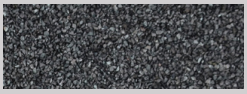
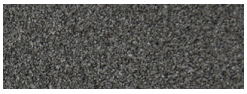
RAPID PREP

STEEL GRIT AND SHOT SIZES

Rapid Prep steel abrasive is produced with precise control of the microstructure to deliver maximum durability and impact energy transfer. This gives Rapid Prep abrasive the strength to produce the lowest process / operational costs for our customers.

SAE SPECIFICATIONS FOR CAST STEEL GRIT					
SAE Size No.	Screen No.	SAE J444 Shot Tolerances	Screen Opening - In	Screen Opening - MM	
G10	7	0% Max	0.1110	2.80	
	10	80% Min	0.0787	2.00	
	12	90% Min	0.0661	1.70	
G12	8	0% Max	0.0937	2.36	
	12	80% Min	0.0661	1.70	
	14	90% Min	0.0555	1.40	
G14	10	0% Max	0.0787	2.00	
	14	80% Min	0.0555	1.40	
	16	90% Min	0.0469	1.18	
G16	12	0% Max	0.0661	1.70	
	16	75% Min	0.0469	1.18	
	18	85% Min	0.0394	1.00	
G18	14	0% Max	0.0555	1.40	
	18	75% Min	0.0394	1.00	
	25	85% Min	0.0278	0.710	
G25	16	0% Max	0.0469	1.18	
	25	70% Min	0.0278	0.71	
	40	80% Min	0.0165	0.425	
G40	18	0% Max	0.0394	1.00	
	40	70% Min	0.0165	0.425	
	50	80% Min	0.0117	0.300	
G50	25	0% Max	0.0278	0.710	
	50	65% Min	0.0117	0.300	
	80	75% Min	0.0070	0.180	
G80	40	0% Max	0.0165	0.425	
	80	65% Min	0.0070	0.180	
	120	75% Min	0.0049	0.125	
G120	50	0% Max	0.0117	0.300	
	120	60% Min	0.0049	0.125	
	200	70% Min	0.0029	0.075	

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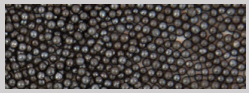
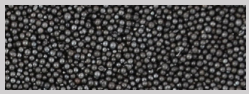
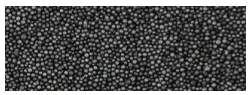
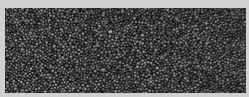
SAE SPECIFICATIONS FOR CAST STEEL SHOT					
SAE Size No.	Screen No.	SAE J444 Shot Tolerances	Screen Opening - In	Screen Opening - MM	
S780	7	0% Max	0.1110	2.80	
	10	85% Min	0.0787	2.00	
	12	97% Min	0.0661	1.70	
S660	8	0% Max	0.0937	2.36	
	12	85% Min	0.0661	1.70	
	14	97% Min	0.0555	1.40	
S550	10	0% Max	0.0787	2.00	
	14	85% Min	0.0555	1.40	
	16	97% Min	0.0469	1.18	
S460	10	0% Max	0.0787	2.00	
	12	5% Max	0.0661	1.70	
	16	85% Min	0.0469	1.18	
	18	96% Min	0.0394	1.00	
S390	12	0% Max	0.0661	1.70	
	14	5% Min	0.0555	1.40	
	18	85% Min	0.0394	1.00	
	20	96% Min	0.0331	0.850	
S330	14	0% Max	0.0555	1.40	
	16	5% Max	0.0469	1.18	
	20	85% Min	0.0331	0.085	
	25	96% Min	0.0278	0.710	
S280	16	0% Max	0.0469	1.18	
	18	5% Max	0.0394	1.00	
	25	85% Min	0.0278	0.710	
	30	96% Min	0.0234	0.600	
S230	18	0% Max	0.0394	1.00	
	20	10% Max	0.0331	0.850	
	30	85% Min	0.0234	0.600	
	35	97% Min	0.0197	0.500	
S170	20	0% Max	0.0331	0.850	
	25	10% Max	0.0278	0.710	
	40	85% Min	0.0165	0.425	
	45	97% Min	0.0139	0.355	
S110	30	0% Max	0.0234	0.600	
	35	10% Max	0.0197	0.500	
	50	80% Min	0.0117	0.300	
	80	90% Min	0.0070	0.180	
S70	40	0% Max	0.0165	0.425	
	45	10% Max	0.0139	0.355	
	80	80% Min	0.0070	0.180	
	120	90% Min	0.0049	0.125	

