

Substance for Success.



Product Guide B-G 2

Additives for “Greener” Systems

NAFTA
market only

Greenability

Greenability

There is no “green” standard, which is broadly accepted by the global industry. Within BYK, “green” refers to all activities required to support our customers’ goals of achieving any specific environmental standard. Therefore we created the word **Greenability** as a definition for our engagement in environmentally-friendly systems. Greenability is our ability to help our customers develop greener products. For decades we have had additives for environmentally-friendly systems in our portfolio and

today more than 50% of our research and development activities are focused on this topic. Our understanding of environmentally-friendly systems includes additives for powder coatings, water-borne systems, high solid and 100% solid systems, VOC-free systems. We also constantly increase the amount of raw materials derived from renewable resources. Our experience in the additive business contributes to our green expertise. Our broad portfolio offers a lot of options to create green solutions.

And, our proven products have a long and trusted history of high performance. To summarize: We help our customers achieve their green goals by offering our expertise, product portfolio and exceptional quality.

VOC-free Additives for “Greener” Products

The following table shows our portfolio of additives, selected for their ability to achieve “greener” end products without sacrificing performance. The decisive criterion being the additive’s VOC content. VOC = **V**olatile **O**rganic **C**ompounds as defined in the Clean Air Act, 40 CFR 51.100(s).

- All listed additives are either **VOC-free** or the VOC content determined per EPA Method 24 is so low, that VOC contribution to the final product would be negligible.
- All listed additives do not contain **phthalates, formaldehyde, or alkylphenol ethoxylates (APEO)** according to the recipe.
- All listed additives are neither **sensitizers** nor are they **highly toxic**.

Definition of “highly toxic”:
 LD50 ≤ 50 mg/kg (oral, rat);
 LD50 ≤ 200 mg/kg (dermal, rabbit);
 LC50 ≤ 200 ppm (4-hour inhalation rat).

- All listed additives are on the **TSCA** inventory (or subject to one of the exemptions). The **DSL** status is indicated by a square dot (■) in the DSL column.
- Reportable components according to **California Proposition 65** are listed in the last column.

VOC-free Additives for “Greener” Systems

	DSL	Non-volatile matter in %	Water content in %	California Proposition 65 reportable component
Wetting & Dispersing Additives				
ANTI-TERRA-U 100	■	99	–	–
BYK-151		38-42	55-57	Toluene
BYK-152		40	60	–
BYK-153	■	40	60	–
BYK-155/50	■	48-52	48-52	–
BYK-156	■	49-53	50	–
BYK-9076	■	92-100	–	–
BYK-9077		98-100	–	–
BYK-P 105	■	97-100	–	–
BYK-W 9010	■	95	0-1	–
BYK-W 9011		97	–	–
BYKOPLAST-1000	■	97-100	–	–
DISPERBYK	■	48-52	50	–
DISPERBYK-102	■	99	–	–
DISPERBYK-108	■	97-100	–	–
DISPERBYK-109		>99.5	–	–
DISPERBYK-111	■	95	0-1	–
DISPERBYK-116	■	97-100	–	–
DISPERBYK-145	■	95-100	–	–
DISPERBYK-185		90-100	–	Ethylene oxide, 1,4-dioxane
DISPERBYK-190	■	38-42	60	–
DISPERBYK-192	■	97-100	0.02	–
DISPERBYK-198		40	60	–
DISPERBYK-199		38-40	60	–
DISPERBYK-2012		40	60	–
DISPERBYK-2015		40	58-62	–
DISPERBYK-2090		78-82	18-22	–
DISPERBYK-2091		53-57	43-47	–
DISPERBYK-2095	■	98-100	0-1	–
DISPERBYK-2096	■	96-100	–	–
DISPERBYK-2155		99	–	–
DISPERPLAST-1142	■	96-100	–	–
DISPERPLAST-1148	■	98-100	–	–
DISPERPLAST-1150	■	99-100	–	–
Dispersing Media				
BYK-1161	■	95-100	–	–
BYK-1162	■	95-100	–	–
Pigment Synergists				
BYK-SYNERGIST 2100		100	–	–
BYK-SYNERGIST 2105	■	100	–	–

