.com
800 741 7756
518 798 5462



Maximum Abrasive Performance. Superior Finished Results.



Harder, safer, more durable and cost-effective than other blasting media, Barton garnet is the abrasive of choice for a wide variety of abrasive blasting applications throughout the world.

Higher Productivity, Lower Costs.

Barton garnet cuts faster and lasts longer, significantly increasing productivity while reducing abrasive consumption, shipping, handling, collection and disposal costs. In addition, it can be recycled several times without diminishing cutting ability.

Superior Surface Quality.

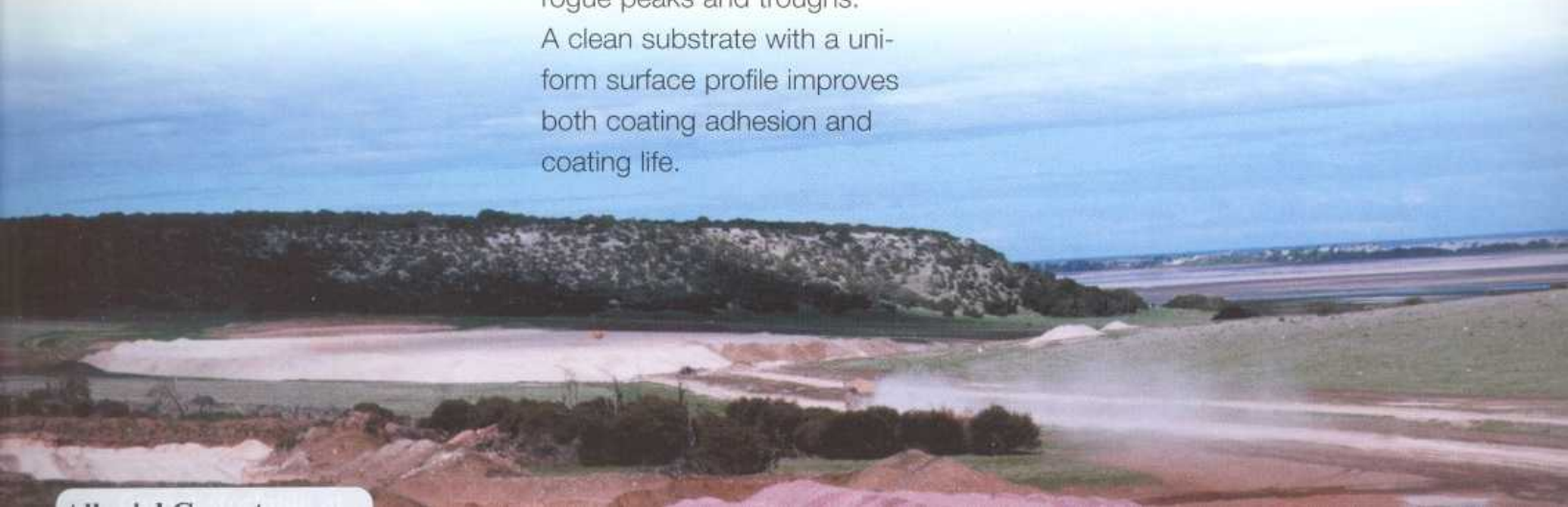
Blasting with Barton garnet produces a clean surface virtually free of embedments, rogue peaks and troughs. A clean substrate with a uniform surface profile improves both coating adhesion and coating life.

Low Dusting, Safe to Use.

A non-ferrous, 100% natural inert mineral containing less than 0.3% free silica, Barton garnet poses no health or environmental risks. It produces less dust than other abrasives, improves operator visibility and reduces cleanup costs while minimizing the impact on adjoining work areas.

Ready to Meet Your Needs.

Whatever your location, industry or application, Barton's multi-national mining operations ensure an ample supply of high-performance garnet abrasive. Quick response and on-time delivery are provided by Barton's regional distribution centers strategically located nationwide.



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BENEFITS OF BLASTING WITH BARTON GARNET, THE NATURAL BLASTING ABRASIVE

Barton garnet abrasives deliver high performance and recyclability in a non-ferrous 100% natural mineral. Barton garnet's superior hardness (7.5 mohs) and high bulk density (130- 150 lbs/ft³) make it the abrasive of choice in many surface preparation applications. Blasting with Barton garnet abrasives results in safer, more cost effective blast cleaning and outstanding surface preparation.

