



STABLE. SAFE. ELECTRIFIED®
Coolant protection designed for your EV

ELECTRIFIED®

FHEV PHEV BEV FCEV

Low electrical conductivity coolants
GLYSANTIN® G26® ELECTRIFIED®

Place, Date

BASF
We create chemistry



ELECTRIFIED®

Our aspiration

- Mobility solutions and sustainability trends are continually evolving, creating new technologies while presenting new challenges.
- With our industry partners we are researching and developing, transforming challenges to opportunities and creating a foundation for future mobility.



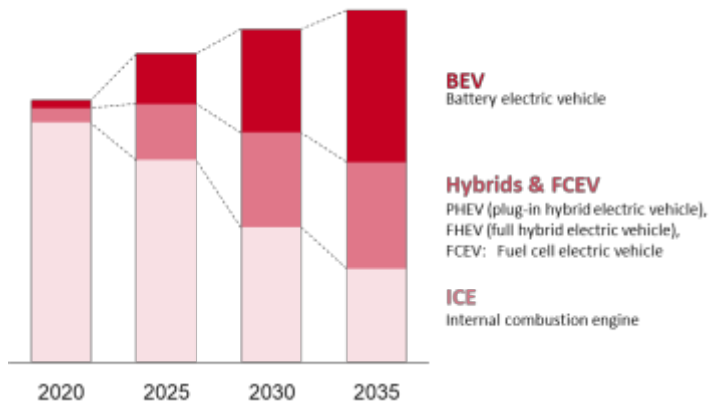
FHEV PHEV BEV FCEV

BASF
We create chemistry

Key facts

- **Electrification**, driven by CO₂- and other emission regulations, is transforming the automotive market.
- The share of battery electric vehicles (BEV) is growing faster and faster → Almost 31% of newly built cars in 2030 will be pure BEV (2035: 43%)

Car built rate (Mio units)



[Backup details](#)

Source: BASF Global Automotive Steering Committee, 04/2025



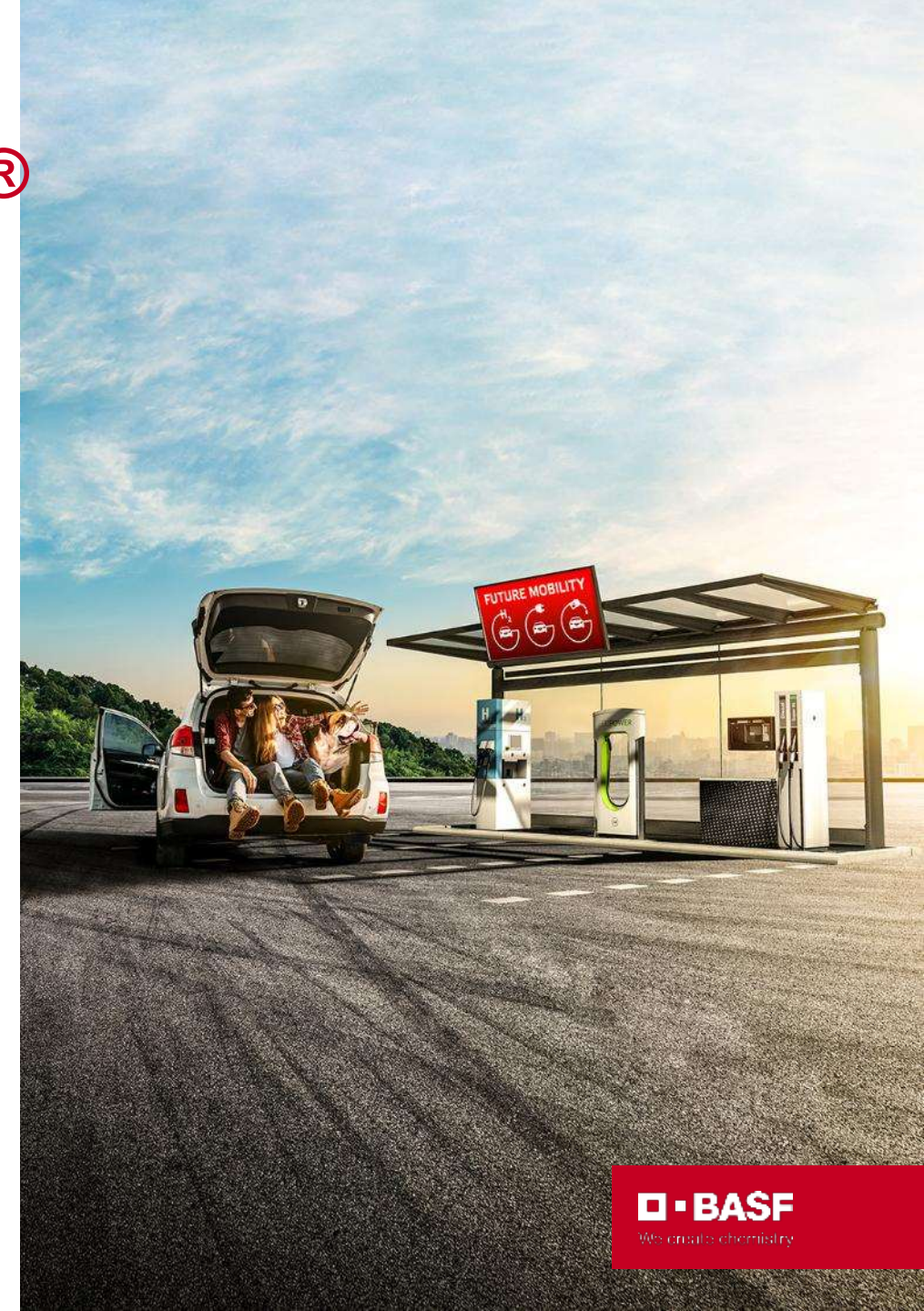
FHEV PHEV BEV FCEV

GLYSANTIN® ELECTRIFIED®

Premium engine coolants for all future mobility requirements

GLYSANTIN® has developed a **dedicated product family** to **meet and exceed** all essential requirements in **safety, performance** and **lifetime** of the respective powertrain technology.