› VOC-free Additives for “Greener” Systems

	DSL	Non-volatile matter in %	Water content in %	California Proposition 65 reportable component
Defoamers / Air Release Agents				
BYK-012	■	96-100	–	–
BYK-014	■	99-100	–	–
BYK-015	■	97.5-100	–	–
BYK-016	■	96-100	0-1	–
BYK-017	■	97.5-100	–	–
BYK-022	■	97-100	–	1,4-Dioxane, acetaldehyde, ethylene oxide, propylene oxide
BYK-023	■	16.5-20.5	81	1,4-Dioxane, ethylene oxide, propylene oxide
BYK-024	■	96-100	–	–
BYK-028	■	98-100	–	–
BYK-035	■	97-100	–	Toluene
BYK-038	■	96-100	–	Ethylene oxide, propylene oxide
BYK-085	■	98-100	–	–
BYK-093	■	98-100	–	–
BYK-094	■	96-100	–	N-methylpyrrolidone
BYK-1610	■	15-19	82.5	Ethylene oxide, 1,4-dioxane
BYK-1615	■	10.5-14.5	86	Ethylene oxide, propylene oxide
BYK-1650	■	26-30	72	Ethylene oxide, 1,4-dioxane
BYK-1730	■	96-100	–	1,4-Dioxane, acetaldehyde, ethylene oxide, propylene oxide
BYK-1770	■	96-100	–	–
BYK-1790	■	97.5-100	–	–
BYK-3105	■	98-100	–	–
BYK-A 535	■	97.5-100	–	–
BYK-S 732	■	98-100	–	–
Surface Additives				
BYK-302	■	95-100	–	–
BYK-307	■	97-100	–	–
BYK-322	■	98-100	–	–
BYK-323	■	96-100	–	–
BYK-331	■	98-100	–	–
BYK-333	■	97-100	–	–
BYK-348	■	96-100	–	–
BYK-349	■	94-100	–	Ethylene oxide
BYK-350	■	98-100	–	–
BYK-356	■	98-100	–	–
BYK-359	■	99-100	–	–
BYK-361 N	■	98-100	0.1	–
BYK-368 P	■	100	–	–
BYK-377	■	96-100	–	–
BYK-378	■	96-100	–	–
BYK-3900 P	■	100	–	–
BYK-3902 P	■	96-97	3-4	–
BYK-3931 P	■	100	–	–
BYK-3932 P	■	96-97	3-4	–
BYK-S 781	■	100	–	–
BYK-S 782	■	100	–	–
BYK-SILCLEAN 3710	■	96-100	–	–
BYK-UV 3500	■	96-100	–	–
BYK-UV 3510	■	96-100	–	Ethylene oxide
BYK-UV 3530	■	96-100	–	–
BYKETOL-PC	■	90	10	–
NANOBYK-3600	■	55	45	–

	DSL	Non-volatile matter in %	Water content in %	California Proposition 65 reportable component
Wax Additives				
AQUACER 501	■	35	62-63	Ethylene oxide, 1,4-dioxane
AQUACER 507	■	35	60	–
AQUACER 526	■	30	65.7	–
AQUACER 531	■	45	55	Ethylene oxide, 1,4-dioxane
AQUACER 533	■	40	59	–
AQUACER 535	■	28-32	68-72	Ethylene oxide, 1,4-dioxane
AQUACER 539	■	35	65	Ethylene oxide
AQUACER 552	■	33-37	63-67	Ethylene oxide
AQUACER 593	■	30	70	Ethylene oxide, 1,4-dioxane
AQUACER 1547	■	35	61	–
AQUAMAT 208	■	35	64	Ethylene oxide, 1,4-dioxane
AQUAMAT 270	■	55	43	Benzene, toluene, ethylbenzene, ethylene oxide, 1,4-dioxane
AQUATIX 8421	■	20	79.5	Ethylene oxide, ethyl acrylate
CERAFLOUR 913	■	100	–	–
CERAFLOUR 914	■	100	–	–
CERAFLOUR 915	■	100	–	–
CERAFLOUR 916	■	100	–	–
CERAFLOUR 928	■	100	–	–
CERAFLOUR 940	■	100	–	–
CERAFLOUR 950	■	100	–	–
CERAFLOUR 960	■	100	–	–
CERAFLOUR 961	■	100	–	–
CERAFLOUR 962	■	100	–	–
CERAFLOUR 965	■	100	–	–
CERAFLOUR 967	■	98-100	0-1	–
CERAFLOUR 968	■	100	–	–
CERAFLOUR 969	■	100	–	–
CERAFLOUR 970	■	100	–	–
CERAFLOUR 981	■	100	–	–
CERAFLOUR 988	■	100	–	–
CERAFLOUR 990	■	100	–	–
CERAFLOUR 991	■	100	–	–
CERAFLOUR 993	■	100	–	–
CERAFLOUR 994	■	100	–	–
CERAFLOUR 995	■	100	–	–
CERAFLOUR 996	■	100	–	–
CERAFLOUR 997	■	100	–	–
CERAFLOUR 998	■	100	–	–
MINERPOL 221	■	98-100	–	–
Processing Additives				
BYK-P 4100	■	98-100	0-1	–
BYK-P 4101	■	94-97	3-5	–
BYK-P 4102	■	100	–	–
BYK-P 4200	■	34-37	63-65	–
BYK-P 9051		99-100	–	–
BYK-P 9060		96-100	–	–
BYK-P 9065		97-100	–	–
BYK-P 9080		98-100	–	–

