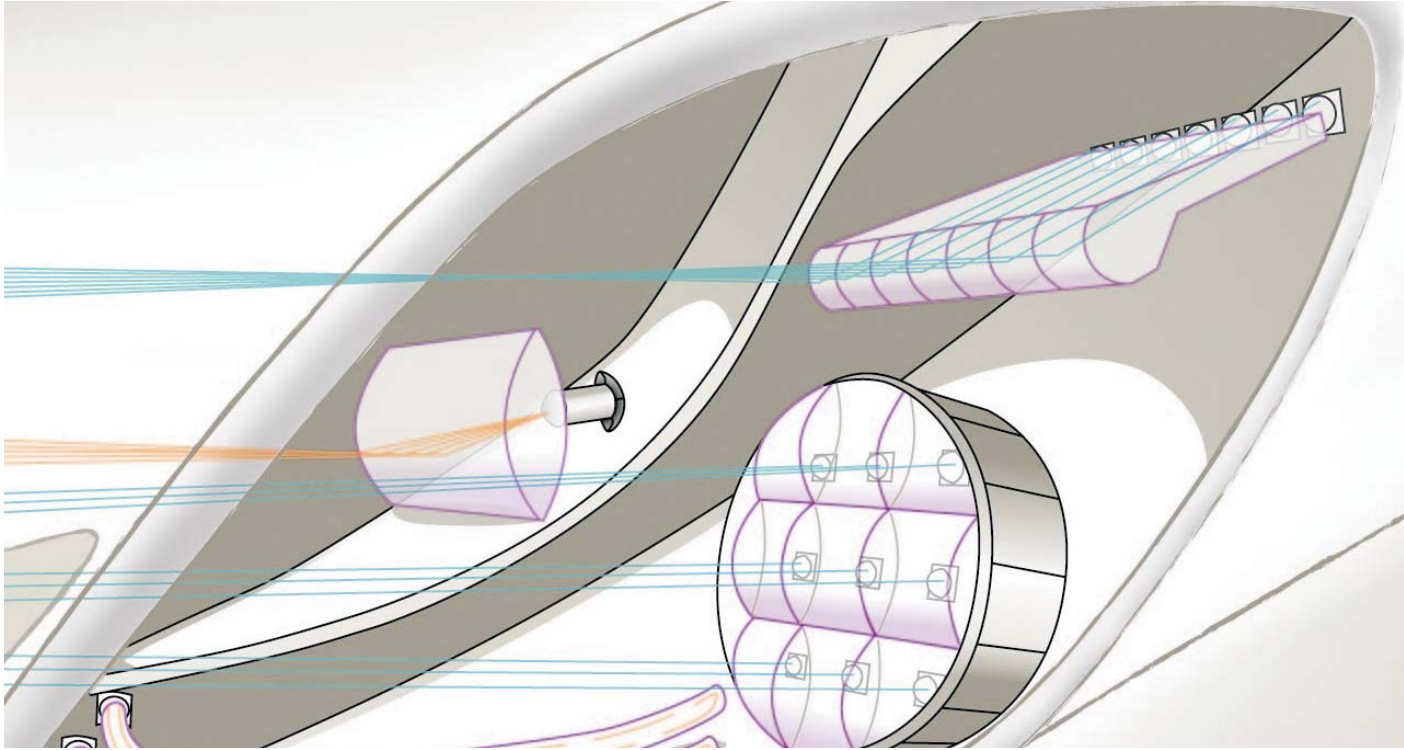


Design in a New Light

ACRYLITE® acrylic polymers for lighting applications





Offering:

ACRYMID®
ultra high heat
weatherable
acrylic polymers

ACRYMID TT70 170° C Vicat temperature resistance

ACRYMID TT50 150° C Vicat temperature resistance

ACRYMID 813 130° C Vicat temperature resistance



ACRYLITE®
high heat
acrylic polymers

Offering:

- | | |
|---------------------------|--|
| ACRYLITE hw55 | 120° C Vicat temperature resistance |
| ACRYLITE FT15 | 115° C Vicat temperature resistance |
| ACRYLITE SuPure 8N | 108° C Vicat temperature resistance |



Offering:

ACRYLITE® df
light diffusing
acrylic polymers

ACRYLITE df20 8N **90% Light transmission / 50% Haze**

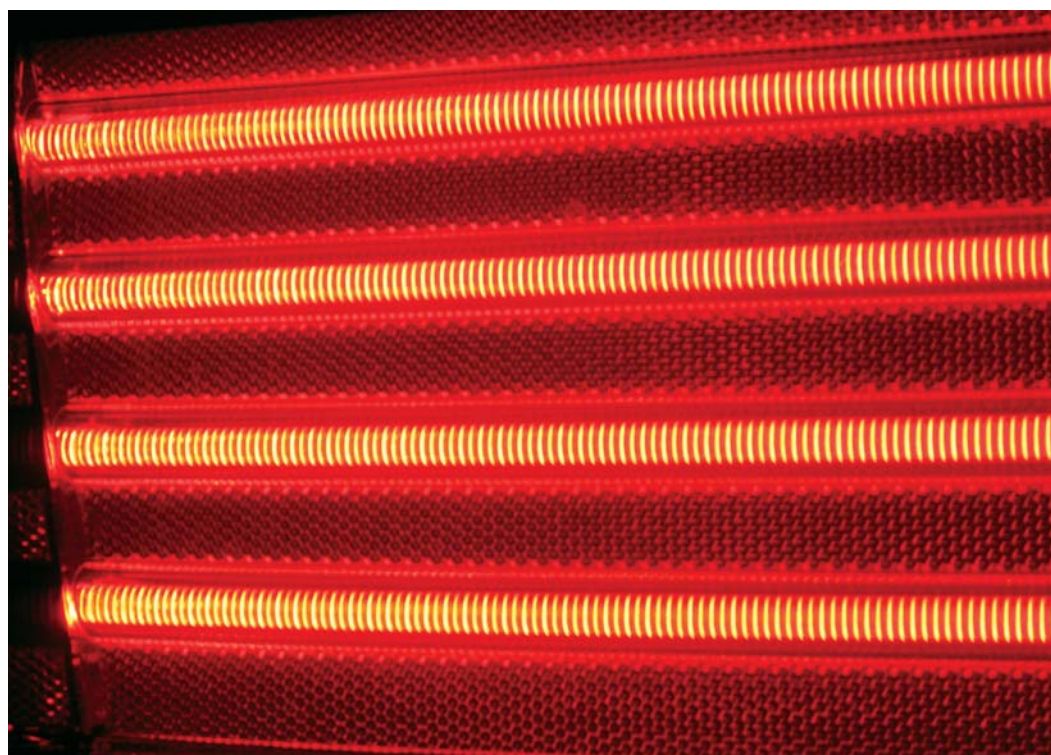
ACRYLITE df21 8N **90% Light transmission / 83% Haze**

ACRYLITE df22 8N **88% Light transmission / 94% Haze**

ACRYLITE df23 8N **86% Light transmission / 96% Haze**

ACRYLITE PLUS zdf **Impact modified with df23 optics**





Offering:

