



# Automotive & transportation coatings

Toughest protection around

# Performance you can trust

The automotive and transportation industries both place very high demands on coating performance. With Perstorp you can be sure you get the highest value products on the market for the creation of superior performing formulations for the rail, aerospace and automotive industries, including coatings for buses, trucks, motorbikes and bicycles.

## Our offer includes:

- ➔ Easaqua™ polyisocyanate cross-linkers for 2K waterborne PU coatings
- ➔ Tolonate™ polyisocyanate cross-linkers for high solids 2K solvent-based PU coatings
- ➔ Capa™ polycaprolactones to improve VOC-level and flexibility of both solvent-based and waterborne 2K PU coatings
- ➔ Charmor™ polyols for intumescent fire protection

For any further information, please consult the specific brochures on these ranges.

## 2K polyurethane formulations for transportation coatings

To meet the high requirements of the transportation industries, 2K polyurethane coatings are the first choice technology for high performance coating applications. Over the past 50 years, polyurethane based materials have proven their superiority in terms of:

- ➔ Outstanding appearance for high gloss and leveling
- ➔ Protection for chemical resistance and very good impact and scratch resistance
- ➔ Durability for non-yellowing performance and exceptional gloss retention upon ageing
- ➔ Fast drying time for better productivity and reduced dust contamination

Automotive industry



Rail industry



Aerospace industry



Our offer for:

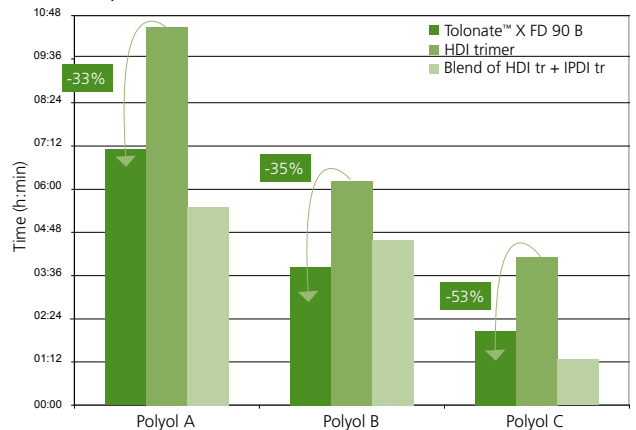
# Automotive coatings

Automotive coatings need to meet some very stringent requirements of the automotive market in terms of aesthetics and protection. Perstorp's offer enables you to meet and exceed these demands by setting new standards for gloss, appearance, acid etch and bird-dropping resistance, weathering and UV resistance, as well as low VOC-levels. Our wide-range offer is ideal for automotive OEM and repair.

## Products:

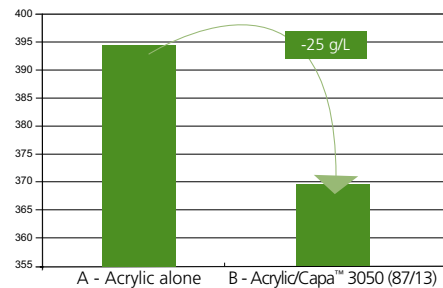
- ➔ Tolonate™ HDT 90 standard trimer used for many years
- ➔ Tolonate™ IDT 70 B or Tolonate™ X FD 90 B to speed up drying, thus adding to productivity and preventing dust contamination
- ➔ Tolonate™ HDT-LV and Tolonate™ HDT-LV2 for high solid clearcoats
- ➔ Easaqua™ X L 600 and Easaqua™ X D 401 for environmentally friendly waterborne formulations
- ➔ Capa™ polyols to reduce VOC-level and improve scratch resistance

Better dust-free time with Tolonate™ X FD 90 B compared to standard HDI trimer



Tolonate™ X FD 90 B gives a faster drying time compared to HDI trimer. Use Tolonate™ X FD 90 B for high productivity and to prevent dust introduction.

Lower VOC thanks to the addition of Capa™



By adding Capa™ polycaprolactones to a 2K solventborne formulation you can lower VOC with maintained viscosity.



