

PHENOLIC CROSSLINKERS

PHENODUR® resins



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About allnex

allnex is a leading producer of industrial coating resins and additives for architectural, industrial, protective, automotive and special purpose coatings and inks. With manufacturing facilities and R&D centers located around the world, the allnex group offers access to a huge global network of innovation and provides

responsive, local support to our customers, helping them to quickly bring advanced coating solutions to market. Formed in 2016 by the merger of two leading resin companies, we have recently further strengthened (y)our business by becoming part of major international player PTT Global Chemical.

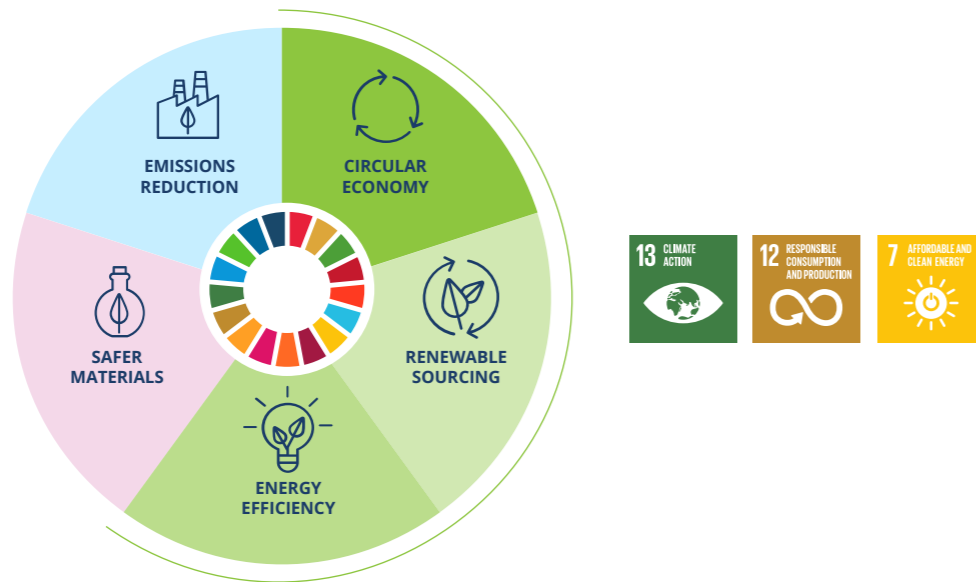
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Sustainability

A fivefold focus for a new tomorrow – the pillars of our sustainability program.

These pillars form the basis of allnex's sustainability program, which covers all aspects from product development, raw material sourcing and manufacturing to supply chain management and customer service. The pillars stand for the circularity that is at the core of all our considerations, defining both how we plan and execute our activities.



- 
Circular Economy
 We diligently explore options to limit the consumption of resources, keep them in use as long as possible, and eventually recover and recycle them at the end of service life.
- 
Renewable Sourcing
 We aim at minimal use of finite resources and strive to reduce climate impacts by looking at renewable alternatives for raw materials and the energy we use.
- 
Energy Efficiency
 We design our product and manufacturing process in a way that enables maximum efficiency in energy utilization across the product lifecycle.
- 
Safer Materials
 We are committed to making the substitution of potentially harmful chemicals by safer options one of our guiding considerations.
- 
Emissions Reduction
 We work to reduce the emissions of volatile organic solvents across the product lifecycle to protect people and the environment.

Being ECOWISE™ is the best way to be part of the solution – and that's exactly what our initiative and ECOWISE™ branded products help everyone to do. They spring from our deep commitment to a more sustainable future. They are also living proof that, with our broad range of technologies and sustainable focus, we are the ideal partner for smoothly and successfully making the transition to the solutions a more ECOWISE™ future needs.

Phenolic Resin Grades

ALNOVOL® PN 650

Non-functionalized /non-reactive phenolic Novolac type. Intended to be used as flexibilizer for phenolic resole grades to increase total phenolic amount in recipe in order to improve retort resistance. Helps to reduce formaldehyde emission. Extremely low free formaldehyde value as form of delivery.

