

# Polystone® Thermoplastics

**Polystone® G (HDPE)**  
**Polystone® P (Polypropylene)**  
**Competence. Performance. Confidence.**

ISO 9001 Certified



# Understanding our customers needs



As part of the Röchling Haren Group, we are recognized world-wide as a leading manufacturer of extruded polyolefin sheets and rods. Persistent innovation with our product line and manufacturing capabilities keeps us at the forefront of technology, and most importantly, at the forefront of market demands, with a quality product and a competitive price.

Committed to quality, Röchling Engineered Plastics' Quality Management System is certified according to ISO 9001, making us the first and only UHMW, HDPE and PP stress-relieved products manufacturer with this accomplishment.

From food cutting boards to semiconductor wet benches, Polystone® G (HDPE) and Polystone® P (Polypropylene) performs the task, and performs it well.



**Quality · Service ·  
Dependability · Inventory**

# Range of Products

## Physical Properties and Specifications

Physical properties			Polystone®				
Property	Units	ASTM Test	G (HDPE)	P (Polypropylene) Homopolymer	P (Polypropylene) Copolymer	P (Polypropylene) Rochling Grey Homopolymer	P (Polypropylene) Rochling Grey Copolymer
Density	gm/cm <sup>3</sup>	D792	.95	.91	.91	.91	.91
Tensile strength at yield 73°F	psi	D638	3000	4700	3700	4700	3700
IZOD impact strength 73°F	ft. lb./in.	D256	3.1	1.0	8.0	1.0	8.0
Hardness 73°F	Shore	D785	67	72	68	72	68
Coefficient of linear thermal expansion	in./in./°F	D696	5-6.5 x 10 <sup>-5</sup>	5-6.5 x 10 <sup>-5</sup>	5-6.5 x 10 <sup>-5</sup>	5-6.5 x 10 <sup>-5</sup>	5-6.5 x 10 <sup>-5</sup>
Continuous service temperature in air (max)	°F	—	180	180	180	239	230

### Polystone® G (HDPE) Polystone® P (Polypropylene)

#### Sheets, extruded

1/16" - 1-1/2" x 48" x 96"  
1/16" - 1-1/2" x 48" x 120"  
1/16" - 1-1/2" x 60" x 120"  
Sheets up to 120" wide available upon request

#### Sheets, pressed

1-3/4" - 4" x 48" x 96"  
1-3/4" - 4" x 48" x 120"  
1-3/4" - 4" x 96" x 240"  
Sheets up to 8" thick available upon request

#### Rods

8mm (.31") - 350mm (13.78")

#### Welding Rods

3mm (.118") - 5mm (.197") diameter

### Specifications and Approvals

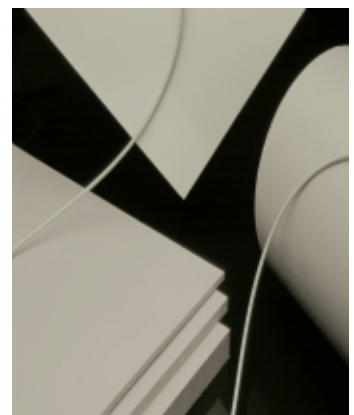
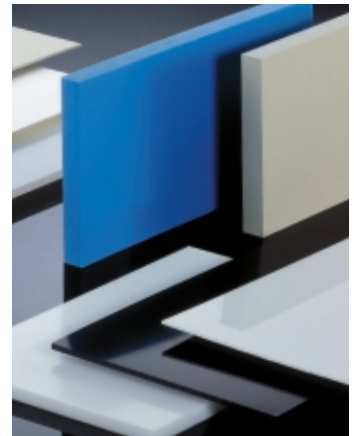
#### Polystone® G (HDPE)

ASTM	D-1248	Polyethylene plastics molding and extrusion materials
FDA	Natural, and colors if requested	FDA Regulation Title 21 CFR 177.1520 Approved for direct contact with meat and poultry
Federal	L-P-390C	Plastic, molding and extrusion, polyethylene and copolymers
Military	MIL-P-23536 MIL-P-21922	Plastic sheets, virgin and borated polyethylene Plastic rods and tubes polyethylene

#### Polystone® P (Polypropylene)

ASTM	D-4101	Propylene plastic injection and extrusion materials
FDA/USDA	Natural, and colors if requested	FDA Regulation Title 21 CFR 177.1520 Approved for direct contact with meat and poultry
Federal	L-P-394C	Plastic molding material (propylene plastics)
UL Rating	UL94 HB	If UL94-V0 is required, Polystone® P Flame Retardant is manufactured from approved materials

The information listed herein is stated to the best of our knowledge and is intended to provide a general guideline for Polystone® and its uses. The values given are based on laboratory testing backed with global industry experience. All properties in this brochure have performed equal or better in laboratory testing. However, the data should not be considered as guaranteed specific properties. Suggested applications are provided for information only and are not specific recommendations.



