



CYRO

Abrasion Resistant Products

Acrylite® AR
ACRYLIC SHEET

Cyrolon® AR
POLYCARBONATE SHEET

Acrylite® GAR
ACRYLIC SHEET

Diamond-like Perfection

A History of Technology, Quality and Service

For more than 20 years, CYRO Industries and its Canadian subsidiary, CYRO Canada Inc., have offered some of the highest quality, most innovative plastics products to the North American market. CYRO's newest generation of abrasion resistant acrylic and polycarbonate sheet products is the result of highly concentrated research and development in the most advanced manufacturing and coating technologies.

CYRO is proud to now be manufacturing ACRYLITE® AR and ACRYLITE® GAR acrylic sheet in its new state-of-the-art coating facility using the proprietary 3M 906 abrasion resistant coating, under license from the 3M Company. CYRO's abrasion resistant sheet product line, which includes CYROLON® AR polycarbonate sheet, provides exceptional product performance and quality to satisfy the market's needs.

CYRO's abrasion resistant sheet products offer abrasion and chemical resistance for demanding applications where frequent handling, heavy traffic and regular cleaning are commonplace. The added protection of an abrasion resistant coating helps to significantly extend service life of the products. Since the sheet is available with the coating on one or two sides, an economical one-side coated sheet can be chosen for applications that do not warrant two-sided protection.

CYRO's abrasion resistant sheet products are covered by the same commitment to service as are all CYRO products. Our sales specialists and customer service representatives can assist with any custom requests. Our Technical Service Center, staffed with experienced engineers, can answer performance or fabrication questions. Our multi-site warehousing and distribution system allows for fast delivery to meet project deadlines.

Brilliance, Clarity and Cost Savings... The CYRO Advantage!

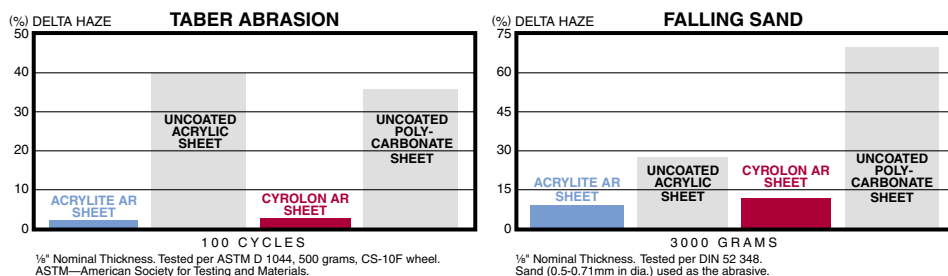
Many applications require abrasion or chemical protection on only the exposed outer side. Until now, it has been either too difficult or too expensive to obtain a one-side coated sheet. CYRO has made purchasing a one-side coated sheet easy, by stocking standard sheet sizes, thicknesses and products in our warehouses. One-side coated sheet also lets you retain design flexibility since you can silkscreen or cement onto the uncoated side. Now, fabricated items can incorporate the protection of abrasion resistance that was previously unavailable, adding value to the finished product.



Abrasion Resistant Products

CYRO's abrasion resistant sheet products offer 40 times the mar resistance of uncoated sheet. For applications subject to frequent public contact, such as displays, exhibits and fixtures, abrasion resistant sheet will help maintain a "like-new" premium appearance much longer. Frequent cleaning can also be a challenge to uncoated sheet. The challenge is met by using CYRO's abrasion resistant sheet products. They can be cleaned with ordinary glass cleaners and still maintain their sparkling clarity.

Diamond like clarity...diamond like performance...all available with CYRO's ACRYLITE AR acrylic sheet, CYROLON AR polycarbonate sheet, and ACRYLITE GAR acrylic sheet products.