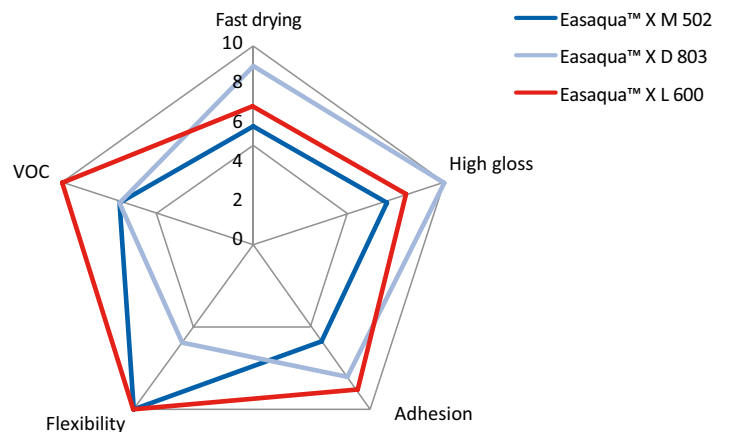
Our offer for:

# Rail vehicle coatings

Rail vehicle coatings have their very own unique requirements, which include demands for anti-graffiti performance and fire protection. For railway companies, the environmental aspect is becoming more and more important, and there is a trend to switch to high solids and waterborne technologies. At the same time as meeting environmental criteria, these coatings also need to provide a nice aesthetic finish. To meet this target, Perstorp provides Easaqua™ polyisocyanates for waterborne formulations which bring excellent anti-graffiti properties together with good appearance and hardness development. By introducing Capa™ polyols the gloss level can be increased even further.

## Products:

- ➔ Easaqua™ X D 803 for excellent anti-graffiti performance
- ➔ Easaqua™ X D 401 for very high gloss
- ➔ Easaqua™ X L 600 a new low viscosity grade with high NCO content
- ➔ Capa™ polyols to increase gloss level and open time



Whatever your needs are, you will find a suitable solution with our Easaqua™ grades.

Excellent anti-graffiti performance with Easaqua™

Anti-graffiti performance	Gloss at 60°	Average ΔE obtained	Requirement on ΔE (NF F31-112)
Neocryl XK 541 with Easaqua™ X D 803	96	0.75	< 1

Clearcoats based on Easaqua™ deliver anti-graffiti performance compliant with the railway industry's requirements, together with excellent appearance. The addition of Capa™ polyols in waterborne formulation can even improve the gloss further.





## Superior fire protection with Charmor™

Intumescent coatings and expendable sealants based on Charmor™ protect buildings and transportation vehicles. Coatings and sealants based on Charmor™ slow the spread of fire, reduce heat and minimize dangerous smoke and fumes more effectively than any alternative products.

Perstorp's offer for intumescent systems includes various grades of Charmor™ that meet the above demands and offer superior performance and fire protection.

- ➔ Charmor™ PM/PT
- ➔ Charmor™ DP

For more information, please see our Charmor™ brochure.

### The intumescent process

When an intumescent coating is exposed to heat, the intumescent effect initiates at approximately 200 °C. Esterification, swelling and carbonization create an effective insulating layer.



Our offer for:

# Aerospace coatings

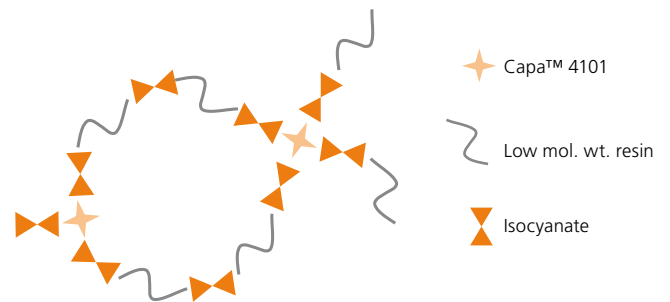
Aerospace coatings represent one of the most challenging categories of coating systems. Not only do they need to withstand wide temperature fluctuations and strong UV-exposure, but also rapid changes in air pressure that may cause cracking and high speed air drag that can cause erosion. On the ground, aircraft need to show chemical resistance to harmful fluids such as fuels, de-icing fluids and hydraulic fluids, e.g. Skydrol.

Perstorp's Capa™ is a key product in aerospace coatings because of the strength it adds, including cold flexibility. Our isocyanates Tolonate™ and Easaqua™ both provide high gloss retention and exceptional weathering resistance for solventborne and 2K waterborne coatings.

## Products:

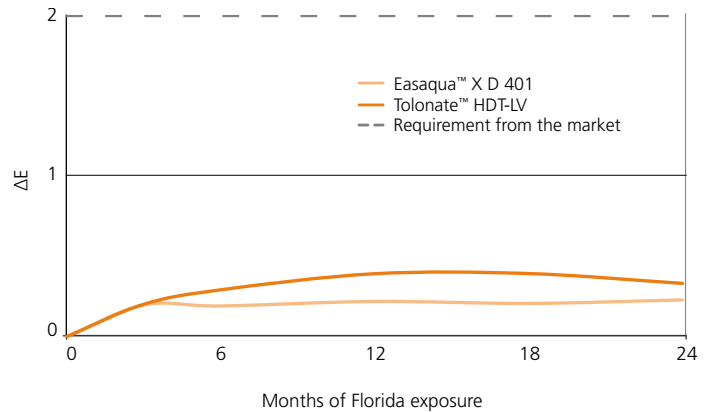
- ➔ Capa™ 4101 for excellent flexibility and chemical resistance
- ➔ Tolonate™ HDT-LV/HDT-LV2 for high solids and durable clear/top coats
- ➔ Tolonate™ X FD 90B to improve chemical resistance and buffability
- ➔ Easaqua™ range for 2K PU waterborne formulations
- ➔ Charmor™ range to ensure fire protection

