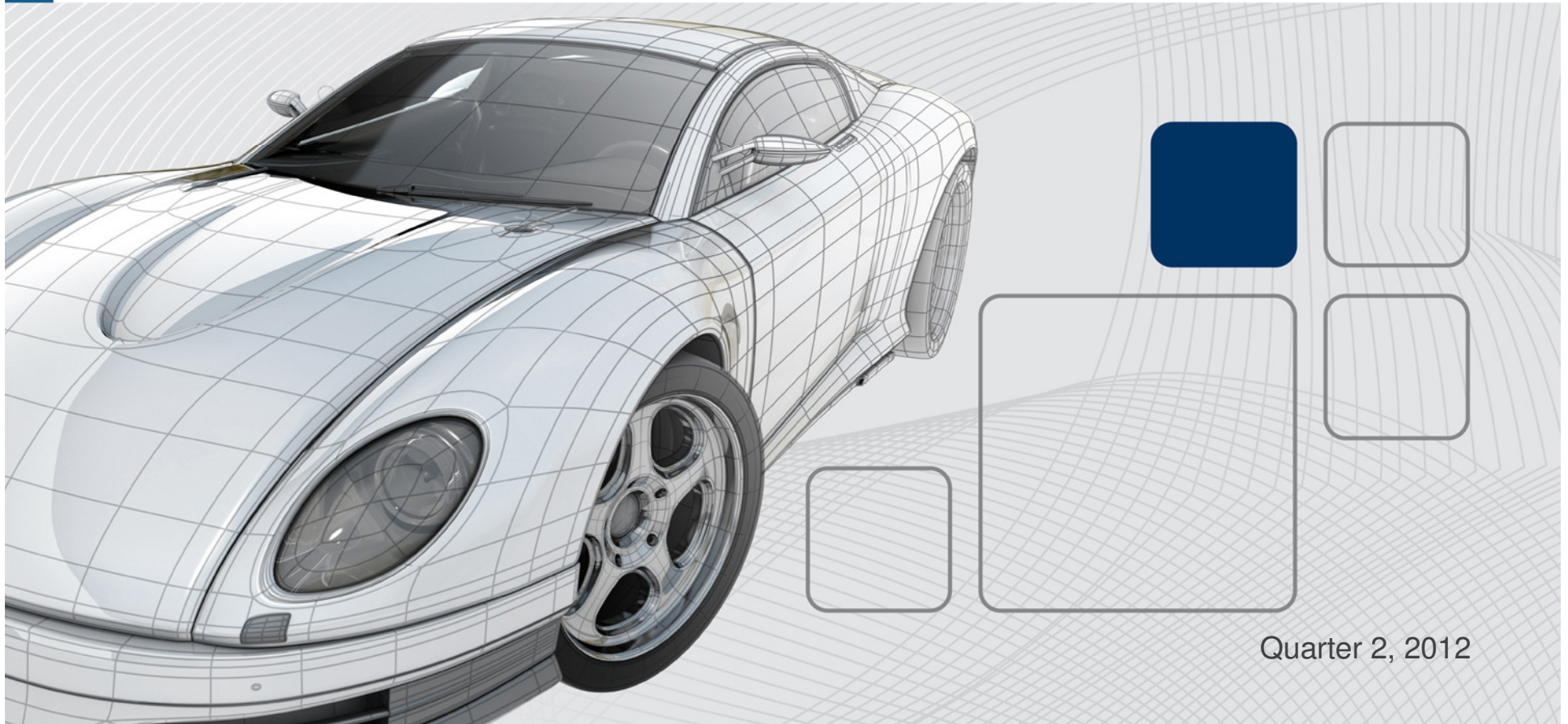




## Advanced Materials

Raising insulation performance in car electronics



Quarter 2, 2012

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# Raising performance

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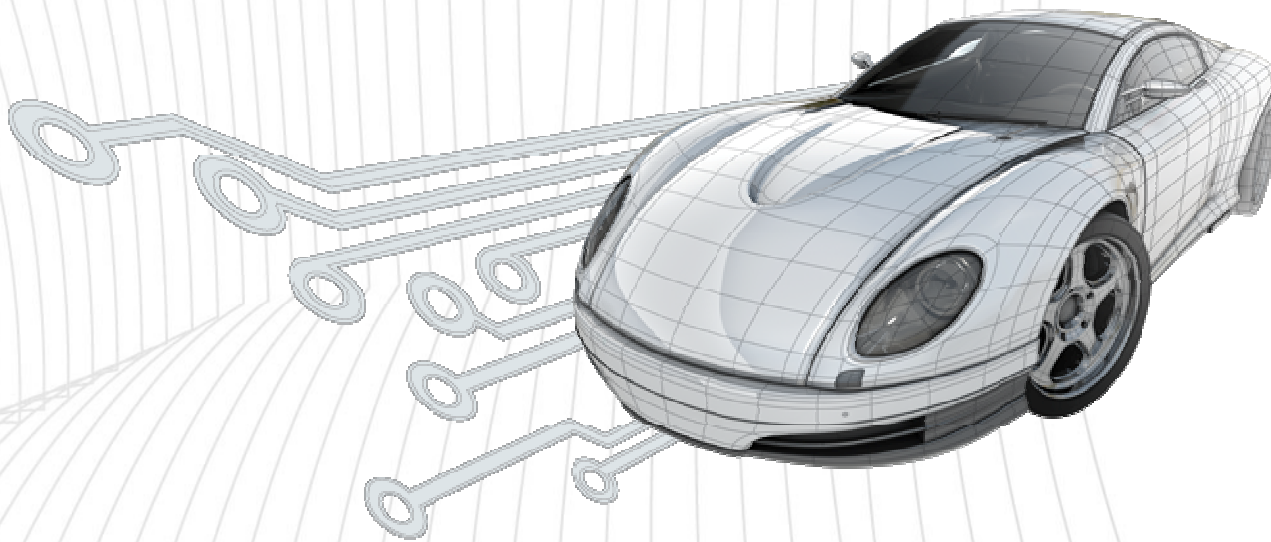
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## Reliability and protection for electronic devices