CHEMICAL RESISTANCE

| Chemical | ACRYLITE AR Sheet | Standard Acrylic Sheet | CYROLON AR Sheet | Standard Polycarbonate Sheet |
|---------------------|-------------------|------------------------|------------------|------------------------------|
| Acetone | > 24 hrs | < 15 min | > 24 hrs | < 15 min |
| Ethylene Dichloride | > 24 hrs | < 15 min | > 24 hrs | < 15 min |
| Gasoline | > 24 hrs | > 24 hrs | > 24 hrs | > 24 hrs |
| Hydrochloric Acid | > 24 hrs | > 24 hrs | > 24 hrs | > 24 hrs |
| Methyl Alcohol | > 24 hrs | > 24 hrs | > 24 hrs | > 24 hrs |
| Methylene Chloride | > 24 hrs | < 15 min | > 24 hrs | < 15 min |
| Methyl Ethyl Ketone | > 24 hrs | > 15 min | < 24 hrs | < 15 min |
| Nitric Acid | < 24 hrs | < 15 min | > 1 hr | < 15 min |
| Sodium Hydroxide | > 24 hrs | < 24 hrs | < 24 hrs | < 24 hrs |
| Sulfuric Acid | > 24 hrs | < 15 min | > 1 hr | < 1 hr |
| Toluene | > 24 hrs | < 15 min | > 1 hr | < 15 min |
| Isopropanol | > 24 hrs | > 24 hrs | > 24 hrs | > 24 hrs |
| Kerosene | > 24 hrs | > 24 hrs | > 24 hrs | > 24 hrs |

Testing the resistance of the above chemicals was conducted per ASTM D 1308. Time intervals for visually inspecting the sheet surface; 15 minutes, 1 hour and 24 hours. The table shows the time it took the chemical to visually attack the surface.



Acrylite[®] AR

ACRYLIC SHEET

ACRYLITE AR acrylic sheet is a continuously manufactured acrylic sheet which utilizes the proprietary 3M 906 abrasion resistant coating on one or both sides, offering 40 times greater resistance to marring and chemical attack than uncoated acrylic. ACRYLITE AR sheet offers outstanding optics and fabrication ease.

Properties

- excellent optical quality
- abrasion and chemical resistant
- ease of fabrication and cleaning
- half the weight of glass
- many times the impact strength of glass

Match Performance to Requirements

ACRYLITE AR sheet is available in several different formulations to meet specific needs.

- Count on ACRYLITE AR acrylic sheet to meet a wide range of needs for a crystal clear, strong, abrasion and chemical resistant sheet product.
- Choose ACRYLITE AR-OP3 acrylic sheet for abrasion and chemical resistance combined with 98 percent ultraviolet light filtering.
- Specify ACRYLITE AR-P99 acrylic sheet to minimize glare.
- Color your application with ACRYLITE AR acrylic sheet in a variety of standard solar tints – Bronze 126-4 and 131-2; Grey 103-2 and 104-1.



Typical Applications

One-Side Coated

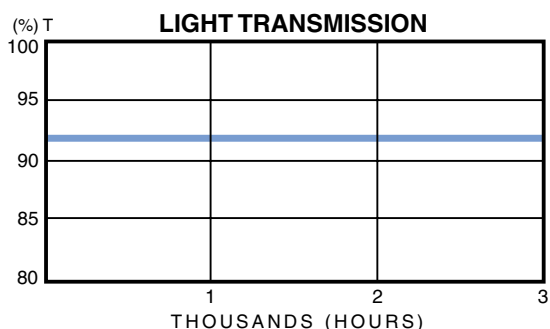
Glazing Museum Displays
POP Displays Insulated Windows
Store Fixtures Signs & Directories
Menu Boards Furniture
Optical Screens Framing

