

SOLID OR VENTED DISCS?

Solid discs have their place, on off road and quarry applications for example where mud, sludge etc can fill the vents reducing their effectiveness, but for on road applications vented discs are generally a superior choice, if they weren't the vehicle manufacturers wouldn't fit them as OE. Vented discs cool up to 40% faster than solid discs so other components such as rubber seals, tyres and bearings around the brake set up are exposed to high temperatures for less time so provide for longer life and better safety.

Vented discs weigh less than an equivalent solid disc by 7kg which amounts to 14kg per axle. Extra weight reduces from payload carrying capacity and increases fuel consumption and because of their extra mass solid discs are also much more expensive than the equivalent vented rotor by at least 30%.

Because it has a much bigger mass a solid disc has a much bigger heat sink so on a single stop the temperature rise during braking will be less with a solid disc than a vented disc. Some suppliers claim that solid discs do not increase brake fade; this

- Vented discs are a superior choice which is why OE manufacturers choose to fit them.

- Vented discs cool up to 40% faster than solid discs.

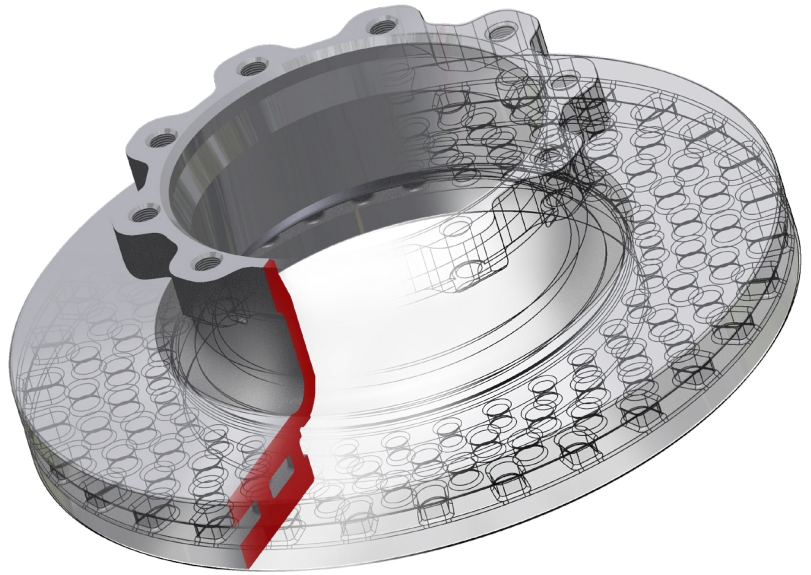
- Vented discs weigh less than the equivalent solid disc by up to 14kg per axle, thus increasing payload and reducing fuel consumption.

- Solid discs cost on average 30% more than their vented equivalent.

- Solid discs increase the chance of brake fade due to slower cooling.

- Juratek discs pass the UN ECE R90:02 standards for thermal fatigue.

- The wear rate benefits of solid discs are so miniscule they hardly register.



cannot be true when repeated brake stops are carried out. As previously explained vented discs are designed to cool significantly quicker than solid discs, therefore over a series of repeated stops a vented brake couple will be less prone to brake fade. For example if the temperature after braking has reached 300°C then 10 seconds later the temperature of a ventilated disc will drop to (say) 250°C. Whereas a solid disc will have only dropped to (say) 290°C. Therefore when the brakes are applied again the temperature of solid discs is higher and therefore more likely to suffer brake fade on subsequent stops.

Because of their mass solid discs may be less prone to distortion when hot but generally this is not an issue with properly designed vented rotors and thermal "hot spotting" and crazing and cracking is as much to do with the composition of the cast iron and the choice of friction material and how well it conforms with the disc to ensure uniform pad/disc contact.

Some competitors have used the UNECE R90:02 Thermal Fatigue Test to compare their Scania vented and solid disc; their solid disc comfortably passes the test but their vented disc fails, only completing 7 of the 15 cycles required. It is important to note that whilst the UN ECE R90:02 Thermal Fatigue Test calls for 15 cycles to be completed, it actually requires, as a minimum, a result no worse than the OE part in terms of the number of cycles achieved before failure. Fras-Le vented brake discs are R90 compliant.

They also draw conclusions from the wear figures claiming longer pad and disc life with the solid disc. However if you look at the actual figures and not the % values you see there is 0.046mm difference in pad wear and 0.004mm difference in disc wear. These differences are not significant.

A solid disc has its place for particular types of application but for the above reasons, Fras-Le will only supply UN ECE R90:02 approved product that is safe and cost effective.

