

General Information

Air Pressure and Production Information

Matching Nozzle Size and Compressor Size for Required Production Rate

Production rate required (sq. ft./hr)	Blast nozzle orifice	Production rate at 100 psi nozzle pressure	Production rate at 90 psi nozzle pressure	Production rate at 80 psi nozzle pressure	Compressor size CFM at 100 psi nozzle pressure
Up to 100	1/4"	100	85	70	185 cfm 40-50 h.p.
101-160	5/16"	160	136	112	250 cfm 60-75 h.p.
161-230	3/8"	230	195	161	375 cfm 75-100 h.p.
231-317	7/16"	317	270	222	450 cfm 125 h.p.
318-400	1/2"	400	340	280	600 cfm 150 h.p.

This chart is estimated and based upon use of a long venturi nozzle, SSPC-6 commercial blast specification.

Nozzle pressure, Abrasive Velocity and Efficiency

Blast Nozzle Pressure	Estimated Abrasive Velocity	Estimated Efficiency Factor
140 psi	588 mph	160%
125 psi	525 mph	138%
110 psi	462 mph	115%
100 psi	420 mph	100%
95 psi	400 mph	93%
90 psi	365 mph	85%
85 psi	330 mph	78%
80 psi	270 mph	70%
75 psi	210 mph	63%
70 psi	190 mph	55%

Approximate Service Life in Hours

Nozzle Material	Steel Shot/Grit	Slag	Aluminum Oxide
Aluminum oxide	20-40	10-30	1-4
Tungsten carbide	500-800	300-400	20-40
BP200 SiAlON	500-800	300-400	50-100
Boron carbide	1500-2500	750-1500	200-1000
ROCTEC®	2500-5000+	1500-3000+	1000-2000+

