CYRO

Product Profile

a *Clear* solution to your impact resistance problems

QUALITY PRODUCTS…INNOVATIVE TECHNOLOGIES…CARING PEOPLE

QUALITY PHILOSOPHY

QUALITY PRODUCTS

INNOVATIVE TECHNOLOGIES

CARING PEOPLE

CYRO'S goal is to provide products and services to our customers that meet their requirements 100 percent of the time.

CYRO's management is dedicated to providing the leadership necessary to be the best supplier in our industry and will create and maintain an environment for Continuous Quality Improvement, where everyone can work effectively for the company.

Every individual in CYRO is a valued employee on the CYRO Team and must be involved in Continuous Quality Improvement. People in various departments must work closely together as a Team to foresee problems that may be encountered with the products or services that CYRO supplies.

Effective training programs will continue to be made available to all employees and expanded to enhance job skills, develop people and teach new methods.

Continuous Quality Improvement requires defect prevention strategies in all areas of CYRO to provide better products and services with continuously lower costs.

CYRO

Acrylite Plus®

IMPACT ACRYLIC MOLDING AND EXTRUSION COMPOUNDS

Continuous Quality Improvement begins with each individual in our company and extends throughout the entire organization to include our suppliers. We have adopted the concept of total "Cost of Use," as compared to a focus on just purchase price in our purchasing decisions. We are moving toward fewer supplier relationships for major purchased items by building long-term partnerships based on loyalty and trust.

CYRO will use appropriate statistical methods to assist in its Continuous Quality Improvement efforts.

The people of CYRO Industries are committed to Continuous Quality Improvement.

- Enhanced Impact Resistance
- Outstanding Clarity
- Excellent Weatherability
- Ease of Processability

Enhanced ***Impact Resistance***

Outstanding *Clarity*

Excellent *Weatherability*

Ease of ***Processability***

Acrylite Plus®

IMPACT ACRYLIC MOLDING AND EXTRUSION COMPOUNDS

As the producer of North America's most complete line of acrylic-based molding and extrusion compounds, CYRO Industries is committed to the development of top-quality, innovative plastics.

CYRO produces a broad line of acrylic and modified acrylic-based products which are used in a wide variety of applications. CYRO's molding and extrusion compounds are the material of choice due to their consistent quality, versatility and excellent performance characteristics.

ACRYLITE PLUS Compounds

Maximum Impact, Maximum Clarity

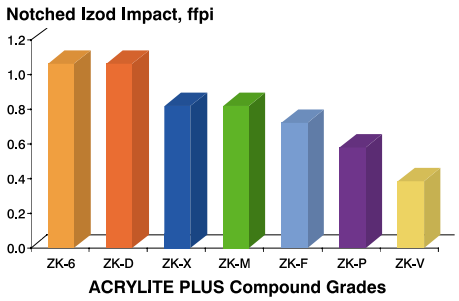
ACRYLITE PLUS® impact acrylic molding and extrusion compounds are specially formulated to offer enhanced impact resistance without sacrificing clarity.

ACRYLITE PLUS compounds, offered in seven grades, provide maximum impact performance, along with the clarity you would expect from a standard PMMA material. In addition, ACRYLITE PLUS compounds offer excellent weatherability for outdoor applications.

ACRYLITE PLUS compounds can be used in a wide variety of applications:

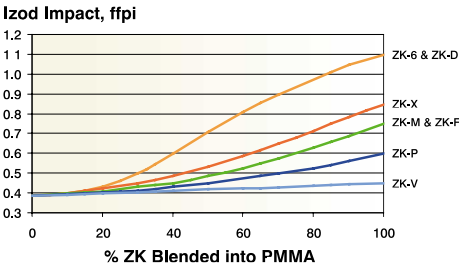
- automotive lighting
- architectural lighting
- housewares
- consumer/personal care products
- business machines
- architectural signs/cap stock
- point-of-purchase displays
- sheet/film products

ACRYLITE PLUS Compounds
Impact Strength



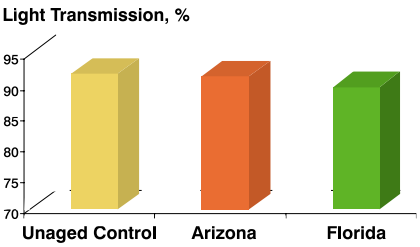
Depending on the application requirements, there is an ACRYLITE PLUS compound grade that provides the optimum balance of impact resistance and melt flow.

ACRYLITE PLUS Compounds
Effect of Grade Levels on Notched Izod Impact Strength



ACRYLITE PLUS compounds can easily be blended with ACRYLITE® acrylic molding and extrusion compounds to further optimize impact strength and processability.

ACRYLITE PLUS Compounds
3 Years Outdoor Weathering



**Specimen - 0.125 inch thickness*

ACRYLITE PLUS compounds resist the adverse effects of outdoor weathering and will retain both their physical properties and appearance after long periods of outdoor exposure.

