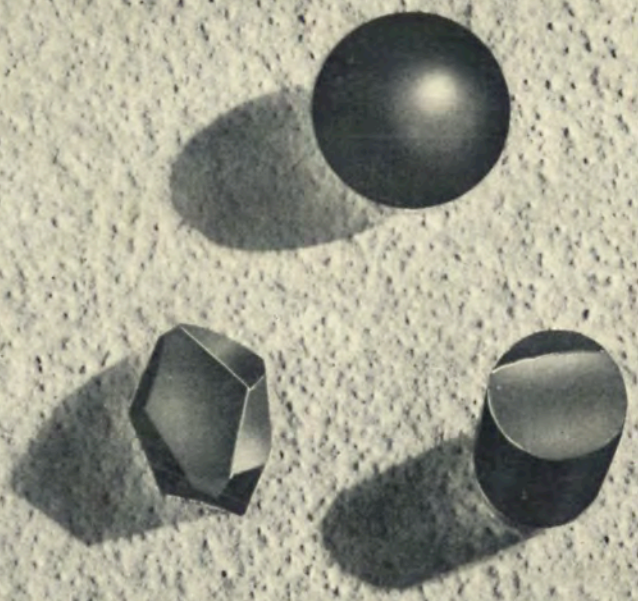

the ABRASIVE SHOT and GRIT co.

MANUFACTURERS OF

BLASTRITE . . . quality abrasives

Springville, (Erie County) New York
Phone: Springville 148 or Springville 1

selecting the proper abrasive

There are four factors to consider in selecting the right abrasive for your particular cleaning or peening problem:

Type of equipment used.

Type of finish desired on the work.

Hardness of the materials being cleaned or peened.

Type of scale or dirt being removed.

Air blast equipment, for example, has relatively low impact characteristics. Taking into consideration the finish desired and toughness of scale, the hardest abrasive in the largest practical size should be used.

An induction type nozzle using vacuum feeding provides the one exception. Here, the hardest abrasive should still be used. But the size must be governed by the ability of the vacuum equipment to pick up and deliver the abrasive to the nozzle. Maximum size shot recommended for this type of equipment is SAE S-230; maximum size grit, SAE G-25.

The centrifugal wheel, on the other hand, has relatively high impact characteristics and mechanical parts naturally are subject to abrasive wear. Taking into consideration finish desired, hardness of materials and type of scale, a softer abrasive in the smallest practical size is required. Maximum size CHILLED iron abrasive recommended is SAE G-12 grit and SAE S-660 shot.

Normally a surface which is to be painted, bonded with steel or rubber, or porcelain enameled should be cleaned with iron or steel grit to give the sharp chisel type finish.

Surfaces that require a peened or relatively smooth hammered-like finish should be cleaned with shot.

All peening is normally done with shot.

Shot or grit size selected should take into consideration the desired impact and coverage factors. Normally in a given time cycle, large shot or grit will give good impact but poor coverage (number of impinges per square inch). Small shot will give good coverage but poor impact.

Metals with heavy scale may require large shot to break off scale. In this event normal break up of abrasive may be sufficient to take care of coverage requirements.

In some cases, particularly with premium abrasives such as malleable or steel, it is advisable to use a mixture of sizes to obtain both coverage and impact on starting a new operation or machine.

abrasive consumption chart

type abrasive	pounds per wheel hour
chilled iron	30 to 40
"B" shot	25 to 35
malleable	11 to 20
cast steel	5 to 12
cut wire steel	4 to 8

Note: These figures are based upon experience under average conditions of carry-out and abrasive loss due to dust arrestors, etc. Excessive dust or sand allowed to remain in the abrasive, particularly in the case of steel and cut wire shot, will naturally reduce life.

Handling castings or parts by means of electro-magnets will also tend to increase abrasive consumption, since the castings become magnetized and the abrasive adheres to them.

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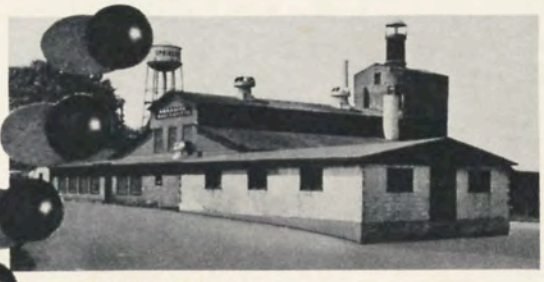
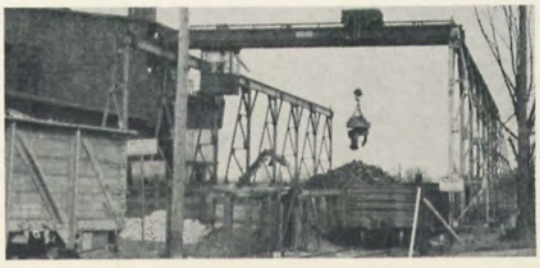


SPRINGVILLE PLANT
Springville, (Erie County) New York
Phone: Springville 1 or 148

TOLEDO STEEL SHOT DIVISION
Toledo, Ohio
Phone: FRanklin 1447

NORTHFIELD PLANT
Northfield, Ohio
Phone: IMperial 7-7651



HOWELL WORKS
Howell, Michigan
Phone: Howell 975

Line

Blastrite CHILLED IRON shot and grit

Important consideration: Has the lowest initial cost of any abrasive.

