

**Shell Brake & Clutch Fluid DOT 4** is a Glycol Ether Borate based hydraulic brake fluid, specifically formulated to exceed the requirements of the internationally recognised hydraulic brake fluid standards: FMVSS No 116 DOT4, SAE J1704 and ISO4925 Class 4.

Designed to provide an elevated Equilibrium Reflux Boiling Point and Wet Equilibrium Boiling Point

The material composition and performance will ensure the safe and reliable operation of vehicle braking systems, the key points being;

**High Boiling Point** – Exceeds the minimum ERBP and WERBP requirements, therefore minimising the risk of vapour lock under extreme conditions

**Optimal Viscosity** – our product is manufactured to ensure the system remains responsive in very cold conditions whilst preventing leakage and maintaining good lubricity at high operating temperatures

**Corrosion Inhibition** – fully protecting the complete range of metallic components within the braking system against corrosion damage and potential system failure.

**Rubber Compatibility** – promotes the correct rubber swell / hardness of all rubber components to maximise the working life of system seals, ensuring a safe system operation

**Fluid Compatibility** - can be safely mixed with other brake fluids meeting the DOT 3 and DOT 4 specification. It is not compatible with a Mineral and Silicone oil based fluid.

#### **TYPICAL PROPERTIES**

Property	Units	Requirement	Shell Dot 4
Appearance	-		Clear and bright
Colour	-	Colourless to amber	Colourless to amber
Density @ 20 °C	g/cm³		1.07
Equilibrium Reflux Boiling Point (ERBP)	°C	230 min.	230 min.
Wet Equilibrium Reflux Boiling Point (WERBP)	°C	155 min.	155 min.
Viscosity @ -40 °C	mm²/s	1500 max.	1500 max.
Viscosity @ 100 °C	mm²/s	1,5 min.	1,5 min.
рН	-	7-11,5	7-11,5

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Property		Units	Requirement	Specification	Method	
					FMVSS 116	
Fluid Stability (High		°C	± 5	±5	SAE J1704	
temperature)					ISO 4925	
					FMVSS 116	
Fluid Stability		°C	±5	± 5	SAE J1704	
(Chemical)	(Chemical)				ISO 4925	
		Increase of	0 15 1 4	0 15 1 4		
		diameter, mm	0.15-1.4	0.15-1.4		
	70 °C	Hardness	10 may	10 may		
		decrease (IRHD)	10 max	10 max		
		Disintegration	none	none		
Effect on		Increase of	0.15-1.4	0 15 1 4	FMVSS 116	
SBR Rubber		diameter, mm	0.15-1.4	0.15-1.4	SAE J1704 ISO 4925	
SBR Rubber		Hardness	15 may	15 max		
	120 °C	decrease (IRHD)	15 max			
	120 C	Disintegration	none	none		
		Hardness	10 max.	10 max.		
		decrease (IRHD)	1011187.	10 11/08.		
		Disintegration	none	none		
		Volume increase,	0-10	0-10	FMVSS 116	
		%				
Effect on EPDM	120 °C	Hardness			SAE J1704	
Rubber	Rubber		15 max	15 max	ISO 4925	
		decrease (IRHD)				
		Disintegration	none	none		
		Appearance	As before test	As before test		
		Sludging,				
	-40 °C	sedimentation	none	none		
Eluidity and		crystallization				
Fluidity and appearance at		or stratification	10 may	10 may	FMVSS 116	
low		Flow time, secs	10 max As before test	10 max As before test	SAE J1704	
temperatures		Appearance	AS DEIDIE LESL	AS DETUTE LEST	ISO 4925	
temperatures		Sludging, sedimentation				
	-50 °C	crystallization	none	none		
		or stratification				
		Flow time, secs	35 max	35 max		
		1000 11110, 3003	551110	55 110		

