

# Novel Adhesives for Bonding Friction Materials to Clutch Discs (Automotive)

## EXECUTIVE SUMMARY

A novel adhesive composition that allows bonding friction materials to clutch discs without use of rivets, resulting in longer-lasting, cheaper, lighter clutch discs.

## BACKGROUND

Friction materials (a crucial component in automotive clutches) are attached to clutch discs predominantly by using rivets. This leads to frequent replacements and material loss (they have to be replaced as they get close to the height of the rivet rather than fully wearing out). Adhesive bonding offers a great alternative, but current adhesive options have severe limitations.

## TECHNOLOGY DESCRIPTION

NCL scientists have developed a novel adhesive composition that can be used to bonding (without use of rivets) friction materials to the clutch discs. A unique formulation provides the necessary bond (lap shear) strength without compromising on the required cushioning properties for clutch applications. This would lead to a radical increase in the lifetime of the clutch discs, and also make them cheaper. [Temperature stability up to 150<sup>o</sup>C (exposure time~30-40 hrs); lap shear strength~10-15 Kg/cm<sup>2</sup>; cushioning~0.3-0.4 mm.]

## MARKET POTENTIAL

The global friction products market was estimated to be \$14.4 billion in 2012 with a projected growth rate of 6% (CAGR; till 2018) indicating a significant market potential for new, innovative products. [\(Source\)](#)

## VALUE/ADVANTAGES

- Adhesively bonded clutch discs fully utilize the friction material, thus reducing loss of the expensive component, and also increasing the lifetime of the clutch disc
- It also leads to the overall reduction of the weight of the clutch disc
- The process for preparing adhesively bonded discs are comparatively easier, cheaper

## APPLICATIONS

- Use in bonding friction material to clutch discs

## TECHNOLOGY STATUS

- Demonstrated at the lab scale, and at commercial scale
- On the lookout for potential partners for spin-off or licensing
- Patent applications filed [US 13/877,226](#); [PCT/IN2011/000688](#); 2361/DEL/2010 (India)

*Clutch discs with and without (right) rivets*

