



Data Sheet

AO 1.8.32

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Product name

Brake Fluid 40 Plus

Category

Automotive Fluids

Description

Shell Brake Fluid 40 Plus is a high performance brake and clutch fluid with a minimum boiling point of 265°C [509°F], meeting or exceeding SAE J1704 and the FMVSS Nr.116 DOT 4 specifications and ISO 4925 Class 6 specifications. In addition, Shell Brake Fluid 40 Plus meets various severe corrosion requirements, incl. according to AFNOR.

The brake fluid forms an essential component in the braking system of a car. In service, the brake fluid absorbs moisture which causes a significant reduction in the boiling point of the brake fluid, with a consequent risk of vapour lock. Use of brake fluids meeting DOT 4 standard limits the effect of water absorption on the brake fluid boiling point.

Shell Brake Fluid 40 Plus provides extended system life to the brake components of a car by: i) offering a longer protection against corrosion during service life, i.e. by retaining a high reserve alkalinity over ageing, and ii) providing a better protection against corrosion at saline conditions.

Shell Brake Fluid 40 Plus has been designed for low viscosity performance at low temperature offering the potential of rapid response in advanced brake control systems, such as Electronic Stability Programme (ESP).

Shell Brake Fluids are completely miscible with one another and are compatible with other approved DOT glycol ether and borate ester brake fluids. **They must not be mixed with silicone type or silicate ester type brake fluids.**

Physical properties

Property	Unit	Test method	Value
Appearance	-	Visual	Clear yellow liquid
Density at 20 °C [68 °F]	g/ml	ASTM D4052	1.042-1.062
Water content	%(m/m)	ASTM D1364	max 0.20

Specifications & Typical Values

FMVSS 116 paragraph	Properties	Unit	DOT 4 Specification	Typical Value
5.1.1	Equilibrium Reflux Boiling Point (ERBP)	°C [°F]	230 [446] min ¹	273 [523]
5.1.2	Wet Equilibrium Reflux Boiling Point (WERBP)	°C [°F]	155 [311] min ²	176 [349]
5.1.3	Kinematic viscosity			
	At - 40 °C [-40 °F]	mm ² /s	1800 max ³	703
	At 100 °C [212 °F]	mm ² /s	1.5 min ⁴	2.1

¹ Shell Sales Specification : 265 °C [509 °F]

² Shell Sales Specification : 170 °C [338 °F]

³ Shell Sales Specification : max 750 mm²/s

⁴ Shell Sales Specification : 1.8 – 2.2 mm²/s

Specifications & Typical Values continued	FMVSS 116 paragraph	Properties	Unit	DOT 4 Specification	Typical Value
	5.1.4	pH (50% vol aqueous ethanol solution)		7.0–11.5 ⁵	7.8
	5.1.5	Fluid stability			
		(a) High temperature stability: ERBP change	°C [°F]	3.0 [5.4] max ^{6, 7}	1 [1.8]
		(b) Chemical stability: ERBP change	°C [°F]	3.0 [5.4] max ^{6, 7}	1 [1.8]
	5.1.6	Corrosion, test strip weight change,			
		Tinned iron	mg/cm ²	0.2 max	0.01
		Steel	„	0.2 max	<0.01
		Aluminium	„	0.1 max	<0.01
		Cast iron	„	0.2 max	0.02
		Brass	„	0.4 max	0.02
		Copper	„	0.4 max	0.03
		Pitting or etching		none	none
		Condition of fluid after test,			
		Gelling at 23 °C [73.4 °F]		none	none
		Deposit		not crystalline	none
		Sediment	%(v/v)	0.10 max	<0.05
		pH		7.0–11.5	7.9
		Condition rubber cup after test			
		Disintegration		none	none
		Hardness decrease	IRHD	15 max	6
		Diameter increase	mm	1.4 max	0.01
	5.1.7	Fluidity and appearance at low temperature			
		(a) At –40 °C [–40 °F]			
		Sludging, sedimentation, crystallisation or stratification		none	none
		Bubble flow time	s	10 max	2
		Appearance after warming to room temperature		as before test	pass
		(b) At –50 °C [–58 °F]			
		Sludging, sedimentation, crystallisation or stratification		none	none
		Bubble flow time	s	35 max	4
		Appearance after warming to room temperature		as before test	pass

⁵ Shell Sales Specification : 7.4 – 8.4

⁶ + 0.05° for each degree that the ERBP exceeds 225°C [437 °F]

⁷ Shell Sales Specification : 3 °C [5.4 °F] max.