We are ready for new mobility concepts and are excited to shape the future!



Overview of existing powertrains

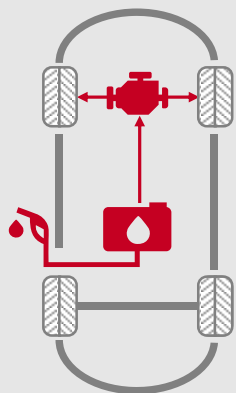
From ICE to FCEV

Powertrain

ICE engine dependent

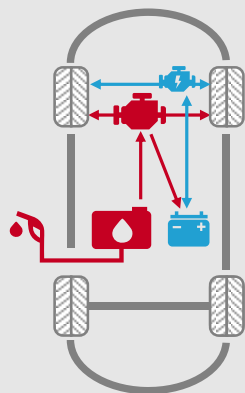
ICE

Internal Combustion Engine (incl. 48V hybrids)



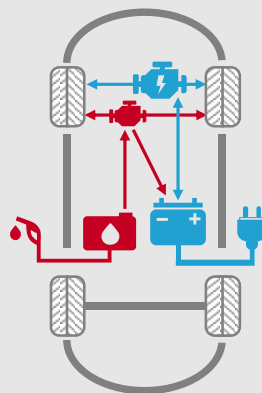
FHEV

Full Hybrid Electric Vehicle



PHEV

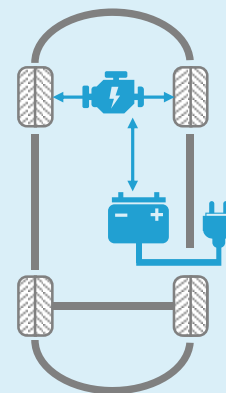
Plug-in Hybrid Electric Vehicle



Full electric vehicle

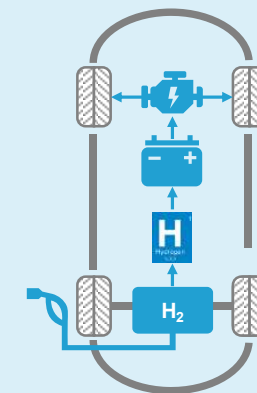
BEV

Battery Electric Vehicle



FCEV

Fuel Cell Vehicle



Primary energy source

Gasoline, diesel
Alternative fuels:
CNG, LNG, LPG

Gasoline

Gasoline

Electricity from grid

Hydrogen



Fuel tank



Battery



Fuel Cell

Powertrain technology determines requirements of engine coolant

Efficient and safe thermal management is a must for all (future) powertrains

	ICE Internal Combustion Engine (incl. 48V hybrids) 	FHEV Full Hybrid Electric Vehicle 	PHEV Plug-in Hybrid Electric Vehicle 	BEV Battery Electric Vehicle 	FCEV Fuel Cell Vehicle 
Powertrain	Gasoline or diesel engine			E-motor	
Storage & generator element	Tank			Battery	
Typical temp.	90 °C			30 °C ¹	70-90 °C
Peak temp.	130 °C			110 °C ²	110 °C
Cooling Circuits	1 cooling circuit	single to multiple cooling circuits			
Coolant volume	as known	average: similar volume like ICE ³			higher than ICE

1) low-temperature circuit, battery type
2) electric engine, power electronics
3) Volume depending on vehicle size/

GLYSANTIN® ELECTRIFIED® offers a solution for every powertrain

	ICE Internal Combustion Engine (incl. 48V hybrids) 	FHEV Full Hybrid Electric Vehicle 	PHEV Plug-in Hybrid Electric Vehicle 	BEV Battery Electric Vehicle 	FCEV Fuel Cell Vehicle 
Powertrain	Gasoline or diesel engine			E-motor	
Engine coolant	GLYSANTIN® ELECTRIFIED® product family with broad approval range for all powertrains, including dedicated solutions for pure BEV and FCEV. R&D for specific solutions; e.g., low electrical conductivity coolants				

Der Schutz-Garant.

GLYSANTIN®

A brand of BASF

ELECTRIFIED®

H₂













GLYSANTIN® G26® ELECTRIFIED® Our dedicated battery coolant for electrified vehicles is suitable for every separate battery cooling circuit

	ICE Internal Combustion Engine (incl. 48V hybrids) 	FHEV Full Hybrid Electric Vehicle 	PHEV Plug-in Hybrid Electric Vehicle 	BEV Battery Electric Vehicle 	FCEV Fuel Cell Vehicle 
Powertrain	Gasoline or diesel engine			E-motor	
Engine coolant	GLYSANTIN® G26® ELECTRIFIED® can be applied to all separate low temperature cooling / battery cooling circuits and battery thermal management systems across the depicted powertrains. 			FC stack	

BASF's Automotive Fluids selling premium Coolants & Brake Fluids

Coolants

OEM-approved premium Coolants for all existing and future powertrains.



Coolants, also known as antifreeze, protect engines from overheating, corrosion and frost.



Brake Fluids

Premium DOT4 Class 6 and 7 Brake Fluids for all existing and upcoming brake technologies.



Brake fluids are hydraulic fluids used in hydraulic brake systems, transferring the braking force.

