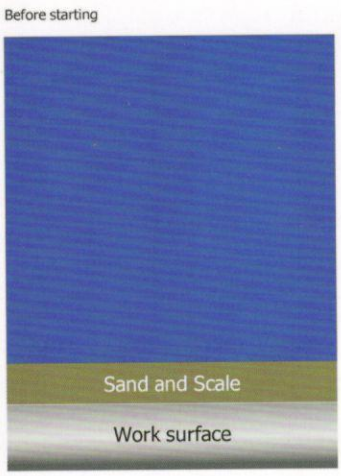
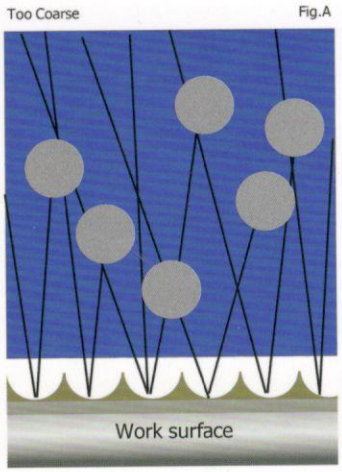
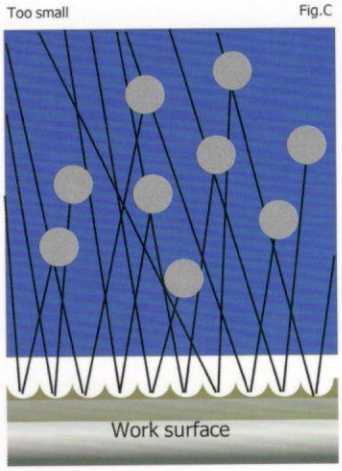
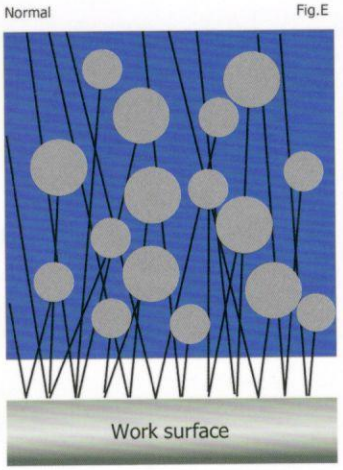
The key for improving the efficiency of blasting operations and cost reduction

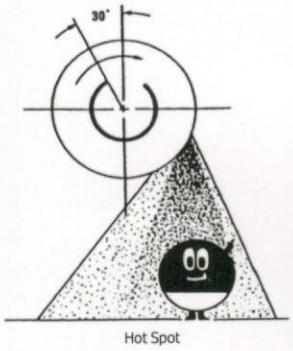
1) Controlling the Operating Mix

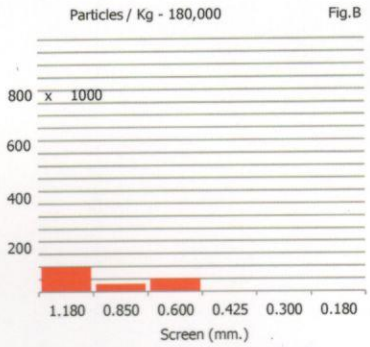


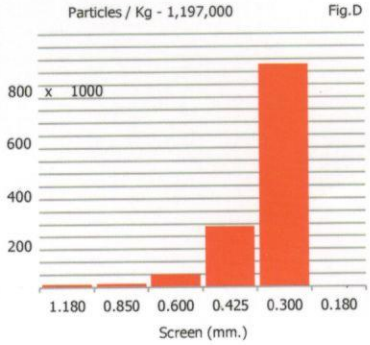


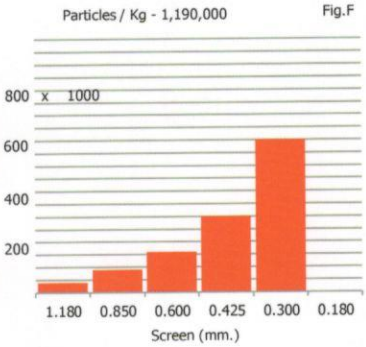










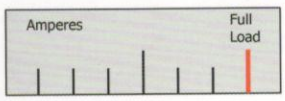


2) Controlling the blasting work

The material to be blasted should get the abrasive blasting.