Important uses: For really difficult cleaning jobs—removing pounded-in forging scale; high alloy steel castings and forgings; tough scale on all sizes of steel parts resulting from heat treating and quenching.

Very effective in centrifugal wheel and air blast equipment for cleaning gray iron, malleable, steel, aluminum, brass and bronze castings, forgings and other metal parts.

Highly efficient for sawing and polishing granite, stone and marble; and as a backup medium in shell molding processes.

Surface Finish: Grit gives the best surface finish for adherence of porcelain enamel, paint, bonded rubber and similar coating materials.

Blastrite CUT WIRE shot

Important characteristics: Produced from SAE 1065 hard drawn steel spring wire cut in the same length as diameter to SAE specifications. Has a hardness range, dependent principally upon the size, of from 36 to 48 Rockwell C; the smaller the wire diameter, the higher the hardness. (See SAE Specifications on Page 10.)

Important considerations: If carry-out and abrasive loss are carefully controlled, DRAWN STEEL wire will generally last about 7 to 9 times longer than regular chilled iron shot or grit.

Important uses: Uniformity of particle size enhances the value of cut wire shot for peening metal parts to increase fatigue life.

Highly effective for use in centrifugal wheel type machines doing impact cleaning on steel, gray iron and malleable castings, and steel forgings when carry-out and abrasive loss are carefully controlled.

Blastrite HI-STRENGTH B chilled iron shot and grit

Important characteristics: An improved high strength iron shot or grit with a slightly lower average hardness (57 Rockwell average) than regular chilled iron shot or grit. Has additional toughness which reduces fracturing of the particles due to impact without sacrificing the abrasive qualities inherent in regular chilled iron shot or grit.

Important considerations: Users reports show that the increased abrasive life and resulting decreased machine maintenance costs more than offset the slightly higher initial cost.

Important uses: HI-STRENGTH B Cast Iron Shot and Grit can be used for most of the same applications as chilled iron shot and grit with increased abrasive life.

this is the BLASTRITE

Blastrite CAST STEEL shot

Characteristics: A high carbon, cast steel product hardened and drawn to Rockwell C 40 to 48. The abrasive life is approximately 3 to 5 times greater than regular chilled iron shot.

Important considerations: There will be an appreciable reduction in abrasive consumption and machine maintenance.

Important uses: Highly recommended for impact cleaning where carry-out and unnecessary abrasive loss are controlled. Excellent peening medium, and is used extensively on continuous blast cleaning of steel in coils. Superior finish for parts to be plated or painted.

Blastrite CAST STEEL grit

Characteristics: High carbon angular steel pellets made in three hardness ranges, standard, medium and high. Designed for particularly difficult cleaning jobs where a grit type surface is desired and where maximum abrasive qualities and maximum abrasive life are required.

Important uses: Excellent for use in preparing surfaces for plating, enameling and painting.

Note: The tendency of steel shot or grit to imbed itself in the material being cleaned or peened is substantially less than any other type metal abrasives.

Both steel shot and grit can be produced in special hardnesses on order.

Blastrite MALLEABLE iron shot and grit

Important characteristics: A heat treated cast iron shot or grit with an average hardness of 40 Rockwell C. Special hardnesses, higher or lower, can be obtained on order.

Its malleable nature enables it to withstand terrific impact without shattering, giving it at least twice the abrasive life of regular chilled iron shot or grit.

Important considerations: A 30 to 50% reduction in maintenance cost is effected. Abrasive consumption is reduced to ½ of chilled iron shot or grit.

Important uses: Very economical and efficient for use in centrifugal wheel-type machines to clean gray iron, malleable, steel, brass, bronze, aluminum and magnesium castings; and to clean forgings, stampings, weldments and other steel parts.

Since the shape of the malleable grit makes it more abrasive than malleable shot, it is more effective on such jobs as cleaning heat treated and quenched steel parts and forgings. It is exceptionally efficient in cleaning steel castings, both green and after annealing or heat treatment.

impact cleaning

Impact cleaning is a process of breaking down material surfaces by bombarding them at a high velocity and impact with hard, granulated particles. With the introduction of centrifugal abrasive-propelling equipment, the popular term, *blast cleaning*, no longer tells the whole story.

