

The following are paraphrased and condensations of the Society of Automotive Engineers and Steel Founders Society of America specifications for cast steel abrasives and include all of the essential features of both specifications. For greater details, request copies of these complete specifications from your Ervin Representative.

SOCIETY OF AUTOMOTIVE ENGINEERS J827 Cast Steel Shot

Chemical Analysis

Carbon	0.85 - 1.2%
Manganese	
S-70 - S-110	0.35 - 1.2%
S-170	0.50 - 1.2%
S-230 and Larger	0.60 - 1.2%
Silicon	0.40 - 1.50%
Sulfur	0.05% maximum
Phosphorous	0.05% maximum

Microstructure

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

Density

The density of cast steel shot shall be not less than 7 gm/cc.

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 objectionable defects.

Hardness

Ninety percent of the hardness checks performed on a representative sample shall fall within the range of 400-540 Knoop hardness number (40-50 HRC). (The hardness may be determined by any of the various methods applicable to small sections such as Tukon Tester with Knoop indenter, at loads determined to provide a reliable conversion to Rockwell C.) (This is Ervin AMASTEEL "S" hardness designation for shot and grit.)

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 of different types of shot or grit.

STEEL FOUNDERS' SOCIETY OF AMERICA 20-66 Standard Specification for Cast Steel Abrasives

Microstructure

The microstructure of the abrasive shall consist of martensite tempered to a degree consistent with the hardness range. The presence of free ferrite or free graphite is unsatisfactory.

Voids

No more than 10% of cast steel abrasive 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 cast steel abrasive particles shall contain shrinkage as determined at 10X magnification. A shrinkage area must be greater than 40% of the area of the abrasive particle to be considered harmful.

Cracks

No more than 15% of cast steel shot particles, and no more than 40% of 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 greater than 20% of the diameter or shortest dimension of the abrasive particle.

Particle Shape of Shot

When examined at 4X magnification, no more than 5% of the shot particles will have a length that is in excess of twice the cross section.

Ervin AMASTEEL Special Hardness

S hardness - 90% minimum (41-51 HRC)

M hardness - 90% minimum (47-56 HRC)






L hardness - 90% minimum (54-61 HRC)











H hardness - 90% minimum (60 HRC minimum)

AMASTEEL is also available in other hardness ranges.

Ervin AMASTEEL Shot and Grit products meet or exceed all of the requirements of SAE and SFSA specifications. The Ervin AMASTEEL Division is also capable of producing material to meet special customer specifications or requirements.

S.A.E. SPECIFICATIONS FOR SHOT AND GRIT SCREENINGS

SAE Size No.	SAE J444 SHOT Tolerances	Screen Opening In-mm	
S780	All Pass No. 7 Screen 85% Min on No. 10 Screen 97% Min on No. 12 Screen .....	.1110 - 2.80 .0787 - 2.00 .0661 - 1.70	
S660	All Pass No. 8 Screen 85% Min on No. 12 Screen 97% Min on No. 14 Screen .....	.0937 - 2.36 .0661 - 1.70 .0555 - 1.40	
S550	All Pass No. 10 Screen 85% Min on No. 14 Screen 97% Min on No. 16 Screen .....	.0787 - 2.00 .0555 - 1.40 .0469 - 1.18	
S460	All Pass No. 10 Screen 5% Max on No. 12 Screen 85% Min on No. 16 Screen 96% Min on No. 18 Screen .....	.0787 - 2.00 .0661 - 1.70 .0469 - 1.18 .0394 - 1.00	
S390	All Pass No. 12 Screen 5% Max on No. 14 Screen 85% Min on No. 18 Screen 96% Min on No. 20 Screen .....	.0661 - 1.70 .0555 - 1.40 .0394 - 1.00 .0331 - 0.850	
S330	All Pass No. 14 Screen 5% Max on No. 16 Screen 85% Min on No. 20 Screen 96% Min on No. 25 Screen .....	.0555 - 1.40 .0469 - 1.18 .0331 - 0.850 .0278 - 0.710	
S280	All Pass No. 16 Screen 5% Max on No. 18 Screen 85% Min on No. 25 Screen 96% Min on No. 30 Screen .....	.0469 - 1.18 .0394 - 1.00 .0278 - 0.710 .0234 - 0.600	
S230	All Pass No. 18 Screen 10% Max on No. 20 Screen 85% Min on No. 30 Screen 97% Min on No. 35 Screen .....	.0394 - 1.00 .0331 - 0.850 .0234 - 0.600 .0197 - 0.500	
S170	All Pass No. 20 Screen 10% Max on No. 25 Screen 85% Min on No. 40 Screen 97% Min on No. 45 Screen .....	.0331 - 0.850 .0278 - 0.710 .0165 - 0.425 .0139 - 0.355	
S110	All Pass No. 30 Screen 10% Max on No. 35 Screen 80% Min on No. 50 Screen 90% Min on No. 80 Screen .....	.0234 - 0.600 .0197 - 0.500 .0117 - 0.300 .0070 - 0.180	
S70	All Pass No. 40 Screen 10% Max on No. 45 Screen 80% Min on No. 80 Screen 90% Min on No. 120 Screen .....	.0165 - 0.425 .0139 - 0.355 .0070 - 0.180 .0049 - 0.125	

SAE Size No.	SAE J444 GRIT Tolerances	Screen Opening In-mm	
G10	All Pass No. 7 Screen 80% Min on No. 10 Screen 90% Min on No. 12 Screen .....	.1110 - 2.80 .0787 - 2.00 .0661 - 1.70	
G12	All Pass No. 8 Screen 80% Min on No. 12 Screen 90% Min on No. 14 Screen .....	.0937 - 2.36 .0661 - 1.70 .0555 - 1.40	
G14	All Pass No. 10 Screen 80% Min on No. 14 Screen 90% Min on No. 16 Screen .....	.0787 - 2.00 .0555 - 1.40 .0469 - 1.18	
G16	All Pass No. 12 Screen 75% Min on No. 16 Screen 85% Min on No. 18 Screen .....	.0661 - 1.70 .0469 - 1.18 .0394 - 1.00	
G18	All Pass No. 14 Screen 75% Min on No. 18 Screen 85% Min on No. 25 Screen .....	.0555 - 1.40 .0394 - 1.00 .0278 - 0.710	
G25	All Pass No. 16 Screen 70% Min on No. 25 Screen 80% Min on No. 40 Screen .....	.0469 - 1.18 .0278 - 0.710 .0165 - 0.425	
G40	All Pass No. 18 Screen 70% Min on No. 40 Screen 80% Min on No. 50 Screen .....	.0394 - 1.00 .0165 - 0.425 .0117 - 0.300	
G50	All Pass No. 25 Screen 65% Min on No. 50 Screen 75% Min on No. 80 Screen .....	.0278 - 0.710 .0117 - 0.300 .0070 - 0.180	
G80	All Pass No. 40 Screen 65% Min on No. 80 Screen 75% Min on No. 120 Screen .....	.0165 - 0.425 .0070 - 0.180 .0049 - 0.125	
G120	All Pass No. 50 Screen 60% Min on No. 120 Screen 70% Min on No. 200 Screen0117 - 0.300 .0049 - 0.125 .0029 - 0.075	

ERVIN INDUSTRIES

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Screen Opening Sizes and Screen Numbers with Max and Min Cumulative Percentages Allowed on Corresponding Screens. ASTM-E-11 and ISO 565 Test Sieves.