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NONDESTRUCTIVE TESTING AND PRODUCT QUALITY

Products that fail to meet consumer expectations of in-service performance waste billions of dollars a year in replacement and litigation costs. To reduce these costs, we need to intensify research on nondestructive testing of these products. Improved methods of nondestructive inspection are needed both in production and in determining in-service condition. Ideally, we need to assess the mechanical or physical condition of all products accurately from the initial steps in their manufacture through their expected service life.

Benefits to the consumer and the manufacturer are substantial. Savings can be realized from reduced consumption of raw material, fewer service calls and claims, and increased service life. We are all aware of the national focus on product quality and conservation. Nondestructive testing offers assistance to manufacturers in obtaining the quality sought by consumers. In addition, nondestructive testing offers a means to insure wise use of raw materials and to avoid premature replacement of products.

Nondestructive testing comprises an array of techniques, such as sonic, optic, laser, gamma-ray, infrared, and X-ray testing, that can be used to assess the condition of a product. Ideally, every product should inspected. In recent years, the industry has substantially increased manufacturing efficiencies and has improved product quality by nondestructive testing. Such testing has proven especially effective with the advent of process control, computer applications, and automation. Production facilities that have applied these techniques have realized significant gains in material recovery and product quality. Significant gains are still possible, however, as technology is improved.

Nondestructive testing provides another important benefit: the use of short-term testing to predict long-term performance of a product. Introduction of new products into the marketplace has increased greatly in recent years. This increase is due largely to decreases in quality and quantity of our raw material supply. In order to meet consumer demand and to reduce cost, many new wood products have been developed. The key to the success of these products is the ability to assess long-term service potential from short-term studies. Over the years there have been classic examples of the failure of a new building product after only a few years of use, resulting in substantial replacement and litigation costs. When a new product is introduced, we need to make sure that testing is sufficient to reduce the likelihood of product failure, while we look at ways to improve short-term nondestructive testing to predict long-term performance.

Why bring this topic to a professional, scientific society? To accomplish development of nondestructive testing techniques that can accurately assess the condition of a material in the various stages of manufacturing or in use, we need two components: (1) sufficient funding, and (2) synergistic combination of the various sciences associated with nondestructive testing and the fundamentals of wood science. We may think we can't impact funding; but we can, if we convince both private and public

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funding sources of the relevance of our goal. To reach our goal, we need to work on both applied projects and fundamental research. In order to make quantum gains in technology, we need to understand the basic scientific principles associated with wood science. As part of a national conscience raising effort about product quality and conservation of raw materials, hopefully we all will see the need to increase our effort to develop the science of nondestructive testing and its application in improving product quality and assuring long-term product service.

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