We serve the Automotive Industry and Industrial Applications with broadly approved premium products

Industry	Automotive			Non-Automotive
Market segment	First Fill (FF)	OEM Service	Aftermarket	Industrial
Description	New built vehicles being filled with Engine Coolants / Brake Fluids	Vehicle servicing at an OEM-owned workshop	Vehicle servicing at independent workshops / by end consumer	First Fill and servicing of e.g., stationary engines, wind turbine, marine
Car age	2-5 years >5 years			
				

We offer OEM-approved, IATF-certified and regionally produced premium products and can support you even further

Products

Our strengths

Our brands

Coolants

- **OEM-approved** premium products
- Broad product portfolio supporting **all powertrains**
- Offering **sustainable product solutions**
- **Global & IATF 16949-certified** production footprint
- Excellent **supply reliability & supply chain management**
- Outstanding **technical expertise & services**
- Offering **regulatory & sustainability services**
- **Long track record** serving the Automotive Industry



ELECTRIFIED®
ECO

Brake Fluids



A glance of GLYSANTIN®: A brand of BASF since 1929



Invented and patented by BASF in **1929**, **GLYSANTIN®** proudly represents the **world's first patented engine coolant** with a history for more than **96 years**.



Ever since, the brand and its products have **continuously evolved** to **meet and exceed** the developing market **needs** while at the same time contributing to a **sustainable development**.

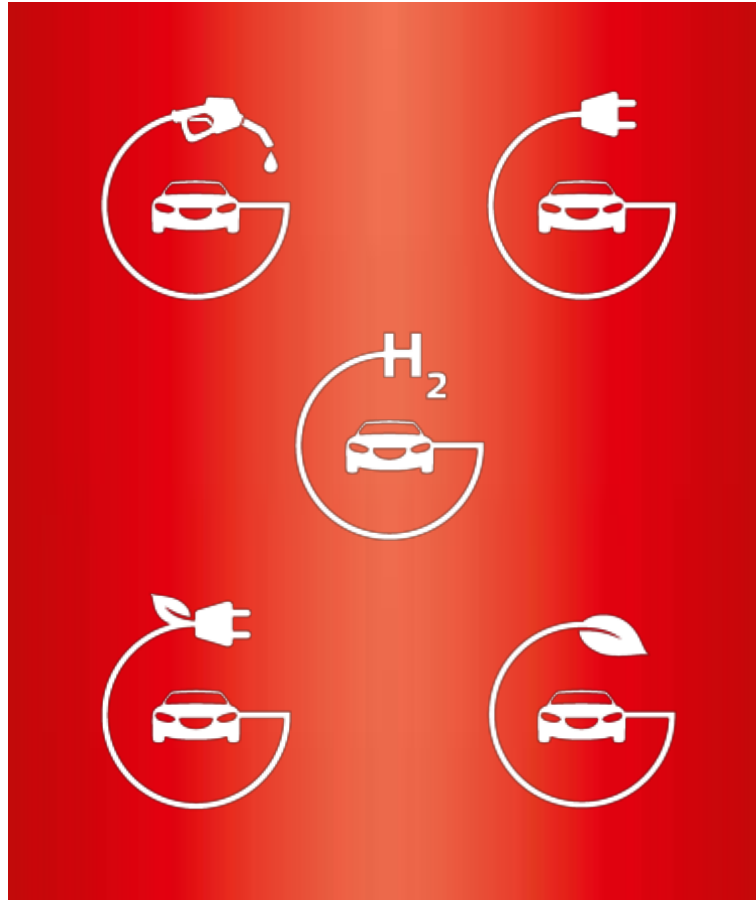


Today, **GLYSANTIN®** offers market leading solutions with **measurable sustainability contributions** for **current & future mobility** and other industrial applications.

GLYSANTIN® – Premium Coolants with sustainability contribution and suitability for every powertrain

GLYSANTIN® ELECTRIFIED®

Tailormade solutions for specific requirements of **current and future mobility concepts**



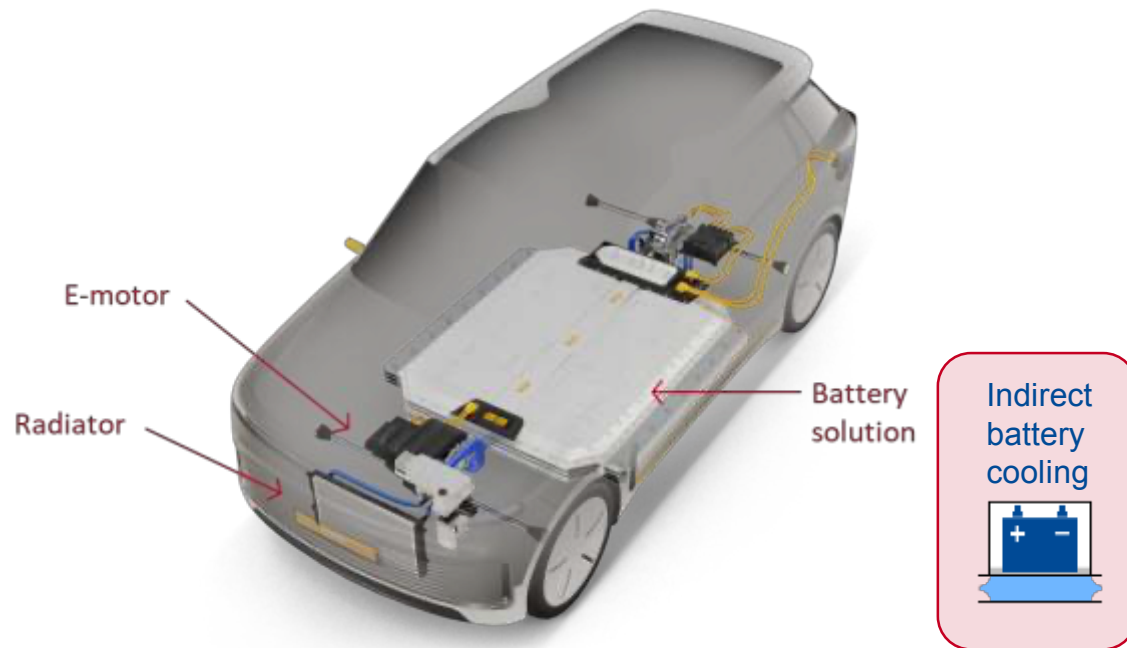
GLYSANTIN® ECO

Market leading solutions with **measurable sustainability contributions**, including concepts for low product carbon footprints and circular solutions



