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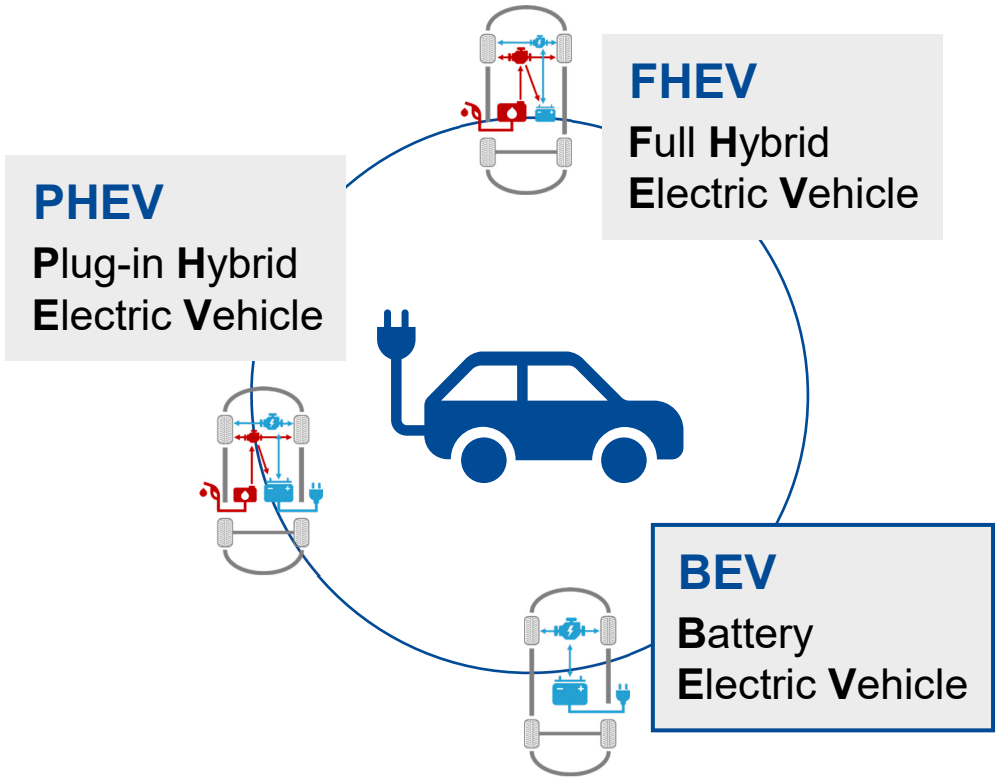
Corrosion protection for electric vehicles

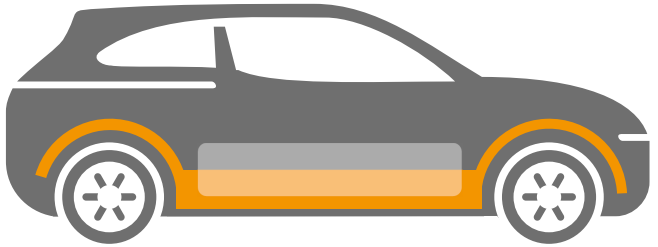
Dr. Audrée Andersen

Director Development E-Coat & Simulation/Automation EMEA,
BASF Coatings GmbH

Platform concepts for battery electric vehicles

OEMs follow various platform strategies, differently impacting E-Coat requirements





Higher metal thickness on rocker panel → Consequence for **E-Coat curability** → Influence on **corrosion protection performance**