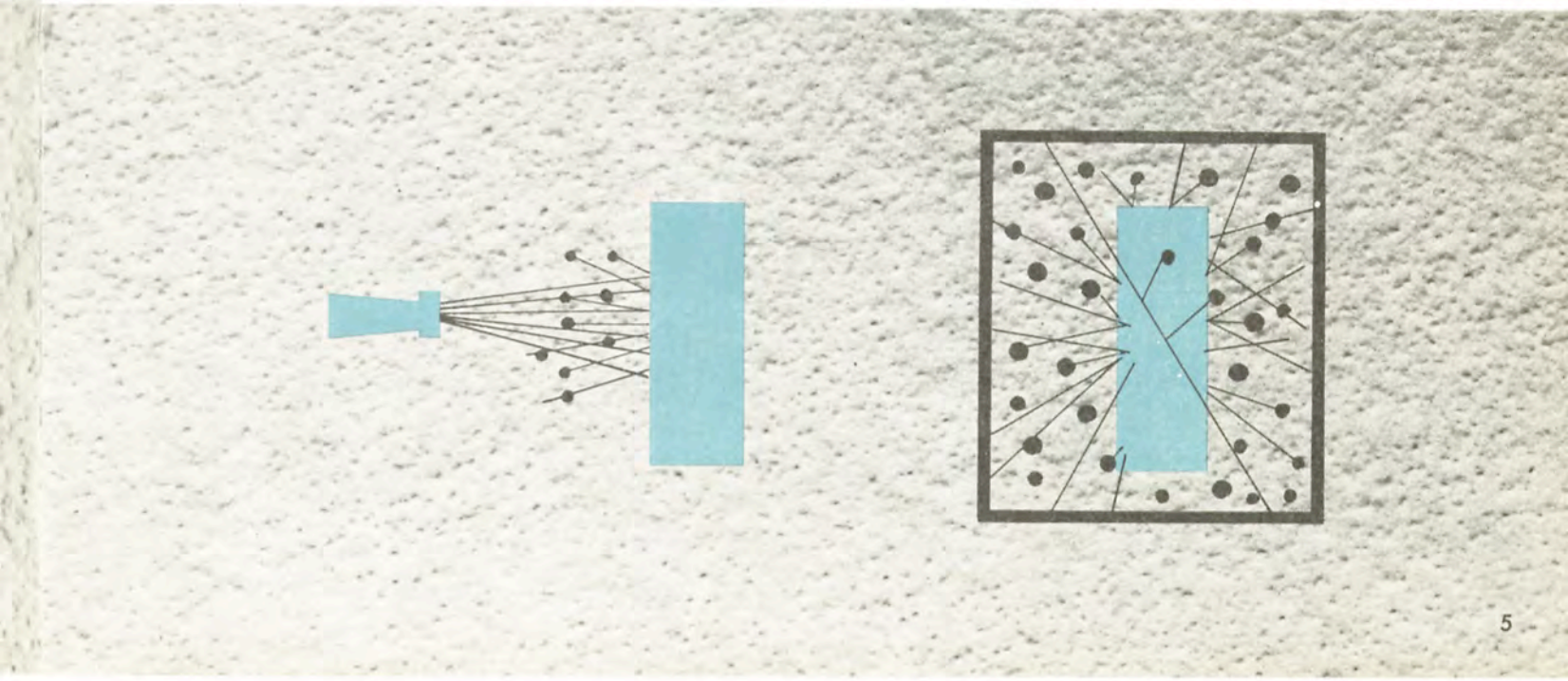
INSTEAD, TODAY, IMPACT CLEANING MAY BE CLASSIFIED IN TWO WAYS:

- ***nozzle blast cleaning***

  A liquid or gaseous medium, such as compressed air is used to carry the abrasive from its source to a point of use, namely a nozzle.

- ***mechanical impact cleaning***

  The abrasive is accelerated by means of centrifugal wheels or other mechanical devices.



shot peening

Abrasive shot peening is a cold-working method of pelting the surface of metal parts with round metallic shot at relatively high velocity. Each shot acts as a tiny peen-hammer which stretches the metal surface radially as it hits, causing a plastic flow of surface fibers beyond their tension yield point. The peened surface is thus put into a state of compression.

The net result of this process is considerably greater fatigue life.

THE ADVANTAGES:

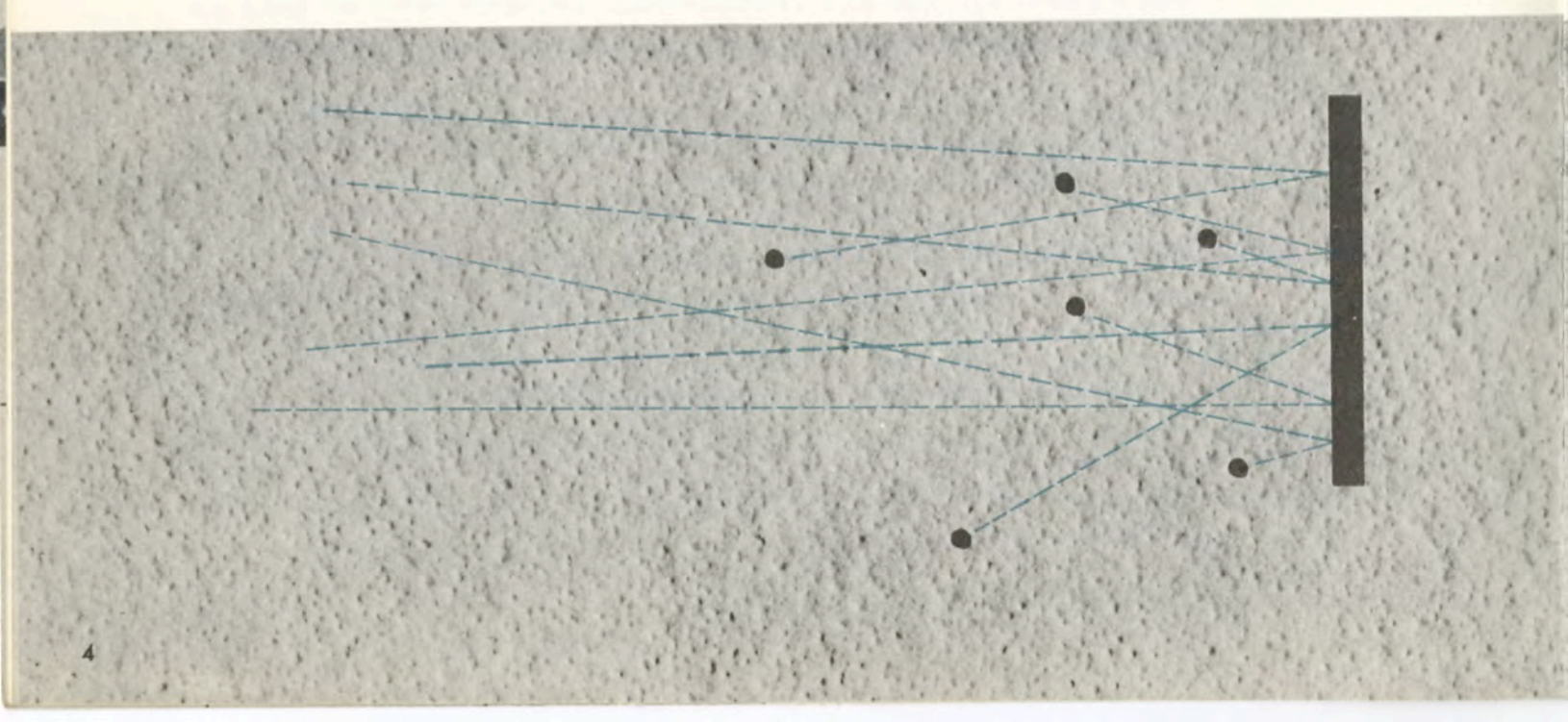
- Increases fatigue life.
- Improves resistance of metals, especially magnesium, to stress corrosion cracking.
- Improves fatigue resistance allowing parts to be made smaller and lighter.
- Closes up surface porosity in non-ferrous die castings.
- Tends to equalize stress concentration when applied to finished parts such as springs or structural and machine parts.
- Increases yield strength of sheet metal and thin plate metal.
- Increases surface wear resistance of parts such as gear teeth.
- Substitutes for polishing surface finishes, with an actual gain in fatigue resistance.

THE RIGHT ABRASIVES:

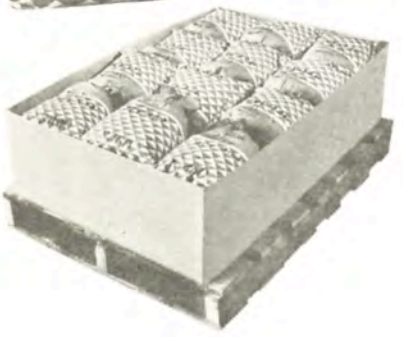
It is important, in this method, to use shot of uniform size in order to get uniformity of blast.

Shot should be uniformly round and of sound material, free of voids, pimples or blow holes. It should have high fatigue durability.

It is accepted practice to use a shot of equal or greater hardness than the part being peened. (Satisfactory results, however, are being obtained on some special applications with a softer shot than the material being peened.)



