BRAKE MATERIALS, PRODUCTS, AND USAGE

Historical Development of Friction Products[4]

The requirements of early automobile friction materials were relatively minimal. Passenger cars were light and designed for low speed operations. Brakes were of an external contracting type and utilized a variety of materials; this included leather and impregnated cotton products which were commonly used along with wool and felt. In 1903 woven asbestos friction materials were first marketed in the United States by the Keasbey and Mattison Company of Ambler, Pennsylvania.[5] Because of their superior heat resistance and durability they rapidly increased in use and soon dominated the market. The woven asbestos brakes continued to be the dominant product used in automobiles until about 1930. They typically contained 70% or more wire-cored asbestos yarn impregnated with drying oils, such as linseed and bituminous material.

Molded brake linings were developed in the early 1920's and gained increasing use with the introduction of internal shoe brakes in 1927. By 1940 virtually all automobiles were equipped with molded brake linings, although woven products continue to be used in trucks, heavy equipment and for specialized applications. The molded linings in use were cut to length, usually by the manufacturer, and mounted on brake shoes using rivets. Until the mid 1920's brakes were only mounted on rear wheels; however, with the development of internal shoes, four wheel mountings soon became standard.

As automobiles were designed for use at higher speeds, brake linings improved in both quality and performance. Various new materials were introduced as fillers, binders, and friction modifiers. In 1948 bonded brake