Nozzled Air and Pressure Requirements Chart

NOZZLE ORIFICE	AIR, POWER, AND ABRASIVE REQUIREMENTS	NOZZLE PRESSURE PSI (BAR)						
		50 (3.45)	60 (4.14)	70 (4.83)	80 (5.52)	90 (6.21)	100 (6.89)	125 (8.62)
1/8 inch (3.2 mm)	AIR (cu ft/min) (cu m/min)	12 (0.34)	13 (0.37)	15 (0.42)	18 (0.51)	19 (0.54)	21 (0.59)	26 (0.74)
	HORSEPOWER (hp) (kW)	1.75 (1.30)	2 (1.49)	2.5 (1.86)	3 (2.24)	3.5 (2.61)	4 (2.98)	6 (4.47)
	ABRASIVE (lb/hr) (kg/hr)	70 (32)	80 (36)	90 (41)	100 (45)	110 (50)	120 (54)	135 (61)
3/16 inch (4.8 mm)	AIR (cu ft/min) (cu m/min)	25 (0.71)	30 (0.85)	35 (0.99)	40 (1.13)	43 (1.22)	45 (1.27)	60 (1.70)
	HORSEPOWER (hp) (kW)	5 (3.73)	8 (5.97)	9 (6.71)	9.5 (7.08)	10 (7.46)	10.5 (7.83)	16 (11.93)
	ABRASIVE (lb/hr) (kg/hr)	150 (68)	170 (77)	200 (91)	215 (98)	240 (109)	260 (118)	320 (145)
1/4 inch (6.35 mm)	AIR (cu ft/min) (cu m/min)	50 (1.42)	55 (1.56)	60 (1.70)	70 (1.98)	75 (2.12)	80 (2.27)	95 (2.69)
	HORSEPOWER (hp) (kW)	10 (7.46)	12 (8.95)	13 (9.69)	16 (11.93)	17 (12.68)	18 (13.42)	25 (18.64)
	ABRASIVE (lb/hr) (kg/hr)	270 (122)	300 (136)	350 (159)	400 (181)	450 (204)	500 (227)	675 (306)
5/16 inch (8 mm)	AIR (cu ft/min) (cu m/min)	80 (2.27)	90 (2.55)	100 (2.83)	115 (3.26)	125 (3.54)	140 (3.96)	190 (5.38)
	HORSEPOWER (hp) (kW)	17 (12.68)	20 (14.91)	25 (18.64)	27 (20.13)	28 (20.88)	30 (22.37)	36 (26.85)
	ABRASIVE (lb/hr) (kg/hr)	470 (213)	530 (240)	600 (272)	675 (306)	750 (340)	825 (374)	1000 (454)
3/8 inch (9.5 mm)	AIR (cu ft/min) (cu m/min)	110 (3.12)	125 (3.54)	145 (4.11)	160 (4.53)	175 (4.96)	200 (5.66)	275 (7.79)
	HORSEPOWER (hp) (kW)	25 (18.64)	29 (21.63)	32 (23.86)	35 (26.10)	40 (29.83)	45 (33.56)	57 (42.50)
	ABRASIVE (lb/hr) (kg/hr)	675 (306)	775 (352)	875 (397)	975 (442)	1060 (481)	1100 (499)	1350 (612)
7/16 inch (11 mm)	AIR (cu ft/min) (cu m/min)	150 (4.25)	170 (4.81)	200 (5.66)	215 (6.09)	240 (6.80)	255 (7.22)	315 (8.92)
	HORSEPOWER (hp) (kW)	35 (26.10)	40 (29.83)	45 (33.56)	50 (37.28)	55 (41.01)	60 (44.74)	70 (52.20)
	ABRASIVE (lb/hr) (kg/hr)	900 (408)	1000 (454)	1200 (544)	1300 (590)	1400 (635)	1550 (703)	1800 (816)
1/2 inch (12.7 mm)	AIR (cu ft/min) (cu m/min)	200 (5.66)	225 (6.37)	250 (7.08)	275 (7.79)	300 (8.50)	340 (9.63)	430 (12.18)
	HORSEPOWER (hp) (kW)	45 (33.56)	50 (37.28)	55 (41.01)	63 (46.98)	70 (52.20)	75 (55.93)	95 (70.84)
	ABRASIVE (lb/hr) (kg/hr)	1200 (544)	1350 (612)	1500 (680)	1700 (771)	1850 (839)	2025 (919)	2525 (1145)
5/8 inch (16 mm)	AIR (cu ft/min) (cu m/min)	300 (8.500)	350 (9.91)	400 (11.33)	450 (12.74)	500 (14.16)	550 (15.58)	700 (19.82)
	HORSEPOWER (hp) (kW)	70 (52.20)	80 (59.66)	90 (67.11)	100 (74.57)	110 (82.03)	120 (89.48)	150 (111.85)
	ABRASIVE (lb/hr) (kg/hr)	1900 (862)	2200 (998)	2400 (1089)	2700 (1225)	3000 (1361)	3300 (1497)	4000 (1814)
3/4 inch (19 mm)	AIR (cu ft/min) (cu m/min)	430 (12.18)	500 (14.16)	575 (16.28)	650 (18.41)	700 (19.82)	800 (22.66)	1100 (31.15)
	HORSEPOWER (hp) (kW)	100 (74.57)	115 (85.76)	130 (96.94)	145 (108.13)	160 (119.31)	175 (130.50)	215 (160.33)
	ABRASIVE (lb/hr) (kg/hr)	2700 (1225)	3100 (1406)	3500 (1588)	3900 (1769)	4300 (1950)	4700 (2132)	5700 (2586)

This table is to be used as reference only. Actual results may vary depending on specific abrasive medium used. This table is based on abrasive with a bulk density of 100 pounds per cubic foot.