- Araldite® insulating systems for ignition coils
- Araldite® and Arathane® encapsulants for harsh environments
- Probimer® soldermasks for high temperature performance
- Focus on e-mobility

# Improved endurance for ignition coils

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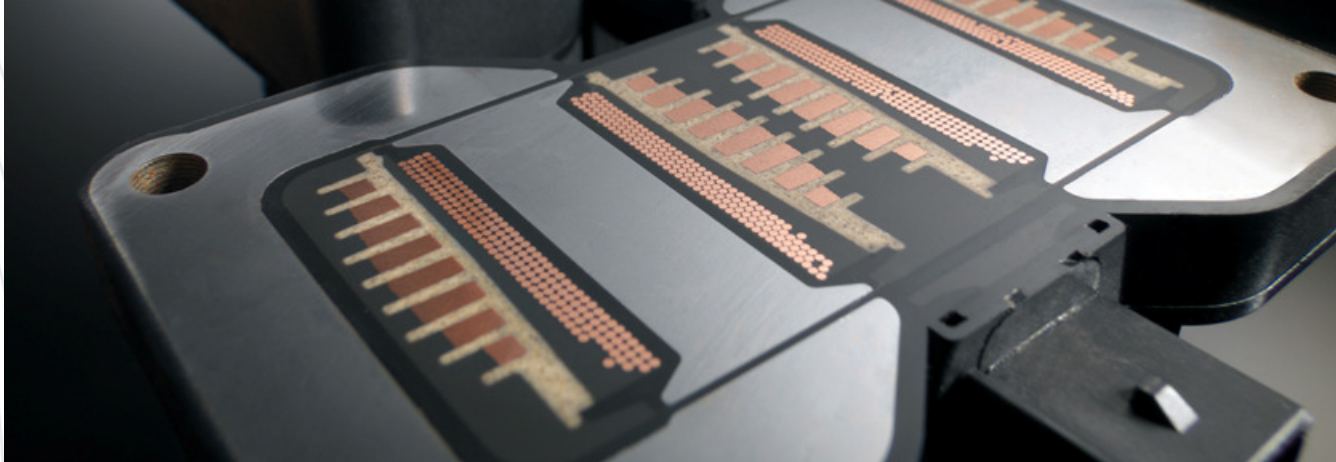
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## Main features and benefits