Two-Side Coated

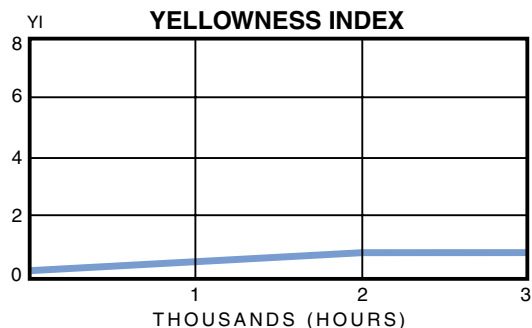
Sports Arena Glazing
School Glazing
Architectural Glazing
Security Glazing
Cleanrooms
Furniture

Weathering

ACRYLITE AR sheet maintains its original appearance and color despite heat, cold, sunlight and humidity. It withstands the adverse effects of outdoor weathering and has been found to experience no significant loss of light transmittance or any appreciable increase in yellowing after an accelerated weathering period of 3000 hours Xenon Arc. This should ensure many years of trouble free performance.



1/8" Nominal Thickness. Xenon arc per ASTM D 2565, Type B. Tested per ASTM D 1003.



1/8" Nominal Thickness. Xenon arc per ASTM D 2565, Type B. Tested per ASTM D 1003.

Cyrolon[®] AR

POLYCARBONATE SHEET

CYROLON AR polycarbonate sheet combines the high impact strength, high service temperature and optical properties of polycarbonate sheet with abrasion and chemical resistance to produce a product with outstanding weatherability and mar resistance. Available with the abrasion resistant coating on one or both sides, CYROLON AR sheet provides tough protection against a variety of threats, while offering the economies of a one-side coating option.

Properties

- abrasion and chemical resistant
- ease of fabrication and cleaning
- improved weatherability
- high impact resistance
- high service temperature
- excellent optical quality
- half the weight of glass





Typical Applications

One-Side Coated

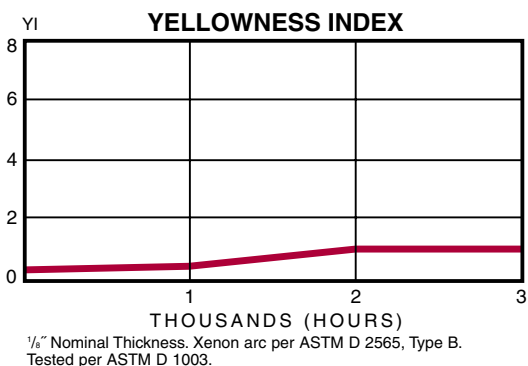
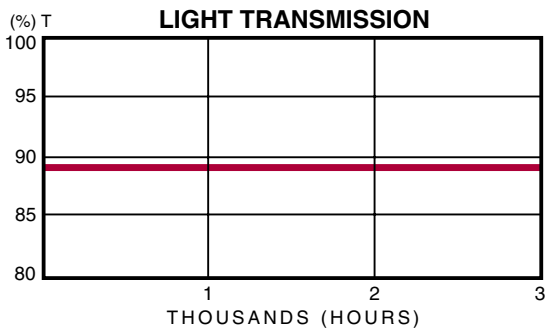
Bus Shelters
Signs
Security Laminations
Electrical Enclosures
Vending Machines
Outdoor Advertising
Video Arcade Games

Two-Side Coated

Transportation Glazing
Architectural Glazing
Security Glazing
Municipal Glazing
School Glazing
Machine Guards
Bus Shelters

Weathering

CYROLON AR sheet offers an improved resistance to weathering over uncoated polycarbonate sheet. No significant loss in abrasion resistance, light transmission or impact will be seen over many years of service.





The ACRYLITE GAR acrylic sheet panels on the right side still allow for a clear view. Meanwhile, the two uncoated sheet panels on the left have become scuffed and marred.

Acrylite® GAR

ACRYLIC SHEET

Clarity and brilliance are unsurpassed with ACRYLITE GAR abrasion resistant acrylic sheet. Made by the cell cast manufacturing process, there is no finer acrylic sheet to meet stringent optical requirements. The unique properties of cast sheet can last even longer because of its abrasion and chemical resistant coating. ACRYLITE GAR utilizes the proprietary 3M 906 abrasion resistant coating, available on one or both sides, combining beauty with long lasting performance.