ACRYLITE® SuPure®
ultra pure acrylic
polymers

ACRYLITE SuPure 8N

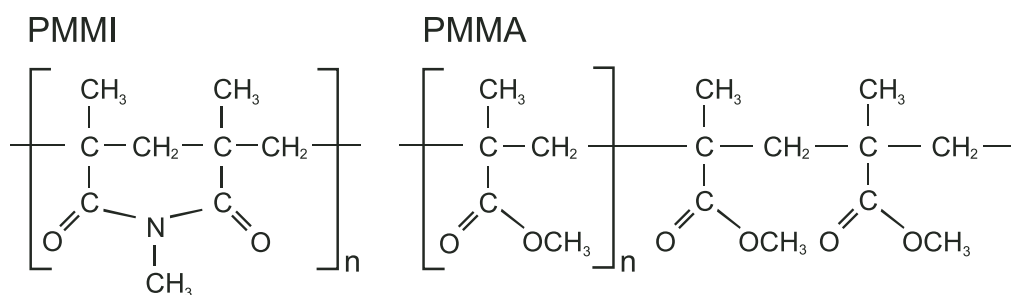
92% Light transmission / 3.3 MFI

ACRYLITE H12

92% Light transmission / 7.0 MFI



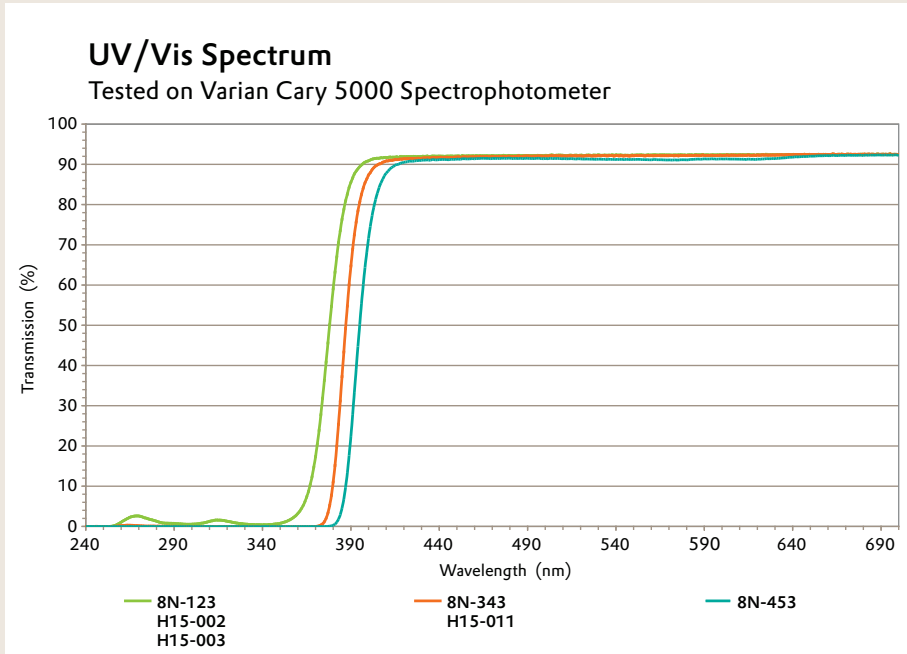
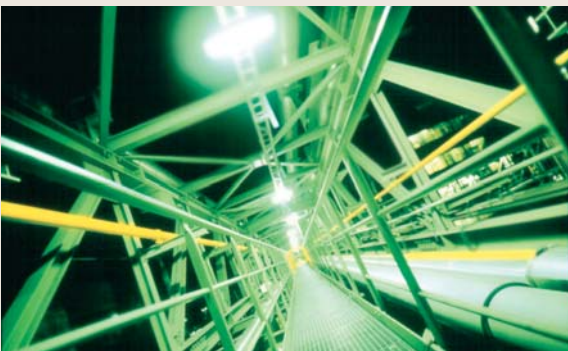
Evonik Cyro offers the widest range of acrylic polymers for optical, thermal, and outdoor LED lighting applications. Our polymers offer excellent optics which yield high efficiencies in all types of demanding lighting applications. Products can be colored to various levels of transparency or to fully opaque, including brilliant white to high gloss piano black.



