QUANTUM DOT 4 BRAKE AND CLUTCH FLUID

1. Description

Quantum DOT 4 Brake & Clutch Fluid meets or exceeds the performance requirements of the following internationally recognised specifications;

- FMVSS 116 DOT 4
- SAE J 1704 (2004)
- ISO 4925 : 2005(E)

Today's rapidly changing automotive designs make it essential to ensure that your brake fluid has the necessary high boiling point, metal corrosion protection, elastomer compatibility, lubricity and fluidity over the possible operating temperature range. Quantum DOT 4 Brake and Clutch Fluid is a proprietary blend of selected glycols, glycol ethers and additives. Glycols provide the necessary lubricity to ensure the effective operation of the moving parts of the braking system. The glycol ethers work as diluents to give a blended fluid with the required fluidity to produce a rapid response to any pressure applied to the brake pedal as well as balancing seal compatibility and minimising vapour lock. The metal components of the braking system are protected by a combination of inhibitors and antioxidants that effectively eliminate corrosion and fluid degradation.

Even with today's leading technologies all brake fluids have finite effective lifetimes. As they pick up water from the atmosphere and through the flexible rubber brake pipes their boiling points fall rapidly, thereby increasing the risk of vapour lock and brake failure under modern traffic conditions. It is, therefore essential that brake and clutch fluid is changed at regular intervals. Consult your vehicle manufacturer's handbook for details.

We not support the use of conductivity-type testers to test the water content and boiling point of Quantum DOT 4 Brake and Clutch Fluid. We recommend using a boiling point tester of the type supplied by Alba Diagnostics (www.brakefluidtester.com). If the proper type of tester cannot be obtained then a Facility/Laboratory that can properly test the brake fluid in line with the FMVSS, SAE and ISO Standards should be used.

We strongly recommend that only fluids meeting the most exacting international standards are used as defined by the FMVSS, SAE and ISO committees.

2. Typical Properties

The following shows typical test data for Quantum DOT 4 Brake and Clutch Fluid.

QUANTUM
AUTOMOTIVE PARTS & CONSUMABLES

TECHNICAL DATA SHEET

QUANTUM DOT 4 BRAKE AND CLUTCH FLUID

TEST PARAMETER	DOT 4 Specification	Quantum Test Data
Equilibrium Reflux Boiling Point °C (ERBP)	230 min	≥ 245
Wet Equilibrium Reflux Boiling Point °C	155 min	≥ 160
FMVSS 571.116 Viscosity @ - 40°C (cSt) @ 100°C (cSt)	 1800 max 1.5 min	 1400 2.0
SAE J1704 Viscosity @ - 40ºC @ 100ºC	 1800 max 1.5 min	 1400 2.0
Specific Gravity @ 20°C	N/A	1.06
pH Value **Fluid Stability** (ERBP Change) High Temperature (°C) Chemical (°C)	7 - 11.5 +/- 3 max +/- 3 max	8.0 2.0 2.0
Effect on Rubber (SBR Rubber) 70°C Swell (mm) Softening (IHRD) Disintegration 120°C Swell (mm) Softening (IHRD) Disintegration	 0.15 - 1.4 10 max None 0.15 - 1.4 15 max None	 0.6 5 None 0.8 6 None
Effect on Rubber (SAE J1704) (EPDM Rubber) 70°C Volume Change (%) Softening (IHRD) Disintegration 120°C Volume Change (%) Softening (IHRD) Disintegration	 0 - 10 10 max None 0 - 10 15 max None	 3.0 3 None 5.0 5 None
Fluidity and Appearance at Low Temperatures -40°C Appearance Flow Time (Sec) -50°C Appearance Flow Time (Sec)	 Clear 10 max Clear 35 max	 Clear 4 Clear 9
Water Tolerance -40°C Appearance Flow Time (Sec) +60°C Appearance Sediment (%v/v)	 Clear 10 max Clear 0.15 max	 Clear 3 Clear < 0.10

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TEST PARAMETER (continued)	DOT 4 Specification	Quantum Test Data
Compatibility		
-40°C Appearance	Clear	Clear
+60°C Appearance	Clear	Clear
Sediment (%v/v)	0.15 max	None
Corrosion		
Weight Change (mg/cm2)		
Tinned Iron	0.2 max	< 0.1
Steel	0.2 max	< 0.1
Aluminium	0.1 max	< 0.1
Cast Iron	0.2 max	< 0.1
Brass	0.4 max	< 0.1
Copper	0.4 max	< 0.1
Pitting	None	None
Solution pH	7 - 11.5	8.0
Appearance of Test Liquid	No Gel or Crystals	Pass
Condition of Rubber after Corrosion Test	No Disintegration	None
Swell (mm)	1.4 max	0.5
Softening (IHRD)	15 max	5
Appearance	No Tack	None
Sediment (%v/v)	0.1 max	0.10
Resistance to Oxidation		
Weight Change (mg/cm2)		
Aluminium	0.05 max	< 0.05
Cast Iron	0.3 max	< 0.25
Appearance	No Gum or Pitting	Pass
Stroking Properties	To Pass	Pass

3. Description

Mixes safely with all brake and clutch fluids manufactured to SAE and DOT specifications. Use for complete changes and top ups. Avoid spillages on paintwork.

4. Precautions

Not suitable for Citroen or other brake fluid systems requiring mineral based fluids.

Contains Polyalkylene Glycol Ethers. IRRITANT – Risk of serious damage to eyes. Keep out of reach of children. Avoid skin and eye contact.

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5. Brake Fluid testing

Quantum recommends that customers should use a boiling point tester of the type supplied by Alba Diagnostics (www.brakefluidtester.com) to determine that the Quantum DOT 4 brake and clutch fluid conforms to the DOT 4 specification. If the proper type of tester cannot be obtained then a facility / laboratory that can properly test the brake fluid in line with the FMVSS, SAE and ISO Standards should be used. Research has confirmed that the use of conductivity-type testers to test brake fluid does not provide accurate results.

Investigations have found that conductivity testers do not test any part of the DOT 3, 4 or 5.1 specifications, and relies on the presumption (which is not always correct) that brake fluid has a conductivity of 0. This is used as the base point for the test and extrapolated into a result: 'percentage of water present' (not part of the DOT 4 specification).This result is then further extrapolated into an estimated boiling point on which a safety critical decision on the condition of the brake fluid is made.

Different brake fluids have different conductivity readings depending on the corrosion additive package and glycols used in manufacture, therefore presuming a conductivity of zero results in a flawed test method.

The Quantum product has undergone independent testing at an SAE certified laboratory to prove the DOT 4 brake Fluid meets the full requirements of the specification.

Testing the quality of brake fluid in use is just as important as the initial fill, therefore it is recommended that brake fluid is tested with a brake fluid tester which boils the fluid and gives a reading which relates to the relevant DOT specification. This is illustrated as the Wet Equilibrium Reflux Boiling point (WERBP) in the DOT 4 specification.