Properties

- superior optical quality
- abrasion and chemical resistant
- ease of fabrication and cleaning
- light weight
- available in thicker custom sheet sizes
- available in custom colors

Typical Applications

One-Side Coated

Hockey Rinks
Museum Cases
Custom Displays
Architectural Glazing

Two-Side Coated

Hockey Rinks
Bus Windows
Architectural Glazing



Players and spectators at the Great Western Forum have the best view thanks to ACRYLITE GAR acrylic sheet.



Abrasion resistant, UV filtering ACRYLITE GAR OP-2 acrylic sheet helps to preserve and protect the wills of George and Martha Washington.

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By specifying ACRYLITE AR abrasion resistant acrylic sheet for its display cases, the Museum at Portland Head Light achieved longer lasting protection and a "like new" appearance.



By replacing its glass window glazing with ACRYLITE AR abrasion resistant acrylic sheet, this New England school has experienced a significant reduction in breakage and window replacement costs.



Glazing oversized works of art with light weight, impact resistant ACRYLITE AR acrylic sheet makes good sense for all creations.

Cleaning To clean off the surface of ACRYLITE AR, ACRYLITE GAR, and CYROLON AR abrasion resistant sheet products, a liquid detergent and water solution is recommended. There are commercially available cleaners that also work well without damaging the coated surface. It is not recommended to use abrasive cleaners on the sheet surface. The following brand name cleaners have been tested and found to work well on coated surfaces.

Caution: Some of these cleaners may attack the uncoated side of the sheet.

| | |
|--------------------------------|------------------------------|
| Fantastik® household cleaner | Mr. Clean® household cleaner |
| Formula 409® household cleaner | Top Job® household cleaner |
| Glass Plus® cleaner | Windex® window cleaner |

To remove paint, ink and graffiti from the coated surface, use a soft cloth soaked in either Isopropyl Alcohol or VM&P Naphtha. Then immediately wash and rinse off residue using a liquid detergent and warm water solution. Never use mechanical methods, such as razor blades, putty knives or scrapers, on the surface of the sheets. This may lead to gouging and removal of the hard coat. Once the coating has been removed, it cannot be repaired.

Cementing ACRYLITE AR, ACRYLITE GAR and CYROLON AR sheets are available with either one or two sides coated for protection against abrasion. When cementing to a non-coated sheet surface, use the same solvent or polymerizing cements commonly used for ACRYLITE or CYROLON sheet products. The most critical factor is the edge of the part to be cemented. The edge must first be properly prepared with low stresses.

Solvent cementing to a hard coated surface cannot be readily accomplished due to the chemical resistance of the coating. To solvent cement onto a coated surface, the coating must first be removed by sanding or routing. When removing the coating, insure that the bonding surface is flat, clean and free of stress.

Thermoforming Line bending or thermoforming ACRYLITE AR or CYROLON AR sheet is not recommended. The abrasion resistant, hard coat surface does not soften when heated. The coating will separate and crack in the heated region, leaving an optically-poor line bent area. This area can lose its abrasion resistant properties.

Thermoforming of larger areas, even the forming of shallow domes, will result in crazing of the coated surface. Therefore, no method of heat forming is recommended for either, one-side or two-side coated products.

Cold Forming Bending of the coated sheets into a generous radius can be done. To calculate the minimum radius of curvature, multiply the thickness of the sheet to be used by 330 for ACRYLITE AR and CYROLON AR sheets. Tighter radii may result in crazing or cracking of the coating and may lead to a loss of abrasion resistant properties.