packaging for easy use



packaging for the Blastrite Line

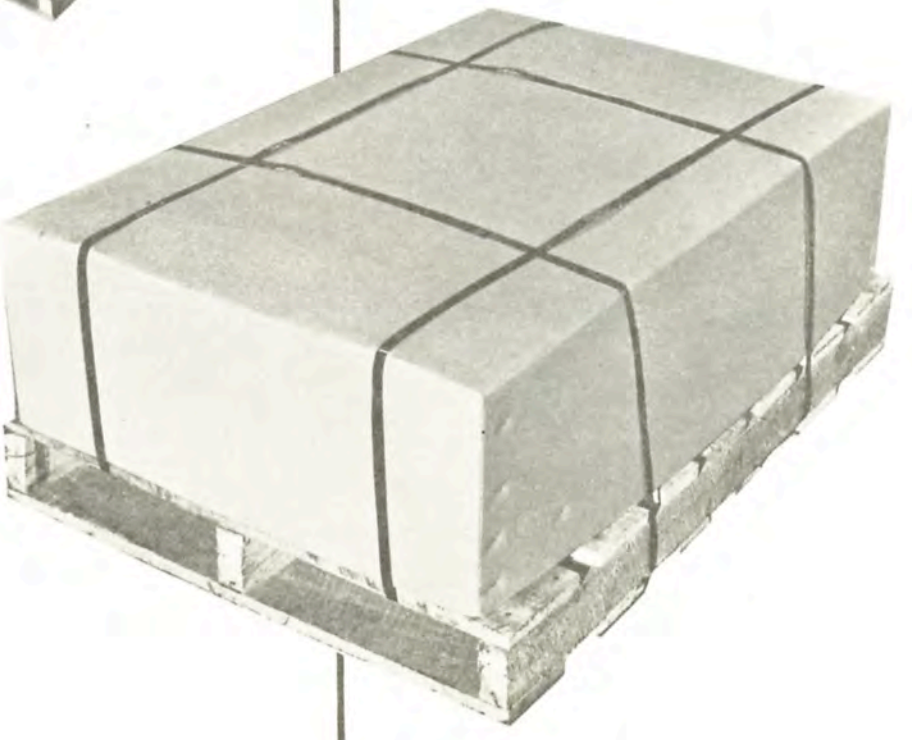
TOUGH:
the 100 lb. Double Burlap bag . . . standard for Chilled iron.

TOUGHER:
the 50 lb. Double Burlap bag . . . standard for Malleable.

TOUGHEST:
the 50 lb. Double Burlap bag . . . Palatized, covered and banded. Standard for steel.

Non-standard packaging quotations on request.

Bags can be Palatized . . . or Palatized and banded . . . or Palatized, covered and banded.



abrasive mixtures

Various mixtures of different types of abrasives have increased in popularity in recent years. The thinking behind this practice is based on blending different abrasives to gain the advantages of both types.

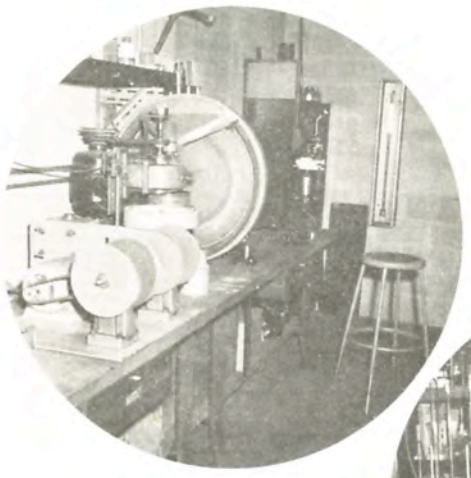
For example, malleable shot or grit is mixed with chilled iron grit to reduce somewhat the severity of the chilled grit on machine parts and get some abrasive life advantages of malleable abrasives.

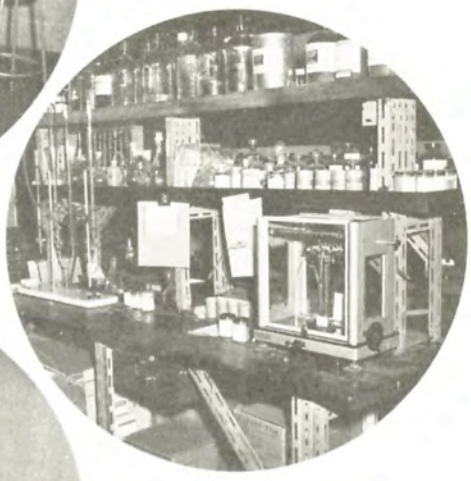
Many combinations of abrasives such as steel shot and malleable shot, steel shot and malleable grit, are available.

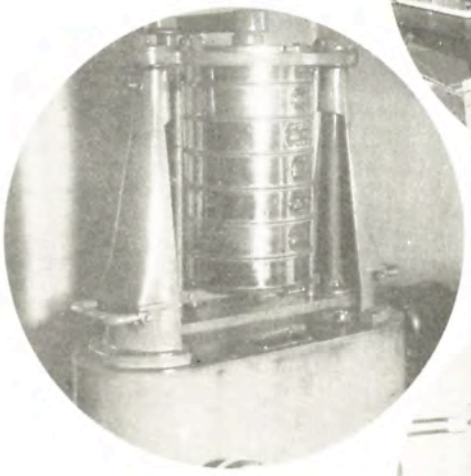
These blends can be mixed in our plants before bagging or can be purchased separately and mixed by the user.

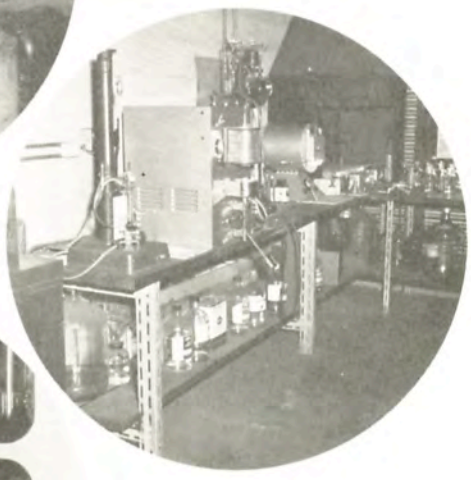
It is important to consider, in determining the percentages of these mixtures, expected life of the separate abrasives. The abrasive load in the machine should remain balanced or stabilized, and should not fluctuate as new material is added.

