

# The Future of Water-Based Polyurethane Resins

Experience. Transformation.



## HYDRAN™ GP WATER-BASED POLYURETHANE RESINS

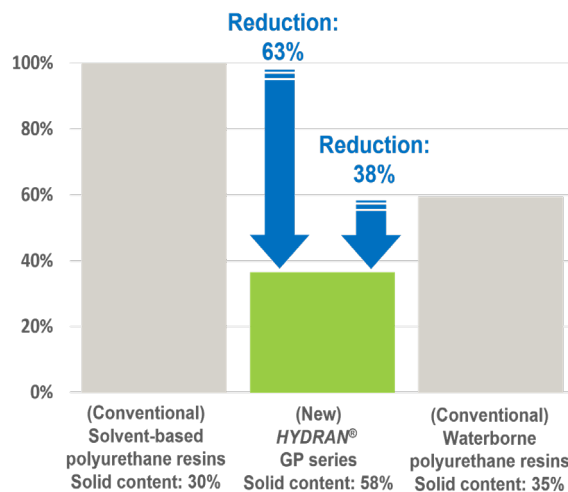
With a higher solid content than conventional water-based polyurethane resins and no amines, our HYDRAN™ GP range can help you shorten process times, lessen odors, and reduce both greenhouse gas emissions and volatile organic compounds (VOCs). These resins deliver an outstanding performance that is comparable to that of solvent-based products, previously seen as difficult for waterborne polyurethane resins.

### THE DIC ADVANTAGE

- Environmentally friendly water-based polyurethane resins
- High solid content of up to 60% helps reduce carbon footprint
- Amine-free, helping reduce VOCs and odors
- Highly compatible with solvent-based systems :  
Softness, Flexibility

### APPLICATIONS

Our versatile HYDRAN™ GP water-based polyurethane resins can be used in a wide range of applications including coatings and adhesives. They are particularly well suited for use in artificial leather for demanding applications. Boasting excellent durability, as well as high chemical and heat resistance, these resins are an excellent choice for automotive interiors and furniture. Their flexibility and hydrolysis resistance also make them ideal for use in apparel and footwear.



Carbon Footprint in Coating Processes

Image of GHG emissions reduction from raw material procurement to final product production process.

Calculation Method

ISO14040, ISO14044 Reference: DIC's own trial calculation. The above figures are the result of our own trial calculation based on our current calculation method, there is a possibility that they may change in the future.

### PRODUCT LINEUP

Used for	Product Name	NCO	OH	NV %	100% Modulus (MPa)	Characteristics
Skin layer Mechanical Foaming 1k Adhesion Layer	GP-100	Aliphatic	Polyether	55-59	3.1	Skin; Flexibility at Low Temperature Adhesion; Wet Lamination, Aging-less Available for Mechanical Foam
Skin Layer	GP-300	Aliphatic	PC	53-58	4.2	Flexibility at Low Temperature High Durability
2k Adhesion Layer	GP-500	Aromatic	Polyether	48-52	2.2	Dry Lamination Long Pot Life

## HYDRAN™ GP-100

	s/b PU DIC Standard Product	Conventional PUD DIC Standard Product	Green-WPU GP-100
<b>FOR SKIN LAYER</b>			
Feature	Standard	Standard	One component
NCO	Aliphatic	Aliphatic	Aliphatic
OH	PEt/PEs	PEt	PEt
NV(%)	24-26	33-37	55-59
Film properties	No cross-linker	Carbodiimide	No cross-linker
100%Modulus (MPa)	5.4	5.3	3.1
Tensile strength (MPa)	73.3	56.4	36.9
Elongation (%)	590	480	460
Flow temperature (°C)	181	190	180
Tg (°C) E'	-64	-78	-80
Heat resistance	+	+	+
Light resistance	+/-	+/-	+/-
Hydrolysis resistance	+	+/-	+
Flexibility at low temperature	+	+	+
Secondary workability	+	+/-	+
<b>FOR ADHESION LAYER/WET LAMINATION</b>			
Feature	Standard	Standard	Aging-free
Process	2K DRY Lamination	2K DRY Lamination	1K WET Lamination
NCO	Aromatic	Aliphatic	Aliphatic
OH	PEt/PEs	PEt	PEt
NV (%)	64-66	43-47	55-59
Film properties	NCO cross-linker	NCO cross-linker	No cross-linker
100%Modulus (MPa)	2.5	5.7	3.1
Tensile strength (MPa)	35	33	36.9
Elongation (%)	520	295	460
Pot-life after adding cross-linker	+	-	++
			(No cross-linker)
Peeling strength	+	+	+
Hydrolysis resistance	+	-	+
Flexibility	+	+	+

## HYDRAN™ GP-300

Feature	s/b PU		Conventional PUD	Green-WPU
	DIC Standard Product	DIC Standard Product	DIC Standard Product	GP-300
<b>PC TYPE FOR SKIN LAYER</b>				
Softness	Aliphatic	Aliphatic	Aliphatic	Aliphatic
Chemical Resistance	PC	PC	PC	PC
NCO	24-26	24-26	33-37	53-38
OH	No cross-linker	No cross-linker	Carbodiimide	No cross-linker
NV (%)	3.7	5.6	5.3	4.2
Film properties	70.0	104.9	75.2	46.4
100% Modulus (MPa)	420	410	340	320
Tensile strength (MPa)	150	190	165	170
Elongation (%)	-37	-29	-27	-33
Flow Temperature (°C)	+	+	+	+
TG (°C) E'	+	+	+	+
Heat resistance	+	+	-	+
Light resistance	-	+	+	+/-
Hydrolysis resistance	+	-	-	+
Oleic acid resistance	+	-	-	+
Flexibility at low temperature	+	-	-	+



## HYDRAN™ GP-500

	s/b PU DIC Standard Product	Conventional PUD DIC Standard Product	Green-WPU GP-500
<b>FOR ADHESION LAYER/DRY LAMINATION</b>			
Feature	Standard	Standard	Long pot-life
Process	2K DRY Lamination	2K DRY Lamination	2K DRY Lamination
NCO	Aromatic	Aliphatic	Aromatic
OH	PEt/PEs	PEt	PEt
NV (%)	64-66	43-47	48-52
Film properties	NCO cross-linker	NCO cross-linker	NCO cross-linker
100%Modulus (MPa)	2.5	5.7	2.2
Tensile strength (MPa)	35	33	22
Elongation (%)	520	295	340
Pot-life after adding cross-linker	+	-	+
Peeling strength	+	+	+
Hydrolysis resistance	+	-	+
Flexibility	+	+	+



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