

NEW ASTM VOLUME AIMS TO INFORM STEEL FORGING BUYERS

Book offers fundamentals on steel forgings and how they are produced, for designers, purchasers, and users.

Edward G. Nisbett retired in 2000 after nearly 50 years of service in metals-related industries, including most recently a 30-year stint with National Forge Co., an integrated producer of open- and closed-die steel forgings. Then, he set out to share his understanding and insights of the technical side of the forging business. He wrote a book on the subject.

Steel Forgings: Design, Production, Selection, Testing, and Application was sponsored by Committee A01 on Steel, Stainless Steel, and Related Alloys of ASTM International, which has designated the book as Manual 53.

It is a resource for design engineers; purchasing managers; manufacturers of pressure vessels, turbines, and generators; metallurgical engineers; university professors; and lawyers. Forging producers also should be familiar with the content of Manual 53. Twenty-two comprehensive chapters discuss:

- Background information on the classification of forgings according to the method of manufacture;
- Importance of steel production methods in establishing the expected properties;
- A critical review of over 60 ASTM forging standards covering applications as diverse as railroad and power generation equipment, pressure vessel components, and a wide range of general industrial equipment;
- The effect of various types of forging operations relative to soundness and application;


- Specialized nondestructive testing methods developed for forgings;
- Economic and quality factors regarding the choice between forgings and other steel product forms;
- Special considerations in the heat treatment of forgings;
- Pros and cons of the timing of machining and the effect of test specimen location on the anticipated mechanical properties of the forging;
- Surface treatments for enhancing forging performance and life; and
- Forging flaws and examples of service problems.

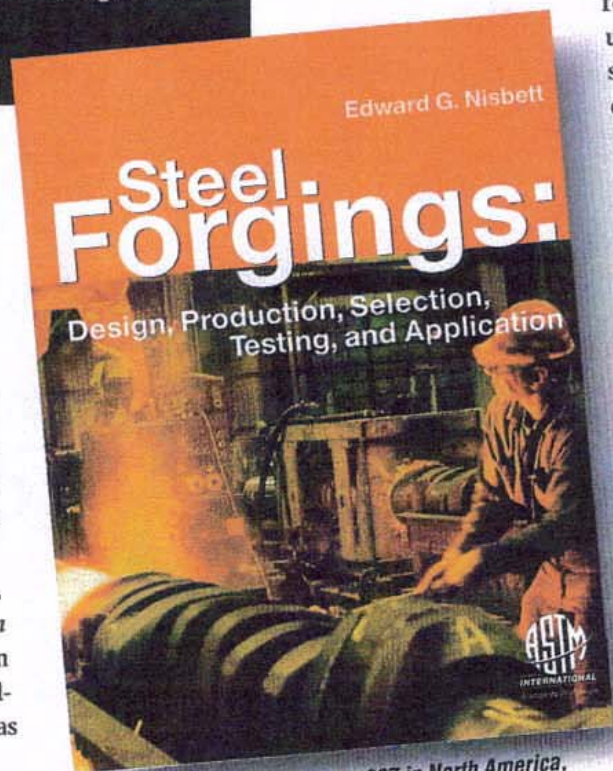
Chapter 6, which covers heating for forging, the wording is typical of the author's practical approach of providing information for purchasers and users of forgings. "Forging crews sometimes seem to work according to the 'Hotter is Better' maxim, possibly because the steel may appear to move more easily and the reduction in forging time can lead to greater financial rewards; however, as explained here the choice of forging temperature must be approached carefully," Nisbett writes.

He continues, "For most steels, the power needed for hot working a given section size decreases with increasing temperature. ... There is an upper limit, of course, to the forging temperature that can be used before serious and even permanent damage is done to the material. This begins as excessive grain growth and then as incipient grain-boundary melting and oxidation.

Care, therefore, must be exercised not only in specifying the forging temperature, but also in the design, maintenance, and use of the heating equipment.

Subsequently, Nisbett discusses Heat to Forge Furnaces, Reheating, and Induction Heating in some detail in this chapter.

In Chapter 20, he elaborates on producing the book for the role of the purchaser. "A major aim of this review of the forging process is to assist the purchasing agent or manager to understand better the product relative to sending out an inquiry or placing a purchase order. ... The purchasing agent is often the only direct link between the forging supplier and the engineer who needs the forging, and it should not be assumed in every case that the needs are fully understood in the request given to the purchasing department." 



Steel Forgings is available for \$87 in North America, \$98 elsewhere. For more information, contact ASTM International at Tel. 610-832-9585, via e-mail at service@astm.org, or visit the website at www.astm.org.