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Standard Specification for Wrought Alloy Steel Rolls for Cold and Hot Reduction¹

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1. Scope

1.1 This specification covers homogeneous wrought hardened alloy steel rolls for use in cold or hot reduction of flat rolled ferrous and nonferrous products.

2. Referenced Documents

2.1 *ASTM Standards:*²

A788/A788M Specification for Steel Forgings, General Requirements

A956 Test Method for Leeb Hardness Testing of Steel Products

E18 Test Methods for Rockwell Hardness of Metallic Materials

E92 Test Method for Vickers Hardness of Metallic Materials

E140 Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, and Scleroscope Hardness

E448 Practice for Scleroscope Hardness Testing of Metallic Materials

3. Ordering Information

3.1 The purchaser shall specify in the inquiry, contract, or order the complete dimensions, hardness range, surface finish, and use. Any other requirements shall also be specified.

3.2 Material supplied to this specification shall conform to the requirements of Specification A788/A788M, which outlines additional ordering information, manufacturing requirements, testing and retesting methods and procedures, marking,

certification, product analysis variations, and additional supplementary requirements.

4. Process

4.1 The steel shall be made by the electric-furnace process. Additional refining by vacuum arc remelt or electroslag is permitted.

5. Manufacture

5.1 The forged rolls shall receive their hot mechanical work under a press or hammer of ample capacity to work the metal throughout its section. However, 6-in. (152-mm) diameter or less rolls may be produced from rolled bars.

6. Discard

6.1 Sufficient discard shall be made from each ingot to secure freedom from piping and undue segregation.

7. Chemical Requirements

7.1 Unless specified by the purchaser, the chemical requirements shall be at the discretion of the manufacturer.

8. Heat Treatment

8.1 The method of heat treatment and hardening shall be at the option of the manufacturer.

9. Hardness Requirements

9.1 The manufacturer shall supply rolls to the hardness ranges agreed upon by the purchaser and the manufacturer.

9.2 A hardness range of either 5 points Shore scleroscope or 100 numbers Vickers hardness is permissible.

10. Hardness Testing

10.1 Each roll shall be tested for hardness and shall be within limits specified on the order. The Shore forged roll scleroscope (HFRS_C or HFRS_D), Rockwell hardness tester, Vickers hardness penetrator, or Leeb hardness tester (in accordance with Test Method A956) may be used to determine compliance with the hardness range specified. The approximate relationship between Shore HFRS_C scleroscope and diamond pyramid hardness is shown in Table 1.

¹ This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloys and is the direct responsibility of Subcommittee A01.06 on Steel Forgings and Billets.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.