# Chemical Resistance

## Machining and Welding Methods

Chemical resistance	Polystone®			Polystone®	
	G	P		G	P
Acetaldehyde	+	/	Glycerine	+	+
Acetic acid	+	+	Hydrochloric acid	+	+
Acetone	+	+	Hydrogen peroxide	30 +	30 +
Acrylonitrile	+	+	Hydrogen sulphide	+	+
Allyl alcohol	96 +	96 +	Lactic acid	+	+
Aluminum chloride	A +	A +	Magnesium chloride	A +	A +
Ammonia	A +	A +	Mercury	+	+
Ammonium chloride	A +	A +	Methanol	+	+
Aniline	+	+	Methyl ethyl ketone	+	+
Benzaldehyde	+	+	Methylene chloride	/	/
Benzene	/	/	Mineral oil	+	+
Benzyl alcohol	+	+	Motor oil	+	+
Bleach (Chlorine)	-	-	Nitric acid	50 /	50 /
Boric acid	A +	A +	Nitrobenzene	+	+
Butanol	+	+	Oleic acid	+	+
Butyl acetate	+	/	Ozone	/	/
Calcium chloride	+	+	Perchloric acid	50 +	20 +
Carbon disulphide	/	/	Petroleum	+	+
Carbon tetrachloride	/ M -	-	Phenol	+	+
Chlorine gas	/	-	Phosphoric acid	+	+
Chlorobenzene	/	/	Potassium chromate	40 +	40 +
Chloroform	/ M -	/ M -	Potassium hydroxide	30 +	30 +
Chromic acid	10 +	10 +	Potassium nitrate	A +	A +
Citric acid	+	+	Potassium permanganate	+	+
Cyclohexanol	+	+	Pyridine	+	/
Cyclohexanone	+	+	Sea water	+	+
Dekalin	+		Sodium carbonate	A +	A +
Dibutyl phthalate	+	+	Sodium chloride	50 +	50 +
Diesel fuel	+	+	Sodium hydroxide	A +	A +
Diethyl ether	+ to /	/	Sulphuric acid	80 +	80 +
Dioxane	+	/	Tallow	+	+
Ethanol	96 +	96 +	Tetrahydrofurane	+ to -	/
Ethyl acetate	+	+	Tetralin	+	-
Ethylene chloride	/	/	Thionyl chloride	-	-
Ethylene diamine	+	+	Toluene	/	/
Ferric chloride	A +	A +	Transformer oil	+	+
Fluorine	-	-	Trichlorethylene	+ to -	/
Formaldehyde	40 +	40 +	Urea, aqueous	33 +	33 +
Formic acid	+	+	Water	+	+
Furfural	+		Zinc chloride	A +	A +

Values obtained at room temperature. Call for high or low temperature applications.  
 Number indicates concentration if < 100 %. M = Values may change under mechanical stress.  
 A = Aqueous solution.

+ = Specimen is resistant .....Swelling < 3% or weight loss < 0.5%. Break elongation not significantly altered.  
 / = Specimen has limited resistance .....Swelling 3-8% or weight loss 0.5-5% and/or break elongation decreased by < 50%.  
 - = Specimen is not resistant .....Swelling > 8% or weight loss > 5% and/or break elongation decreased by > 50%.

### Recommended Machining and Welding Conditions

Polystone® G and P can be efficiently machined with all known tools used in wood and metal processing.

#### Sawing

Fast-running circular and band saws are suitable. Smooth surfaces can be achieved when the teeth are lightly set. Saw blades with teeth more than 5/8" apart are suggested. Especially with PP, fast chip removal is essential to prevent melting.

#### Milling

Fairly high feed rates and revolutions work best with attention to reduce heat generation. Suggested 9,000-12,000 rpm with a feed rate of 250-350 inches per minute.