Cost Effectiveness - Barton garnet is harder, heavier and more durable than other blast abrasives. It cuts faster and significantly increases productivity while reducing abrasive consumption. Barton garnet abrasives can be recycled up to 5 times or more without losing its superior cutting ability. Reduced abrasive consumption leads to significant savings in shipping, handling and disposal.

Low Dusting - Blast cleaning with Barton garnet produces significantly lower dust emissions because of its inherent toughness and rapid settling due to its high specific gravity. Lower dust levels lead to minimum disruption and danger to adjoining operations, improved operator visibility and reduced cleanup costs.

Health and Safety - Barton garnet is an inert natural mineral that poses no health or environmental risks. All Barton garnet contains less than 0.1% free silica. Barton garnet is certified by the California Air Resources Board (CARB) for dry, unconfined blasting. Barton garnet meets all current EPA, NIOSH and OSHA chemical limits and is listed on the Qualified Products List (QPL) for the U.S. Navy's specification Mil-A-22262B (SH).

Superior Surface Preparation - Barton garnet grains clean deep into cavities and pitted areas down to bare metal, thoroughly removing all rust, soluble salts and other contaminants. Barton garnet abrasives are ideal for use on steel, stainless steel, aluminum and other substrates and provide a surface that is virtually free of embedments and rogue peaks and troughs. Barton garnet products improve coating adhesion and coating life by producing a clean substrate with a uniform surface profile.

<p>For more information contact:</p> <p>Barton garnet is distributed in North America by Barton Mines Co. L.L.C. Distributor inquiries are welcomed.</p>	<p>Barton Mines Co., LLC Blast Media Division 1557 State Route 9 Lake George, NY 12845</p>	<p>USA/Canada 800-741-7756 Fax 518-798-5728 www.barton.com</p>
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Field Notes

East Coast shipyard **cuts blasting costs almost 30%** with Barton Garnet



Coal or copper slag has long been the standard shipyard blasting abrasive because of its low price. But a comparison trial convinced an East Coast shipyard that they could realize significant savings by switching to Barton Garnet despite its higher initial cost.

Trial parameters were to remove 12-20 mil epoxy coating and 3/16" non-skid surface from an Army landing vessel in for general refurbishment. All blasted surfaces were to be brought to an SSPC-10 finish.

Open nozzle time and garnet consumption were closely monitored and compared with data from blasting with slag. The results with Barton Garnet were impressive:

- Abrasive consumption
DOWN 69%
- Disposal costs
DOWN 69%
- Total blasting time
DOWN 36%
- Dust generation
DOWN 75%

By switching to Barton Garnet, the shipyard is assured of getting top-quality results and excellent value, together with many added benefits.

Worker safety and visibility are greatly improved in the low-dust environment, and blasting is now possible regardless of wind direction. Less manpower is needed for receiving abrasive shipments and charging blast pots. Plus, Barton Garnet can be recycled up to four times, saving the shipyard even more than the 30% demonstrated by the trial.

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World Class Garnet Abrasives



World-Class Garnet Abrasives

Cost-Efficient – Barton Garnet cuts faster, minimizes consumption, maximizes productivity. Recyclable up to 5 times with no loss of performance.

Low Dust Generation – Improves operator safety and visibility, reduces cleanup costs.

Safety Approved – No risk to human health or the environment. Certified by all regulatory agencies and U.S. Navy MIL-A-22262B(SH).

Superior Surface Preparation – Ideal for use on steel, stainless steel, aluminum and other substrates. Improves coating adhesion and durability by producing a clean substrate with a uniform surface profile.

Abrasive Performance Comparison

Average air pressure at venturi nozzles 100 psi based on multiple daily needle gauge reading. New Schmidt Microvalves used, open 1.5-1.75 turns.