Target → **One** paint solution for all platforms

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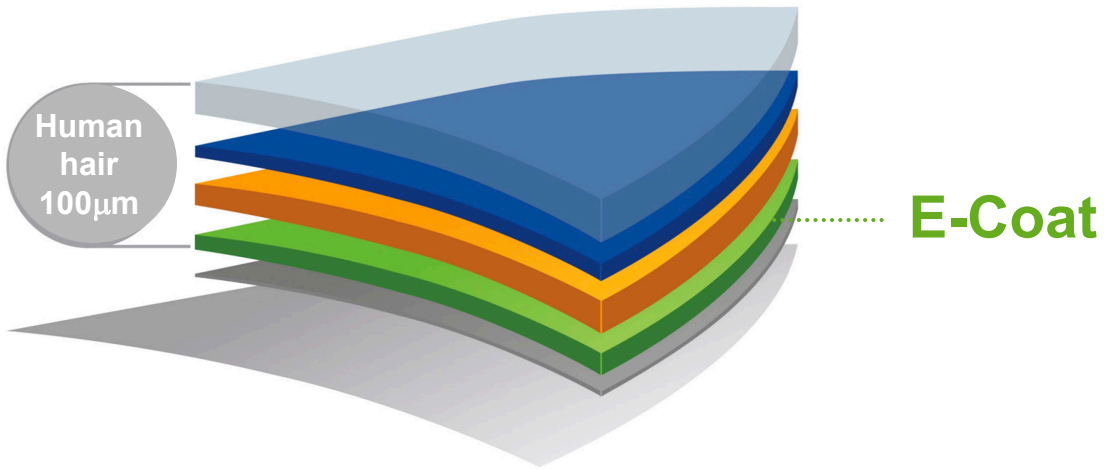
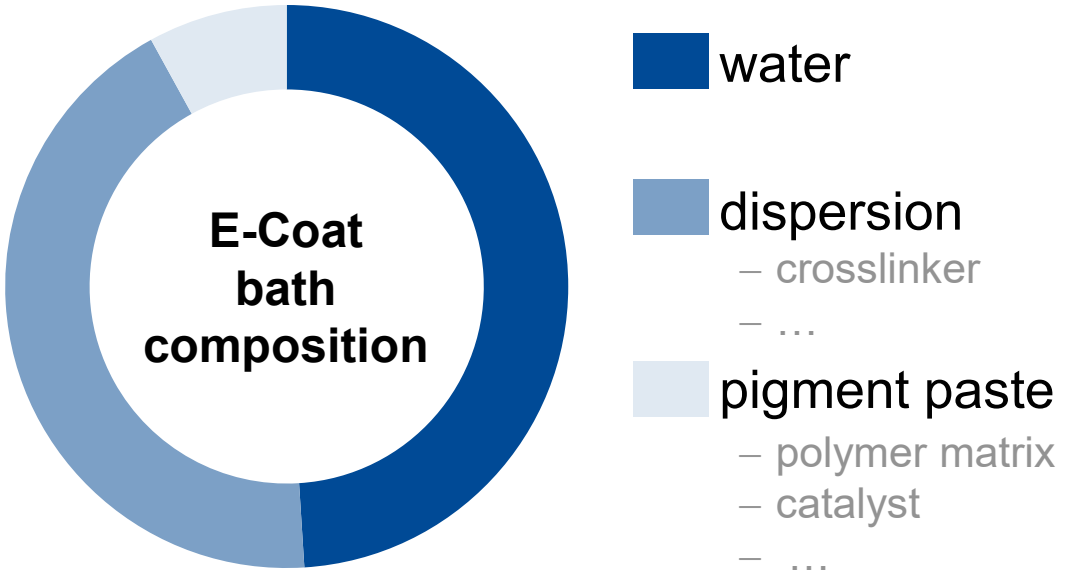
E-Coat technology: high-tech corrosion protection paint layer