- Impregnation of fine wire windings (30 $\mu$ m)
- Operating temperature 150-180°C / >1000 hrs
- Thermal shock / thermal mismatch (-40° / +140°C)
- High voltage resistance (up to 30 KV/mm)
- Crack resistance
- Adhesion to thermoplastic housing / bobbin
- Compatibility with integrated PCB
- Dielectric strength, dielectric constant

# Improved endurance for ignition coils

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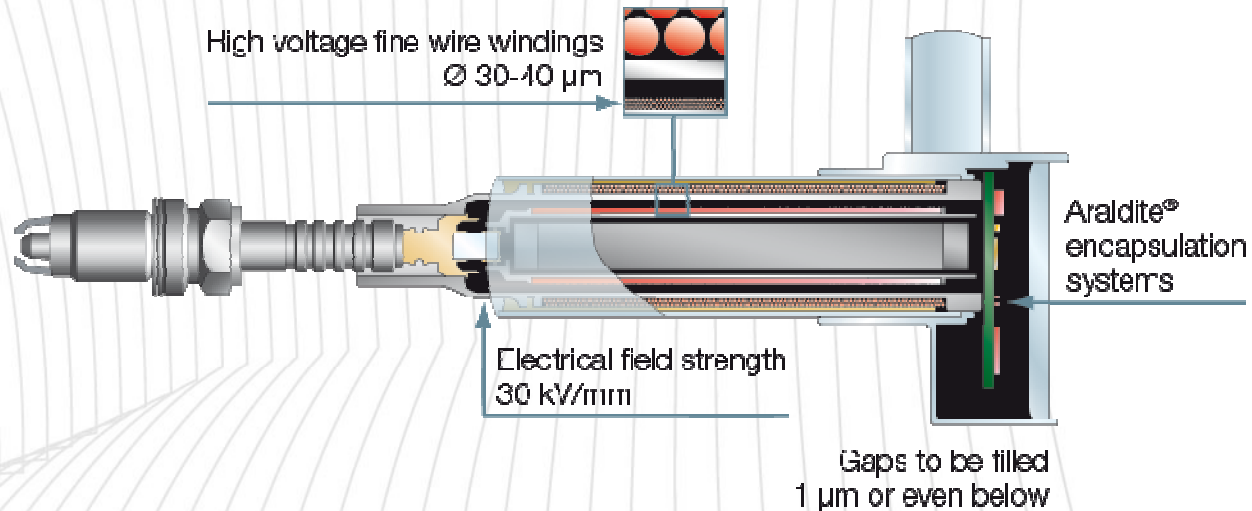
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## Manufacturing process: vacuum potting

- Mass production => Short cycle times (10´000 parts per day and equipment)
- Fast filling (gaps 1 mm)
- Short curing (current 4 - 6hrs, future 0.5 - 2hrs)

# Insulation systems for easy processing

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**Araldite®**

build  
bond  
protect

## Araldite® CW 5725-3 / Aradur® HY 5726

<b>Curing conditions</b>	Hot	
<b>Tg</b>	144° C	ISO 11357-2
<b>CTE</b>	35 10 <sup>-6</sup> K <sup>-1</sup>	ISO 11359
<b>Thermal class</b>	H	IEC 60085
<b>Hardness shore D at 23° C</b>	D90	DIN 53505
<b>Flammability</b>	UL 94 / HB	Class / Requirements

# Insulation systems for high Tg

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**Araldite®**

build  
bond  
protect

## Araldite® CW 5763 / Aradur® HY 5726

<b>Curing conditions</b>	Hot	
<b>Tg</b>	126° C	ISO 11357-2
<b>CTE</b>	33 10 <sup>-6</sup> K <sup>-1</sup>	ISO 11359
<b>Thermal class</b>	H	IEC 60085
<b>Hardness shore D at 23° C</b>	D90	DIN 53505
<b>Flammability</b>	UL 94 / HB	Class / Requirements