	Barton Garnet	Coal Slag	Garnet Savings
Abrasive Consumption	3.7 lbs/ft ²	12.1 lbs/ft ²	8.4 lbs/ft ²
Total Nozzle Hours	38.2	60	36.3%
Total Abrasive Cost	\$3,763	\$4,011	\$248
Total Disposal Cost	\$494	\$1,604	\$1,110
Compressor Fuel Cost	\$840	\$1,320	\$480
Total Direct Abrasive Impacted Costs	\$5,097 (\$0.67/ft ²)	\$6,935 (\$0.91/ft ²)	26.5%

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Blast Media Division
1557 State Route 9
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USA
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(Outside USA) 518.798.5462
Fax: 518.798.5728
Email: info@barton.com



COST SAVINGS EXAMPLE

Blasting With Garnet vs. Slag

Contractor :

JOHNSON INDUSTRIAL PAINTERS

DATE : 11-30-02

Blasting Criteria	Garnet	Slag	Savings with Garnet
Lbs. per sq. ft. used	2.49	6	3.51 lbs. per sq. ft.
Total nozzle hours	78	90	12 nozzle hours
Total man-hours for blasting	277	341	64 man hours
Tons of Abrasive used	11	26.48	15.48 tons
Total # of compressor days	5	6	1 day
Total # of sandpot days	5	6	1 day
Total # of decon trailer days	5	6	1 day
Gallons of diesel used	320	400	80 gallons
Cost of Abrasive	\$3,146.00	\$3,410.62	\$ 264.62 Abrasive
Cost of Labor for Blasting	\$6,457.30	\$7,945.40	\$1,488.10 Labor
Cost of Equipment for Blasting	\$1,851.00	\$2,402.00	\$ 551.00 Equipment
Cost of Fuel for Blasting	\$ 320.00	\$ 400.00	\$ 80.00 Fuel
Cost of Disposal	\$ 528.00	\$1,271.04	\$ 743.04 Disposal
Total Cost	\$12,302.30	\$15,429.06	\$3,126.76 Total

TOTAL SAVINGS WITH GARNET \$3,126.76

These results are based upon an independent study conducted by Johnson Industrial Painters and are not necessarily indicative of the results for all projects. Actual results may vary depending upon surface substrate(s), equipment and current environmental conditions.

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Material Safety Data Sheet

(This MSDS Complies with 29 CFR 1910.1200)

Date of Issue: December 2005

Section 1 - Chemical Product and Company Identification

Product/Chemical Name: Garnet Abrasive Grains and Powders
Chemical Formula: (Fe, Mg)₃Al₂(SiO₄)₃
CAS Number: 1302-62-1
Other Designations: Almandite and Pyrope Garnet
General Use: Industrial Abrasives
Manufacturer/Supplier: Barton Mines Company, L.L.C., 1557 State Route 9, Lake George, NY 12845
 Phone: (518) 798-5462 (7:30 AM - 5:30 PM EST), FAX: (518) 798-5728
 Emergency Phone: (518) 798-5462 or (518) 251-2296 or (518) 798-5510

Section 2 - Composition / Information on Ingredients

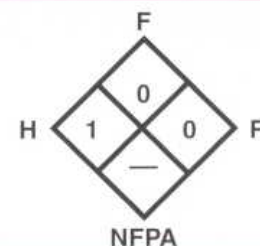
	Ingredient Name	ACGIH TLV TWA	CAS Number	%Wt
Primary Ingredient:	Almandite and Pyrope Garnet	10 mg/m ³ Total Dust	1302-62-1	94 - 99.6%
Trace Impurities:	0.4 - 6% misc. trace minerals consisting of Hornblende, Magnetite, and Feldspar.			

Section 3 - Physical and Chemical Properties

Physical State:	Solid	Water Solubility:	Not soluble in water
Appearance and Odor:	Red, Pink, Whitish Grains or Powders	Other Solubilities:	Not Relevant
Odor Threshold:	No odor	Boiling Point:	Not Relevant
Vapor Pressure:	Not Relevant	Melting Point:	1,315° C (2,399° F)
Vapor Density (Air = 1):	Not Relevant	Viscosity:	Not Relevant
Specific Gravity (H₂O = 1):	3.9 - 4.1	Mean Refractive Index:	1.77 - 1.79
pH:	Not Relevant	Evaporation Rate:	Not Relevant

Section 4 - Fire Fighting Measures

Flash Point: Non-flammable solid
Flash Point Method: Not Relevant
LEL: Not Relevant
UEL: Not Relevant
Flammability Classification: Not Relevant
Extinguishing Media: Use appropriate extinguishing media for surrounding fire.
Unusual Fire or Explosion Hazards: None



Section 5 - Stability and Reactivity

Stability: Stable
Polymerization: Polymerization can not occur.
Chemical Incompatibilities: None known
Hazardous Decomposition Products: None known

Section 6 - Health Hazard Information

Acute Effects: (Effects of overexposure)
Inhalation: Dust may cause irritation of nasal and respiratory tract.
Eye: Dust may cause irritation.
Skin: May cause abrasions.
Ingestion: No known effects, however ingestion not recommended.