High Heat Lighting Grades – Typical Physical Properties

Key Properties	Method	ACRYMID TT70	ACRYMID TT50	ACRYMID 813	ACRYLITE hw55	ACRYLITE FT15	ACRYLITE SuPure 8N
Optical							
Transmission Factor % @ D65 / 10°	ISO 13468-2	91	91	91	91	91	92
Haze, %	ASTM D1003	< 1	< 1	< 1	< 1	< 1	< 0.5
Yellowness Index	ASTM E313	< 1	< 1	< 1	< 0.5	< 0.5	< 0.5
Refractive Index	ISO 489	1.536	1.530	1.512	1.512	1.500	1.490
Rheological							
Melt Volume Rate, cm ³ /10 min (230°C & 3.8 kg)	ISO 1133	–	–	–	1.2	4.5	3.0
(260°C & 10 kg)	ISO 1133	1.7	5.0	20.0	–	–	–
Mechanical							
Tensile Modulus, MPa @ 1mm/min	ISO 527	4000	4000	4000	3600	3500	3300
Stress @ Break, MPa @ 5mm/min	ISO 527	80	80	85	80	50	77
Strain @ Break, % @ 5 mm/min	ISO 527	3	3	4	3.5	3.1	5.5
Charpy Impact Strength kJ/m ² 23 °C	ISO 179 / 1eU	20	20	20	20	18	20
Ball Hardness H _{961/30} MPa	DIN 53 456	211	201	200	211	202	183
Physical							
Vicat Softening Point, °C @ B/ 50	ISO 306	170	150	130	120	115	108
Deflection Temperature, °C @ 0.45 MPa	ISO 75	158	140	118	109	107	103
°C @ 1.8 MPa	ISO 75	149	132	111	106	105	98
Density g / cm ³	ISO 1183	1.21	1.21	1.21	1.19	1.19	1.19
Water Absorption, 23 °C/50% RH	ISO 62	0.63	0.54	0.44	0.60	0.46	0.32
Sat/23 °C	ISO 62	6.0	4.0	5.0	2.2	2.0	2.0
Mold Shrinkage, mm/mm	ISO 294	0.001 - 0.004	0.002 - 0.005	0.002 - 0.005	0.002 - 0.006	0.002 - 0.005	0.003 - 0.006
Coefficient of Linear Thermal Expansion, mm/mm/°C, 0 -50 °C	ISO 11359-2	5.7	5.3	5.1	6.4	6.6	8.0

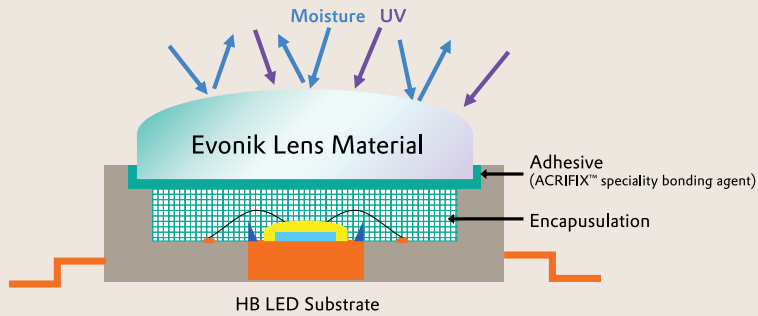
Special UV blocking and HID grades are available as well as the low absorption coefficient SuPure polymer.



Light Diffusing and Conventional Lighting Grades – Typical Physical Properties

Key Properties	ASTM Method	ACRYLITE SuPure 8N	ACRYLITE df20 8N	ACRYLITE df21 8N	ACRYLITE df22 8N	ACRYLITE df23 8N	ACRYLITE PLUS zdf	ACRYLITE H12
Optical								
Light Transmission, %	D 1003	92	90	90	88	86	85	92
Haze, %	D 1003	< 0.5	50	83	94	96	96	< 0.5
Yellowness Index	D 1925	< 0.5	< 1*	< 2*	< 4.5*	< 6.5*	< 5.5*	< 0.5
Rheological								
Melt Flow Rate, g/10 min(230°C & 3.8 kg)	D 1238	3.3	3.2	3.1	3.0	2.9	3.1	7.0
Mechanical								
Tensile Strength, psi [MPa]	D 638	11,300 [77.9]	11,350 [78.3]	11,500 [79.3]	11,500 [79.3]	11,500 [79.3]	6,400 [44.1]	9,500 [65.5]
Tensile Modulus, x 10 ⁶ psi [GPa]	D 638	0.47 [3.2]	0.54 [3.7]	0.55 [3.8]	0.55 [3.8]	0.55 [3.8]	0.25 [1.7]	0.47 [3.2]
Tensile Elongation @ Yield, %	D 638	4 - 6	4	4	4	4	4	4 - 6
Tensile Elongation @ Break, %	D 638	4 - 6	4	4	4	4	20	4 - 6
Flexural Strength, psi [MPa]	D 790	16,200 [111.7]	19,000 [131]	20,000 [138]	20,000 [138]	19,000 [131]	10,000 [69.0]	17,000 [117.2]
Flexural Modulus, x 10 ⁶ psi [GPa]	D 790	0.5 [3.5]	0.50 [3.5]	0.50 [3.5]	0.50 [3.5]	0.50 [3.5]	0.26 [1.8]	0.49 [3.4]
Notched Izod, ft-lb/in [J/m]								
¼" [6.35 mm] bar @ 23°C	D 256	0.36 [19]	0.3 [16]	0.3 [16]	0.3 [16]	0.3 [16]	1.0 [52.5]	0.36 [19]
¼" [6.35 mm] bar @ 0°C	D 256	-	-	-	-	-	0.5 [26.3]	-
Rockwell Hardness, M Scale	D 785	95	95	95	95	95	44	94
Physical								
Vicat Softening Point, °F [°C]	D 1525	226 [108]	243 [117]	246 [119]	246 [119]	246 [119]	226 [108]	221 [105]
Deflection Temperature, °F, [°C] @ 1.8MPa, annealed, 0.250"	D 648	212 [100]	221 [105]	221 [105]	221 [105]	221 [105]	185 [85]	201 [95]
Specific Gravity	D 792	1.19	1.19	1.19	1.19	1.19	1.15	1.19
Water Absorption, % Max	D 570	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Mold Shrinkage, in/in, mm/mm	D 551	0.004 - 0.007	0.003 - 0.006	0.003 - 0.006	0.003 - 0.006	0.003 - 0.006	0.003 - 0.006	0.004 - 0.006
Bulk Density, g/cc	D 1895	0.66	0.66	0.66	0.66	0.66	0.71	0.66
Coefficient of Linear Thermal Expansion, in/ in/°F, 32 -212°F	D 696	0.00004	0.00004	0.00004	0.00004	0.00004	0.00005	0.00004
mm/mm/°C, 0 -100°C	D 696	0.000072	0.000072	0.000072	0.000072	0.000072	0.00009	0.000072

