

Brake fluid - what do the ratings mean?

■ Words: RDA EBC Brakes, Club Supporting Sponsor



There are three main classifications of brake fluids: "DOT 3", "DOT 4" and "DOT 5".

The "DOT" stands for *Department of Transport* and is an American-based standard which includes 14 different requirements, both physical composition and operating, under which each must be made.

The most important is the measurement of its boiling point characteristics and this is measured within two ranges, being its dry boiling point and its wet boiling point.

Dry boiling point is the point at which the fluid boils when first used out of the bottle and wet boiling point is a measurement based on 3.7% water absorption in the brake fluid and at what point it starts to boil.

Water is absorbed into the brake fluid by design and it traps a lot of heat from the brake operation.

These two events alter the effectiveness of the brake fluid and the minimum operating temperatures as described by the US Department of Transport regulations ensure the fluid is still capable of functioning safely.

• DOT 3

Usually glycol ether-based with a minimum dry boiling point of 205° Celsius and a minimum wet boiling point of 140° Celsius (with 3.7% water content as discussed above).

• DOT 4

Also glycol ether-based with a touch of borate esters to increase its immunity to water absorption.

DOT 4 must have a minimum of 230° Celsius dry and 197° Celsius wet.

• DOT 5

Silicone-based and must have a minimum boiling point of 265° Celsius dry and 180° wet.

Being silicone-based, this type of fluid flows more easily through the

pressurised braking system, giving greater braking performance and thereby reducing heat build-up. The disadvantage is that by its nature – being more compressible – it allows more room for air to be present within the fluid (air becomes trapped within its molecular structure).

• There is a fourth classification of brake fluid being **DOT 5.1**. Recent innovations have led to the development of a glycol ether-based fluid that now meets the characteristics as required under the industry standard DOT 5. It has the same dry and wet minimum boiling points and is basically DOT 4 fluids with higher boiling points.

Also being glycol ether-based it doesn't share the negative feature of silicone

based fluids or DOT 5, as air is not trapped within the silicone.

These are also sometimes known within the industry as **"DOT 4 plus"**.

DOT 5.1 is therefore the best of the best but it comes at a cost differential from DOT 3, DOT 4 and DOT 5 fluids.

Why should I buy brake fluid in small containers and not in bulk like engine oil?

Buying brake fluid in small containers and not using leftovers is paramount to having a safe and effective braking system as, once opened, the contents are drawing moisture and air and losing compression and therefore its optimum performance characteristics, the same as if sealed within your hydraulic braking system as described above. ●



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