Medical Conditions Aggravated by Long-Term Exposure:

Chronic respiratory disease may be aggravated by exposure to nuisance dust.

Emergency and First Aid Procedures

Inhalation: Remove to fresh air, if breathing is difficult administer oxygen, obtain medical assistance, if needed.
Eye Contact: Flush with large amounts of water, obtain medical assistance, if needed.
Skin Contact: Thoroughly wash exposed area with soap and water.
Ingestion: Obtain first aid or medical assistance, if needed.

Primary route(s)

of entry: Inhalation, Skin Contact

Section 7 - Spill, Leak, and Disposal Procedures

Spill / Leak Procedures

Spills: Sweep or vacuum up material for disposal or recovery.
Disposal: Dispose of in accordance with local, state and federal regulations. Material contaminated in use may require special disposal requirements.

Section 8 - Exposure Controls / Personal Protection

Ventilation: Provide sufficient mechanical (General and/or Local Exhaust) ventilation to maintain dust exposure below threshold limit value (TLV).
Respiratory Protection: If needed use a NIOSH/MSHA approved dust respirator, cartridge, or mask.
Eye Protection: Recommend federally approved safety eyeglasses.
Protective Gloves: As desired by user.

Section 9 - Special Precautions and Comments

No special precautions necessary for normal handling and storage of the material.

The information set forth herein is believed to be accurate but is not warranted with respect to the accuracy of the information or recommendations. Recipients are advised to confirm in advance of need that the information is current and applicable to their circumstances and usage.

Prepared By: R. Strain



GENERAL BLASTING GUIDELINES

These guidelines will aid in achieving maximum performance from Barton Garnet Abrasives:

1. **CLEAN BLAST POT:** Remove all foreign materials or other blasting abrasives. Contaminants make proper abrasive metering impossible and increase dust generation.
2. **AIR SUPPLY:** Clean, dry air (use aftercooler/dryer as needed) with an air pressure range of 95-115 psi at the nozzle. Higher air pressure yields greater productivity, all things being equal, and increases particle breakdown. When recycling, 95 psi is recommended. Pressures above 100 psi at nozzle help ensure optimum abrasive efficiency in the form of faster cutting, lower abrasive consumption and lower dust generation.
3. **ABRASIVE METERING:** Very little garnet is required to produce a clean, uniform finish. Generally speaking, no more than half as much garnet as compared to coal slag/silica sand will be needed provided the correct grade of garnet is used. To set metering valve, close valve, then open slowly while blasting to introduce abrasive to air stream to find the point where the fastest cut is achieved. For new steel applications and to remove coatings under 5 mils, one indication of a proper abrasive to air mixture is a "blue flame" at the nozzle. A coating/contaminant that is thicker/tougher to remove requires more abrasive to be metered into the air stream to maintain fast cutting. Note: Running the abrasive too lean will reduce cutting speed and running the abrasive too rich will waste abrasive, increase dust generation, etc.
4. **ABRASIVE GRADES:** Barton produces five blasting grades of garnet. The 30x60 grade typically produces a 2-3 mil profile on steel and is for removing light rust, mill scale (new steel applications) and coatings up to 15-20 mils. The #36 grade typically produces a 3.5-4.5 mil profile and is for removing heavier rust and 20-60 mils of coating. The #16 grade typically produces a 4-5+ mil profile and is for removing 60+ mils and the heaviest rust. For applications requiring 1-2 mil profiles or for aluminum/fiberglass, etc., #80 and #100 grades are also available. Test samples are always available free of charge, fob.
5. **DETERMINING CORRECT GRADE:** The grade required is determined primarily by the profile specified and the coating/contaminant to be removed. On-site testing should be conducted to determine the best grade given application-specific performance. As a general rule, use the finest grade that will create the needed profile and remove the coating quickly.
6. **METERING VALVES:** A Schmidt Micro/Thompson valve is suggested because they allow very precise metering and are easy to adjust and re-set, though almost any valve will work.
7. **NOZZLES, Couplings, Whips:** A venturi-type nozzle will yield maximum performance. A long bore #7 or #8 is suitable for most typical applications. Use largest nozzle possible given application and sufficient air pressure/volume. Replace nozzles once they are 1.5 sizes larger than the original orifice. Consider brass couplings and Hi-Flex whips as needed.