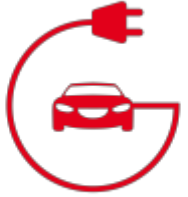
Indirect cooling of BEVs

Scheme: Indirectly cooled **BEV** powertrain



Source: [BASF virtual car](#) → powertrain → BEV





Indirect cooling of BEVs

Concept and coolant requirements



Powertrain concept:

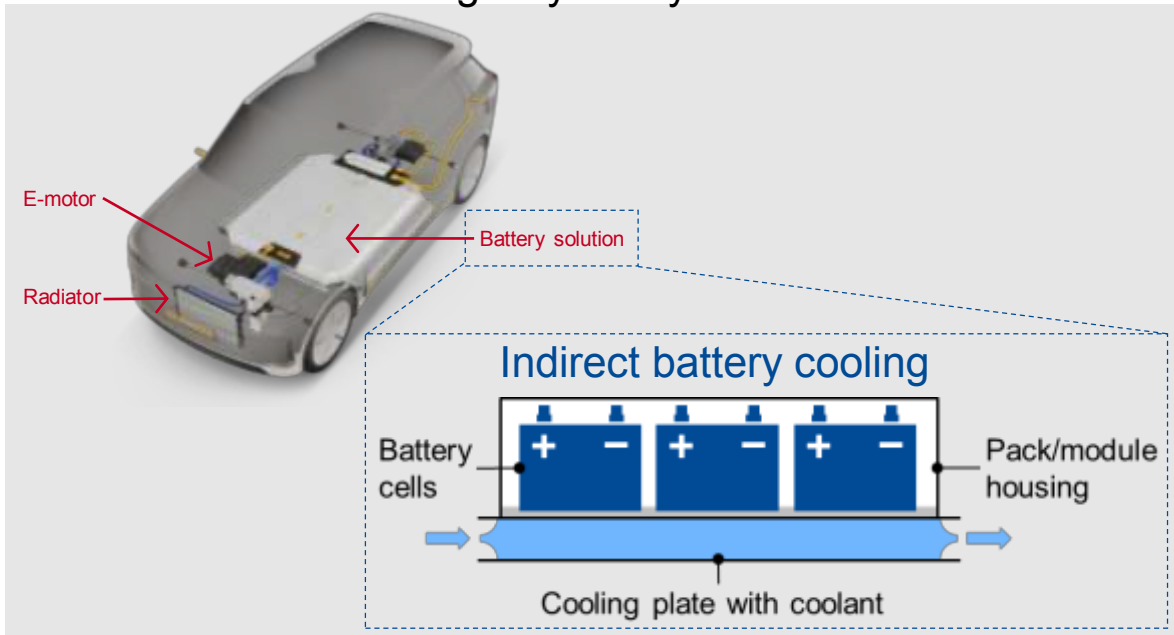
Fully electric vehicle. Energy is stored in a lithium-ion battery pack, charged by an external power source. The battery represents one of the highest value parts in the BEV, thus its longevity is key.

Requirements for the coolant (additional to ICE requirements) Standard requirements

- Cool / heat battery pack to maintain optimal operating temperature
- Compatibility with all materials of the BEV cooling circuit
- Corrosion protection in a broad temperature window

Additionally

- Amount of coolant strongly depending on battery capacity
- Additional Coolant properties to increase vehicle safety desirable



Source: [BASF virtual car](#) → powertrain → BEV
Backup: [Heat generation in electric vehicles](#)



Low Electrical Conductivity Coolants (LECCs) increase the safety of electrified vehicles

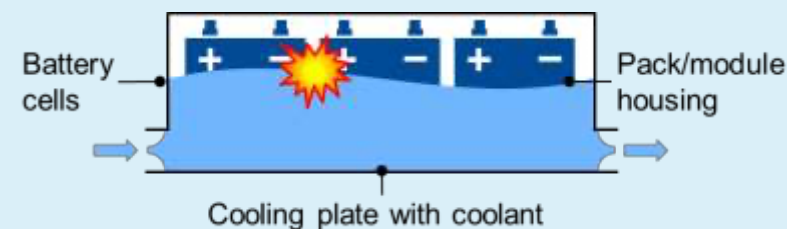
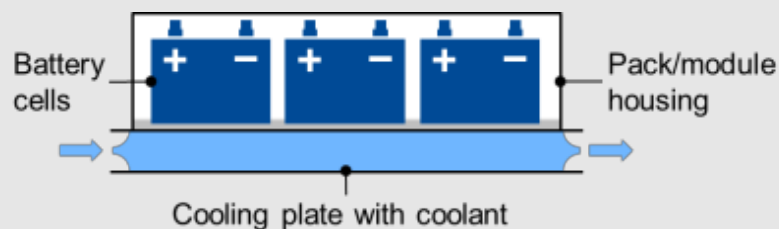
Operational modes of indirect cooling systems in electrified vehicles

Scenario

Regular driving, parking, charging

Crash, system failure

Battery pack



Cooling circuits and battery cells

- No direct contact between coolant and battery cell
- Safe condition and operation

- Direct contact between coolant and battery cell
- H_2/O_2 generation in the presence of water and conducting fluid
- Self discharge & leak currents
- Overheating, fire, explosion

LECCs maintain a low and stable current

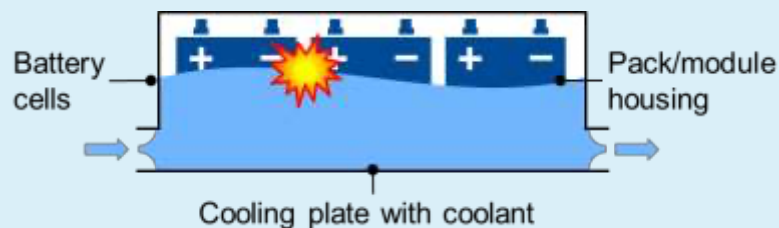
Low and stable currents when exposed to voltage sources