# Insulation systems for high performance

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**Araldite®**

build  
bond  
protect

## Araldite® CW 5742 / Aradur® HY 5726

<b>Curing conditions</b>	Hot	
<b>Tg</b>	210° C	ISO 11357-2
<b>CTE</b>	38 10 <sup>-6</sup> K <sup>-1</sup>	ISO 11359
<b>Thermal class</b>	N	IEC 60085
<b>Hardness shore D at 23° C</b>	D90	DIN 53505
<b>Flammability</b>	UL 94 / HB	Class / Requirements



# Insulation systems comparison

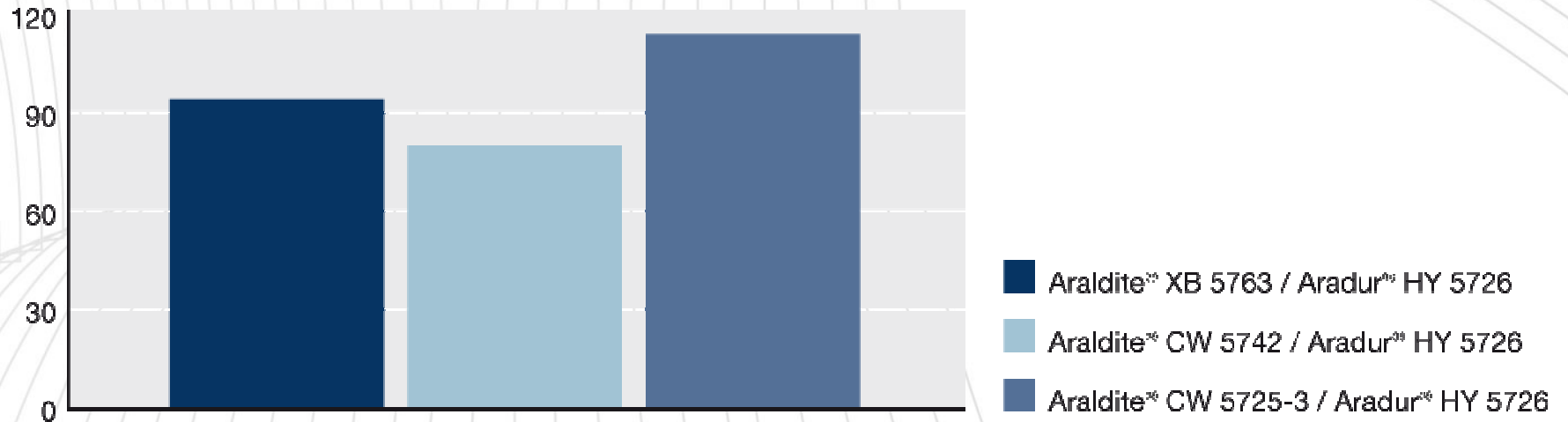
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## Flexural strength in Mpa



# Insulation systems comparison

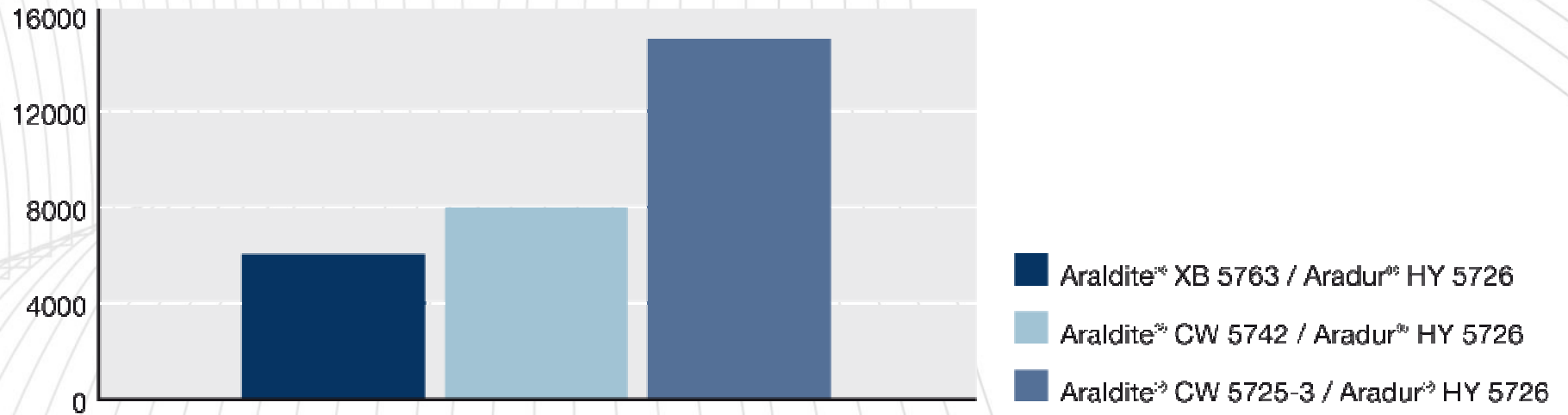
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## Viscosity at 60°C in Pa.s



