

The following are paraphrased as condensations on the Society of Automotive Engineers 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.

### Chemical Analysis

Carbon	.80 – 1.2%
Manganese	
S-70 – S-110	0.35 – 1.2%
S-170	0.50 – 1.2%
S230 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), and H hardness of 735 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 Shot.

### General Appearance

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

### Voids for Shot

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

### Shrinkage

No more that 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 that 15% of cast steel shot and 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 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 Test

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 of grit relative fatigue life and energy transfer of different types of shot or grit.



M hardness – 90% min. 495-650 KHN (47-56 HRC)

L hardness – 90% min. 612-754 KHN (54-61 HRC)

H hardness – 90% min. 732 KHN (60 HRC minimum)