Typical Physical Properties of ACRYLITE PLUS Compounds

	ASTM Method	ZK-6	ZK-D	ZK-X	ZK-M	ZK-F	ZK-P	ZK-V
Optical Properties								
Light Transmission, %	D-1003	91.5	91.5	91.5	91.5	92.0	92.0	91.5
Haze, %	D-1003	1	1	1	1	1	1	1
Refractive Index	D-542	1.49	1.49	1.49	1.49	1.49	1.49	1.49
Rheological Properties								
Avg Melt Flow, g/10 min @ 230°C & 3.8 kg	D-1238	1.7	5.8	1.0	3.5	13.0	4.5	2.0
Mechanical Properties								
Tensile Strength, psi [MPa]	D-638	6,300 [43.4]	6,400 [44.1]	9,300 [64.1]	8,500 [58.6]	8,200 [56.2]	10,500 [72.4]	9,100 [62.7]
Tensile Modulus, x 10^6 psi [GPa]	D-638	0.22 [1.5]	0.23 [1.6]	0.37 [2.5]	0.32 [2.2]	0.33 [2.3]	0.40 [2.8]	0.44 [3.0]
Tensile Elongation @ Yield, %	D-638	5	5	5	5	5	5	5
Tensile Elongation @ Break, %	D-638	55	40	25	30	25	20	15
Flexural Strength, psi [MPa]	D-790	8,600 [59.3]	9,400 [64.8]	15,000 [103.4]	13,000 [89.6]	10,000 [68.9]	15,700 [72.4]	15,300 [105.5]
Flexural Modulus, x 10^6 psi [GPa]	D-790	0.22 [1.5]	0.23 [1.6]	0.35 [2.5]	0.32 [2.2]	0.29 [2.0]	0.40 [2.8]	0.44 [3.0]
Notched Izod, ft-lb/in [J/m] on 1/4" [6.35 mm] bar								
@ 23°C	D-256	1.10 [58.1]	1.10 [58.1]	0.85 [44.9]	0.85 [44.9]	0.75 [39.6]	0.60 [31.5]	0.40 [21.0]
@ 0°C	D-256	0.70 [36.8]	0.65 [34.1]	0.60 [31.7]	0.50 [26.3]	0.45 [23.9]	0.35 [18.5]	0.20 [10.5]
Rockwell Hardness, M Scale	D-785	40	33	70	38	65	80	80
Physical Properties								
DTL, °F [°C] @ 264 psi annealed	D-648	194 [90]	190 [88]	200 [93]	196 [91]	196 [91]	198 [92]	203 [95]
Vicat Softening Point, °F [°C]	D-1525	201 [94]	201 [94]	230 [110]	210 [99]	208 [98]	219 [104]	217 [103]
Specific Gravity	D-792	1.16	1.16	1.16	1.18	1.17	1.18	1.18
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	0.004 - 0.007	0.003 - 0.006	0.003 - 0.006	0.003 - 0.006	0.004 - 0.007
Coefficient of Linear Expansion								
in/in/°F, 32 – 212°	D-696	0.00004	0.00004	0.000052	0.00004	0.00004	0.00004	0.00004
[mm/mm°C, 0 – 100°C]		[0.000072]	[0.000094]	[0.000072]	[0.000072]	[0.000072]	[0.000072]	[0.000072]
Flammability		UL 94 HB	UL 94 HB	UL 94 HB	UL 94 HB	UL 94 HB	UL 94 HB	UL 94 HB
Surface Resistivity, ohms/square		$3x10^{13}$	$6x10^{13}$	-	$4x10^{13}$	-	-	-

quality***products***

Why Choose Cyro?

innovative***technologies***

caring***people***

SERVICE AS GOOD AS THE PRODUCTS

CYRO puts equal effort toward developing superior grade products for your injection molding, extrusion and thermoforming requirements, and providing complete individualized technical and commercial service. Those are the main reasons why CYRO Industries is a leading supplier of acrylic and acrylic-based multipolymer compounds for extrusion, thermoforming and injection molding applications.

CYRO Industries is a wholly-owned subsidiary of Degussa.

SUPPORT FROM THE TECHNICAL SERVICE CENTER

The CYRO Technical Service Center utilizes a broad range of injection molding, extrusion and thermoforming, and testing equipment for product and process evaluations. Our Technical Service Department is also able to provide on-site assistance in customer plants when necessary. Arrangements for technical service visits can be scheduled through your sales representative or directly with our Technical Service Group. Whether for advice during pilot runs or process troubleshooting, CYRO engineers are ready to help you.

Another aspect of our technical service is the availability of MOLDFLOW® computer-aided design* programs, which we license from Moldflow PTY, Ltd., of Australia. These programs are used to help analyze part and mold designs in an effort to predict potential problems or solve existing ones.

MOLDFLOW® is a mold filling simulation program. It gives information on the filling pattern, weldline location, pressure distribution, material temperature, shear rates, and shear stresses. The user can use such information to evaluate the effects of potential modifications to part design, gate location and count, and material used in molding process. This allows the user to evaluate modifications before modifying the tool.

** MOLDFLOW isa trademark of Moldflow PTY, Ltd.*

CYRO www.cyro.com www.degussa.com

Americas: CYRO Industries
379 Interpace Parkway
PO Box 677
Parsippany, NJ 07054 USA
Phone: 800-631-5384

Europe: Degussa AG
Molding Compounds Business Line
Kirschnallee
64293 Darmstadt, Germany
Phone: +49 (0) 6151 - 18 4711

Asia Pacific Degussa (SEA) PTE. LTD.
3 International Business Park
#07-18, Nordic European Centre
SGP - Singapore 609 927
Phone: + 65-6890 6811

3000A-0103-5PHIA

Printed in U.S.A.