Code Approval ACRYLITE AR sheet and ACRYLITE GAR sheet meet the requirements of the following codes and regulations:

- ANSI Z 97.1 for use as Safety Glazing Materials Used in Buildings
- ANSI Z26.1, AS-4, 5, 6 & 7 for Safety Glazing Materials for Glazing Motor Vehicles
- Uniform Building Codes for use as a Light Transmitting Plastic:
 - See BOCA Evaluation Services, Inc., Research Report # 94-30
 - ICBO Evaluation Service, Inc. Evaluation Report # 3715-CC2 Classification (ACRYLITE AR sheet, ACRYLITE GAR sheet)
 - SBCCI PST & ESI Evaluation Report # 95112A
 - City of Los Angeles, Research Report RR 24392
 - Wisconsin Material Approval, Approval # 950043-L
 - ICBO Evaluation Service, Inc. Evaluation Report #3715- CC1 Classification (CYROLON AR sheet)
 - NY City MEA #428-92-M (CYROLON AR sheet)
- Consumer Products Safety Commission, Safety Standard for Architectural Glazing Materials, 16CFR 1201, Categories I & II
- UL Recognized Component, File # E54671: (ACRYLITE AR sheet, ACRYLITE GAR sheet)
 - UL Flammability Ratings: HB in all thicknesses
- UL Listed (UL792) Burglary-Resistant Glazing Material, File #BP6370, in thicknesses 0.093" to 0.500" (CYROLON AR sheet)
- Federal Railroad Administration, FRA 49 CFR Part 223, Type I and II Ballistics and Impact, in thickness of 0.375", 0.500" and the configuration of 0.236"/0.25" Air Gap/0.236" (CYROLON AR sheet)

Flammability: ACRYLITE AR sheet is a combustible thermoplastic. Precautions should be taken to protect this material from flames and high heat sources. ACRYLITE AR sheet usually burns to completion if not extinguished. The products of combustion, if sufficient air is present, are carbon dioxide and water. However, in many fires sufficient air will not be available and toxic carbon monoxide will be formed, as it will when other common combustible materials are burned. We urge good judgment in the use of this versatile material and recommend that building codes be followed carefully to assure it is used properly.

Important: The information and statements contained herein are not to be taken as warranty or representation for which we assume legal responsibility nor as permission, inducement or recommendation to practice any patented invention without a license. The information is offered solely for your consideration, investigation and verification. Users should perform their own testing and verification to determine the applicability and suitability of the information and any products for their particular purpose.

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Fire Precautions:

ACRYLITE AR acrylic sheet and CYROLON AR polycarbonate sheet are combustible thermoplastics. Precautions should be taken to protect these materials from flames and high heat sources. ACRYLITE AR and CYROLON AR sheets usually burn rapidly to completion if not extinguished. The products of combustion, if sufficient air is present, are carbon dioxide and water. However, in many fires sufficient air will not be available and toxic carbon monoxide will be formed, as it will when other common combustible materials are burned. We urge good judgement in the use of these versatile materials and recommend that building codes be followed carefully to assure they are used properly.

For the name of your local Authorized Distributor, call toll-free 1-800-631-5384 or contact the nearest CYRO sales office.

Rockaway, NJ 07866

100 Enterprise Drive
P.O. Box 5055
(973) 442-6130

Plano, TX 75074

101 East Park Blvd.
Suite 1039
(972) 424-6830

San Ramon, CA 94583

3180 Crow Canyon Place
Suite 240
(925) 866-9300

Technical Center:

Orange, CT 06477

25 Executive Blvd.
P.O. Box 550
(203) 795-6081

In Canada:

CYRO Canada Inc.

6285 Northam Drive
Suite 100
Mississauga,
Ontario L4V 1X5
(905) 677-1388
(800) 268-4743

International Sales:

Rockaway, NJ 07866

100 Enterprise Drive
P.O. Box 5055
FAX: (973) 442-6083



CYRO Industries, Rockaway, NJ 07866

ACRYLITE[®] AR acrylic sheet
and ACRYLITE[®] GAR
acrylic sheet coated with



906 ABRASION RESISTANT
COATING
UNDER LICENSE BY 3M