

Process Specification



2135 West Maple Road
Troy, MI 48084-7186

Specification: 608
Revision Date: 4/5/2010

SHOT PEENING FOR GEARS

1. Shot Peening Requirements:

Table 1- Shot Peening Requirements

Property	Requirements	
Shot Media	Cast steel shot	Conditioned Cut wire shot (CCW) *
Shot Size	Shot Size: S230 thru S330 (As defined in latest revision of SAE J444)	Shot Size: CCW 28, 32, 35 Wire Diameter: 0.028-0.035 in. (As defined in latest revision of SAE J441)
Required Hardness Range	55-62 HRC	55-60 HRC
Sieve Requirement	90% min of particles	90% min of particles
Arc Height (Intensity)	0.014-0.018 A ₂ at the tooth root & root fillet ¹	0.017-0.021 A ₂ at the tooth root & root fillet ¹
Coverage	100% coverage at the tooth root & root fillet. Over spray and ricochet on the tooth flanks are acceptable.	

* Un-conditioned cut wire shot is not permitted

¹ The almen strip requirement may vary from supplier to supplier, and will depend on the minimum and aim residual stress values listed in Table 2.

Note: All phosphating must be done after shot peening.

2. Residual Stress:

The shot peening process must be approved by Materials Engineering through residual stress measurement. The required minimum residual stress values are shown below in Table 2.

Table 2- Residual Stress Requirements

Depth (in.)	Minimum Residual Stress (ksi)	Minimum "Aim" Residual Stress (ksi)
Surface	-60	-80
-0.002	-100	-130
-0.004	-100	-130

Process Specification



2135 West Maple Road
Troy, MI 48084-7186

Specification: 608
Revision Date: 4/5/2010

3. Reference Specifications:

- SAE J444 - Cast Shot and Grit Size Specifications for Peening and Cleaning
- SAE J827 - High-Carbon Cast-Steel Shot
- SAE J441 - Conditioned Cut Wire Shot

Date	Change
4/5/2010 Level C Request 30055-317	Cast steel shot size was modified to reflect the correct shot designation and shot hardness range specified per SAE J444 and J827, respectively. The designated shot size was 230H-330H, and the required hardness range was 55-60 HRC per Section 1. Arc Height was 0.014-0.018A ₂ for conditioned cut wire in Section 1. Added term "Un-conditioned" to Note in Section 1. Added superscript 1 to Section 1: "The almen strip requirement may vary from supplier to supplier, and will depend on the minimum and aim residual stress values listed in Table 2." Added statement to Section 2, "The shot peening process must be approved by Materials Engineering through residual stress measurement." Added reference specification, SAE J827, to Section 3.
9/5/2009 Level B Request 31345-1	Added conditioned cut wire shot requirements to Section 1 and tabularized shot peening requirements. Added Section 2 for residual stress reference. Added Section 3 for Reference SAE specifications.
07/15/2001 Level A Request 21283-1	Expanded allowable shot size up to 330 and added SAE J444 sizing requirement

Approved By: S. Foster
Vice President - Quality