Scenario

Crash, system failure

Battery pack

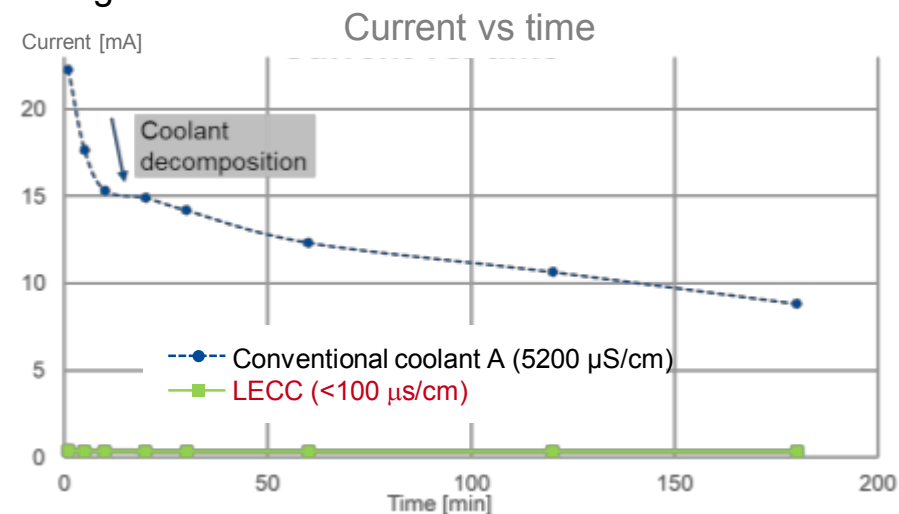


Cooling circuits and battery cells

- Direct contact between coolant and battery cell
- H_2/O_2 generation in the presence of water and conducting fluid
- Self discharge & leak currents
- Overheating, fire, explosion

LECC

Low electrical conductivity leads to low and stable currents & low fluid decomposition when exposed to voltage sources





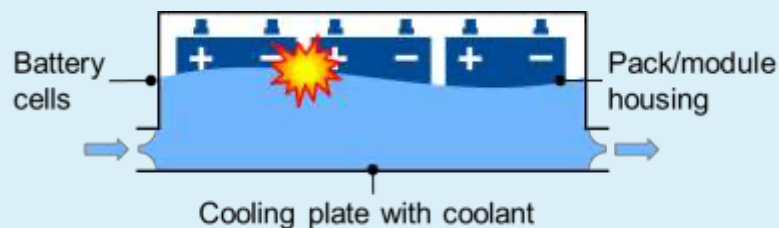
LECCs lead to a low generation of hydrogen

Low generation of hydrogen when exposed to voltage sources

Scenario

Crash, system failure

Battery pack

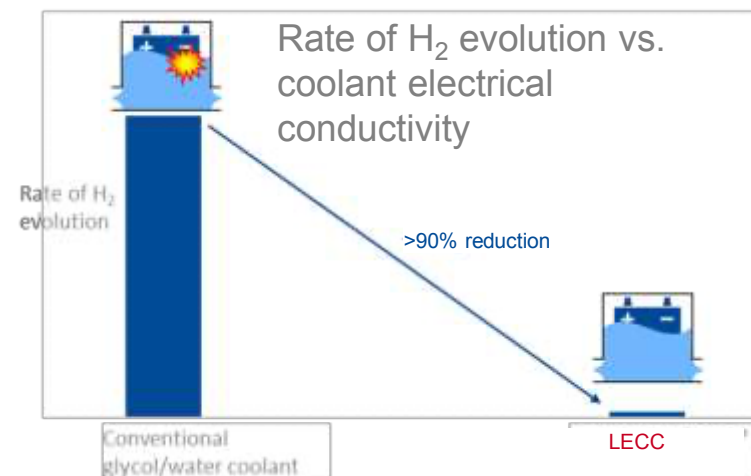


Cooling circuits and battery cells

- Direct contact between coolant and battery cell
- H_2/O_2 generation in the presence of water and conducting fluid
- Self discharge & leak currents
- Overheating, fire, explosion

LECC

Low electrical conductivity leads to low generation of hydrogen upon contact to a voltage source



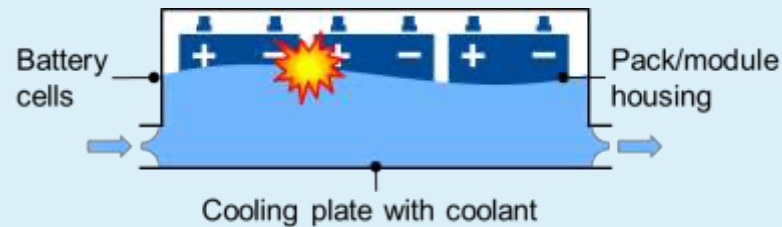
LECCs do not show self discharge reactions



Scenario

Crash, system failure

Battery pack



Cooling circuits and battery cells

- Direct contact between coolant and battery cell
- H_2/O_2 generation in the presence of water and conducting fluid
- Self discharge & leak currents
- Overheating, fire, explosion

LECC

- No self discharge due to stable and low current
- Drastically **reduced formation of explosive H_2/O_2 mixtures** due to minimal H_2 evolution
 - No thermal runaway reaction
 - No fire
 - No explosion

Our LECC - GLYSANTIN® G26® ELECTRIFIED®

Due to its low electrical conductivity,
GLYSANTIN® G26® ELECTRIFIED®
maintains low and stable currents when
exposed to a voltage source.

This translates into low fluid decomposition,
low generation of hydrogen and low self-
discharge,
making it a safety optimized product
for electrified vehicles.