Watch the Ammeter

For full cleaning power



At Full Load
(Varies according to motor power)
Wheel is throwing maximum abrasive volume

3) Blasting at full load

The total use of steel abrasive flow throwed by the wheel results in perfect cleaning and less blasting cycles.

Operating Mix compound of large grains having mass to remove contaminants. However, it creates coverage failure (Fig.A) due to the low number of particles / kg (180,000 Fig.B). The blasting cycles become longer trying to get an adequate coverage which causes high consumption of steel abrasives, energy, spare parts and productivity dropping.

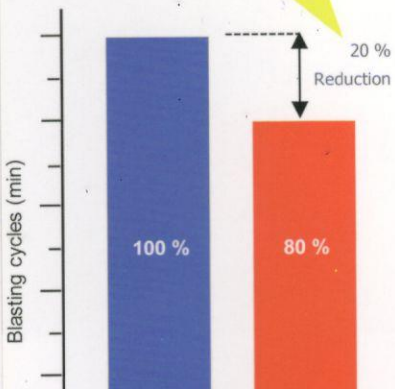
Operating Mix compound of small grains provides surface coverage due to high number of particles / kg (1,197,000 Fig.D) but do not have sufficient mass to remove contaminants (Fig.C). Also in this case, blasting cycles become longer trying to get an adequate removal of contaminants, however the consequences are inadequate cleaning, costs increasing and productivity dropping.

Operating Mix compound of all grain sizes and a large amount of particles / kg (1,190,000 Fig.F) by removing all contaminants in surface coverage (Fig.E) can reduce the blasting cycles.
Results : lower consumption of steel abrasives and energy, longer life os spare parts and productivity gains.

The shot blasting machine is designed to form the Operating Mix if it is properly operated :

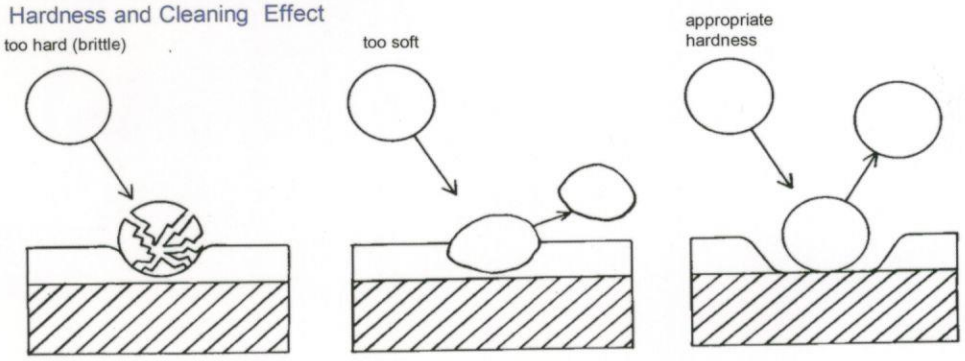
- Supply of new steel abrasive : Frequent additions according to the proportional consumption.
- Adequate exhaustion in order to remove only steel abrasives below the smallest size contained in the operating Mix (see chart of size).
- Prevention of losses due to the accumulation of steel abrasives inside the processed parts.
- Prevention of losses due to leakage in the equipment.

Siambrator's steel abrasives can reduce 20% blasting cycles.



