

Basic Brake Fluid & Fluid Maintenance Information:

Brake fluid is hydroscopic, meaning it absorbs water. When new from the bottle, it can be considered "dry" with a higher boiling point. Over time, brake fluid absorbs water lowering its boiling point to the "wet" level.

As far as street cars are concerned, wet boiling point numbers are more important than dry because the fluid stays in your car for quite a while (maybe two years). After months of exposure to humid air and changing climate conditions, brake fluid performance is most likely closer to the wet boiling point than the dry boiling point.

Due to the extreme temperatures that high performance brake systems operate at, standard fluids are not recommended for track use.

Carbotech Performance Brakes do not sell and do not recommend using a silicone based brake fluid with any of its products. For more information please scroll down to the bottom of the page, it will be under the subject "a word of caution."

Changing old brake fluid removes water from the brake lines. Changing old brake fluid is extremely important because new (dry) brake fluid has a much higher boiling point, compared to older (wet) brake fluid. Compressible gas bubbles form when brake fluid boils, which can result in a soft brake pedal.

Once brake fluid soaks up moisture it thickens and will not be able to withstand the heat created under the pressure of heavy braking. What happens next is a significant drop in the fluids boiling temperature (wet boiling point). When the fluid boils it turns into vapor and forms air bubbles, and this can result in more pedal travel to properly apply the brakes (soft pedal). Do not confuse this with "brake fade" that occurs when the brake compounds get too hot as a result of prolonged braking or improper bedding. Brake fade requires greater and greater pedal effort to stop the vehicle while boiling fluid increases pedal travel and makes the pedal feel soft.

BLEEDING YOUR BRAKES

Bleeding the brakes is flushing the old brake fluid out of the master cylinder, brake lines, calipers and wheel cylinders and replacing it with fresh fluid. When bleeding your brakes, always start with the caliper farthest from the master cylinder. Have one person operating the bleed screw while another person slowly and repeatedly depresses the brake pedal. Make sure you CLOSE the bleed screw before the brake pedal is released. Always remember to NEVER put old fluid that has been drained out of the system, back into the master cylinder of any car. Please discard of any and all used brake fluid properly and responsibly.

Brakes can be bled manually (Carbotech recommends consulting with a properly trained technician before doing so) by taking a piece of clear tubing and attaching it to the bleeder screw on each caliper and wheel cylinder. By opening the screw and manually depressing and releasing the brake pedal to force the brake fluid through the lines.

Why bleed your brakes?

- To remove any moisture contamination that might have entered the system. Brake fluid needs to be replaced periodically, because brake fluid will absorb moisture over a period of time. This can occur with a vehicle that has been driven 60,000 miles a year, and it can occur on a vehicle that has been sitting in a garage for a year. Fluid contamination is

a function of time and humidity, and has nothing to do with the mileage driven. Moisture can enter the system through seals and through microscopic pores in the hoses. It should be noted that moisture can enter the system every time the fluid reservoir is opened, which is a good reason not to open it unnecessarily.

- To remove air bubbles that may have entered the system. Because of a leak or because the fluid level got too low. The air must be removed because it is compressible and can result in a soft spongy pedal.
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Carbotech Brake Fluid:



AP Racing Brake Fluids have been developed specifically for use under the arduous conditions encountered at the highest levels of motorsport. All AP Racing Brake Fluids are compatible with all hydraulic brake systems designed to conform to S.A.E. J1703 requirements. AP 600 Brake Fluid is intended for competition use only. AP 551 can be used for either competition or road use.

The new AP Racing PRF 660 has been developed for use in extreme high temperature racing conditions. Conforms to and exceeds FMVSS 116 DOT 4 and SAE J1703 and J1704.

AP Racing Formula DOT 5.1 Brake Fluid conforms to S.A.E. J1703 specifications and is ideal for High Performance Road Applications, Competition and Track Days.

All AP Racing Brake Fluids are Polyalkalene Glycol Ether based and are not a silicone based fluid. AP Racing does not sell and do not recommend using a silicone based brake fluid with any of its products.

Color variations may occur in AP 600 brake fluid due to its manufacturing process. This has no effect on the quality and performance of this product.

AP Racing Formula DOT 5.1 Road/Competition Brake & Clutch Fluid. Family No. CP4510

'Typical' New Dry Boiling Point - 275°C (527°F)

'Wet' E.R. (Equilibrium Reflux) Boiling Point - 184°C (363°F)

AP Racing Formula DOT 5.1 is a premium specification Motor Vehicle Brake and Clutch Fluid which conforms to and exceeds the current international specifications U.S. FMVSS No 116, DOT 3, DOT 4, and DOT 5.1, S.A.E. J1703, SAE J1704 and ISO4925. Suitable for High Performance Road Applications including vehicles fitted with ABS and ESP.



AP Racing Formula DOT 5.1 is **non silicone** based.

Superior -40°C (-40°F) viscosity makes it suitable for vehicles operating in cold climates.

AP Racing Formula DOT 5.1 fluid will mix safely with other DOT 5.1 fluids along with DOT 3 and DOT 4 Fluids conforming to the above specifications.

Note: Not suitable for vehicles with Mineral Oil Systems.