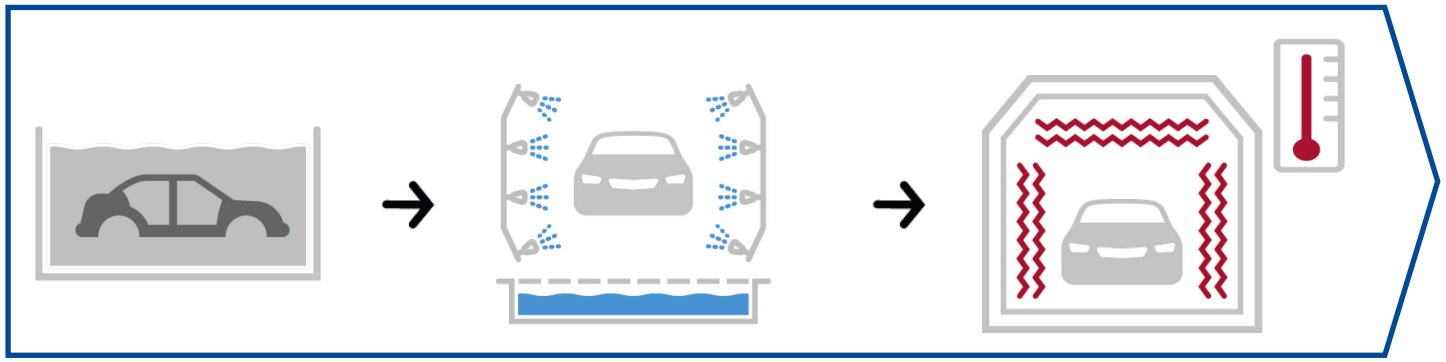




Challenging lengthy development loops
Simulation speeds up development

E-Coat technology: enhancing technical capabilities while keeping sustainable benefits

Dip-coating application process



Sustainable value proposition

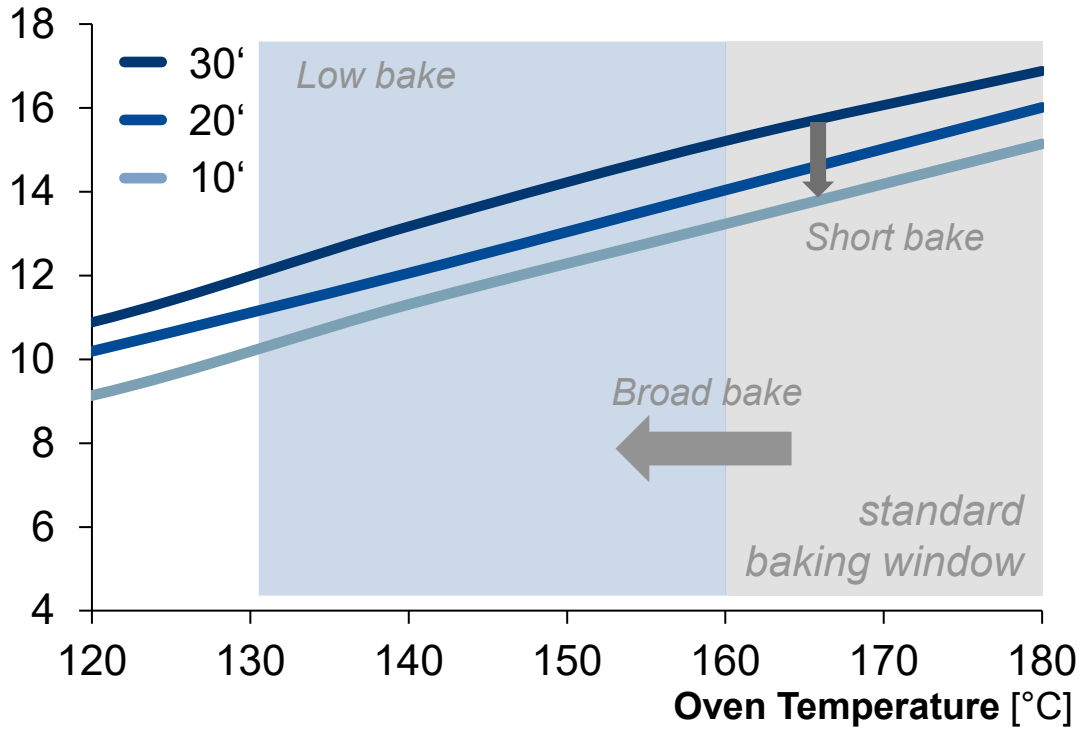
- Tin-free
- HAPs*-free
- Low VOC**
- Material efficiency > 95%