Furthermore, **GLYSANTIN® G26®
ELECTRIFIED®** is fully compliant with the
requirements published in the GB 29743.2-2025
standard.



FHEV

PHEV

BEV

FCEV

BASF

We create chemistry

GB 29743.2-2025 National Standard

Mandatory standard for electrified vehicles

In 2023, the **Ministry of Transport in China** initiated the definition of a national standard (GB 29743.2-2025) describing the **mandatory use of low electrical conductivity coolants (LECC)** for electrified passenger cars in China to **increase safety**. The mandatory implementation of such electric vehicle coolants became effective on **October 1st, 2025**.

To date, the scope includes pure **battery electric vehicles (BEV)**, **plug-in hybrid electric vehicles (PHEV)**, **full hybrid electric vehicles (FHEV)**, **mild hybrids** (e.g., 48V hybrids), **fuel cell electric vehicles (FCEV)** as well as **electric trucks and buses**.



China National Standards
中华人民共和国国家标准



GB 29743.2-2025 National Standard Timeline

2023

- Aug 2022, LECC GB task force set-up
- Mar 2023, first workshop in Shanghai
- Aug 2023, first GB draft published



1st round NEV GB workshop

2024

- Jan, the third workshop in Beijing
- Oct, the modified version released after consolidation of the comments from the industry



3rd round NEV GB workshop

2025

- Mar 28, the final GB version approved and published
- Oct 1st, the GB will start to be effective



Release of the GB draft (3rd edition GB)



Official Release of NEV GB (final Edition will be published)

Mar

May

Nov

Jan

Oct

Mar

Oct

2nd round closed-door discussion between MOT and OEMs

Release of the GB draft for comments (1st edition GB)

Release of the GB draft (2nd edition GB)

Officially implemented on October 1st



GLYSANTIN® ELECTRIFIED®

GLYSANTIN® G26® ELECTRIFIED® as new LECC

Besides offering a broad portfolio of conventional and dedicated coolants, **GLYSANTIN®** has developed a new LECC (GLYSANTIN® G26® ELECTRIFIED®) **complying** to the new GB 29743.2-2025 standard. This was **confirmed** by various third-party test laboratories, such as e.g. SGS and MoT.*

We are ready for new mobility concepts and are excited to shape the future together with you!

* SGS-CSTC Standards Technical Services Co., Ltd, Shanghai, China
Research Institute of Highway Ministry of Transport (MoT), China

GLYSANTIN® portfolio [suitable for every powertrain](#)

Cover page of test reports for GLYSANTIN® G26 ELECTRIFIED®
Confirms compliance to GB 29743.2-2025 standard



Our LECC - GLYSANTIN® G26® ELECTRIFIED®

GLYSANTIN® has developed a new **low electrical conductivity coolant (LECC)**.

GLYSANTIN® G26® ELECTRIFIED® shows **excellent corrosion protection, flux compatibility and elastomer compatibility**. Furthermore, **GLYSANTIN® G26® ELECTRIFIED®** is **fully compliant** with the requirements published in the **current GB 29743.2-2025 standard (confirmed by external test institutes*)**.

We are ready for new mobility concepts and are excited to shape the future together with you!

* SGS-CSTC Standards Technical Services Co., Ltd, Shanghai, China
Research Institute of Highway Ministry of Transport (MoT), China



FHEV PHEV BEV FCEV

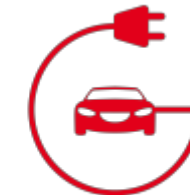
GLYSANTIN® G26® ELECTRIFIED®: Product characteristics



GLYSANTIN®'s latest LECC GLYSANTIN® G26® ELECTRIFIED® offers the following benefits:

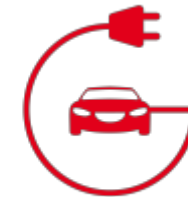
- MEG-based, fully formulated product with effective inhibitors to meet upcoming GB 29743.2-2025
- Comprehensive additive package
 - Effective organic corrosion inhibitors for copper and brass
 - OAT combination for long-life corrosion protection of steel, aluminum and its alloys
 - Excellent flux compatibility
- Global marketability
 - Compliant with Chinese and EU regulations
 - Including bittering agent and dye

Physical-chemical data of GLYSANTIN® G26® ELECTRIFIED®



Parameters	G26: Typical result <u>RM/50</u>	G26: Typical result <u>Concentrate</u>	Method
Appearance	according to sample	according to sample	Visual
Water content, %	48.9	0.3	DIN 51777
Density at 20 °C, g/cm³	1.069	1.113	DIN 51757
pH as-is	8.5	8.3	ASTM D1287
Reserve alkalinity, mL HCl 0.1 mol/L	0.6	1.2	ASTM D1121
Refractive index at 20 °C	1.387	1.432	DIN 51423
Electrical conductivity in µS/cm at 25 °C	80 – 90	25 – 30	ASTM D1125
Freezing point, °C	-40	-	ASTM D1177
Boiling point, °C	>108	>165	ASTM D1120
Ash, %	-	0.1	ASTM D1119

Results of glassware corrosion tests according to GB 29743.2-2025 玻璃器皿腐蚀



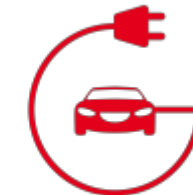
GB 29743.2-2025 80 °C, 336 h, 33% , aeration 6 L/h	Specification GB 29743.2-2025	G26
Weight change	mg/coupon	mg/coupon
Copper	±10	0.2 ✓
Brass	±10	0.2 ✓
Steel	±10	0.3 ✓
Al ZL101A (AlSi7Mg)	±10	2.2 ✓
Al 3003 (Mn)	±10	2.1 ✓
Al 4043 (Si)	±10	1.6 ✓
Al 6063 (Mg)	±10	2.7 ✓

- Excellent **corrosion protection**, even for high dilution & corrosive salt content beyond typical operation conditions
- **Stable pH and RA** indicate good long-life behavior