Every blasting application is unique. If blasting issues develop, please contact your Barton Regional Sales Manager or our Corporate office for assistance.

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		Blast Media Division	USA/Canada 800-792-5462
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Distributor inquiries are welcomed.		Lake George, NY 12845	www.barton.com

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HEALTH, SAFETY AND ENVIRONMENTAL COMPLIANCE

The simple act of requesting a "low free silica" blasting media is not sufficient protection for the owner, the contractor or the general public.

The costs of complying with the strict OSHA exposure standards and rising costs of disposal argue that only the cleanest substitutes for silica sand and slag should be employed.

*The table below shows the total and soluble limits of the toxic metals regulated by California's Title 22 hazardous waste standards. **BARTON GARNET**, mined in Australia and imported by Barton Mines Company and its distributors, contains none of the listed metals.*

*Compare **BARTON GARNET** with the alternatives. Consider the choices. **BARTON GARNET** abrasives – assurance of minimum exposure and minimum risk.*

- REPORT OF ANALYSIS -

California Waster Extraction Test – Sec. 66700

	TOTAL CONTENT		SOLUBLE CONTENT	
	Allowable	Barton Garnet	Allowable	Barton Garnet
Antimony	0.05 %	< 0.01 %	15mg/l	< 1mg/l
Arsenic	0.05	< 0.001	5	< 0.01
Barium	1.0	< 0.001	100	< 0.1
Beryllium	0.0075	< 0.0001	0.75	< 0.01
Cadmium	0.01	< 0.001	1	< 0.1
Chromium	0.25	< 0.001	500	< 0.1
Chromium (+6)	0.05	< 0.002	5	< 0.1
Cobalt	0.80	< 0.001	80	< 0.1
Copper	0.25	< 0.001	25	< 0.1
Fluoride	1.80	< 0.01	180	< 1.0
Lead	0.10	< 0.01	5	< 0.1
Mercury	0.002	< 0.0001	0.2	< 0.02
Molybdenum	0.35	< 0.001	350	< 0.1
Nickel	0.20	< 0.001	20	< 0.1
Selenium	0.01	< 0.00001	1	< 0.001
Silver	0.05	< 0.0005	5	< 0.05
Thallium	0.07	< 0.005	7	< 0.05
Vanadium	0.24	< 0.001	24	< 0.1
Zinc	0.50	< 0.001	250	< 0.1

A copy of the analysis is available upon request.

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TECHNICAL DATA SHEET FOR COARSE BARTON GARNET

Mineral Composition

Garnet (Almandite).....	>98.0%
Ilmenite.....	<1.0%
Quartz.....	<0.5%
Others.....	Trace

Physical Characteristics

Bulk density.....	131-137 lbs/ft ³
Specific Gravity.....	4.0
Hardness (Mohs).....	7.50
Melting Point.....	1,250°C
Particle Shape.....	Sub-rounded to sub-angular
Reactivity.....	Inert

Sizing - Typical % Retained

U.S. Mesh	Grade		
	#16	#36	30x40
16	4		
18	12		
20	32	1	
25	43	12	
30	8	36	
35	1	40	17
40		10	33
45	1		35
50			11
60			3
70			1

Chemical Composition

Almandite Garnet $\text{Fe}_3\text{Al}_2(\text{SiO}_4)_3$

Garnet, a homogenous mineral, contains no free chemicals, all oxides and dioxides are combined chemically.

Other Characteristics

Radioactivity.....	Not detectable above background
Moisture Absorption.....	Non-hygroscopic
Total Chlorides.....	Less than 50 ppm
Free Iron.....	Less than 0.01%
Copper.....	Less than 0.01%
Other Heavy Metals.....	Less than 0.01%

Recommended Blasting Conditions

Nozzle pressure.....	90+ psi
Nozzle size.....	typically #6 or larger
Work distance.....	18-24 inches

Suggested Reading: Barton's "Recommended Blasting Guidelines".