Cross-linking achieved with Capa™ 4101



The high functionality of Capa™ 4101 leads to good chemical resistance (e.g. resistance to Skydrol).

Similar weatherability resistance for waterborne (Easaqua™) and solventborne (Tolonate™) 2K PU



Low yellowing after 24 months of Florida exposure while maintaining very high gloss (approx. 95 GU).

Better cold flexibility with the addition of Capa™



Acrylic / 10% of Standard Polyester      Acrylic / 10% of Capa™ 3050

Conical mandrel test done on coatings heated during 24h at 80 °C and then cooled to -25 °C for 3h.





## Product data summary

### Tolonate™ for solvent-based & solvent-free PU formulations

	Type	Solids content (%)	Viscosity avg (mPas)	NCO avg (%)	Equivalent weight (g)	Free solids monomer content (%)
Tolonate™ HDB 75 MX*	HDI biuret	75	3,000	22.0	191	< 0.3
Tolonate™ HDT 90	HDI trimer	90	500	19.8	212	< 0.2
Tolonate™ HDT-LV	HDI trimer	100	1,200	23.0	183	< 0.2
Tolonate™ HDT-LV2	HDI trimer	100	600	23.0	183	< 0.5
Tolonate™ X FD 90B	HDI trimer	90	2,000	17.4	240	< 0.5
Tolonate™ D2	NCO blocked	70	60	12.3	342	< 0.5

\* other solvent types available: B = butyl acetate, M = methoxypropyl acetate, X = xylene

### Easaqua™ self-emulsifying for two-component formulations

	Viscosity* (mPas at 25°C)	NCO* (%)	Solids content* (%)	APEO-free
Easaqua™ WT 1000	3,200	9.4**	63	No
Easaqua™ X M 502	3,600	18.3	100	Yes
Easaqua™ X L 600	1,500	20.6	100	Yes
Easaqua™ X D 401	1,050	15.8	85	Yes
Easaqua™ X D 803	200	12.2	69	Yes

\* average value

\*\* NCO blocked

### Capa™

	Type	MW	OH (%)	Viscosity at 23 °C (mPas)
Capa™ 2043	Diol	400	8.5	240
Capa™ 3031	Triol	300	17.0	1,320
Capa™ 3050	Triol	540	9.4	1,190
Capa™ 3091	Triol	900	5.5	1,246
Capa™ 4101	Tetrol	1,000	6.6	1,850

### Charmor™

	Melting point (°C)	Water solubility (% at room temperature)	Typical hydroxyl number (mg KOH/g)	Density (kg/m³)	Particle size
Charmor™ PM	260	5.25	1,645	1,400	< 40 µm typ. 98%
Charmor™ PT	250	4.70	1,615	1,400	< 40 µm typ. 98%
Charmor™ DP	222	0.22	1,325	1,370	< 40 µm typ. 98%



## Your Winning Formula

The Perstorp Group, a trusted world leader in specialty chemicals, places focused innovation at your fingertips. Our culture of performance builds on 130 years of experience and represents a complete chain of solutions in organic chemistry, process technology and application development.

Matched to your business needs, our versatile intermediates enhance the quality, performance and profitability of your products and processes. This is how we enable you to meet market demands for safer, lighter, more durable and environmentally sound end-products – for the aerospace, marine, coatings, chemicals, plastics, engineering, and construction industries, as well as automotive, agricultural, food, packaging, textile, paper and electronics applications.

Our chemistry is backed by reliable business practices and a global commitment to responsiveness and flexibility. Consistent high quality, capacity and delivery security are ensured through strategic production plants in Asia, Europe and North America, as well as sales offices in all major markets. Likewise, we combine product and application assistance with the very best in technical support.

As we look to the future, we strive for the development of smarter and safer products and sustainable processes that reduce environmental impact and create real value in new chemical applications. This principle of proactive innovation and responsibility applies not only to our own business, but also to our work with yours. In fulfilling it, we partner with you to create a winning formula that benefits your business – as well as the people it serves.

Discover your winning formula at [www.perstorp.com](http://www.perstorp.com)