Results from 3rd party test report, SGS

Corrosion under heat-rejection according to GB 29743.2-2025

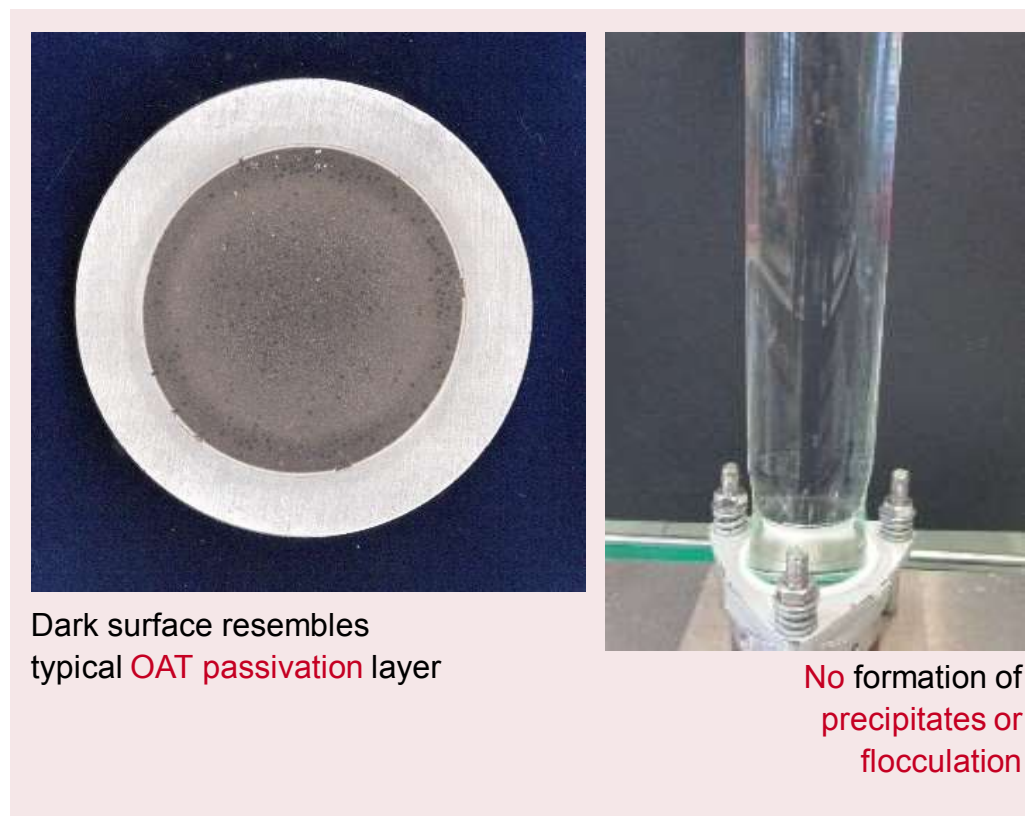


GB 29743.2-2025 135 °C, 168 h	Specification GB 29743.2-2025	<u>G26</u>
Corrosion rate	$\leq \pm 1.0$	0.1 ✓
Fluid visual appearance	Precipitate ≤ 0.05 mL	≤ 0.05 mL ✓

pH before test		8.3
pH after test		7.9
RA before test		0.3
RA after test		0.3

- Extremely low corrosion rate
- No formation of precipitates or flocculation
- Stable pH and RA indicate good long-life behavior
- Dark surface resembles typical OAT passivation layer

Results from 3rd party test report, SGS





Dynamic bench tests: GLYSANTIN® G26® ELECTRIFIED® meeting GB 29743.2-2025

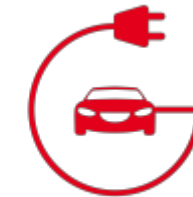
GB 29743.2-2025 80 °C, 1064 h, RM/50, 15 L/min,	Specification GB 29743.2-2025	<u>G26</u>
Weight loss	mg/coupon	mg/coupon
Copper	±10	2.0 ✓
Brass	±10	2.8 ✓
Steel	±10	0.5 ✓
Al ZL101A (AlSi7Mg)	±10	8.0 ✓
Al 3003 (Mn)	±10	8.2 ✓
Al 4043 (Si)	±10	6.0 ✓
Al 6063 (Mg)	±10	7.9 ✓
pH after test	6.5~10.0	7.5 ✓
Δ pH before and after test	±1.0	-0.8 ✓
F-ion concentration after test	Reported	8 ✓
Electrical conductivity after test	≤ 300 μS/cm	91 μS/cm ✓

Strong customer support ensured due to installation of over half a dozen test rigs for dynamic bench testing at BASF Shanghai.



Results from 3rd party test report, SGS

Foam, hard water, storage & rubber compatibility according to GB 29743.2-2025



GLYSANTIN® G26 ELECTRIFIED®: Full compliance with requirements from GB 29743.2-2025

Foam test, 30°C	GB 29743.2-2025	<u>G26</u>
Volume, mL	≤100	10 ✓
Breakdown time, s	≤5	1 ✓
Foam test, 80°C	GB 29743.2-2025	<u>G26</u>
Volume, mL	≤100	5 ✓
Breakdown time, s	≤5	0.4 ✓
Hard water stability	GB 29743.2-2025	<u>G26</u>
Sediment volume, mL	≤0.05	<0.05 ✓
Storage stability	GB 29743.2-2025	<u>G26</u>
Color change, sediment	no change	no change ✓

EPDM compatibility	GB 29743.2-2025	<u>G26</u>
Hardness change, IRHD	±5	-4 ✓
Volume change, %	±5	3 ✓
Tensile strength at break change, %	±15	-6 ✓
Elongation at break change, %	±30	14 ✓

Si-rubber compatibility	GB 29743.2-2025	<u>G26</u>
Hardness change, IRHD	±5	1 ✓
Volume change, %	±5	4 ✓
Tensile strength at break change, %	±15	-8 ✓
Elongation at break change, %	±30	-8 ✓

