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SURFACE VEHICLE RECOMMENDED PRACTICE

An American National Standard

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MECHANICAL AND CHEMICAL REQUIREMENTS FOR NONTHREADED FASTENERS CARBON STEEL SOLID RIVETS

***Foreword*—**This Reaffirmed Document has been changed only to reflect the new SAE Technical Standards Board Format.

***1. Scope*—**These specifications cover the mechanical and chemical requirements for carbon steel solid rivets used in automotive and other related industries.

2. References

2.1 Applicable Publication—The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated the latest revision of SAE publications shall apply.

2.1.1 SAE PUBLICATION—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J417—Hardness Test and Hardness Number Conversions

***3. Grouping*—**Rivets in Grades 0 and 1 fall in two groups; namely, those of small diameter—7/16 in and less, usually driven cold, and over 7/16 in usually driven hot. It is recommended that the rivets for cold driving in sizes over 7/16 in be ordered annealed.

***4. General Data*—**Rivets for cold driving are specified so as to provide the necessary ductility for the application.

The properties of rivets intended for hot driving are not necessarily those found in the driven rivet. Therefore, the specifications for hot driven product are designed to furnish satisfactory properties after cooling from the driving heat.

***5. Steel Process*—**Steel shall be produced by any suitable process to conform to the chemistry specified.

***6. Quality*—**Surface shall be commercially free of injurious cracks and seams, and steel shall be free of injurious pipe and excessive segregation.

Annealed rivets for cold driving should be free of loose scale.

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7. *Number of Tests on Annealed Rivets*

a. Samples shall be selected for hardness test from each lot of rivets as follows in Table 1:

TABLE 1—SAMPLES

Items in Lot	Number of Samples
to 800	3
801–8000	6
8001–22000	9
over 22000	15

b. All samples must meet the hardness requirements of the specification for acceptance, but retests are permitted as stated in paragraph C. Retests.

c. Retests—If any sample from the same lot fails to meet the specified requirement, double the number of samples shall be tested, in which case for acceptance all of the additional samples shall meet the specification (see Table 2):

TABLE 2—GRADES AND PROPERTIES

Grade	Tensile Properties of Hot Rolled Rod or Bar from which Rivets are Produced		Chemical Composition Ladle Analysis % Max	Heat Treatment of Rivets
0	Tensile strength, psi:	40,000–55,000	P —0.040	7/16 in dia and under are furnished annealed to Rockwell B 65 max(1)
	Yield point, min, psi:	23,000	S —0.050	
	Elongation in 8 in, Min, %:	27		
1	Tensile strength, psi:	52,000–62,000	P —0.040	7/16 in dia and under are furnished annealed to Rockwell B 85 max(1)
	Yield point, Min, psi:	28,000	S —0.050	
	Elongation in 8 in, Min, %:	24		
2(2)	Tensile strength, psi:	55,000–70,000	C —0.28	Not specified
	Yield point, Min, psi:	29,000	Mn—0.30—0.90	
	Elongation in 8 in., Min, %:	22	P —0.040	
			S —0.050	
			Si —0.25	
3(2)	Tensile strength, psi:	68,000–82,000	C —0.30	Not specified
	Yield point, Min, psi:	38,000	Mn—1.65	
	Elongation in 8 in, Min, %:	20	P —0.040	
			S —0.050	

1. Hardness to be taken in accordance with SAE Information Report, Hardness Tests and Hardness Number Conversions—SAE J417.
2. Grades 2 and 3 intended for hot driving only. The tensile requirements of grade 3 are met by heating to 1450 °F, holding at this temperature for not less than 30 min and cooling slowly in the furnace.

PREPARED BY THE SAE IRON AND STEEL TECHNICAL COMMITTEE