General Information

Material	Mesh Size	Shape	Density lbs/ft ³	Mohs	Friability	Initial Cost	No. of Cycles	Per Use Cost	Source	Typical Applications
Sil. Sand †	6-270	★	100	5.0-6.0	high	low	1	med.	nat.	Outdoor blast cleaning
Min. Slag	8-80	★	85-112	7.0-7.5	high	med.	1-2	med.	b-p	Outdoor blast cleaning
Steel Grit	10-325	★	230	8.0	low	high	200+	med.	mfg.	Removing heavy scale
Steel Shot	8-200	●	280	8.0		high	200+	low	mfg.	Cleaning, peening
Al. Oxide	12-325	★	125	9.0	med.	high	6-8	med.	mfg.	Cleaning, finishing, deburring, etching
Silicon Carbide	12-325	★	110	9.5	med.	high	5-6	med.	mfg.	Surf. prep on extremely hard substrates
Glass Bead	10-400	●	85-90	5.5-6.0	med.	med.	8-10	low	mfg.	Cleaning, finishing
Plastic	12-80	★	45-60	3.0-4.0	low/med.	high	8-10	med.	mfg.	Paint stripping, deflashing, cleaning
Wheat Starch	12-80	★	45	3.0	med.	med.	12-15	high	mfg.	Paint, adhesive removal; composites
XL-Corn Hybrid Polymer	16-60	★	45	3.0	low	high	14-17	med.	mfg.	Composite paint removal, adhesive deflash
Corn Cob	8-40	★	35-45	2.0-4.5	med.	low	4-5	low	b-p	Removing paint from delicate surfaces

★ = Angular ● = Spherical nat. = Natural b-p = By-product mfg. = Manufactured
 † Consult OSHA regulations before using silica sand as a blast abrasive.

Minimum Compressor Air Line Sizes

Nozzle No.	Nozzle Orifice Size	Minimum Air Line ID
No. 3	3/16" (5.0mm)	1" (25.0mm)
No. 4	1/4" (6.5mm)	1" (25.0mm)
No. 5	5/16" (8.0mm)	1-1/4" (32.0mm)
No. 6	3/8" (9.5mm)	1-1/2" (38.0mm)
No. 7	7/16" (11.0mm)	2" (50.0mm)
No. 8	1/2" (12.5mm)	2" (50.0mm)
No. 10	5/8" (16.0mm)	2-1/2" (64.0mm)
No. 12	3/4" (19.0mm)	3" (76.0mm)

Degrees of Cleanliness

	SSPC Std.	NACE Std.	SIS Std.
White Metal Blast	SSPC-SP 5	NACE No. 1	SA-3
Near White Metal Blast	SSPC-SP 10	NACE No. 2	SA-2 1/2
Commercial Blast	SSPC-SP 6	NACE No. 3	SA-2
Brush-off Blast	SSPC-SP 7	NACE No. 4	SA-1

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Blast Media Anchor Pattern Guidelines

Anchor pattern (profile) varies with media type and size. These data are based on constant nozzle air pressure of 90-95 psi, using a long-venturi nozzle held 18-24" from the blast surface at 80-90 degrees to a mild steel work piece. *The anchor pattern produced will vary depending upon substrate material, blast pressure and angle, and abrasive used.*

Abrasive or Blast Media	Media Hardness	½ Mil Profile	1 Mil Profile	1½ Mil Profile	2 Mils Profile	2-1/2 Mils Profile	3 Mils Profile	4 Mils Profile
Silica Sand	5-6 Mohs	80/120	30/50	20/40	16/300	12/25	10/20	8/16
Mineral Sand	7 Mohs	90	80	55				
Indl Garnet	7-8 Mohs	100	80	60	40	36	24	16
Flint	6.5-7 Mohs		30/60	20/50	16/35	10/30	8/52	6/20
Coal Slage	7 Mohs		40/60	40/60	20/40 or 30/60	20/40 or 30/60	16/40	08/20
Copper or Nickel Slags	7-7.5 Mohs		70/100	60/80	40/80	30/50	20/40	16/30
Alox	9 Mohs	120	80	54	40	36	24	16
Silicon Carbide	9.5 Mohs	150	100	80	54	40	36	30
Nut Shells(a)	3-3.5 Mohs	35/60	14/30	6/10				
Plastic Media(a)	3-4 Mohs	No anchor pattern produced						
Corn Cobs(a)	4 Mohs	Only minor anchor pattern produced						
Crushed Glass	5.5 Mohs	100/140	80/100		40/80		20/40	10/30
Glass Beads(b)	5-6 Mohs							
Chilled Iron & Steel Grit(b)	40-68 Rc	G-200	G-120	G-80	G-50	G-40	G-25	G-16
Chilled Iron & Steel Shot(b)	40-68 Rc							