Relation between Hardness & Lifetime of Blasting Abrasives

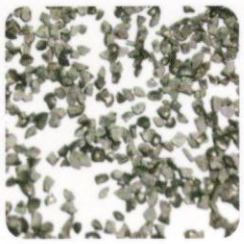
Hardness and Cleaning Effect



Hardness and Rebounding Property

Steel Abrasives for Shot Blasting Process

Steel Shot



Steel Grit

Chemical Composition	Properties	Shot	Grit
C = 0.80 - 1.20 %	**Density**	> 7.00 g/cc	
Si = > 0.40 %	**Microstructure**	Uniform Martensite	
Mn = 0.35 - 1.20 %	**Hardness**	40 - 51 HRC.	GH = 63 - 67
P = < 0.050 %			GL = 50 - 60
S = < 0.050 %			GP = 40 - 50

As per SAE International Standards J 444 & J 827 & J 1993

Size Distribution

Mesh No.	Sieve (mm.)	Shot Number S-780	S-660	S-550	S-460	S-390	S-330	S-280	S-230	S-170	S-110	S-70
7	2.800	All pass										
8	2.360		All pass									
10	2.000	85 % min		All pass	All pass							
12	1.700	97 % min	85 % min		5 % max	All pass						
14	1.400		97 % min	85 % min		5 % max	All pass					
16	1.180			97 % min	85 % min		5 % max	All pass				
18	1.000				96 % min	85 % min		5 % max	All pass			
20	0.850					96 % min	85 % min		10 % max	All pass		
25	0.710						96 % min	85 % min		10 % max		
30	0.600							96 % min	85 % min		All pass	
35	0.500								97 % min		10 % max	
40	0.425									85 % min		All pass
45	0.355									97 % min		10 % max
50	0.300										80 % min	
80	0.180										90 % min	80 % min
120	0.125											90 % min
200	0.075											

Steel Shot Application

- Removal of sand and other surface contamination from steel and iron casting, cast pipes, malleable fittings copper and aluminium alloy castings and other general foundry products.
- Descalling of forged steel products and heat-treated products.
- Shot peening for automotives parts, aircraft components, railway casting, all sorts of gears, super hard steel chips, various tools.

Before

After

Before

After

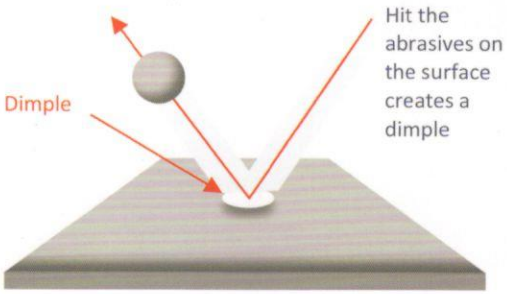
Size Distribution

Mesh No.	Sieve (mm.)	Grit Number G-10	G-12	G-14	G-16	G-18	G-25	G-40	G-50	G-80	G-120	If any
7	2.800	All pass										
8	2.360		All pass									
10	2.000	80 %		All pass								
12	1.700	90 %	80 %		All pass							
14	1.400		90 %	80 %		All pass						
16	1.180			90 %	75 %		All pass					
18	1.000				85 %	75 %		All pass				
20	0.850											
25	0.710					85 %	70 %		All pass			
30	0.600											
35	0.500											
40	0.425						85 %	70 %		All pass		
45	0.355											
50	0.300							80 %	65 %		All pass	
80	0.180								75 %	65 %		
120	0.125									75 %	60 %	
200	0.075										70 %	

Steel Grit Application

- Removal of rust and other surface contamination from steel structure, steel plates, steel billets, and other general construction.

Shot Peening

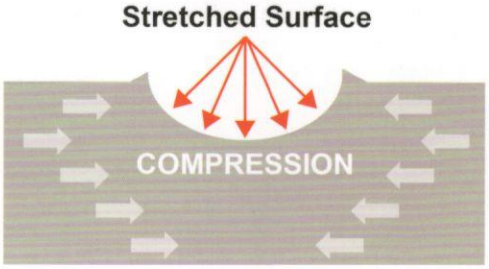


Shot peening is a cold working process in which small spherical media called shot bombard the surface of a part. During the shot peening process, each piece of shot that strikes the material acts as a tiny peening hammer, imparting to the surface a small indentation or dimple. To create the dimple, the overlapping dimples from shot peening create a uniform layer of compressive stress at metal surfaces, shot peening provides considerable increases in part life.
Compressive stresses are beneficial in increasing resistance to fatigue failures, corrosion, cracking, fretting, galling and erosion caused by cavitation.