Increasing reactivity while keeping these advantages remains challenging

*HAPs = hazardous air pollutants
**VOC = volatile organic compound

E-mobility trend triggers customers' sustainability expectations

CO_2 emissions [$kgCO_2$/unit]
during constant production for different object temperatures (°C)*



Savings potential E-Coat process [%]
CO_2 emissions

Broad bake
– Keep curing conditions constant

Short bake
– Keep oven temperature
– Shorten curing time

-10%

Low bake
– Shift curing conditions to lower range

-35%

*greenfield, standard dryer, 150,000 cars/y (3 shifts), 550kg/car material mix Steel/Alu, surface 100 m^2/car, Factor CO_2 power = 0.570kg Co_2/kWh, Factor CO_2 gas = 0.239 kg CO_2/kWh

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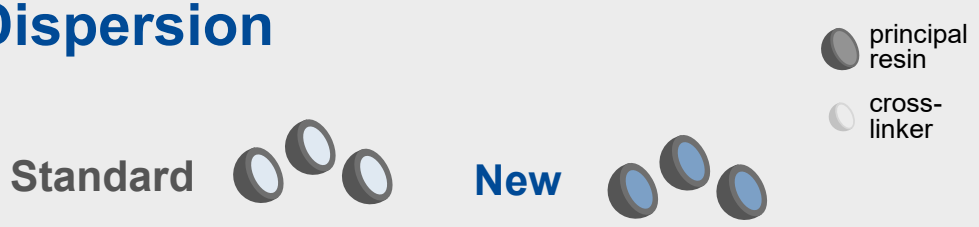
Synthetic development boosts reactivity while keeping existing benefits

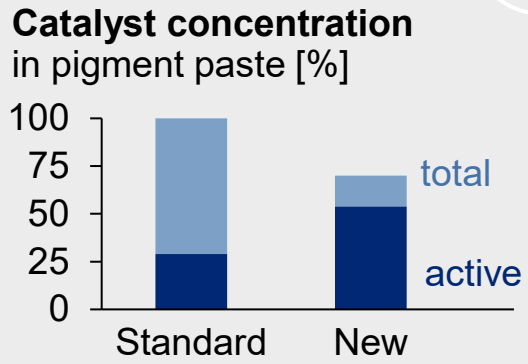
Dispersion



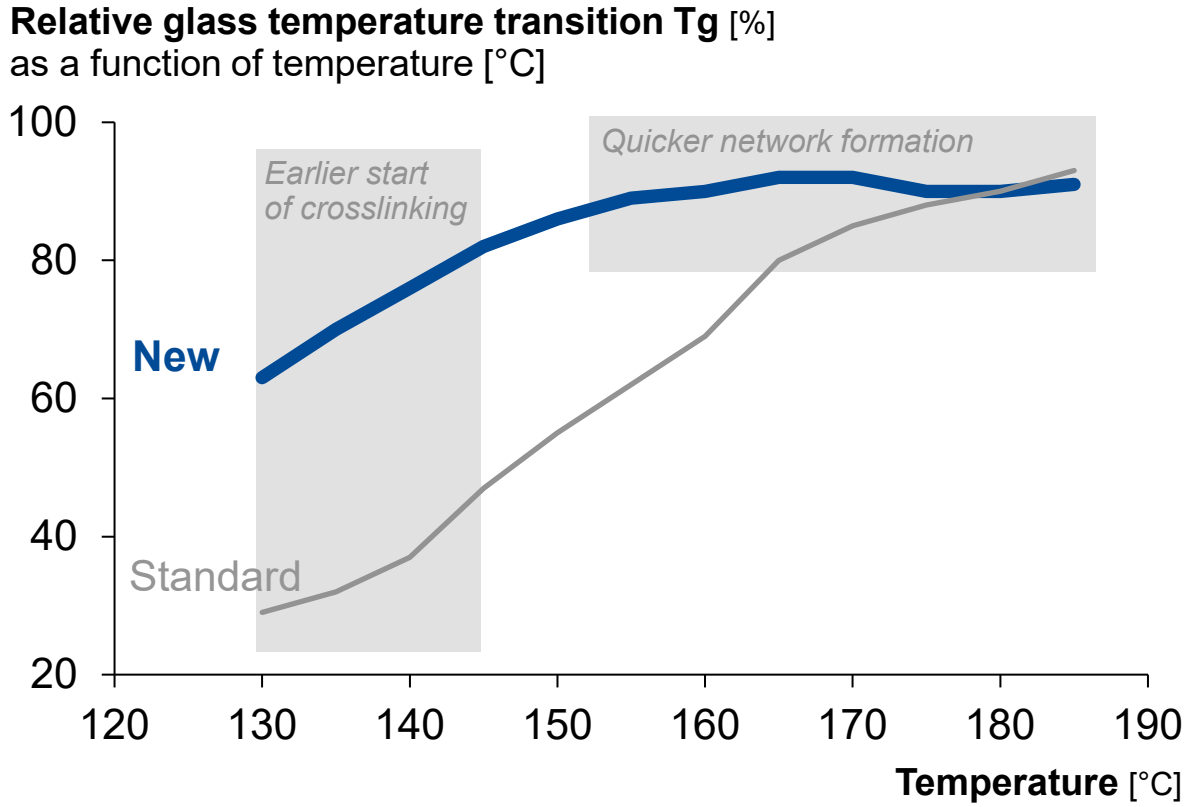
Use of reactive capping agents in crosslinker