- (a) Nut shells produce minor anchor pattern and are used for cleaning and deburring. They may be used in blast rooms and cabinets. Plastic media is commonly used to remove paint from aircraft or clean delicate surfaces, such as fiberglass. Corn cobs are used for cleaning delicate surfaces like electric motors, brick, stone, and wood.
- (b) Glass beads produce a satin or matte finish. Available mesh sizes of beads range from coarse (20/30) to fine (170/325). Glass beads, chilled iron and steel grit and shot are used in enclosures where they can be contained, recycled, and reused. When contained, recyclable media are more economical, when compared with expendable media, due to number of use cycles.

Information provided by Clemco Industries Corp., NC Minerals LLC and Abrasives Incorporated.



Black Magic® Coal Slag

Quick cleaning Superior performance



40-60
Extra
Fine

1-2 mil
1/8" Nozzle (min)

Surface cleaning
Removal of:
Light rust
Light coatings
Profile: Smooth
Industry Uses:
Automotive
Steel
Blast Result:
Brush off

30-60
Fine

1.5-2 mil
1/8" Nozzle (min)

Light Cleaning
Removal of:
Mill scale
Light coatings & rust
Profile: Slight
Industry Uses:
Automotive
Steel
Blast Result:
White Metal

20-40
Medium
Fine

2-3 mil
3/16" Nozzle (min)

General Cleaning
Removal of:
Mill scale
Rust • Coatings
Profile: Moderate
Industry Uses:
New construction
Bridges • Tanks
Pipelines
Blast Result:
Near White to White Metal