# Insulation systems comparison

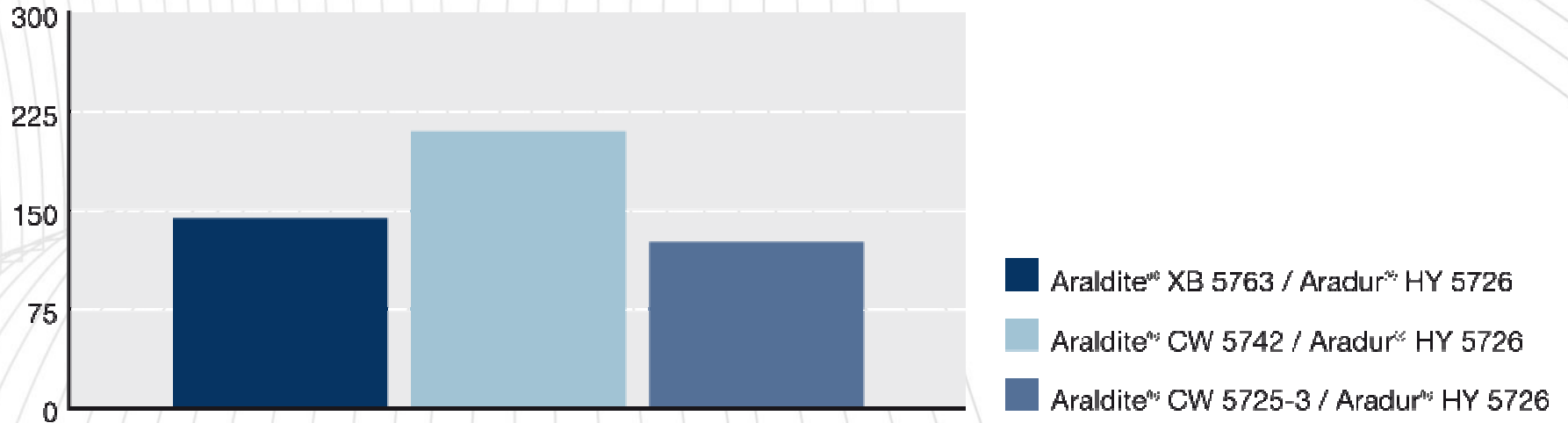
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## Glass transition temperature $T_g$ in °C



# E-mobility partner

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## The next technological leap for automotive industry

New environment regulations towards CO<sub>2</sub> reduction, rising fuel prices and growing mobility, all are factors that trigger the need to develop alternative propulsion forms in automotive market. Thus electrification of powertrain systems has been becoming a major area of focus for OEMs and industry suppliers.

Hunstman offers a wide range of encapsulating solutions meeting the most stringent requirements in terms of processibility, thermal management, dielectric and mechanic properties.

For plug-in-hybrids, semi-hybrids to full-electric vehicles, our products can be used in e-motors, inverters and converters as well as ECUs.