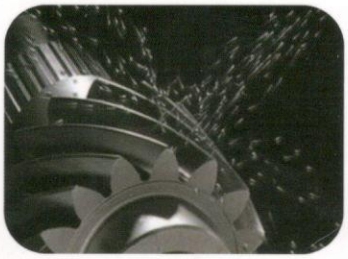
Case of Actual Application

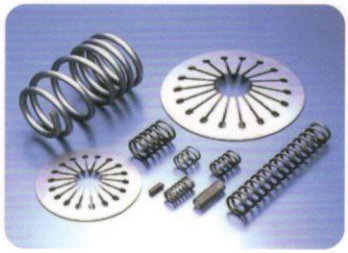
Die for cold forging	(SKD11)	About 6.0 times longer
Die for cold forging	(YXR 3)	About 5.0 times longer
Die for hot forging	(SKD61)	About 2.5 times longer
Die for cold forging	(SKH 9)	About 2.0 times longer
Die for cold forging	(SKD61)	About 2.0 times longer

Above data are for reference only, and are subject to differ in accordance with the processing parameters such as projection velocity, angle and the characteristics of peening shot.



Shot peening is used on gear parts, cams and camshafts, clutch springs, connecting rod, crankshafts, gearwheels, leaf and suspension springs, rock drills and turbine blades. It is also used in foundries for sand removal, decoring, descaling and surface finishing of castings such as engine blocks and heads. Its descaling action can be used in the manufacturing of steel products such as strip, plates, sheets, wire and bar stock.



Standard Specification of Peening Shot

Size Distribution

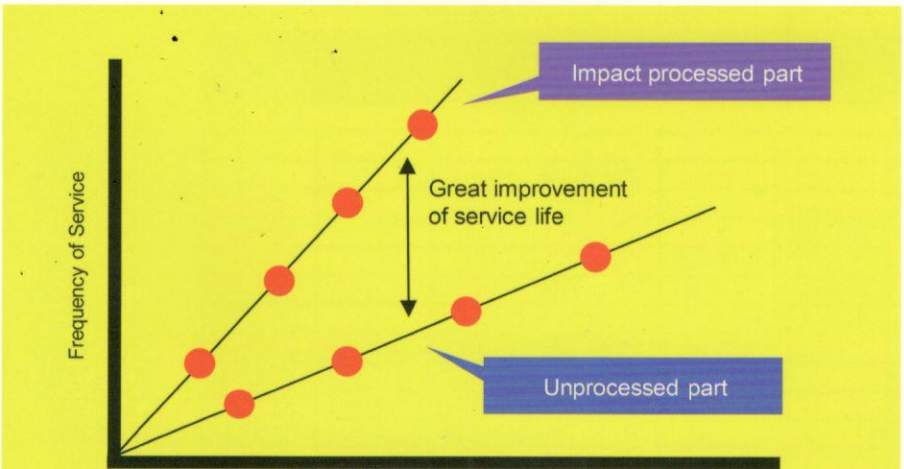
Mesh No.	Sieve (mm.)	S-330 SB-10P	S-280 SB-8P	S-230 SB-6P	S-170 SB-4P	S-110 SB-3P	S-70 SB-2P
16	1.180	5 % max					
18	1.000	65 % min	5 % max				
20	0.850	90 % min	65 % min	5 % max			
25	0.710	98 % min	90 % min	65 % min	10 % max		
30	0.600		98 % min	90 % min			
35	0.500			98 % min		10 % max	
40	0.425				85 % min		
45	0.355				97 % min		10 % max
50	0.300					80 % min	
80	0.180					90 % min	80 % min
120	0.125						90 % min