› VOC-free Additives for “Greener” Systems

	DSL	Non-volatile matter in %	Water content in %	California Proposition 65 reportable component
Rheology Additives				
AQUATIX 8421	■	20	79.5	Ethylene oxide, ethyl acrylate
BYK-425		99	–	–
BYK-R 606	■	96-100	–	–
Viscosity Depressants				
VISCOBYK-5025	■	95-100	0-1	–
VISCOBYK-5100		94-100	–	–
VISCOBYK-5120	■	90-100	–	–
VISCOBYK-5125	■	92-95	–	–
Inorganic UV Absorbers				
NANOBYK-3810	■	20.5-23	77-79.5	–
NANOBYK-3820	■	45	55	–
NANOBYK-3840	■	44	55	–
NANOBYK-3845	■	99-100	–	–
NANOBYK-3860		55	43	–

Looking for suitable additives for greener coating systems? Please find our product recommendations at www.byk.com/greenability.

Would you like to talk to a specialist on this topic? Our Green Experts will be glad to assist you further: GreenExperts.BYK@altana.com.

Looking for information on additives based on renewable raw materials? We have detailed information for you at www.byk.com/renewable.

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B-G 2



B-G 5



CM-G 20



- Greenability Overview B-1:**
 We help our customers achieve their "green" goals through our knowledge, service and range of products.
- Product Guide B-G 2:**
Additives for "Greener" Systems
 Summary of BYK additives that can be used for the formulation of "greener" systems.
- Product Guide B-G 5:**
Additives Based on Renewable Raw Materials
 Summary of BYK additives with details regarding the percentage of renewable resources.
- Product Guide CM-G 20:**
Additives for "Greener" Closed Mold Applications
 Summary of BYK additives than can be used for the formulation of "greener" closed mold applications.

Products and Applications

BYK Additives

Product Range Additives:

- Additives to improve surface slip, leveling and substrate wetting
- Adhesion promoters
- Defoamers and air release agents
- Processing additives
- Rheological additives
- UV-absorbers
- Viscosity depressants
- Wax additives
- Wetting and dispersing additives for pigments and extenders

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Application Areas:

Coatings Industry

- Architectural Coatings
- Automotive Coatings
- Industrial Coatings
- Can Coatings
- Coil Coatings
- Wood & Furniture Coatings
- Powder Coatings
- Leather Finishes
- Protective & Marine Coatings

Plastics Industry

- Ambient Curing Systems
- PVC Plastics
- SMC/BMC
- Thermoplastics

Printing Ink Industry

- Flexo Inks
- Gravure Inks
- Silk Screen Inks
- Offset Inks
- Overprint Varnishes

Paper Coatings

- Impregnation
- Coatings

Adhesives & Sealants

Construction Chemicals

Pigment Concentrates

Raw Materials for Manufacturing of Release Agents

BYK Instruments

BYK offers a complete line of testing instruments to meet your needs in many application areas:

- Gloss/Appearance
- Color

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Product Guide B-G 5

Additives Based on Renewable Raw Materials

Greenability

How “Green” is “Green”?

Additives from renewable raw materials.