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		Annoarance	As before test	As before test		
Water tolerance	-40 °C	Appearance	As before test	As before test		
		Sludging, sedimentation crystallization or stratification	none	none	FMVSS 116	
		Flow time, secs	10 max	10 max	SAE J1704	
	App 60 °C Strat	Appearance	As before test	As before test	ISO 4925	
		Stratification	none	none		
		Sediment, % v/v	0.15 max	0.15 max		
		Tinned iron	± 0.2 max	± 0.2 max		
	Wt.	Steel	± 0.2 max	± 0.2 max		
	change	Aluminum	± 0.1 max	± 0.1 max		
	(mg/cm2)	Cast iron	± 0.2 max	± 0.2 max		
	(mg/ cmz)	Brass	± 0.4 max	± 0.4 max		
		Copper	± 0.4 max	± 0.4 max		
	Pitting or etching		none	none		
	pH (after test)		7-11.5	7-11.5		
	Gelling at 23 ± 5 °C		none	none		
	Deposit		No crystalline	No crystalline		
Wet	Sediment, %v/v		0.1 max	0.1 max	FMVSS 116	
corrosion		Increase of diameter,	1.4 max	1.4 max	SAE J1704 ISO 4925	
	SBR rubber	Hardness decrease (IRHD)	15 max	15 max		
		Disintegration	none	none		
		Volume increase, %	10 max	10 max		
	EDPM Rubber	Hardness decrease (IRHD)	10 max	10 max		
		Disintegration	none	none		

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		I ·				
		Tinned iron	± 0.2 max	± 0.2 max		
	Wt. change	Steel	± 0.2 max	± 0.2 max		
		Aluminum	± 0.1 max	± 0.1 max		
	(mg/cm2)	Cast iron	± 0.2 max	± 0.2 max		
	(mg/cmz)	Brass	± 0.4 max	± 0.4 max		
		Copper	± 0.4 max	± 0.4 max		
Dry	Pitting or etching		none	none	FMVSS 116	
corrosion	pH (after test)		7-11.5	7-11.5	SAE J1704	
conosion	Gelling at 23 ± 5 °C		none	none	ISO 4925	
	Deposit		No crystalline	No crystalline	]	
	Sediment,	.%v/v	0.1 max	0.1 max		
	SBR	Disintogration		none		
	rubber	Disintegration	none			
	EDPM	Μ		none		
	Rubber	Disintegration	none			
		Sludging		none		
	-40 °C	sedimentation	none			
		crystallization or				
Compatibility		stratification				
		Stratification	none	none		
	60 °C	Sediment	0.05 max	0.05 max	FMVSS 116	
		%v/v				
		Pitting or			SAE J1704	
		etching (tin foil)	none	none	ISO 4925	
		Gum deposit	Trace only	Trace only		
<b>_</b> • • • •		Aluminum				
Resistance to oxidation		wt. change	0.05 max	0.05 max		
		mg/cm2				
		Cast iron wt.				
		change mg/cm2	0.3 max	0.3 max		
		change mg/ cmz				



#### **Storage and Handling**

- Consult and follow the specifications on the safety data sheet.
- Keep brake fluid in original packaging.
- After use, replace the cap tightly to avoid absorption of moisture and contamination caused by dirt, petroleum products or other materials.
- Brake fluid contamination affects its performances and may result in brake failure.
- Do not dispose this product in soil, water or sewers.
- Minor spills should be soaked up with, sand or absorbent granules.
- Dispose of content / container in accordance with local regulations.

#### **Hazards and Safety**

As with all chemical products, awareness and control of any potential hazards is of high importance. Please consult the material safety data sheet which is available detailing the hazards associated with this product.

The content of this Technical Data Sheet has been prepared by taking into consideration the relevant international standards and the information contained in specifications of vehicle and equipment manufacturers. This Technical Data Sheet and the statements in content cannot be interpreted as a guarantee commitment in respect of product specifications or usage in any application.

It is the consumer's responsibility to use this product in accordance with its ordinary purpose and comply with the applicable laws and regulations. Kemetyl Kimya San. Tic. Ltd. *Sti. shall not be held responsible for any claims or damages arising out of abnormal use, improper usage, use for the wrongful purposes or risks and consequences by the nature of product structure.* 

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