PHENODUR® EP 560

Straight phenol based type of very high chemical resistance and limited flexibility. For can coatings including BADGE- and BPA-NI formulas and interior drum linings. Higher free phenol level vs. PHENODUR® PR 371.

PHENODUR® PR 217

Medium reactive, rather dark color, good flexibility (deep drawing ability) and acid retort resistance.

PHENODUR® PR 285

Very reactive, cures from 160°C onwards. Catalysts are not recommended. For “coil for can” systems and BADGE- and BPA-NI applications.

PHENODUR® PR 371/70B and 70B LF

Straight phenol based type of very high chemical resistance and limited flexibility. For can coatings including BADGE- and BPA-NI formulas and interior drum linings. Low free formaldehyde version available.

PHENODUR® PR 385

Straight phenol based type of very high chemical resistance and limited flexibility. For can coatings including BADGE- and BPA-NI formulas and interior drum linings. Very low free formaldehyde and phenol content.

PHENODUR® PR 401, PHENODUR® PR 411

Straight Bisphenol A based products. Very reactive, very light color (silver lacquer); somewhat less flexible, good sterilization resistance. PHENODUR® PR 411 has lower content of free formaldehyde and monomers vs. PHENODUR® PR 401.

PHENODUR® PR 515/60LG and 60B/X

Partially Bisphenol A based. Very reactive, light color, somewhat less flexible, good sterilization resistance. PHENODUR® PR 515 is slightly more flexible than PHENODUR® PR 401 and PHENODUR® PR 411.

PHENODUR® PR 516/60B and 60B LF

BISPHENOL A free alternative to PHENODUR® PR 515; recommended for BADGE- and BPA-NI usage. Low free formaldehyde version available.

PHENODUR® PR 517

Good flexibility and high sulphur resistance with EPOXY- and PE resins. Low free formaldehyde of < 0,5%.

PHENODUR® PR 520

Type PHENODUR® PR 516, higher solid (less VOC) and less migration, curing speed slightly lower vs. original type PHENODUR® PR 516. Intended to be used for BADGE- and BPA-NI application.

PHENODUR® PR 521

Higher reactive version of PHENODUR® PR 516, for BADGE- and BPA-NI usage.

PHENODUR® PR 566

Good flexibility and sulphur resistance, light color, Medium reactivity.

PHENODUR® PR 612

High solid, low viscosity, medium reactive, giving yellow/greenish color shade; very flexible and good retort resistance. Catalyst is necessary (CYCAT® XK 406 N).

PHENODUR® PR 616

Higher reactive version of PHENODUR® PR 612 with enhanced curing speed. Addition of catalyst (CYCAT® XK 406 N) is recommended. For “coil for can” systems and BADGE- and BPA-NI applications.

PHENODUR® PR 722

Very good overall properties, very good sulphur staining resistance; medium reactivity, excellent flexibility, rather light in color. Catalyst CYCAT XK 406 N is necessary.

PHENODUR® PR 787 50MP

Higher reactive version of VPR 1785 by maintaining excellent flexibility. To be combined either with less epoxy than usual or with polyvinyl butyral/ polyesters to formulate BADGE- and BPA-NI systems. Eco-friendly product, free formaldehyde and free monomers < 0.1%.

PHENODUR® PR 825

Very light color, excellent flexibility and good sulphur resistance, medium reactivity, for BADGE- and BPA-NI usage, “coil for can” cycle and foils.

PHENODUR® PR 827

Light color, excellent flexibility and good sulphur resistance, medium reactivity, for BADGE- and BPA-NI usage, “coil for can” cycle and foils.

PHENODUR® PR 830

Light color, excellent flexibility and good sulphur resistance, medium reactivity, for BADGE- and BPA-NI usage, “coil for can” cycle and foils. Alternative to PHENODUR® PR 827 in different solvent.