# Encapsulation for e-motors

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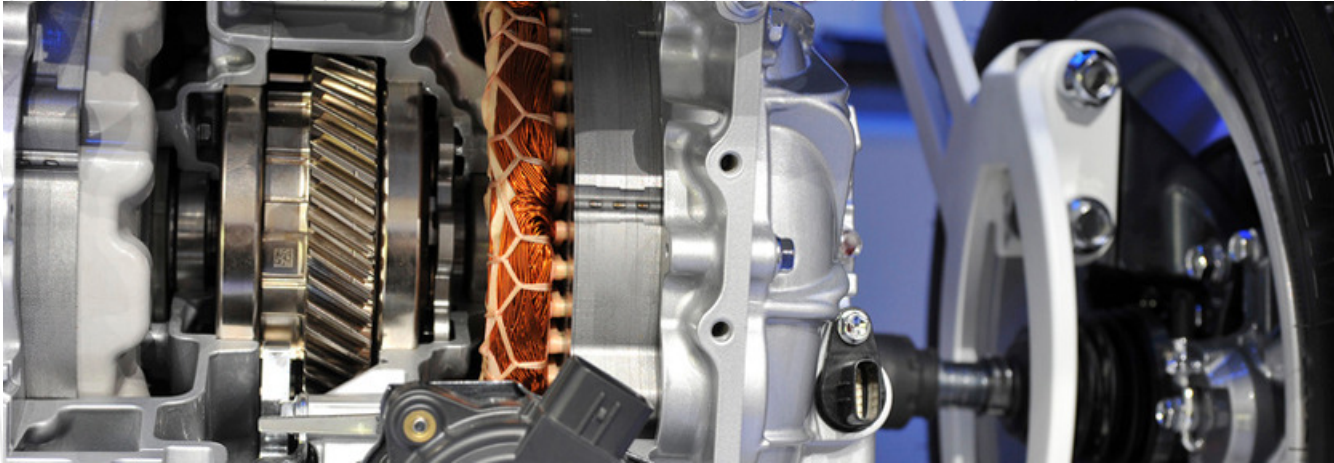
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## Main features and benefits

- High operating temperature / thermal endurance
- Thermal mismatch / low CTE
- Crack resistance / toughness
- Heat conductivity

# Encapsulation for e-motors

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**Araldite®**  
build  
bond  
protect

## Aratherm® XB 2731

<b>Curing conditions</b>	Hot	
<b>Tg</b>	160° C	ISO 11357-2
<b>CTE</b>	20 / 55 10 <sup>-6</sup> K <sup>-1</sup>	Below Tg / Above Tg
<b>Thermal class</b>	H	IEC 60085
<b>Thermal conductivity at 25° C</b>	3.0 W/mK	ISO 8894-1
<b>Flammability</b>	UL 94 / V-0 (12 mm)	Class / Requirements

## Araldite® CW 229-3 / Aradur® HW 229-1

<b>Curing conditions</b>	Hot	
<b>Tg</b>	110 - 125° C	ISO 11357-2
<b>CTE</b>	30 / 100 10 <sup>-6</sup> K <sup>-1</sup>	Below Tg / Above Tg
<b>Thermal class</b>	H	IEC 60085
<b>Thermal conductivity at 25° C</b>	0.65 - 0.75 W/mK	ISO 8894-1
<b>Flammability</b>	UL 94 / V-1 (12 mm), HB (4 mm)	Class / Requirements