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TECHNICAL DATA & PHYSICAL CHARACTERISTICS FOR BARTON GARNET ABRASIVES

Average Chemical Composition (wt %)

SiO ₂	36%
Al ₂ O ₃	20%
FeO.....	30%
Fe ₂ O ₃	2%
TiO ₂	2%
MnO.....	1%
CaO.....	2%
MgO.....	6%

Sizing - Typical % Retained

U.S. Mesh	Grade		
	30x60	80 Mesh	100 Mesh
35	5		
40	11		
50	44	9	
60	26	42	
70	11	31	5
80	3	16	50
100		2	35
120			8
140			2

Recommended Blasting Conditions

Nozzle pressure.....	90+ psi
Material flow.....	400-600 lbs/hr
Nozzle size.....	#6 or larger
Work distance.....	18-24 inches

Mineral Composition (Warranted Limit)

Garnet (Almandite).....	+97.0%
Ilmenite.....	<2.0%
Zircon.....	<0.2%
Quartz.....	<0.1%
Others.....	<0.25%

Physical Characteristics

Bulk density.....	140-150 lbs/ft ³
Specific gravity.....	4.1
Hardness (Mohs).....	7.50
Melting point.....	1,250°C
Particle shape.....	Sub-rounded to sub-angular
Reactivity.....	Inert

Other Characteristics

Conductivity.....	10-15ms/m (max 25 ms/m)
Radioactivity.....	Not detectable above background
Moisture Absorption.....	Non-hygroscopic
Total Chlorides.....	10-15 ppm (max 25 ppm)
Free Iron.....	Less than 0.01%
Copper.....	Less than 0.01%
Other Heavy Metals.....	Less than 0.01%

Results of solubility and environment leach testing under federal (EPA toxicity) and state (California Title 22) are available upon request.

Barton garnet is certified by the California Air Resources Board for dry unconfined blasting. Barton garnet meets all current EPA, NIOSH and OSHA chemical limits and is on the Qualified Products List for U.S. Navy specification MIL-A-22262B(SH).

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BARTON GARNET PARTICLE SIZE DISTRIBUTION PERCENT RETAINED

U.S. Mesh Size	#16	#36	30x40	30x60	80 Mesh	100 Mesh	Turbex	U.S. Mesh Size
14	1							14
16	5							16
20	34							20
25	51	12						25
30	8	29	1	2				30
35	1	40	10	5				35
40		14	19	11				40
50		5	53	45	9			50
60			15	25	42			60
70			2	10	31	5		70
80				2	16	50		80
100				1	2	35		100
120						8	4	120
140						2	18	140
170							26	170
200							24	200
230							17	230
270							7	270
Pan							4	Pan

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High Performance Grades For Every Application.

Ship Building and Repair.

Barton garnet is used extensively at shipyards worldwide for blasting pre-construction primer, tightly adherent mill scale and rust. It also enables precise control of feathering when blasting weld seams and construction damage. Low dust levels improve working conditions and productivity in tanks, voids and confined spaces. Other proven shipyard applications include maintenance of US Navy Vertical Launch Systems (VLS), superstructures, fiberglass hulls, hangar decks, tank work and aluminum surfaces.

Industrial Painting Contracting.

Facility maintenance, turn-around jobs, tank projects and blast room work are just a few of the applications where Barton garnet helps contractors increase productivity, reduce consumption and shorten the cleanup process.



Petro-Chemical.

Applications include offshore platforms, pipe racks and pipeline projects. High productivity rates with Barton garnet abrasives speed completion of turnaround jobs and reduce costly plant downtime.

Blast Rooms/Heavy Equipment Repair.

Completely non-ferrous garnet grains are utilized in blast room applications where aluminum surfaces, sensitive substrates or installed electromagnetic components preclude the use of steel grit or shot. Typical heavy equipment applications involve the overhaul of construction and military vehicles.

Denim Blasting.

Barton garnet is 100% uncrushed and naturally rounded, causing less damage to denim than angular abrasives and improving

the quality of the finished

product. Sub-angular particles and consistent product grading give the blaster more control in creating the desired blast pattern and surface finish.

Powder Coating.

Powder coaters value the high-quality surface finish and uniform profile created



by Barton garnet. High durability allows for several re-uses of the abrasives in blast room applications.

Power Generation.

Barton Turbex is a specially graded turbine cleaning media ideally suited for abrasive cleaning of turbine blades and other delicate machinery components. Technically engineered Turbex easily cuts through tightly adherent surface contaminants to produce a clean, uniform finish.

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