16-40
Medium

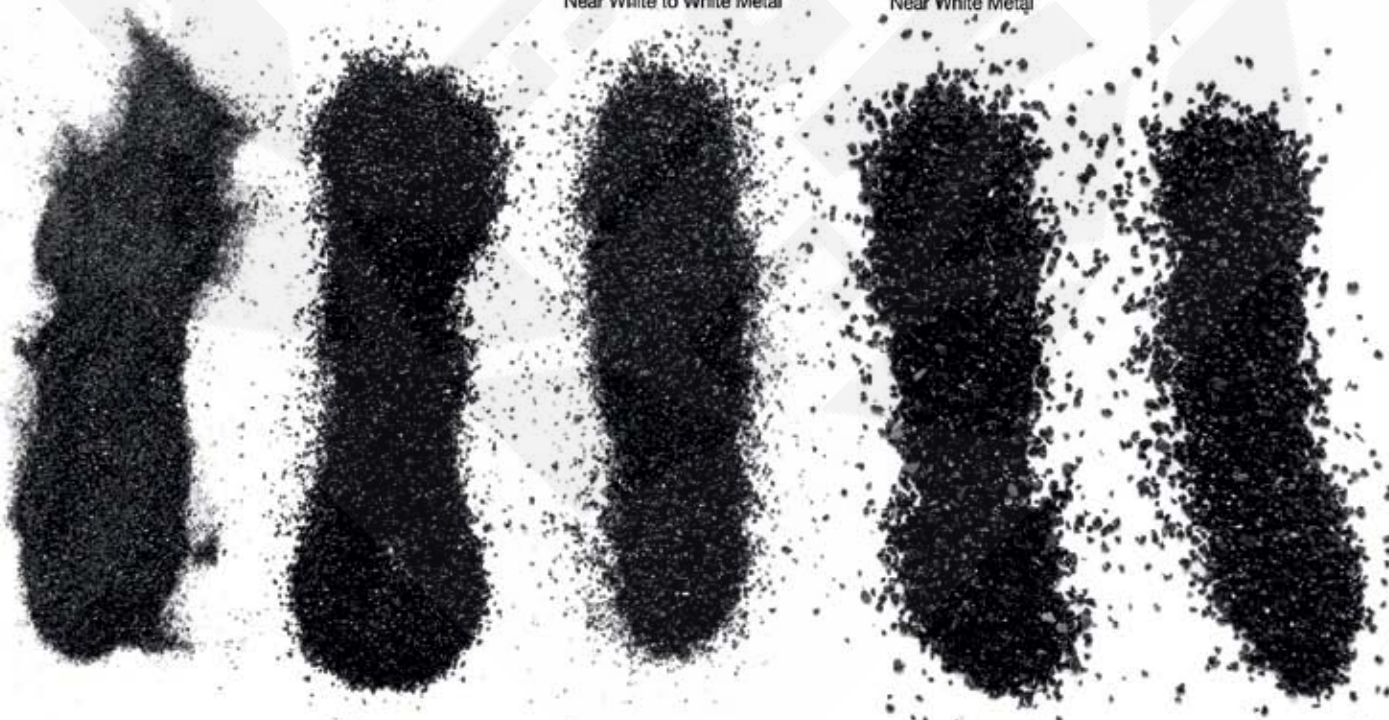
3-4 mil
1/4" Nozzle (min)

General Cleaning
Removal of:
Medium to heavy coatings
Heavy mill scale & rust
Profile: Moderate - deep
Industry Uses:
Structural Steel
Bridges • Ships
Bridges
Blast Result:
Near White Metal






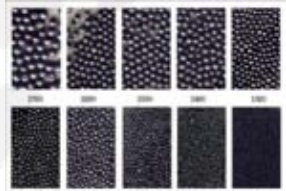
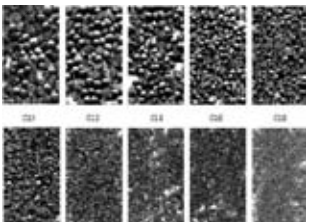
8-20
Coarse

4+ mil
5/16" Nozzle (min)

Heavy Cleaning
Removal of:
Heavy coatings & rust
Epoxy • Linings
Profile: Deep
Industry Uses:
Concrete • Ships
Water towers
Blast Result:
Commercial