Pigment paste

Reduce total catalyst concentration while increasing active catalyst ratio



Application for patents pending



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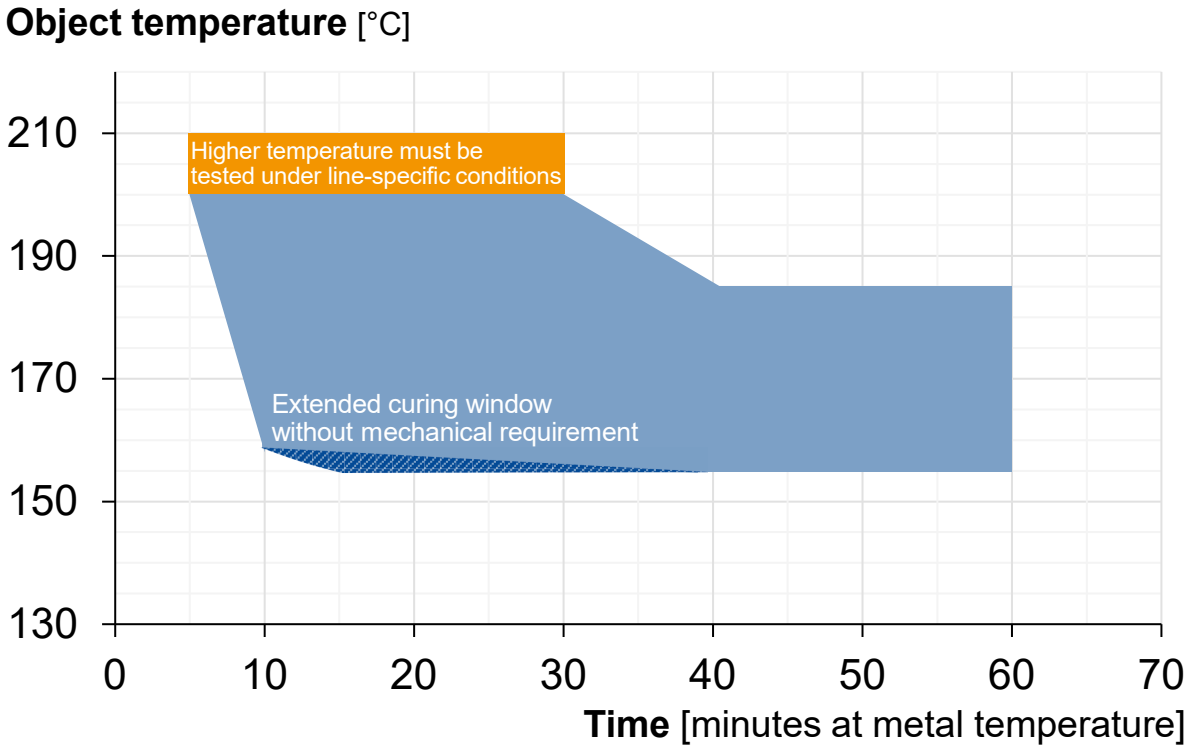
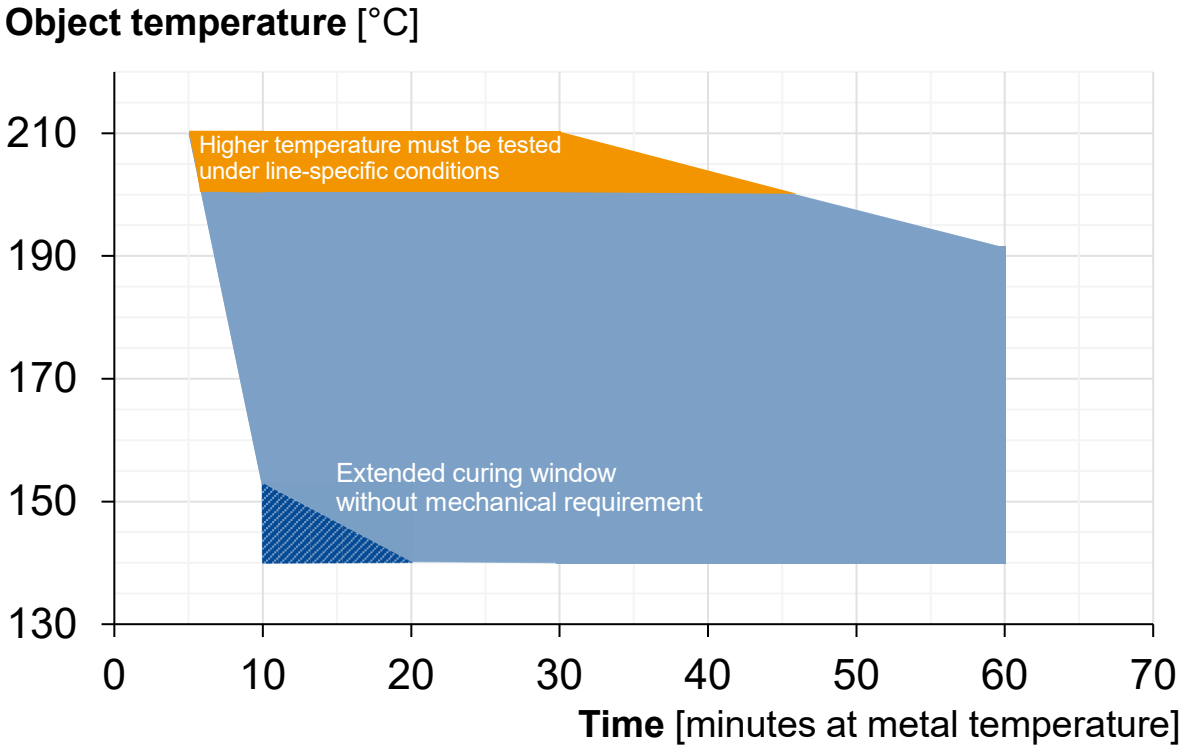
New product offers a broader baking window

First response to novel e-mobility requirements

Standard technology



New CathoGuard® technology



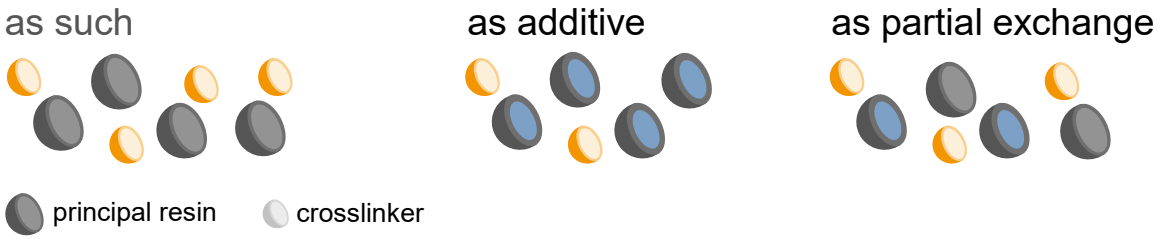
R&D further investigations lead to higher reactivity capabilities