PHENODUR® PR 897, PHENODUR® PR 898

Excellent flexibility and retort resistance; low reactivity. The cured film is slightly golden in color. Catalyst CYCAT XK 406 N is necessary.

PHENODUR® PR 899

Excellent chemical resistance, medium flexibility, golden color shade, for BADGE- and BPA-NI lacquers.

PHENODUR® VPR 1785/50MP and 65B

Very high flexibility. To be combined either with less epoxy than usual or with polyvinyl butyral/polyesters to formulate BADGE- and BPA-NI systems. Eco-friendly products, free formaldehyde and free monomers < 0.1%.

PHENODUR® VPM 1150

Not a phenolic resin, TMA hardener (crosslinker) for high molecular weight epoxide resins to formulate clear and white interior/exterior coatings. Formaldehyde-free product.

PHENODUR® PR 307, PR 308, PR 309

Tinting/coloring resins to adjust gold shade of the cured coating films. Very dark as form of delivery. PR 309 is the newest coloring agent development of Allnex and is not based on natural resin, extracted of pinewood stumps.

PHENODUR® VPW 1942

Waterborne phenol/epoxide pre-condensate; A unique combination of high molecular weight, high solids, extremely low VOC and very small particle size; good reactivity, light golden in color, for “coil for can” (coilcoating); very good adhesion to aluminum and other non-ferrous metals; excellent corrosion resistance at low film thickness; medium retort resistance and sulphur staining resistance; good wetting and flow. For interior drum linings and heat curing anti-corrosion primer application.

PHENODUR® VPW 1946

Waterborne type PHENODUR® VPW 1942 resin with higher curing speed and improved chemical resistance. For interior drum linings and heat curing anti-corrosion primer application.

PHENODUR® VPW 1947

real self-crosslinking grade, can be used either as sole binder, or in combination with backbone binders, good adhesion on various metal substrates, excellent chemical/acid resistance, high hardness & heat resistance.