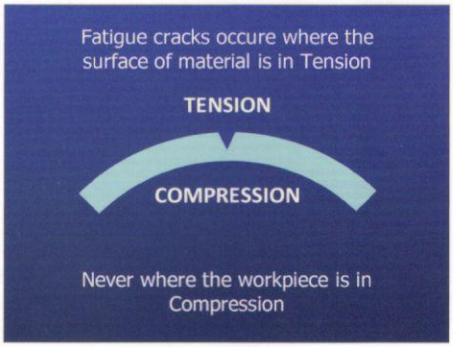
Hardness

Type	Average Hardness
P	47 ± 3 HRC
M	53 ± 3 HRC
H	58 ± 3 HRC

Characteristic

The peening shot of Siambrator satisfied all requirement of impact treatment such as uniform hardness and shape, consistency in size, high resistance to fracture, free of interior defects, etc.





Benefits obtained by Siambrator shot peening are :
- Increase the material fatigue life.
- Prevents stress corrosion and cracking of metal plates from opening on the workpiece surface.

MATERIAL SAFETY DATA SHEET

Section 1. Identification

Product name :	Steel Shot and Steel Grit	**Date issue :**	04-01-19
Company name :	Siambrator Co., Ltd.	**Emergency number :**	+662 516 3925-6
Address :	27/9 Moo 5, Paholyothin Rd., Klong Nueng, Klong Luang Pathumthani 12120, Thailand	**Information number :**	+662 516 3925-6 +662 516 3927 (Fax)

Section 2. Hazard Identification

Emergency overview : Cast steel shot and grit are nonhazardous as received. Fine metallic dust is generated as the abrasive break down from impact and wear during normal use. Since the ferrous content is >96%, dust or fumes will consist mainly of iron or iron oxide. In addition, the fine steel dust created can be a mild explosion hazard (see Section 5).

Threshold limit value : Permissable exposure limits, see Section 2.

Eye : Abrasion injuries possible if safety glasses are not worn.

Skin : Abrasion injuries possible during blasting operations or similar exposure, with high velocity direct exposure to skin.

Ingestion : Not available.

Inhalation : Dust from use may cause coughing or shortness of breath.

Carcinogenicity : See Section 11.

Section 3. Composition and information on ingredients

Componenets	CAS No.	OSHA - PEL	ACGIH - TLV	% by wieght
Iron	1309-37-1	10 mg/m^3	5 mg/m^3 TWA	96
Carbon	1333-86-4	N/A	N/A	0.8 - 1.2
Manganese	7439-96-5	5 mg/m^3	5 mg/m^3 TWA	0.3 - 1.2
Silicon	7440-21-3	10 mg/m^3	10 mg/m^3 TWA	> 0.4

PEL means OSHA Permissible Exposure Limit

TLV means American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value

TWA means 8 hour Times Weighted Average

Section 4. First aid measures

Eye contact : Flush eye with clean running water.
If have any remaining particle or irritation persists, get medical attention.

Skin contact : Wash with soap and water. Obtain first aid or medical assistance as needed.

Inhalation : If there is gross inhalation of dust causing coughing, move out of area into fresh air.

Ingestion : Not likely. If swallowed, get medical attention.

Section 5. Fire fighting measures

Flammable properties : Nonflammable.

Flash point : N/A.

Autoignition : 930'C (solid iron exposed to oxygen)

Extinguishing media : Fire extinguishing method for dust created due to use : use Class D extinguishing agents or dry sand to exclude air. Do not use water or other liquid, or foam.

Fire fighting instruction : Cast steel shot and grit will not burn or explode.

Unusual fire and expolsive hazards : A mild fire or explosion hazard situation may be created due to the fine dust that may result from use.

