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page 1 of 3

SAE SPECIFICATION J444 - CAST SHOT AND GRIT SIZE SPECIFICATIONS

 <p>The Engineering Society For Advancing Mobility Land Sea Air and Space INTERNATIONAL® 400 Commonwealth Drive, Warrendale, PA 15096-0001</p>	SURFACE VEHICLE RECOMMENDED PRACTICE	SAE J444	REV. MAY93
		Issued	1946-01
		Revised	1993-05
		Superseding J444 AUG84	

1. Scope

This SAE Recommended Practice pertains to blast cleaning and shot peening and provides for standard cast shot and grit size numbers. For shot, this number corresponds with the opening of the nominal test sieve, in then thousandths of inches¹, preceded by an S. For grit, this number corresponds with the sieve designation of the nominal test sieve with the prefix G added. These sieves are in accordance with ASTM E 11.

2. References

2.1 - Applicable Publications - The following publication forms a part of this specification to the extent specified herein.

2.1.1 - ASTM Publication - Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959

- ASTM E 11 - Standard Specifications for Wire Cloth Sieves for Testing Purposes.

2.2 - Related Publications - The following publications are provided for information purposes only and are not a required part of this document. The latest issue of SAE publications shall apply.

2.2.1 - SAE Publications - Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001

- SAE J445 - Metallic Shot and Grit Mechanical Testing - For Information on Shot Durability Determination
- SAE J827 - Cast Steel Shot - For Information on Composition and Shapes
- SAE J1993 - Cast Steel Grit - For Information on Composition and Shapes
- SAE J2175 - Low Carbon Steel Shot - For Information on Composition and Shapes

3. Testing Procedure - Sieve Analysis

3.1 - Equipment

3.1.1 - A rotating and tapping type of testing machine shall be used.

3.1.1.1 - The shaking speed shall be 275 to 295 rpm.

3.1.1.2 - The taps per minute shall be 145 to 160 when tapping machines are used.

3.2 - Sieves

3.2.1 - The testing sieves shall be in accordance with ASTM E 11. They shall be of the 203 mm (8 in) diameter series, of either 25 mm (1 in) or 51 mm (2 in) height.

3.3 - Procedure

3.3.1 - A 100 g sample of the shot or grit shall be obtained from a representative quantity.

3.3.2 - The sample shall be placed on the top sieve of a stack of three or four sieves, depending on media and size (Figures 1 and 2). Nest the selected sieves and fit a pan to the bottom sieve.

3.3.3 - The sample shall be run in the testing machine for 5 min ± 5 s for sizes using sieve designation 35 or coarser and 10 min ± 5 s for sizes using sieve designation finer than 35.

3.3.4 - The stack of sieves shall be removed from the testing machine and the percentage of total weight shall be recorded for the media remaining on each sieve.

3.4 - Any alternate method agreed upon by the supplier and the user which gives equivalent results will be acceptable.

1. Example: S-550 indicates a cast steel shot identified by a nominal sieve opening of 0.0555 in.

Figure 1 - Cast Shot Specifications for Shot Peening or Blast Cleaning

Sieve Opening Standard (mm)*	Sieve Designation	Nominal Sieve Opening (in)	Test Sieve Opening Size and Designation with Maximum and Minimum Cumulative Percentages Allowed on Corresponding Test Sieve													
			SAE Shot Number													
			S1320	S1110	S930	S780	S660	S550	S460	S390	S330	S280	S230	S170	S110	S70
4.75	4	.187	All Pass													
4.00	5	.157		All Pass												
3.35	6	.132	90% min		All Pass											
2.80	7	.111	97% min	90% min		All Pass										
2.36	8	.0937		97% min	90% min		All Pass									
2.00	10	.0787			97% min	85% min		All Pass	All Pass							
1.70	12	.0661				97% min	85% min		5% max	All Pass						
1.40	14	.0555					97% min	85% min		5% max	All Pass					
1.18	16	.0469						97% min	85% min		5% max	All Pass				
1.00	18	.0394							96% min	85% min		5% max	All Pass			
.850	20	.0331								96% min	85% min		10% max	All Pass		
.710	25	.0278									96% min	85% min		10% max		
.600	30	.0234										96% min	85% min		All Pass	
.500	35	.0197											97% min		10% max	
.425	40	.0165												85% min		All Pass
.355	45	.0139												97% min		10% max
.300	50	.0117													80% min	
.180	80	.0070													90% min	80% min
.125	120	.0049														90% min
.075	200	.0029														

* Corresponds to ISO Recommendations

Figure 2 - Cast Grit Specifications for Blast Cleaning

Sieve Opening Standard (mm)*	Sieve Designation	Nominal Sieve Opening (in)	Test Sieve Opening Size and Designation with Maximum and Minimum Cumulative Percentages Allowed on Corresponding Test Sieve												
			SAE Grit Number												
			G10	G12	G14	G16	G18	G25	G40	G50	G80	G120	G200	G325	
4.75	4	.187													
4.00	5	.157													
3.35	6	.132													
2.80	7	.111	All pass												
2.36	8	.0937		All pass											
2.00	10	.0787	80%		All pass										
1.70	12	.0661	90%	80%		All pass									
1.40	14	.0555		90%	80%		All pass								
1.18	16	.0469			90%	75%		All pass							
1.00	18	.0394				85%	75%		All pass						
.850	20	.0331													
.710	25	.0278					85%	70%		All pass					
.600	30	.0234													
.500	35	.0197													
.425	40	.0165						80%	70%		All pass				
.355	45	.0139													
.300	50	.0117							80%	65%		All pass			
.180	80	.0070								75%	65%		All pass		
.125	120	.0049									75%	60%		All pass	
.075	200	.0029										70%	55%		
.048	325	.0017											65%	20%	

* Corresponds to ISO Recommendations

4. Notes

4.1 - Marginal Indicia - The change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions have been made to the previous report. An (R) symbol to the left of the document title indicates a complete revision of the report.

Rationale

Not applicable.

Relationship of SAE Standard to ISO Standard

Not applicable.

Applications

This SAE Recommended Practice pertains to blast cleaning and shot peening and provides for standard cast shot and grit size numbers. For shot, this number corresponds with the opening of the nominal test sieve, in ten thousandths of inches, preceded by an S. For grit, this number corresponds with the sieve designation of the nominal test sieve with the prefix G added. These sieves are in accordance with ASTM E 11.

The accompanying shot and grit classifications and size designations were formulated by representative of shot and grit suppliers, equipment manufacturers, and automotive users.

Reference Section

- SAE J445 - Metallic Shot and Grit Mechanical Testing - For Information on Shot Durability Determination
 - SAE J827 - Cast Steel Shot - For Information on Composition and Shapes
 - SAE J1993 - Cast Steel Grit - For Information on Composition and Shapes
 - SAE J2175 - Low Carbon Steel Shot - For Information on Composition and Shapes
 - ASTM E 11 - Standard Specifications for Wire Cloth Sieves for Testing Purposes.
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