#### Welding

Quality welds are achieved with the appropriate temperature setting and air pressure. The welding rod must be compatible, and along with the joint surfaces, both should be clean before starting.

#### Thermoforming

A controllable heating system is required that is designed to provide even heat to each point of the sheet. Typical heat time is 10 minutes per 1/8" sheet thickness.

#### Polystone® G (HDPE)

Extrusion welding melt temperature: 395°F - 440°F  
 Hot gas welding temperature: 608°F  
 Thermoforming temperature range: 285°F - 300°F

#### Polystone® P (Polypropylene)

Extrusion welding melt temperature: 410°F - 460°F  
 Hot gas welding temperature: 590°F  
 Thermoforming temperature range: 320°F - 350°F



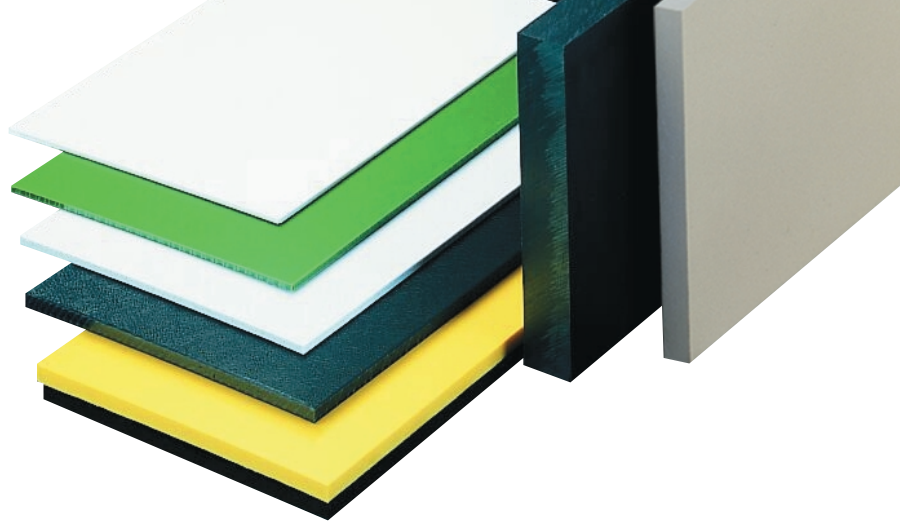
Polystone® sheets are easily cut and welded



Seams are routed to leave a smooth, clean joint



**Polystone® G (HDPE)**  
**Polystone® P (Polypropylene)**



Polystone® G and P sheets are extruded with exceptionally close tolerances and, since they are always stress-relieved, you can be assured of the flatness. Our unique in-line trimming process produces a clean, square cut that does not require re-trimming.

**Polystone® G:**

- Outstanding impact resistance
- Easily fabricated and welded
- Operating temperature up to 180° F (82° C)
- FDA and USDA accepted
- Resistant to most acids and solvents

**Polystone® P:**

- Exceptional chemical resistance
- Easily fabricated, welded and formed
- Operating temperature up to 180° F (82° C), and up to 239° F (115° C) with heat stabilizers
- High impact resistance
- FDA and USDA accepted

<b>Polystone® G</b> Selection Table	Material Description	Standard Color
Natural	Standard high-density polyethylene, FDA/USDA accepted	Opaque white
Colors	Available in standard and custom colors	Assorted
Cut-Rite	Food preparation cutting boards, textured both sides	Natural and assorted
Play-Tec	Designed for playground structures, textured both sides, U.V. stabilized	Assorted solid and co-extruded
Marine-Tec	Designed for boat builders with a unique texture on both sides, U.V. stabilized	Assorted marine colors
Marine-Tec lite	Special foamed core reduces weight by as much as 20%	Assorted marine colors
Polystone	Bathroom partitions, textured both sides (available in HDPE or PP)	Assorted solid and granite
Pipe Grade	Special grade for the HDPE pipe market, U.V. stabilized	Black

<b>Polystone® P</b> Selection Table	Material Description	Standard Color
Natural Homopolymer	Standard polypropylene, FDA/USDA accepted	Opaque white
Natural Copolymer	Higher impact strength, especially in cold temperatures as low as -40° F	White
Colors	Available in standard and custom colors	Assorted
White	Designed for the semiconductor industry, with protective masking	Bright white
Röchling Grey	Operating temperature is increased up to 239° F	Grey-Tan
Flame Retardant	Manufactured from UL-94 VO approved materials	White
Polystone	Bathroom partitions, textured both sides (available in HDPE or PP)	Assorted solid and granite
Foamlite	Extruded foam sheet with closed pores, textured scratch-resistant surface	Assorted