Abrasive Blasting Media

<p>BLACK MAGIC® Coal Slag</p> <p>Sharp, angular shaped blasting media, cost effective, low free silica (less than 0.1%) A common choice by contractors for wide variety of substrates. Available in Fine, Medium, Coarse and Extra Coarse. Available additives include Blastox® to stabilize environmentally hazardous heavy metals, such as lead; and Dustnet® to reduce up to 97% of nuisance dust during normal transfer operations and as much as 76% of respirable dust during blasting. Hardness 6.5-7.5.</p>	
<p>Crushed Glass</p> <p>The angular nature of crushed glass grit allows for aggressive surface profiling and removal of coatings and surface contamination. Crushed glass grit contains no free silica, is non-toxic and inert and contains no heavy metals. Hardness 5-6; Available Grit size range Coarse to Extra Fine; Angular shape.</p>	
<p>Garnet</p> <p>Garnet, a naturally inert mineral, is a sharp, angular, twelve-sided crystal (officially a rhombic dodecahedron), with a hardness of between 7.5 and 8.5 on the Mohs scale. Available in grit sizes from coarse to fine.</p>	
<p>Starblast</p> <p>Starblast™ blasting abrasives are a loose blend of uniformly sized coarse and fine staurolite sands that have clean, rounded surfaces. It is a general purpose staurolite abrasive used to remove rust, mill scale and weathered coatings. Available in 50 lb bags, 4,000 lb bulk bags and bulk carloads and truckloads. Hardness 6.5 - 7.0.</p>	
<p>Aluminum Oxide</p> <p>Aluminum oxide is an extremely sharp, long-lasting blasting abrasive that can be recycled many times. Hardness 8-9; Available Grit size range 12-220; Angular shape.</p>	
<p>Steel Shot</p> <p>Blasting with steel shot is a popular method for cleaning, stripping and improving a metal surface. Steel shot is manufactured into a round ball shape that results in a smooth and polished surface. The peening action of the steel shot produces improved compressive strength to metal surfaces. Hardness 40-51 HRC; Available size range S-70 to S-780; Spherical shape.</p>	
<p>Steel Grit</p> <p>Highly demanding, aggressive applications are ideal for steel grit. Steel grit offers a very fast stripping action for many types of surface contaminants from steel and other foundry metals. Softer than aluminum oxide but still angular in shape, steel grit will not fracture as easily making it perfect for creating an etched surface on metal. Hardness 47-56 HRC; Available Grit size range G-25 to G-120; Angular shape.</p>	

General Information

Abrasive Blasting Media

<p>Glass Beads</p>	
<p>Manufactured from lead-free, soda lime-type glass, containing no free silica, glass beads are manufactured into preformed ball shapes. Glass beads produce a much smoother and brighter finish than angular abrasives. Glass beads can be recycled approximately 7-10 times. Hardness 5-6; Available sizes #3 - #13; Round shape.</p>	
<p>Corn Cob</p>	
<p>Corn cob is an organic, soft blasting grit that is safe for delicate parts and soft substrates. As the preferred blasting media for log homes and other wood surfaces, corn cob offers excellent cleaning and stripping properties without damage to the substrate. Hardness 4-4.5; Available size range Extra Coarse to Extra Fine; Ground, Angular shape.</p>	
<p>Walnut Shell</p>	
<p>Walnut shell grit is used for applications that require aggressive stripping or cleaning without damage or effect on the underlying substrate. Organic and biodegradable, walnut shell is extremely durable, angular in shape but is considered a soft abrasive. Walnut shell sees utility in applications such as cleaning hard woods and aircraft and automotive stripping. Hardness 4.5-5; Available size range Extra Coarse to Extra Fine; Angular shape.</p>	
<p>Plastic Abrasive</p>	
<p>Plastic abrasives are available in a variety of types that deliver quick stripping rates and consistent performance. This media is ideal for stripping coatings and paint from substrates, including aluminum and other delicate metals, composites and plastics. The relative softness of plastic abrasive media makes it ideal for automotive and aerospace blasting applications. Hardness 3-4; Available size range 12-80; Soft, angular shape; Urea, Melamine, Acrylic compositions.</p>	
<p>Sodium Bicarbonate (Baking Soda)</p>	
<p>Sodium Bicarbonate (Baking Soda) is used to clean, de-paint and degrease a wide variety of sensitive substrates including glass. With a Moh's hardness of 2.5 it is an extremely versatile abrasive that can be used on the toughest of coatings and the most sensitive of surfaces. Available in 3 different particle sizes; additional flow aids can be added to provide the correct formulation for the job.</p>	
<p>Ceramic Bead</p>	
<p>ZirPro ceramic beads perform very efficiently in dry or wet pressure blasting systems and in multi-turbine blasting equipment. ZirPro ceramic media ensures excellent working conditions thanks to their low dust emission, round shape, smooth surface and high strength. Chemically inert, the ceramic beads do not contaminate the treated substrates.</p>	
<p>Also Available: Aluminum Shot</p>	
<p>Stainless Shot and Stainless Cut Wire</p>	