

## **ROTORS FOR TRACK DAYS**

**Choosing the correct disc brake setup for a fun day at the track can often be confusing and expensive if you use a product not fit for purpose.**

The aftermarket disc brake industry is very competitive and full of confusing sales hype and marketing to attract buyers.

However, unfortunately aesthetics and product packaging are no substitute for product performance when attending a track day.

Disc Brakes Australia (DBA) has been manufacturing disc rotors for over 45 years in Sydney Australia. Throughout that time the business has held strong connections to Motorsport both at grassroots and professional levels.

This has resulted in countless hours of product testing through extreme race situations, including rally, endurance, and various other racing codes. Constantly testing the limitations of our rotors has resulted in advancements in product performance and durability.

One of the biggest challenges DBA has faced, was developing a disc rotor that would survive 24hrs of continuous racing at the unforgiving Mount Panorama Circuit at Bathurst NSW. Rotors that could survive the gruelling 24hrs without needing a costly pit stop to change, provided a championship win for the GT Performance class Subaru WRX STi. This product soon became known as the **DBA 4000 Series** disc rotor, which expanded into the range we know today.

**Not a bad looking rotor after a long day at Bathurst** (Fig.1, Fig.2, Fig.3)



Fig.1



Fig.2

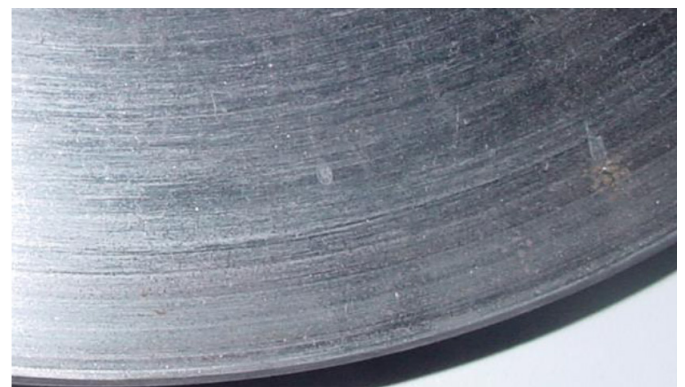


Fig.3

The two most important factors when it comes to disc brake rotors used in extreme applications are **heat capacity** and **thermal stress management**.

**Heat capacity** design is a compromise between having enough metal mass in the friction ring to accept and process the kinetic energy transferred into the brake system to decelerate the vehicle while trying to minimise the rotating mass of the wheel assembly (un-sprung weight).

**Thermal stress management** is about minimising fatigue to prolong the life of the disc rotor. Regardless of the manufacturer or disc design, grey cast iron will fatigue in motor-sport applications. The thermal expansion from heating and contraction when cooling initiates a stress and strain cycle which is essentially metal fatigue. It is common practice for professional race teams to discard the disc rotors after a known period whether it be the number of laps or hours in race conditions to avoid any unpredicted failures due to metal fatigue.

### Plain, Drilled or Slotted disc rotors?

Without question, it's slotted rotors wherever possible. There are drivers that like to maintain the factory setup with plain face discs and this is o.k. Certainly the disc rotor in Fig 2. image was a plain type due to the racing class requirements it was entered in.

The purpose of slots in the disc rotor is to evacuate the waste material (dust) from the friction surfaces. The slots will ensure consistent friction performance throughout the

life of the disc and pad whereas more scrutiny is required in friction material selection with plain discs to avoid surface glazing and declining friction performance.

This leaves us with drilled or drilled and slotted discs. Drilled disc rotors are not recommended for track use of any kind.

Unfortunately, the drill holes are focus points where stress and fatigue will accelerate and eventually result in crack formation. Drilled disc rotors have proven to improve braking performance on the street where normal driving conditions rarely exceed 250°C and stress is not a concern, however in motorsport applications drilled rotors are to be avoided.

### Heat treatment, Cryogenics, Vibrational stress relieving?

Yes, there are several treatments or processes applied to disc rotors marketed in the industry. Typical processes such as Cryogenic treatment is a method where the discs are treated post manufacturing. The discs are often sourced direct from an external or unknown manufacturer and processed later by the distributor who may not have detailed knowledge of the material properties which can result in a product that is not fit for purpose.

**DBA 4000** series one piece and **DBA 5000** series two-piece disc rotors undergo a thermal stress reduction procedure during the manufacturing process, known as Thermal Stability Profiling (TSP). This is to ensure the metal structure is optimum and to ensure maximum performance and durability out of the box.