* YI values on light diffusion materials do not correlate with the appearance of similar YI values of transparent polymers



The Perfect Complement – ACRIFIX™ Specialty Bonding Agents

ACRIFIX™ 2R 0190 is a versatile all purpose, weatherable reactive cement that can be used for optical joints to LEDs. Use ACRIFIX 2R 0195 reactive cement, with its unique satin finish, to create strong and seamless joints with textured, light-diffusing products. Or, if you prefer a non-methylene chloride solvent cement, use ACRIFIX™ 1S 0117 which has superior capillary action for better flow through and is quick drying.

Technical Support

Visit the TechKnowlogy Center at www.acrylite-polymers.com where visitors have immediate access to FAQs, technical information, tips, and hundreds of other facts about ACRYLITE acrylic products.



Evonik Cyro LLC

379 Interpace Parkway
Parsippany, NJ 07054

PHONE +1 973 541-8000

www.acrylite-polymers.com
www.evonik.com

Important Notice:

This information and all technical and other advice are based on Evonik's present knowledge and experience. However, Evonik assumes no liability for such information or advice, including the extent to which such information or advice may relate to third party intellectual property rights. Evonik reserves the right to make any changes to information or advice at any time, without prior or subsequent notice. EVONIK DISCLAIMS ALL REPRESENTATIONS AND WARRANTIES, WHETHER EXPRESS OR IMPLIED, AND SHALL HAVE NO LIABILITY FOR, MERCHANTABILITY OF THE PRODUCT OR ITS FITNESS FOR A PARTICULAR PURPOSE (EVEN IF EVONIK IS AWARE OF SUCH PURPOSE), OR OTHERWISE. EVONIK SHALL NOT BE RESPONSIBLE FOR CONSEQUENTIAL, INDIRECT OR INCIDENTAL DAMAGES (INCLUDING LOSS OF PROFITS) OF ANY KIND. It is the customer's sole responsibility to arrange for inspection and testing of all products by qualified experts. Reference to trade names used by other companies is neither a recommendation nor an endorsement of the corresponding product, and does not imply that similar products could not be used.

ACRYLITE®, ACRYLITE PLUS®, ACRYMID® and SuPure® are registered trademarks of Evonik Cyro LLC in the Americas. These same products are manufactured and marketed under the PLEXIGLAS® and Pleximid® trade names on the European, Asian, African and Australian continents.

© 2010 Evonik Cyro LLC. All Rights Reserved. Printed in USA.