MATERIAL SAFETY DATA SHEET

Section 6. Accidental release measures

Personal precautions : See section 8.

Cleanup measures : Shot spilled or leaked onto floors can create hazardous walking conditions. No special precaution need to be followed when cleaning up spills or leaks of shot or grit. When cleaning up large of dust , a NIOSH approved respirator should be used. Spilled shot and grit can reclaimed for reuse, or disposed of as a nohazardous solid waste. Collected dust from blast cleaning or shot peening operations always contains contaminants from the surfaces of the parts being processed, and therefore the dust may be classed as a hazardous waste and, as such, must be disposed of according to appropriate local, state of federal regulations.

Section 7. Handling and storage

Normal storage : General dry storage, ambient air temperature and pressure. Keep dry to avoid rusting.

Handling : Make sure the floor can support the weight. Avoid breakage of bagged material and spills of bulk material. Spillage may create slippery conditions, clean up spills immediately to reduce slip hazards.

Section 8. Exposure controls and personal protection

Ventilation : Provide sufficient local mechanical exhaust ventilation to maintain exposures below PELs or TLVs during abrasive blasting operations.

Respiratory protection : Use appropriate NIOSH approved respiratory protection for respirable dust if PEL or TLV are exceeded.

Eye protection : Safety glasses with side shield recommended. If there is potential for exposure to particles which could cause mechanical injury to the eye, wear goggles.

Skin & hand protection : Gloves as desired by user.

Section9. Physical and chemical properties

Appearance :	Nearspherical or angular steel particles.	**Solubility :**	Insoluble in water
Odor :	Odorless	**Specific gravity :**	7.6 at 20'C
Boiling point :	2,850 - 3,150 'C	**Vapor density :**	N/A
Melting point :	1,371 - 1,483 'C	**Vapor pressure :**	N/A
Flash point :	None	**Evaporation rate :**	N/A

Section 10. Stability and reactivity

Stability :	Stable
Incompatibility with other materials :	Not available
Hazardous decomposition products :	None
Hazardous polymerization :	Will not occur

Section 11. Toxicological information

Carcinogenicity : OSHA, not listed. IARC, chromium (IV) - carcinogenicity to humans (Group 1), metallic chromium and Chromium (III) compounds - not cllassifiable as to their carcinogenicity to humans (Group 3) ; nickel compounds are carcinogenic to humans, metallic nickel is possibly carcinogenic to humans (Group 2B). Fumes can be generated by welding or flame cutting a surface containing new or used abrasive ot the dust creasted by use of the abrasive. Welding or flame cutting may convert a small portion of the chromium to hexavalent chromium (IV). IARC reports that welding fumes are possibly carcinogenic to humans. Overexposure to dut and fumes may cause mouth, eye and nose irritation. Prolonged overexposure to manganese dust or fumes afftects the central nervous system. Chronic overexposure can cause manganese poinsoning, and attendant apathy, loss of appetite, uncontrolled laughter, issomnia followed by sleepiness, headache, difficult in walking frequent falling, tremors salivation, sweating, and mental detachment. Prolonged overexposure to iron oxide fume can cause siderosis, or "iron pigmentation" of the lung. It can be seen on a chest X-ray but causes little or no disability.

MATERIAL SAFETY DATA SHEET

Section 12. Ecological information

Not available.

Section 13. Disposal considerations

Spill or leak : Thoroughly sweep the shot and grit, they can be reused after remove contamination. Spill will cause the floor to become slippery resulting in serious bodily injures.

Waste disposal : The shot and grit can be diposed as non hazardous solid waste. Dust generated from the use of shot and grit for cleaning and shot peening contain impurities removed from the surface of blasted work pieces. If the impurities contain hazardous materials, they must be disposed in accordance with prevailing regulations.

Section 14. Transport information

Not available.

Section 15. Regulatory information

Not available.

Section 16. Other information

Created : 16/03/2016

Last updated : 16/03/2016

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