

# Technical Data Sheet (TDS)

## Shell Antifreeze Concentrate

### MEG Based Inorganic Additive Coolant Concentrate



**Shell Antifreeze Concentrate** is an engine coolant concentrate (antifreeze) based on mono ethylene glycol, containing no nitrites, amines or phosphates (NAP free). This product is suitable for both petrol and diesel engines, carefully chosen additives give the following properties in aqueous mixtures:

1. Thermal characteristics that permit effective engine cooling without boiling.
2. Anticorrosion protection of all metals and alloys used in the cooling system of modern vehicles.
3. Protection against frost, depending on the concentration chosen.
4. Compatibility with rubber and plastics used in the cooling system.
5. Excellent antifoaming characteristics.

| Typical Properties Shell Antifreeze Concentrate |                                     |
|-------------------------------------------------|-------------------------------------|
| Appearance                                      | Clear liquid, blue-green            |
| Density @ 20 °C                                 | 1,125 g/cm <sup>3</sup> ASTM D 4052 |
| pH (50% vol in water)                           | 8,9 ASTM D 1287                     |
| Freezing Point (50% vol in water)               | -37 °C ASTM D 1177                  |
| Boiling Point (100%)                            | 169 °C ASTM D 1120                  |
| Boiling Point (50% vol in water)                | 109 °C ASTM D 1120                  |
| Reserve Alkalinity (ml HCl N/10)                | 17 ml ASTM D 1121                   |
| Foaming Characteristics at 88 °C                | ASTM D 1881                         |
| - Height                                        | 30 ml                               |
| - Breaktime                                     | 2 seconds                           |

*\*These are typical properties and do not constitute a specification, for specification limits please refer to the product specification.*

**Shell Antifreeze Concentrate** complies with the following quality standards:

|               | Group                | Standard       |
|---------------|----------------------|----------------|
| USA           | ASTM Standards       | ASTM D3306     |
| UK            | British Standards    | BS 6580 : 2010 |
| France        | French Standards     | NF R15-601     |
| Germany       | FVV Standards        | FVV Heft R443  |
| Australia     | Australian Standards | AS 2108        |
| International | SAE Standards        | SAE J1034      |
| Spain         | UNE Standards        | uNE 26361      |
| Austria       | Austrian Standards   | ONORM V 5123   |
| Italy         | CuNA Standards       | NC 956-16      |

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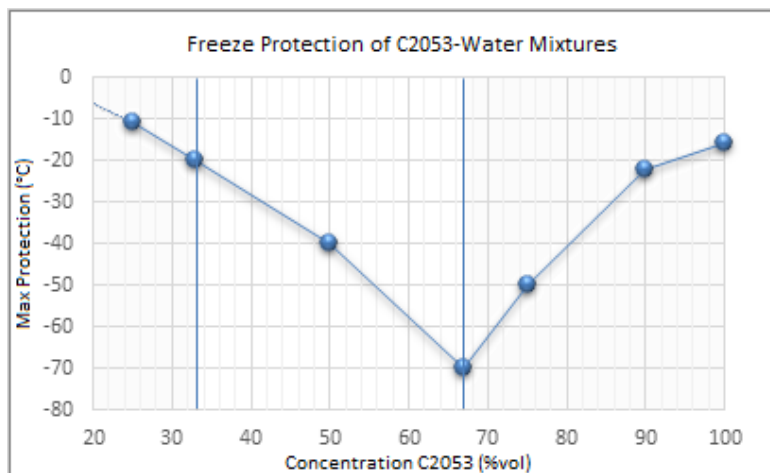
These specifications as well as many years of practical experience in the field have demonstrated that **Shell Antifreeze Concentrate** engine coolant concentrate is suitable for use with all type of cars currently manufactured in Europe.

#### Freeze Protection

**Shell Antifreeze Concentrate** is a concentrated product and should be diluted for use with good quality water. Kemetyl recommends that for optimum performance distilled or deionized water is used. The freeze protection afforded by the various dilutions is detailed in the table below:

| Concentration (vol %) | H2O (vol %) | Freeze Protection (°C) |
|-----------------------|-------------|------------------------|
| 33                    | 67          | -20                    |
| 50                    | 50          | -40                    |
| 67                    | 33          | -70                    |

In order to provide a satisfactory level of corrosion protection it is recommended to use at least 33% (1:2) volume of **Shell Antifreeze Concentrate** in the coolant solution. In line with most car manufacturers Kemetyl recommends a 50% (1:1) volume solution for optimum performance. For cold climates use 67% (2:1) volume, concentrations above 67% volume are not recommended and give no advantage.



Freezing Protection = Average of Freezing Point (ASTM D1177) and Pour Point (ASTM D97)

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#### Corrosion Protection

Protection from corrosion is the most important function of a coolant concentrate and is achieved by the inclusion of a well-balanced inhibitor package. In modern engines with the greater use of aluminium alloys and thinner section castings, avoidance of corrosion problems is critical. The corrosion products in engine cooling systems can circulate within the system causing fouling which leads to overheating problems.

The inhibitor package of **Shell Antifreeze Concentrate** is the result of very extensive testing which includes laboratory tests, simulated service tests, static engine test and field service trials. The tables below demonstrate the effective corrosion protection provided when tested against the industry standards such as ASTM D1384 (multi-metal corrosion in glassware) and ASTM D4340 (corrosion of cast aluminium alloys under heat-rejecting conditions).

#### ASTM D1384

(Glassware Corrosion, mg per test piece)

| Test Specimen | Monoethylene Glycol<br>(33% vol in H2O) | Shell Antifreeze<br>(33% vol in H2O) | ASTM D3306 limit |
|---------------|-----------------------------------------|--------------------------------------|------------------|
| Copper        | 6,5                                     | 2                                    | 10               |
| Solder        | 345                                     | 2                                    | 30               |
| Brass         | 8                                       | 4                                    | 10               |
| Steel         | 1474                                    | 2                                    | 10               |
| Cast Iron     | 2472                                    | 1                                    | 10               |
| Aluminium     | 30                                      | 3                                    | 30               |

#### ASTM D4340

(Corrosion of Cast Aluminium Alloys under Heat-Rejecting Conditions)

| Mass Change (mg/cm <sup>2</sup> /week) | ASTM D3306 Limit |
|----------------------------------------|------------------|
| -0,1                                   | 1,0              |

#### Compatibility

Although it is always recommended to use deionized or demineralized water to dilute antifreeze, **Shell Antifreeze Concentrate** is formulated to be able to cope with different water qualities and is compatible with hard water. **Shell Antifreeze Concentrate** is compatible with all types of plastics and rubbers used in engine coolant systems.

**Shell Antifreeze Concentrate** is fully miscible with other coolants and can be safely mixed with them. However, optimal performance and longevity of service can only be guaranteed by exclusive use of **Shell Antifreeze Concentrate**.

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#### Storage and Handling

**Shell Antifreeze Concentrate** has a shelf life of at minimum two years when stored in air tight containers at a maximum temperature of 30°C. Translucent containers should not be stored outside in direct sunlight, especially in warm climates. **Shell Antifreeze Concentrate** can be stored in mild steel, lacquer lined or HDPE containers. As with any glycol-based engine coolant the use of galvanized steel is not recommended for pipes or any other part of the storage/mixing installation.

Disposal of used or unused coolant must be carried out in accordance with local and national law, consult the material safety data sheet for further information.

#### 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. Şti. 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.*

*This Technical Data Sheet shall be valid on issue date. Right to amend information provided in content of this Technical Data Sheet without prior notice is reserved.*