**Specifications &
Typical Values
continued**

FMVSS 116 paragraph	Properties	Unit	DOT 4 Specification	Typical Value
5.1.8	Reserved			
5.1.9	Water tolerance (a) At -40 °C [-40 °F] Sludging, sedimentation, crystallisation or stratification Bubble flow time Appearance after warming to room temperature (b) At +60 °C [140 °F] Stratification Sedimentation	s %(v/v)	none 10 max as before test none 0.15 max ⁸	none 2 pass none <0.05
5.1.10	Compatibility (a) At -40 °C [-40 °F] Sludging, sedimentation, crystallisation or stratification (b) At +60 °C [140 °F] Stratification Sedimentation	 %(v/v)	 none none 0.05 max	 none none <0.05
5.1.11	Resistance to oxidation Test strips Pitting or etching Gum deposit Weight change Aluminium Cast iron	 mg/cm ² mg/cm ²	 none trace only 0.05 max. 0.3 max	 none pass 0.01 <0.01
5.1.12	Effect on SBR cups (a) 70hr at 70 °C [158 °F] Hardness decrease Appearance Base diameter increase (b) 70 hr at 120 °C [248 °F] Hardness decrease Appearance Base diameter increase	 IRHD mm IRHD mm	 0-10 no disintegration 0.15-1.40 0-15 no disintegration 0.15-1.40	 6 none 0.40 12 none 0.73
5.1.13	Stroking test properties		to pass	pass

⁸ Shell Sales Specification: 0.05 %(v/v) max.

Other Specifications	Specification clause	Properties	Unit	Specification		Typical Value
				min	max	
	D53 1258	Copper	mg/m ²	-7000	500	-200
		Brass	mg/m ²	-5000	500	-750
		Bronze	mg/m ²	-5000	500	-250
		Steel	mg/m ²	-1000	1000	0
		Iron	mg/m ²	-1000	1000	350
		Aluminium S7 G06	mg/m ²	-1000	1000	0
		Aluminium 2017 ^A	mg/m ²	-1000	1000	50
		Zinc Z-A4G	mg/m ²	-10000	5000	1850
		Apperance of fluid		no deposits		none
		ERBP after test	°C [°F]	min 130 [266]		156 [313]
		pH after test		6.0–11.0		7.8
		Watercontent after test	%(m/m)	min 3.3		4.7
	Specification clause	Properties	Unit	Specification	Typical Value	
	SAE J1704	Effect on EPDM slab stock				
		(a) 70 hr at 70 °C [158 °F]				
Hardness decrease		IRHD	0-10		1	
Appearance			no disintegration		none	
Volume increase		%	0-10		0.9	
(b) 70 hr at 120 °C [248 °F]						
Hardness decrease		IRHD	0-15		1	
Appearance			no disintegration		none	
	Volume increase	%	0-10		1.7	
Safety data	Property	Unit	Test method		Typical value	
	Flashpoint (PMCC)	°C [°F]	ASTM D93		140 [284]	
	Auto Ignition Temperature	°C [°F]	ASTM E659		>300 [>572]	

Test methods	<p>ASTM methods are published by the American Society for Testing and Materials, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, USA 19428-2959.</p> <p>SAE specifications are issued by the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096, USA.</p> <p>The Department of Transportation Specifications DOT 3, DOT 4 and DOT 5.1 are described under the Code of Federal Regulations (United States) Motor Vehicle Safety Standard Nr.116, Motor Vehicle Brake Fluids. Details are published in the Federal Register.</p> <p>ISO Standards are published under the supervision of the International Standards Organisation and are available from National Standards Institutes.</p> <p>AFNOR methods are published by the Association française de normalisation, 11, avenue Francis de Pressensé 93571 Saint-Denis La Plaine Cedex..</p> <p>SMS methods are issued by Shell International Chemicals B.V., Shell Research and Technology Centre, Amsterdam, The Netherlands, and are available through your local Shell Chemicals Company.</p> <p>The test methods mentioned above are not necessarily those used for quality control analysis, but such methods have been validated against them.</p>
Storage and handling	<p>Care should be taken to avoid moisture pick up.</p> <p>Further advice on storage and handling may be obtained from your local Shell company. Shell Brake Fluid 40 Plus is available from Shell in bulk and drums; details available on request.</p>
Hazard Information	<p>Before handling the product please read the Safety Data Sheet of Shell Brake Fluid 40 Plus carefully and follow the advice given.</p>
Product Code	U6239
	<p>The expression 'Shell Chemicals' refers to the companies of the Royal Dutch / Shell Group which are engaged in chemical businesses. Each of the companies which make up the Royal Dutch / Shell Group of companies is an independent entity and has its own separate identity.</p> <p>The information contained in this publication is to the best of our knowledge, true and accurate, but any recommendations or suggestions which may be made are without guarantee, since the conditions of use are beyond our control.</p> <p>Furthermore, nothing contained herein shall be construed as a recommendation to use any product in conflict with existing patents covering any material or its use.</p>
	<p>The above typical values do not constitute a specification.</p>