AP Racing 600 Competition Brake & Clutch Fluid. Family No. CP3600

'Typical' New Dry Boiling Point in excess of - 300°C (572°F)
'Wet' E.R. (Equilibrium Reflux) Boiling Point - 210°C (410°F)

AP 600 Fluid has been developed for racing applications where higher than normal temperatures are being experienced, e.g. when using carbon/carbon discs and the ultimate in brake fluid performance is required. It should be noted that before using AP 600 fluid, any existing brake fluid should be drained completely from the brake system. The system should be thoroughly purged with new AP 600 brake fluid and can then be filled completely with AP 600 fluid.

IMPORTANT NOTE

DO NOT USE AP600 fluid in contact with any type of magnesium components (e.g. gearbox / clutch components) as a chemical reaction is caused resulting in gases being generated. This will then prevent the clutch hydraulics from working efficiently.



AP Racing PRF660 Competition Brake & Clutch Fluid. Family No. CP4660

AP Racing PRF 660 has been developed for use in extreme high temperature racing conditions

'Typical' New Dry Boiling Point - 320°C
'Wet' E.R. (Equilibrium Reflux) Boiling Point - 199°C (390°F)

AP Racing PRF660 Fluid Conforms to and exceeds U.S. FMVSS No 116 DOT 4, SAE J1703 and SAE J1704 specifications and has been developed for racing applications where higher than normal temperatures are being experienced, e.g. when using carbon/carbon discs and the ultimate in brake fluid performance is required. It should be noted that before using AP Racing PRF660 fluid, any existing brake fluid should be drained completely from the brake system. The system should be thoroughly purged with new AP Racing PRF660 brake fluid and can then be filled completely with AP Racing 660 fluid.



IMPORTANT NOTE

DO NOT USE AP Racing PRF660 fluid in contact with any type of magnesium components (e.g. gearbox / clutch components) as a chemical reaction is caused resulting in gases being generated. This will then prevent the clutch hydraulics from working efficiently.

SILICONE BRAKE FLUIDS – A WORD OF CAUTION

Carbotech Performance Brakes & AP RACING NEITHER MARKETS SUCH FLUIDS NOR RECOMMENDS THEIR USE WITH OUR OWN OR ANY OTHER BRAKING SYSTEM

Virtually all of the problems with Silicone Brake Fluids relate to:

Long/spongy pedal
Sudden loss of brakes
Hanging on of brakes

They reflect certain properties of silicone fluids identified by us over many years and recently ratified in SAE publications, namely:

High ambient viscosity
High air absorption
High compressibility
Low lubricity
Immiscibility with water

Research has shown that the relationships between problems reported and properties identified may be expressed as follows:

Long /Spongy Pedal

- a) Compressibility, up to three times that of glycol based fluids
- b) High viscosity, twice that of glycol based fluids, leading to slow rates of fill and retention of free air entrapped during filling, and hence bleeding difficulties.

Sudden loss of brakes

- a) Air absorption. Gasification of absorbed air at relatively low temperature produces vapor lock effect.
- b) Immiscibility (failure to mix) with water. Whilst the presence of dissolved water will reduce the boiling point of glycol based fluids any free water entrapped in silicone-filled systems will boil and produce vapor lock at much lower temperatures (100°C or thereabouts)

Hanging on of brakes

- a) Low lubricity. In disc brake systems the sole mechanism for normalization of system pressure upon release of pedal pressure is a designed-in tendency of seals to recover to their 'at rest' attitude. Low lubricity works against this tendency.
- b) High viscosity exacerbates the effect of (a) above.

It should not be assumed, therefore, that the high price of silicone fluids implies higher performance in hard driving or even normal road use.

AP Racing glycol based fluids do not contain the adverse properties described above. The recently introduced [Formula DOT 5.1](#) which exceeds the performance criteria of DOT 5 (Silicone), is suitable for all conditions likely to be encountered in modern driving conditions.

Carbotech Disclaimer

Disclaimer:

Carbotech™ Performance Brakes AX™ and XP™ products are for use ONLY IN HIGH PERFORMANCE AND MOTORSPORT EVENTS. Motorsport is dangerous. No warrant or representation is made as to this product's ability to protect the user from injury or death. The user assumes that risk. Carbotech recommends that the user take all necessary safety precautions at all times.

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Returns:

You may return most new and uninstalled products within one month after the date they are shipped to you. To return products you must follow Carbotech's return procedures, including obtaining a return merchandise authorization (RMA) and returning products within one month after you receive an RMA. Carbotech has the right to refuse any return of used or installed product. Carbotech will not accept for return any products you purchased from a reseller.

Carbotech will refund the original purchase price of products, and related sales taxes. Except when Carbotech shipped incorrectly, SHIPPING & HANDLING, DELIVERY AND SIMILAR FEES (including related sales taxes) ARE NOT REFUNDABLE. YOU ARE RESPONSIBLE FOR PRODUCTS UNTIL CARBOTECH RECEIVES THEM. YOU WILL BE CHARGED A 15% RESTOCKING FEE TO RETURN PRODUCTS. THIS RETURN POLICY IS NOT A WARRANTY. Additional restrictions may apply.