

BRAKE TECH

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UNDERSTANDING BRAKE PAD CONSTRUCTION

Brake pads are wear items that can only last so long. One of the main concerns engineers face is maintaining the integrity of the lining assembly for the service life of the lining. The friction lining on a disc brake pad is mounted on a steel backing plate. The plate provides stiffness and rigidity, and allows the caliper to squeeze the pads against the rotor.

New methods for mounting the brake pad (friction material) onto the steel backing plate are constantly being tested. Working in an undercar service shop, it's important that you understand how parts work and are aware of the research and development that has gone into each product. The more you know about what you are selling, the better you can educate your customers.

Methods used for mounting the friction material to the backing plate include:

- Rivets: Rivets are used to attach the friction material to the backing plate.

- Adhesive: Friction material is bonded to the backing plate using an adhesive.

- Molding: Molded pads are made by pressing, heating and curing the friction material to the backing



Friction material must be able to maintain a firm hold on the backing plate under high shear loads and extreme heat, while being placed in a corrosive environment for an extended amount of time.

plate. In Integrally-Molded (I-M) applications, the friction material is extruded through, rather than riveted or glued to, the metal backing plate, forming an integrated, single-piece component. According to the manufacturer, this design spreads out and absorbs heat and energy over a larger surface area, resulting in quieter performance and longer pad life.

A related term is "integrally molded insulator" (IMI). On these applications, the insulator is located between the backing plate and friction material. The result is a qui-

eter, more durable component.

- Mechanical locking: Instead of using an adhesive, the friction material is mechanically locked to the backing plate.

One of the newer forms of mechanical locking is known as NRS. Now used by several brake pad suppliers, NRS relies on dozens of tiny curved hooks that project from the surface of the backing plate, creating an incredibly strong mechanical lock between the backing plate and friction material. Some of the hooks face one way and some the opposite way. The shape, distribution and angle of the hooks provide adhesion between the plate and friction material.

The hooks only project about 1/16th of an inch above the surface of the plate, so the pads can wear quite a bit before the tops of the hooks are exposed. Even when the hooks do become exposed, tests have shown that the hooks cause no damage to the rotor.

Maintaining the integrity of the brake lining assembly is something that every brake technician is concerned about. It's important to make sure that the brake parts that are installed on customers' vehicles are well-built, reliable and trouble free. ■