Novel concept allows for versatile usage

Dispersion

- Separation crosslinker from principal resin
- Stability under optimization
- Broad evaluation of concept ongoing

Concept



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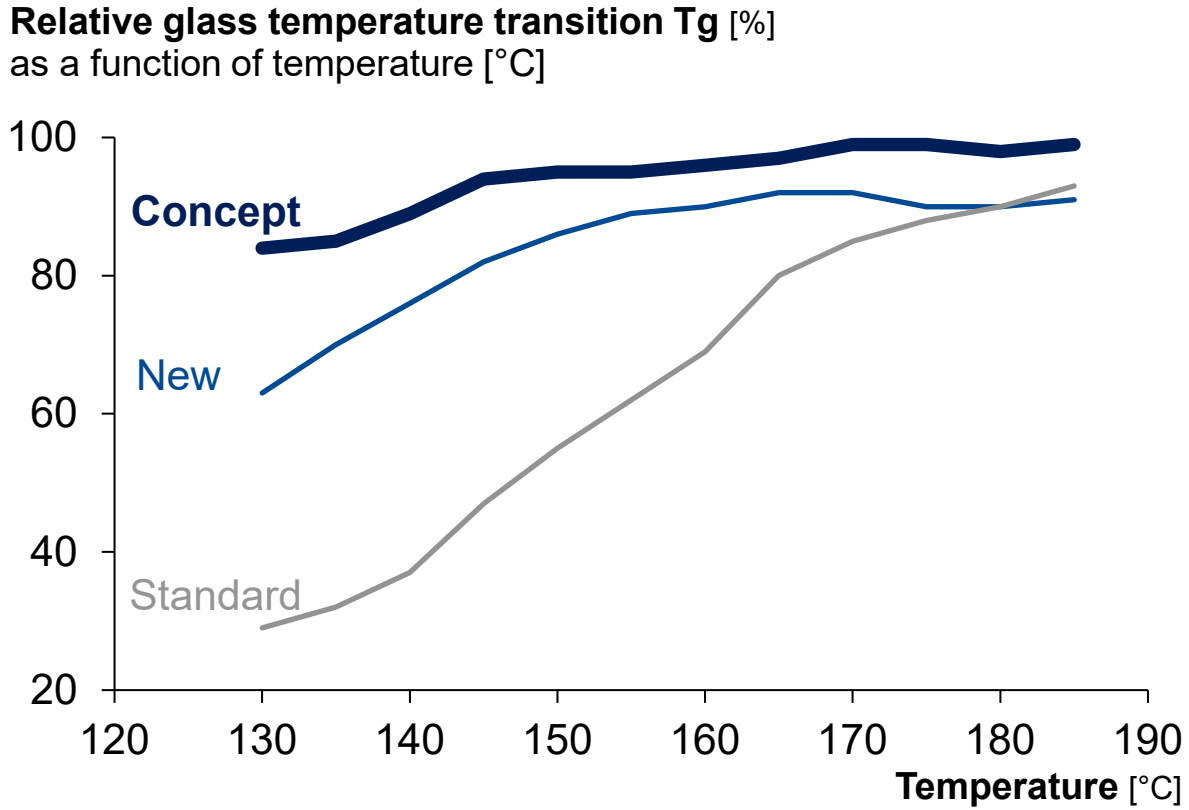

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Cathodic electrocoat technology – next steps

Our contribution to sustainable mobility

2021

First serial production with CathoGuard® solution 140°C

Concept 130°C under development

2022

Global market launch of CathoGuard® solution 140°C

Concept 130°C optimization

2023

Global production upscale & registration 130°C solution

Future

Global market launch 130°C solution

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