Results from 3rd party test report, SGS

Excellent flux compatibility: No gel formation



Flux test with G26 RM/50 300 ppm flux, 60 °C, 168 h	<u>G26</u>	Comparative sample
Δ pH: before and after test	-1.0	-1.5
Gel formation	None ✓	Yes ✗
Fluid appearance		
Test specimen		

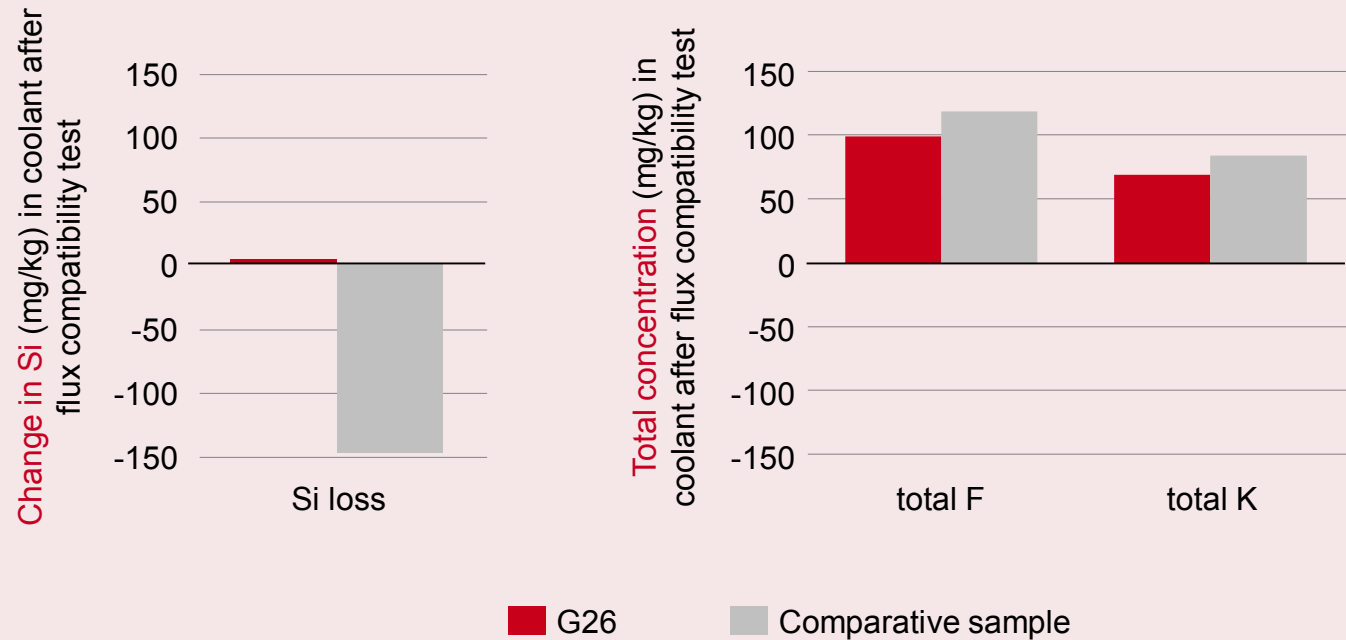
GLYSANTIN® G26®
ELECTRIFIED® shows
excellent flux compatibility:

- No formation of gel
- Uniform passivation of aluminum
- Little pH-drop confirms a stable and well-balanced formulation

Excellent flux compatibility: Low flux dissolution



Fluid analysis after flux compatibility testing



GLYSANTIN® G26®
ELECTRIFIED® shows
excellent flux compatibility in
comparison to other samples:

- **Lower depletion** in Si
corrosion inhibitor
- **Lower flux dissolution**
tendency (total fluoride (F)
and potassium (K))

Excellent performance of GLYSANTIN® G26® ELECTRIFIED® in OEM fleet tests

GLYSANTIN® G26® ELECTRIFIED® has been tested by various OEMs in fleet tests, showing excellent performance

Only small changes in electrical conductivity and pH observed

Vehicle type	Milage (km)	Electrical conductivity of G26 (µS/cm)	pH
BEV	110,000	123 ✓	8.2 ✓

Vehicle type	Milage (km)	Electrical conductivity of G26 (µS/cm)	pH
REEV	50,000	120 ✓	7.9 ✓



Our LECC - GLYSANTIN® G26® ELECTRIFIED®

GLYSANTIN® G26® ELECTRIFIED® is our newly developed **low electrical conductivity coolant (LECC)**, specifically designed to **fully comply** with the **GB 29743.2-2025** standard.

As MEG-based LECC with **comprehensive additive package**, it shows **superior corrosion protection** and **excellent foam, hard water, storage & rubber compatibility**.

Compliance with GB 29743.2-2025 standard confirmed by third-party test laboratories:
SGS-CSTC Standards Technical Services Co., Ltd, Shanghai, China
Research Institute of Highway Ministry of Transport (MoT), China

Cover page of test reports for **GLYSANTIN® G26 ELECTRIFIED®**
Confirms compliance to GB 29743.2-2025 standard



GLYSANTIN® & GLYSANTIN® G26® ELECTRIFIED®

Dedicated premium battery coolants for indirect cooling applications of electrified vehicles

As the first patented engine coolant of the world,
GLYSANTIN® ELECTRIFIED® wants to offer premium engine,
battery and fuel cell coolants for all future mobility requirements.

We thus developed our low electrical conductivity coolant (LECC)
GLYSANTIN® G26® ELECTRIFIED® fully compliant with the
latest GB 29743.2-2025 standard, **confirmed** by various third-
party test laboratories, such as e.g. SGS and MoT.*

Contact us – let's shape the future together!



* SGS-CSTC Standards Technical Services Co., Ltd, Shanghai, China
Research Institute of Highway Ministry of Transport (MoT), China