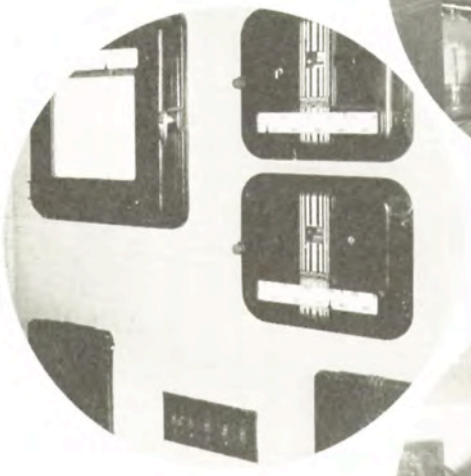
For example. On mixing chilled iron (expected life 40 lbs. per wheel hour) with malleable (expected life 20 lbs. per wheel hour), the most stable mixture would be approximately 66% chilled iron to 33% malleable.

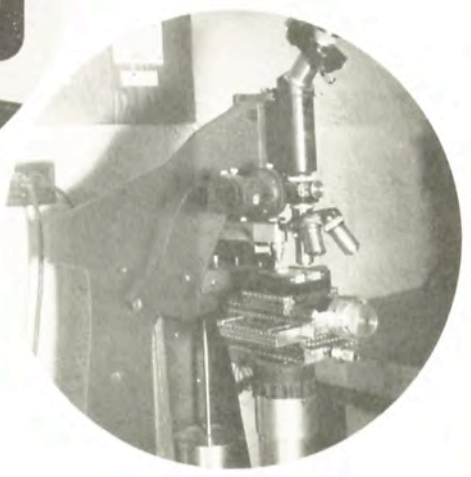


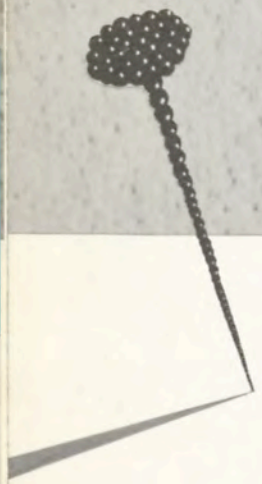












This is the Blastrite Line

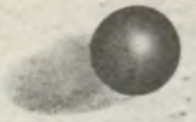
manufactured under rigid production control

All our shot and grit must pass through many quality control inspection steps

- Raw materials are selected for the qualities that produce the desired metallurgical properties in the finished product.
- Control over melting operations is closely supervised by laboratory personnel.
- Routine quality control of screening, crushing, cleaning, and heat treatment is supervised by laboratory personnel.
- All production employees are carefully trained to be quality conscious.
- The Springville and Howell Plants, which use cupola furnaces, contain laboratories equipped for complete physical testing and research.
- The Toledo Plant, which uses the electric-arc furnace practice, is equipped with complete chemical and metallurgical testing equipment in addition to its physical testing equipment.

SAE Grit specifications

Grit Number	HIGH-LIMIT SCREEN		NOMINAL SCREEN		LOW-LIMIT SCREEN	
	Max. grit retained, %	Screen number and aperture	Min. grit retained, %	Screen number and aperture	Max. grit to pass, %	Screen number and aperture
G 10	0	7 (0.111)	80	10 (0.0787)	10	12 (0.0661)
G 12	0	8 (0.0937)	80	12 (0.0661)	10	14 (0.0555)
G 14	0	10 (0.0787)	80	14 (0.0555)	10	16 (0.0469)
G 16	0	12 (0.0661)	75	16 (0.0469)	15	18 (0.0394)
G 18	0	14 (0.0555)	75	18 (0.0394)	15	25 (0.0280)
G 25	0	16 (0.0469)	70	25 (0.0280)	20	40 (0.0165)
G 40	0	18 (0.0394)	70	40 (0.0165)	20	50 (0.0117)
G 50	0	25 (0.0280)	65	50 (0.0117)	25	80 (0.0070)
G 80	0	40 (0.0165)	65	80 (0.0070)	25	120 (0.0049)
G 120	0	50 (0.0117)	60	120 (0.0049)	30	200 (0.0029)
G 200	0	80 (0.0070)	55	200 (0.0029)	35	325 (0.0017)
G 325	0	120 (0.0049)	20	325 (0.0017	—	—



