International Congress on Engineering Science and Sustainable Urban Development
Denmark – Copenhagen
September, 2018

Surface modification of OEM brake pad by scorching process

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Abstract

One of the main ingredients of a brake pad is resin material that acts as a matrix in the friction material. In the production process, the mixture of ingredients goes through pressure and temperature to increase the strength and integrity of the brake pad. However, baking process produces gases reducing the fade resistance of brake pads. The scorching process gets some millimeters of friction material surface porous resulting in slightly weakening the integrity of the components and as a result, friction materials can easily be contacted with the brake disc in the first braking condition. This means that the pads and discs need less time to get matched to each other. Having done scorching process, some properties such as hardness reduce, coefficient of friction whereas wear rate increase.

Key words: friction material, scorching process, brake pad

1. Introduction

Brake pads are considered to be safety critical parts in vehicles. They are, in fact, a composite of friction materials (FM) made of various materials of four categories; friction modifiers, reinforcements, fillers and resin binders such as phenolic resin [1]. The fabrication process of the brake pads consists of several different stages. Through the end of the process there might be one important stage in the production of OEM (original equipment manufacturer) brake pad that is the *scorching process*. In this process, the mating face of a brake pad gets heated by different sources like hotplate or infrared. This can bring about changing physical, mechanical, tribological properties of pads such as reduction in hardness, the strength and integrity of the whole constituents over a certain thickness of FM surface by decomposition of resin binder and increasing porosity.

Porosity, on the one hand, can improve acoustic and thermal properties by increasing porosity and changing its distribution and, on the other hand, it can change the thermal conductivity and sound insulation [2]. Some engineers believe that the hardness of the