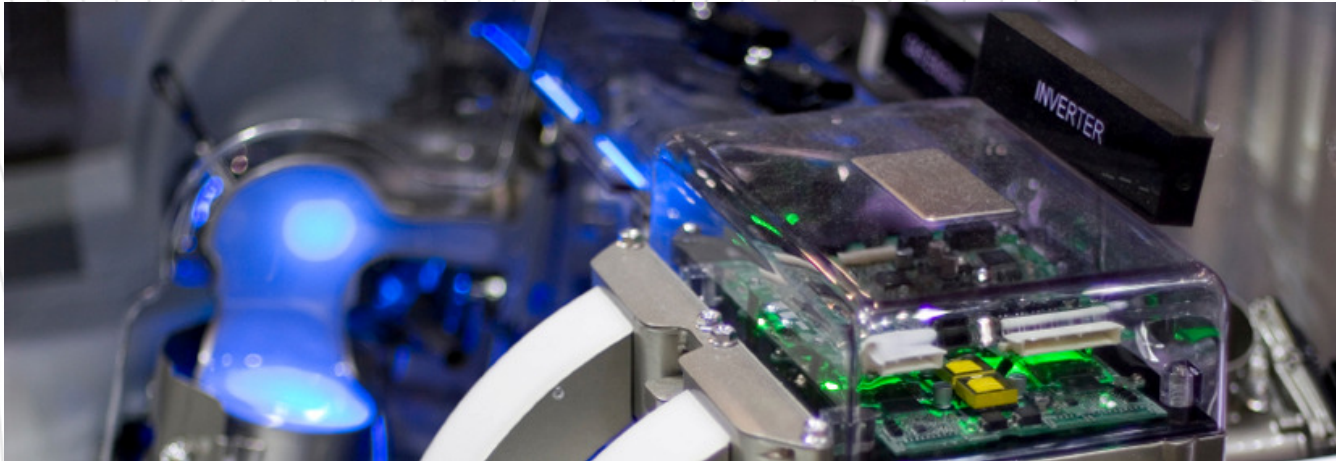
# Encapsulation for inverters and converters

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## Main features and benefits

- Flexible
- Excellent flow properties

# Encapsulation for inverters / converters

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**Arathane®**

## Arathane® CW 5620 / Arathane® HY 5610

<b>Curing conditions</b>	Cold	
<b>Tg</b>	20° C	ISO 11357-2
<b>B</b>	H	IEC 60085
<b>Hardness shore D at 23° C</b>	D40 / A85	DIN 53505
<b>Flammability</b>	UL 94 / V-0 (6 mm)	Class / Requirements

## Arathane® CW 5650 / Arathane® HY 5610

<b>Curing conditions</b>	Cold	
<b>Tg</b>	-40° C	ISO 11357-2
<b>Thermal class</b>	E	IEC 60085
<b>Hardness shore D at 23° C</b>	D27 / A83	DIN 53505
<b>Flammability</b>	UL 94 / V-0 (6 mm)	Class / Requirements



# Encapsulation for Electronic Control Unit

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## Main features and benefits

- Flexibility
- Processibility
- Low viscosity
- Thermal endurance

# Encapsulation for Electronic Control Unit

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**Araldite®**

build  
bond  
protect

## Arathane® CW 5620 / Arathane® HY 5610

<b>Curing conditions</b>	Cold	
<b>Tg</b>	20° C	ISO 11357-2
<b>B</b>	H	IEC 60085
<b>Hardness shore D at 23° C</b>	D40 / A85	DIN 53505
<b>Flammability</b>	UL 94 / V-0 (6 mm)	Class / Requirements

## Araldite® CW 2243-2L / Aradur® HY 1872

<b>Curing conditions</b>	Cold	
<b>Tg</b>	8° C	ISO 11357-2
<b>Thermal class</b>	E	IEC 60085
<b>Hardness shore D at 23° C</b>	D20 / A70	DIN 53505
<b>Flammability</b>	n.a.	Class / Requirements

# Encapsulation for Electronic Control Unit

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## Euremelt® 3413

<b>Curing conditions</b>	Cold	
<b>Tg</b>	-35° C	ISO 11357-2
<b>B</b>	F	IEC 60085
<b>Hardness shore D at 23° C</b>	D28 / A86	DIN 53505
<b>Flammability</b>	UL 94 / V-0	Class / Requirements

# Keep our products at your fingertips

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## View the brochure on SlideShare

With this brochure get an overview of our comprehensive range of insulation systems for electronics applications.



## Download our mobile apps on your smartphone

With these apps select immediately the right:

- Araldite® industrial adhesive for your specific need
- Araldite® composite formulated system for your process / application

Access the product description or send us an email to request the technical data sheet.



### Araldite® - Adhesives (Europe)

Download on [iPhone](#) | [Android](#) | [BlackBerry](#)

### Huntsman - Composite resins (Europe)

Download on [iPhone](#) | [Android](#) | [BlackBerry](#)



# For more information

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