SAE Shot specifications

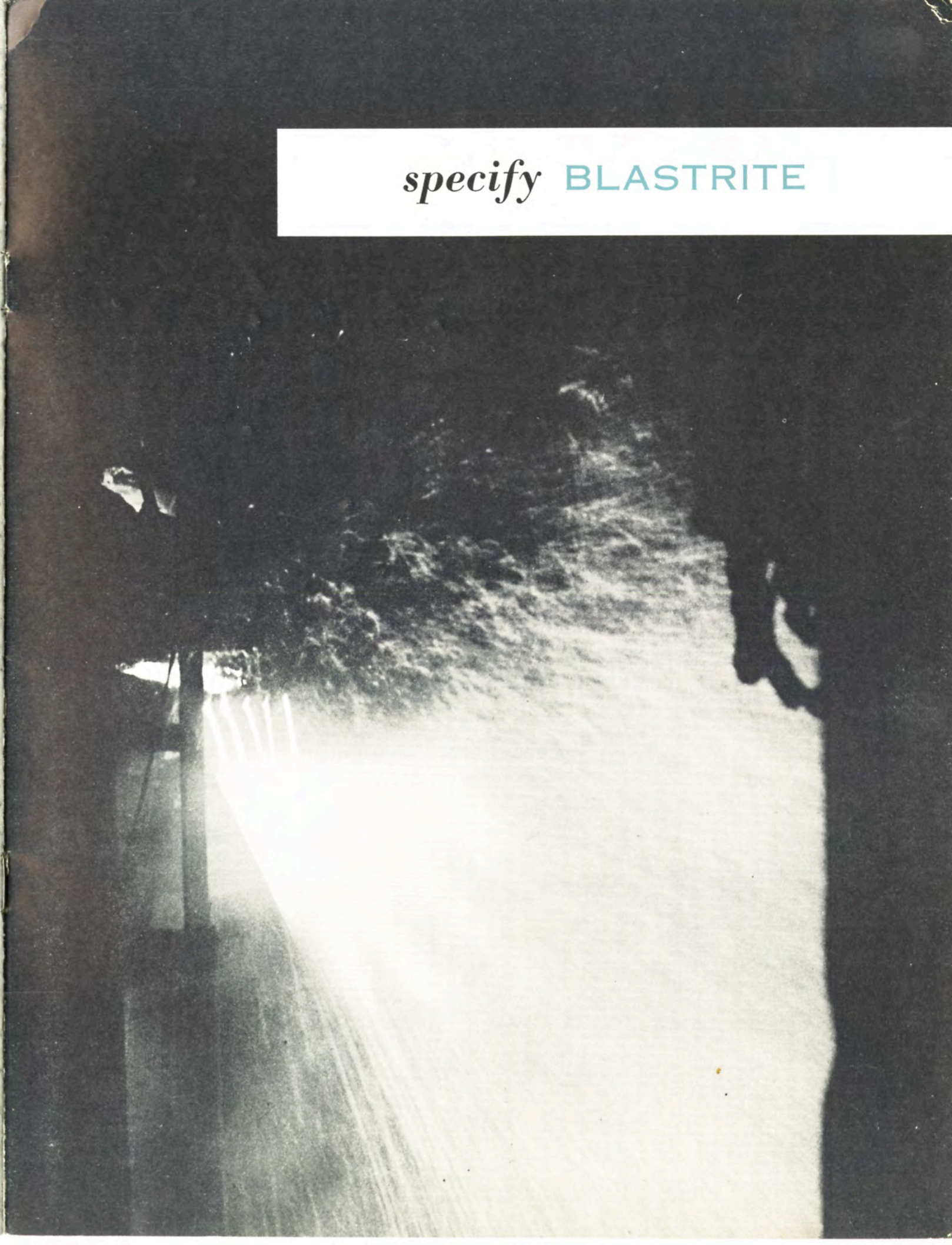
Shot No.	ON	% Max.	THRU	ON	% Max.	THRU	ON	% Min.	THRU	ON	% Max.	THRU	% Max.
1320	4(.187)	0				4(.187)	6(.132)	90	6(.132)	7(.111)	7	7(.111)	3
1110	5(.157)	0				5(.157)	7(.111)	90	7(.111)	8(.0937)	7	8(.0937)	3
930	6(.132)	0				6(.132)	8(.0937)	90	8(.0937)	10(.0787)	7	10(.0787)	3
780	7(.111)	0				7(.111)	10(.0787)	85	10(.0787)	12(.0661)	12	12(.0661)	3
660	8(.0937)	0				8(.0937)	12(.0661)	85	12(.0661)	14(.0555)	12	14(.0555)	3
550	10(.0787)	0				10(.0787)	14(.0555)	85	14(.0555)	16(.0469)	12	16(.0469)	3
460	10(.0787)	0	10(.0787)	12(.0661)	5	12(.0661)	16(.0469)	80	16(.0469)	18(.0394)	11	18(.0394)	4
390	12(.0661)	0	12(.0661)	14(.0555)	5	14(.0555)	18(.0394)	80	18(.0394)	20(.0331)	11	20(.0331)	4
330	14(.0555)	0	14(.0555)	16(.0469)	5	16(.0469)	20(.0331)	80	20(.0331)	25(.028)	11	25(.028)	4
280	16(.0469)	0	16(.0469)	18(.0394)	5	18(.0394)	25(.028)	80	25(.028)	30(.0232)	5	30(.0232)	10
230	18(.0394)	0	18(.0394)	20(.0331)	10	20(.0331)	30(.0232)	75	30(.0232)	35(.0197)	12	35(.0197)	3
170	20(.0331)	0	20(.0331)	25(.028)	10	25(.028)	40(.0165)	75	40(.0165)	45(.0138)	12	45(.0138)	3
110	30(.0232)	0	30(.0232)	35(.0197)	10	35(.0197)	50(.0117)	70	50(.0117)	80(.007)	10	80(.007)	10
70	40(.0165)	0	40(.0165)	45(.0138)	10	45(.0138)	80(.007)	70	80(.007)	120(.0049)	10	120(.0049)	10