The percentage of renewable materials in a product is another key indicator that is used to evaluate the eco-friendliness of a product. This factor also plays an important role in the development of eco-friendly coating and plastic systems. Thanks to its intensive product and application research, BYK now offers its customers a comprehensive portfolio of additives that are based on renewable materials.

What exactly do we mean by renewable resources?

A natural resource is considered to be renewable when it is replaced by means of natural processes at a rate that is comparable to or faster than the rate at which it is consumed by humans.

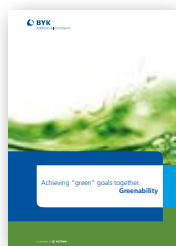
Various inorganic substances are considered to be “neutral” if they are not affected by combustion or biological decomposition: such as water or silicon dioxide. These neutral substances are not included in our listed data.

Looking for information on additives based on renewable raw materials?
We have detailed information for you at www.byk.com/renewable.

Would you like to talk to a specialist on this topic?
Our Green Experts will be glad to assist you further: GreenExperts.BYK@altana.com.

Looking for suitable additives for greener coating systems? Please find our product recommendations at www.byk.com/greenability.

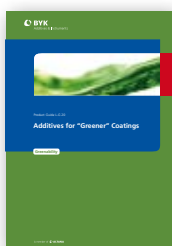
B-1



B-G 5



L-G 20



- **Greenability Overview B-1:**
We help our customers achieve their “green” goals through our knowledge, service and range of products.
- **Product Guide B-G 5: Additives Based on Renewable Raw Materials**
Summary of BYK additives with details regarding the percentage of renewable resources.
- **Product Guide L-G 20: Additives for “Greener” Coatings**
Summary of BYK additives that can be used for the formulation of “greener” coating systems.

Product name	Renewable raw materials (in %)
Wetting/Dispersing Additives	
ANTI-TERRA-203	50
ANTI-TERRA-204	46
ANTI-TERRA-205	47
ANTI-TERRA-U	33
ANTI-TERRA-U 80	52
ANTI-TERRA-U 100	64
BYK-P 104	39
BYK-P 104 S	31
BYK-P 105	76
BYK-W 961	59
BYK-W 966	34
BYK-W 980	52
BYKOPLAST-1000	65
BYKUMEN	34
DISPERBYK-106	30
DISPERBYK-107	75
DISPERBYK-108	83
DISPERBYK-109	80
DISPERBYK-116	42
DISPERBYK-130	36
DISPERBYK-192	33
DISPERBYK-2095	49
DISPERBYK-2096	80
DISPERPLAST-P	38
LACTIMON	38
Wax Additives	
CERAFLOUR 993	96
CERAFLOUR 994	96
MINERPOL 220	59
MINERPOL 221	65
Processing Additives	
BYK-3950P	70
BYK-P 4102	70
BYK-P 9050	90
BYK-P 9051	87
BYK-P 9060	64
BYK-P 9065	91
BYK-P 9080	71
BYK-P 9900	36
Dispersing Media	
BYK-1161	95
BYK-1162	95
Viscosity Depressants	
VISCOBYK-5100	47
VISCOBYK-5120	95
VISCOBYK-5125	65
Rheology Additives	
BYK-405	39
BYK-R 605	39
BYK-R 606	70
Foam Stabilizer	
BYK-8070	56

Products and Applications

BYK Additives

Product Range Additives:

- Additives to improve surface slip, leveling and substrate wetting
- Adhesion promoters
- Defoamers and air release agents
- Foam stabilizers
- Processing additives
- Rheological additives
- UV-absorbers
- Viscosity depressants
- Waxes
- Wetting and dispersing additives for pigments and extenders

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Application Areas:

Coatings Industry

- Architectural Coatings
- Automotive Coatings
- Industrial Coatings
- Can Coatings
- Coil Coatings
- Wood & Furniture Coatings
- Pigment Concentrates
- Powder Coatings
- Leather Finishes
- Protective & Marine Coatings

Plastics Industry

- Ambient Curing Systems
- PVC Plastics
- SMC/BMC
- Thermoplastics

PUR Industry

- C.A.S.E. Applications
- PUR Foams

Printing Ink Industry

- Flexo Inks
- Gravure Inks
- Silk Screen Inks
- Offset Inks
- Overprint Varnishes

Paper Coatings

- Impregnation
- Coatings

Adhesives & Sealants

Construction Chemicals

Raw Materials for Manufacturing of Release Agents

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