

THE PROTECTIVE FOOTWEAR STORY

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In 1967 it had been 23 years since Standard Z41.1, "Men's Safety-Toe Footwear," had been revised. It was, of course, badly in need of revision due to the development of new shoe styles, new materials, new techniques in shoe manufacturing, and expanded applications for the use of occupational protective footwear.

As a member of the committee which developed the 1967 version I can report that the committee meetings did not run smoothly as far as all areas of the Standard were concerned. There was considerable controversy on some of the points which required a great amount of diplomacy and soul searching to resolve. The development of a complete Standard which has the unanimous approval of all members of the committee, who in turn represent all interested groups, is not easy. The United States of America Standards Institute has a mechanism whereby differences of opinion and strong convictions can be resolved. This is known as the "consensus" principle, and while the Standards Institute's definition of consensus is rather vague, the meat of the mechanism is that all of the various opinions and convictions of the various committee members are carefully weighed and evaluated before a decision is made as to the direction the Standard will take. I am firmly convinced that the consensus principle is a necessary mechanism in the development of Standards; otherwise, many of the Standards which have been released by the Standards Institute would not now be in existence.

The Z41.1 Standard outlines the specifications, performance requirements, and methods of tests for safety footwear designed primarily to protect the toes of the wearer. Perhaps the greatest change in the 1967 version of the Standard over the previous version was the introduction of three classes of acceptable safety shoes:

1. *Class 75.* This shoe must provide 16/32 inch clearance after 75 foot-pounds of impact, and 1½ inch clearance after 2,500 pounds compression.

2. *Class 50* must provide 16/32 inch clearance after 50 foot-pounds impact and 1,750 pounds compression.

3. *Class 30.* This shoe must provide 16/32 inch clearance after 30 foot-pounds of impact and 1,000 pounds compression.

The new Standard requires that all shoes be clearly marked to indicate the class of protection they provide. For example, a Class 75 shoe would be marked *USAS Z41.1-1967/75*. Such a marking technique would appear to be a fairly simple step to take. Actually, the marking of shoes became a most difficult problem because at the time the Z41.1 Standard was released the shoe manufacturers had literally millions of pairs of safety shoes in stock which were not marked in accordance with the new Standard. This meant that safety shoe manufacturers had to immediately start marking all newly manufactured shoes and to hold them in reserve until all existing shoes could be moved out of the warehouses and sold. As time went on it became quite apparent a deadline was going to have to be established after which time all shoes sold would be marked in accordance with their test results. It was agreed that all safety footwear manufacturers would have their shoes stamped by January 1, 1969.

As previously indicated, the Z16.1 Standard calls for three levels or classifications of shoes: the "75" shoe, the "50" shoe and the "30" shoe. Although the Standard does not suggest where each of these classifications are most appropriate, the implication is that they are, respectively, for heavy, medium, or light exposures or industries.

The impact and compression tests which are required to be made before a shoe can be marked are fairly detailed and lengthy as to procedures and restrictions. The impact test calls for a 50 pound weight to be dropped from a height of 18 inches with at least ½-inch clearance remaining between the toe cap and the insole. The compression test calls for applying a load, at the rate of 50 pounds per second, after the first 500 pounds of load, to the highest point of the