Phenolic Resins for Can Coatings

Products	NV (solid content/solvent)	Compatibility			Typical stoving conditions				Erichsen cup no. 2	Resistance		Applications							HazCom	
		With epoxy resins	With PVB	Color (cured film)	Time [min]	Temperature (°C)	Catalyst CYCAT® XK 406N	Wedge bend		Lactic acid 2% (1h-129°C)	Cysteine test (90min-121°C)	Coil for can	Can	Tubes	Drums	Metal foils	Silver lacquer	Bis-A/ BADGE NI	Water borne	Free formaldehyde < 0.1%
ALNOVOL® PN 650	60 B	Yes	Yes	less dark	10-12	200	Yes	Flexibilizer	Flexibilizer	Flexibilizer	Flexibilizer	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes
PHENODUR® EP 560	71	Yes	Yes	less dark	10-12	180-200	Yes	Good	Good	Very good	Good	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
PHENODUR® PR 217	65 B	Yes	No	dark	10-12	200	Yes	Very good	Good	Good	Poor	No	Yes	Yes	No	No	No	No	No	No
PHENODUR® PR 285	55 IBB	Yes	Yes	dark	10-12	190	No	Very good	Good	Good	Good	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes
PHENODUR® PR 371	70 B / 70 B LF	Yes	Yes	less dark	10-12	180-200	Yes	Good	Good	Very good	Good	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
PHENODUR® PR 385	64 B	Yes	Yes	less dark	10-12	180-200	Yes	Good	Good	Very good	Good	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
PHENODUR® PR 401	72 B	Yes	Yes	very bright	10-12	180-200	Yes	Medium	Good	Good	Good	Yes	Yes	No	Yes	Yes	Yes	No	No	No
PHENODUR® PR 411	75 B	Yes	Yes	very bright	10-12	190	Yes	Medium	Good	Good	Good	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes
PHENODUR® PR 515	60 LG / 60 BX	Yes	Yes	bright	10-12	200	Yes	Medium	Good	Medium	Poor	Yes	Yes	Yes	Yes	Yes	No	No	No	No
PHENODUR® PR 516	60 B / 60 B LF	Yes	Yes	bright	10-12	200	Yes	Good	Good	Good	Good	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
PHENODUR® PR 517	60 B	Yes	Yes	less dark	10-12	200	Yes	Very good	Good	Good	Very good	No	Yes	Yes	No	No	No	Yes	No	No
PHENODUR® PR 520	65 B	Yes	Yes	bright	10-12	200	Yes	Good	Good	Good	Good	No	Yes	Yes	No	No	No	Yes	No	No
PHENODUR® PR 521	65 B	Yes	Yes	less dark	10-12	180-200	Yes	Medium	Good	Very good	Good	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
PHENODUR® PR 566	65 BX	Yes	Yes	very bright	10-12	200	Yes	Very good	Very good	Medium	Good	No	Yes	No	No	No	Yes	Yes	No	No
PHENODUR® PR 612	80 B / 80 B LF	Yes	Yes	less dark	10-12	200	Yes	Good	Very good	Good	Medium	No	Yes	Yes	No	Yes	No	Yes	Yes	No
PHENODUR® PR 616	65 B	Yes	Yes	less dark	10-12	200	Yes	Good	Very good	Good	Medium	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes
PHENODUR® PR 722	53 BGB	Yes	Yes	less dark	10-12	200	Yes	Very good	Very good	Good	Good	No	Yes	No	No	No	No	No	No	Yes
PHENODUR® PR 787	50 MP	Yes	Yes	less dark	10-12	200	No	Good	Good	Very good	Good	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes
PHENODUR® PR 825	70 MPAC	Yes	Yes	very bright	10-12	200	Yes	Very good	Very good	Medium	Good	Yes	Yes	No	No	Yes	Yes	Yes	No	No
PHENODUR® PR 827	70 MPAC	Yes	Yes	very bright	10-12	200	Yes	Very good	Very good	Medium	Good	Yes	Yes	No	No	Yes	Yes	Yes	No	No
PHENODUR® PR 830	75 B	Yes	Yes	very bright	10-12	200	Yes	Very good	Very good	Medium	Good	Yes	Yes	No	No	Yes	Yes	Yes	No	No
PHENODUR® PR 897	53 BGB	Yes	No	less bright	10-12	200	Yes	Good	Good	Very good	Good	No	Yes	Yes	No	No	No	No	No	No
PHENODUR® PR 898	52 BGB	Yes	Yes	less bright	10-12	200	Yes	Good	Good	Very good	Good	No	Yes	Yes	No	No	No	No	No	No
PHENODUR® PR 899	60 MPAC	Yes	Yes	less dark	10-12	200	Yes	Good	Good	Very good	Good	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
PHENODUR® VPR 1785	50 MP , 65B	Yes	Yes	less dark	10-12	200	Yes	Very good	Very good	Very good	Good	No	Yes	Yes	No	Yes	No	Yes	Yes	Yes

Phenolic Resins for Special Usage

Products	NV (solid content/solvent)	Compatibility			Typical stoving conditions				Erichsen cup no. 2	Resistance		Applications							HazCom	
		With epoxy resins	With PVB	Color (cured film)	Time [min]	Temperature (°C)	Catalyst CYCAT® XK 406N	Wedge bend		Lactic acid 2% (1h-129°C)	Cysteine test (90min-121°C)	Coil for can	Can	Tubes	Drums	Metal foils	Silver lacquer	Bis-A/ BADGE free	Water borne	Free formaldehyde < 0.1%
Non-phenolic crosslinker for epoxy functional or polyester resins																				
PHENODUR® VPM 1150	50 EPAC	Yes	n. a.	clear	10-12	200		Very good	Very good	Good		Yes	Yes	No	No	Yes	Yes	Yes	No	n.a. (formaldehyde-free)
Coloring resin as additive																				
PHENODUR® PR 307	63 XMP	Yes	Yes	very dark	n. a.	180-200		n. a.	n. a.	n. a.	n. a.	Coloring resin				No	Yes	No	Yes	
PHENODUR® PR 308	62 MP	Yes	Yes	very dark	n. a.	180-200		n. a.	n. a.	n. a.	n. a.	Coloring resin				No	Yes	No	Yes	
PHENODUR® PR 309	63 BMP	Yes	Yes	very dark	n. a.	180-200		n. a.	n. a.	n. a.	n. a.	Coloring resin				No	Yes	No	Yes	