NOTE: **1.** 4(.187) denotes U. S. Standard Sieve Size No. 4 with .187" aperture.

2. Percent of total sample by weight retained by ON screen and passed by THRU screen.

3. Shot should be round and solid, as it has been found in practice that the round particles stand up better than the irregular shaped particles.

4. The shot number is roughly the size of the shot pellets in ten-thousandths of an inch.


specify BLASTRITE

SAE Cut Wire specifications

DESCRIPTION

Cut steel wire shot shall be the product of carbon steel wire cut into the form of cylinders with lengths approximately equal to the wire diameter. Conditioned cut steel wire shot with cut edges pre-rounded may be specified when required for special applications.

IDENTIFICATION

All cut steel wire shot shall be classified according to the wire size from which it is obtained. It shall be identified by the prefix letters CW meaning cut wire. This designation shall be followed by a suffix number equivalent to the mean diameter of the wire from which the shot is produced.

CHEMICAL COMPOSITION

The chemical composition shall conform in general to the following specification.

Carbon	.45-.75
Manganese	.60-1.20
Phosphorous	.045 Max.
Sulphur	.050 Max.
Silicon	.10-.30

TENSILE PROPERTIES

Shot shall be made from wire conforming to the following tensile strengths.

Shot Size	Mean Wire Diameter	Tensile Strength
CW-62	.0625	237,000 - 272,000 psi.
CW-54	.054	243,000 - 279,000 psi.
CW-47	.047	248,000 - 286,000 psi.
CW-41	.041	255,000 - 293,000 psi.
CW-35	.035	261,000 - 301,000 psi.
CW-32	.032	265,000 - 305,000 psi.
CW-28	.028	271,000 - 311,000 psi.
CW-23	.023	345,000 - 380,000 psi.
CW-19	.019	349,000 - 384,000 psi.

HARDNESS

The hardness of the shot particles (as cut) shall have the following minimum values as determined by using a vickers indenter having a 5 kilogram load on a Tukon hardness test machine or equivalent. (Converted to Rockwell "C")

Shot Size	Minimum Hardness
CW-62	36 RC
CW-54	39 RC
CW-47	41 RC
CW-41	42 RC
CW-35	44 RC
CW-32	45 RC
CW-28	46 RC
CW-23 and finer	48 RC

SIZE CLASSIFICATION

Cut steel wire shot shall be made from wire of the following diameters. Shot sizes varying from those shown are available and may be obtained by arrangement between the shot manufacturers and user.

Shot Number	Wire Diameter
CW-62	.0625 plus or minus .002
CW-54	.054 plus or minus .002
CW-47	.047 plus or minus .002
CW-41	.041 plus or minus .002
CW-35	.035 plus or minus .001
CW-32	.032 plus or minus .001
CW-28	.028 plus or minus .001
CW-23	.023 plus or minus .001
CW-19	.019 plus or minus .001

INSPECTION PROCEDURE

Shot particles to be checked for length and hardness are to be mounted and ground and polished to the centerline of the cylinder longitudinal cross section. The combined length of ten random particles shall be within the tolerances of the following table. As an alternate method, the total weight of fifty random particles shall be within the limits of the following table.

Shot Size	Length of Ten Pieces	Weight of Fifty Pieces
CW-62	.620 plus or minus .040	1.09 to 1.33 grams
CW-54	.540 plus or minus .040	.72 to .88 grams
CW-47	.470 plus or minus .040	.48 to .58 grams
CW-41	.410 plus or minus .040	.31 to .39 grams
CW-35	.350 plus or minus .030	.20 to .24 grams
CW-32	.320 plus or minus .030	.14 to .18 grams
CW-28	.280 plus or minus .030	.10 to .12 grams
CW-23	.230 plus or minus .020	.05 to .07 grams
CW-19	.190 plus or minus .020	.03 to .04 grams

SOUNDNESS Shot particles shall be free of shear cracks and laps and shall not contain excessive seams or burrs.

PACKAGING This material shall be packaged to prevent loss.

ABRASIVE SHOT & GRIT CO., INC.

SPRINGVILLE, (ERIE COUNTY) NEW YORK

CATALOG NO. ASG 357

LITHO. U.S.A.