

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

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

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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.

**AMASTEEL**

"The World's Standard for Quality."

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. For additional details, request copies of these complete specifications from your Ervin Representative.

SOCIETY OF AUTOMOTIVE ENGINEERS J827 Cast Steel Shot and J1993 Cast Steel Grit.

Chemical Analysis

| | |
|-----------------------------|---------------|
| Carbon | .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 within 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 within the following 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 be not 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 objectionable 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 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 cast steel shot 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.

Ervin AMASTEEL 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)

AMASTEEL 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.

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