*All grades are available in homopolymer and copolymer*

# Polystone® G (HDPE) defines dependability and versatility in a wide variety of industries

A polyethylene with outstanding impact resistance and tensile strength making it the perfect choice for a wide range of applications such as:

- tanks and vessels
- food cutting boards
- light-duty tank, chute and bin linings
- playground structures
- restroom partitions
- boat accessories



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- 1 Polystone® G Natural tanks and tank linings
- 2 Cut-Rite cutting boards
- 3 Ski covers, doors, cabinetry and seat backs are fabricated from Marine-Tec and Marine-Tec Lite
- 4 Play-Tec is machined into various shapes and designs on commercial playground structures
- 5 Polystone restroom partitions
- 6 Polystone® G Pipe Grade fabricated into large manhole covers

# Polystone® P (Polypropylene) takes corrosion resistance to a new level

Best known for its outstanding chemical resistance, this polypropylene is easily fabricated, welded and machined for applications such as:

- structural tanks and linings
- plating barrels
- ducts and fume hoods
- semiconductor processing equipment
- orthotic and prosthetic devices
- pump and valve components



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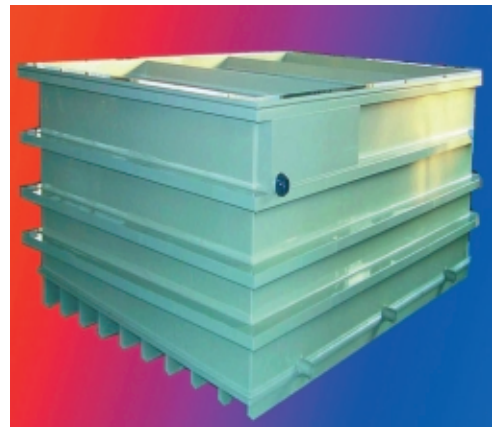


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- 7 Polystone® P Natural chemical tanks
- 8 Laboratory equipment and cabinetry is fabricated from Polystone® P White
- 9 Large tanks over 80 foot long built with Polystone® P Copolymer
- 10 Polystone® P Natural Homopolymer plating barrel
- 11 Foot brace formed from Polystone® P Copolymer sheet
- 12 Polystone® P Röchling Grey extra-heat stabilized chemical tank



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# Röchling, the international leader in plastics manufacturing and fabricating

## Range of products

Semi-finished products (sheets, panels, rods, profiles) as well as highly precise machined items of

- thermoplastics
- glass fibre reinforced plastics
- laminated compressed wood



Companies within the Röchling Haren group:

### EUROPE

Röchling Haren KG, Haren/Germany  
Röchling Trovidur KG, Troisdorf/Germany  
Röchling Technische Kunststoffe KG, Lützen/Germany  
Rimito Plast Oy, Rusko/Finland  
AB Formatern, Virserum/Sweden  
Röchling Materials Ltd., Gloucester/Great Britain  
Permal Composites S.A., Maxéville/France  
Röchling Engineering S.à.r.l., Maxéville, Lyon/France  
Leripa Kunststoff GmbH & Co. KG, Rohrbach/Austria  
Röchling Engineering Plastics Italia s.r.l., Arcisate (Varese)/Italy  
Röchling Plastpur S.A. Unipersonal, Bocairent (Valencia)/Spain

### USA

Röchling Engineered Plastics, Gastonia (NC), Ontario (CA)  
Röchling Machined Plastics, Greensburg (PA)

### FAR EAST

Röchling Engineering Plastics Pte. Ltd., Singapore  
Röchling Engineering Plastics (India) Pvt. Ltd., Mumbai/India



### East

#### Röchling Engineered Plastics

P.O. Box 2729  
Gastonia, NC 28053-2729  
Tel: 704-922-7814  
Fax: 704-922-7651  
**800-541-4419**  
www.roechling.com  
rep@roechling.com



### West

#### Röchling Engineered Plastics

2040 Carlos Avenue  
Ontario, CA 91761  
Tel: 909-923-6601  
Fax: 909-923-3280  
**800-545-5177**  
www.roechling.com