Typically ratios EP:Phenolics, PE:Phenolics or Phenolic:PVB 80:20 to 1:1
n. a. = not applicable

Product availability can vary by usage location. Please contact your local allnex representative regarding availability in specific countries and regions.

Waterborne Phenolic Resins

Products	NV (solid content/solvent)	Compatibility			Typical stoving conditions			Wedge bend	Erichsen cup no. 2	Resistance		Applications							HazCom	
		With epoxy resins	With PVB	Color (cured film)	Time [min]	Temperature (°C)	Catalyst CYCAT® 6925			Lactic acid 2% (1h-129°C)	Cysteine test (90min-121°C)	Coil for can	Can	Tubes	Drums	Metal foils	Silver lacquer	Bis-A/ BADGE free	Water borne	Free formaldehyde < 0.1%
PHENODUR® VPW 1942	52WA	n. a.	n. a.	n. a.	10 – 12	200 – 230	Yes (blocked)	Good	Moderate	Good	Moderate	Yes	Yes		Yes	Yes		No	Yes	Yes
PHENODUR® VPW 1946	46WA	n. a.	n. a.	n. a.	10 – 12	170 – 200	Yes (blocked)	Good	Moderate	Good	Moderate	Yes	Yes		Yes	Yes		No	Yes	Yes
PHENODUR® VPW 1947	50WA	Yes	n. a.	n. a.	10 – 12	170 – 200	Yes (blocked)	Moderate	Moderate	Very Good	Good	Yes	Yes		Yes	Yes		Yes	Yes	No

Phenolic Resins for General Line

Products	Type	Applications						Chemical resistance	Water/corrosion resistance	Oil resistance	Properties and uses
		Primer	Topcoat	Inks	Powder coatings	Adhesives					
PHENODUR® PR 263 / 70B	Phenolic resin	Yes						Yes	Yes	Yes	1K or 2K air drying and/or forced drying corrosion protection wash- and shop primer. Compared to BECKOPOX® EM 460, faster drying, improved chemical resistance and less yellowing resistant.
PHENODUR® VPR 1740/50WA	Phenol resol dispersion	Yes				Yes		Yes			Fast drying, low emission, low coloring, good leveling and adhesion, high chemical and thermal resistance, good compatibility to latexes based on SBR or acrylates. Binder for impregnations, adhesives, textiles, filter.
ALPEX® CK 450	Cyclized Rubber			Yes				Yes	Yes		High chemical and scratch resistance; anti-corrosion and zinc-rich paints. Water tank coatings. Available as CK450/60WS.
ALPEX® CK 514	Cyclized Rubber	Yes									Offsets, letterpress, screen printing inks. Reduces emulsification. Increase scratch resistance. Improved gloss, reduce flocculation.
ALNOVOL® PN 320	Novolac	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Insoluble in hydrocarbons; good compatibility to PVB. Low emission; high reactivity to epoxy powders.
ALNOVOL® VPN 1132	Novolac mod.			Yes		Yes					Generating long open time, lower activation temperature and high heat resistance for PUR adhesives. Improves flexibility of enamels.

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Definitions

Products	Type
B	n-butanol
IB	Iso-butanol
LG	Solvent mixture
X	Xylene
BG	Butylglycol (butyl cellosolve)
MPAC	Methoxy propyl acetate
MP	Methoxy propanol
EPAC	Ethoxy propyl acetate
WA	Water