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The following are paraphrased as condensations of the Society of Automotive Engineers specifications J-827 Cast Steel Shot, J-1993 for Cast Steel Grit, J-444 Cast Steel Shot and Grit Sizes, and include all of the essential features of these specifications.

SOCIETY OF AUTOMOTIVE ENGINEERS J827 CAST STEEL SHOT AND J1993 CAST STEEL GRIT

Chemical Analysis

Carbon	0.80 - 1.2%
Manganese	
S-70 – S-110	0.35 - 1.2%
S-170	0.50 - 1.2%
S-230 and Larger – All Grit	0.60 - 1.2%
Silicon	0.4% minimum
Sulfur	0.05% maximum
Phosphorous	0.05% maximum

Microstructure

The Microstructure of cast steel shot and grit shall be uniform Martensite, tempered to a degree consistent with the hardness range, with fine well distributed carbides, if any.

Hardness

Shot

Ninety percent of random hardness check performed on a representative sample shall fall with the range of 402-558 Knoop hardness number (40-51 HRC).

Grit

Ninety percent of random hardness check performed on a representative sample shall fall with the ranges. S hardness range of 402-558 Knoop hardness number (40-51 HRC), M hardness range of 495-650 Knoop (47-56 HRC), L hardness range 612-754 Knoop (54-61 HRC), and H hardness of 732 Knoop minimum (60 HRC).

The hardness may be determined by any of the various methods applicable to small sections such as Micro Hardness Tester with a Knoop indenter, at loads determined to provide a reliable conversion to Rockwell C.

Density

The density of cast steel shall not be less than 7.3 gm/cc Grit and 7 gm/cc for shot

General Appearance

The cast steel shot shall be as nearly spherical as commercially possible and no more than 20% of the shot particles shall have objectional defects.

Voids for Shot

No more than 10% of the cast steel shot particles shall contain voids as determined at 10X magnification. A void must be greater than 10% of the area of the abrasive particle to be considered harmful.

Shrinkage

No more than 10% of the cast steel shot particles shall contain shrinkage as determined at 10X magnification. Shrinkage is an internal cavity with irregular dendritic surface, whose area is larger than 40% of the particle area.

Cracks

No more than 15% of the cast steel and 40% of the cast steel grit particles shall have cracks as determined at 10X magnification. A crack is a linear discontinuity whose length is greater than 3 times its width and radial in direction.

Particle Shape of Shot

When examined at 10X magnification, no more than 5% of the shot particles will have a length that is in excess of twice the cross section.

Mechanical Tests

Several designs of shot testing machines are available commercially for application to routine procedures. See SAE J445 for methods of checking uniformity of shipments of shot or grit to determine relative fatigue life and energy transfer of different types of shot or grit.

Rapid Prep Abrasive Special Hardness

M hardness - 90% minimum 495-650 KHN (47-56 HRC)
L hardness - 90% minimum 612-754 KHN (54-61 HRC)
H hardness - 90% minimum 732 KHN (60 HRC minimum)

Rapid Prep Abrasive is also available in other hardness ranges. For these requirements, the hardness of 90% of the representative sample will be within a range of 7 HRC points.

Rapid Prep Abrasive products meet or exceed all of the requirements of SAE specifications and Rapid Prep is also capable of producing material to meet special customer specifications or requirements.