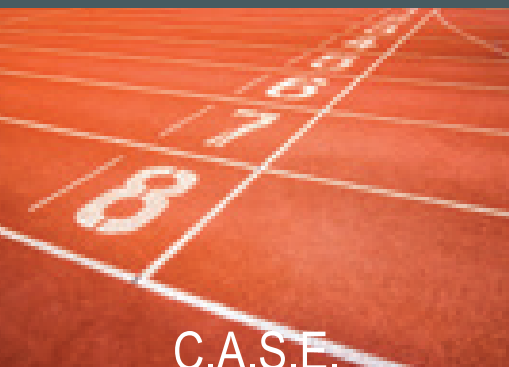




CARPENTER



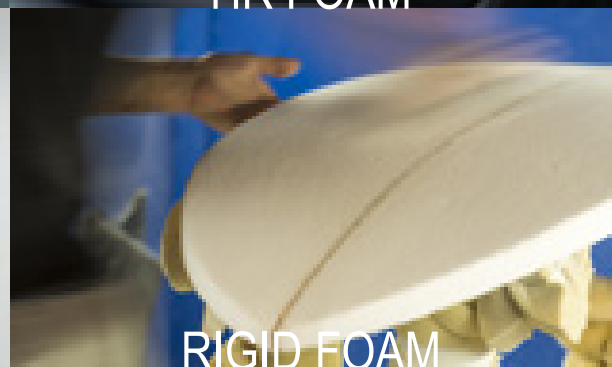
HR FOAM



C.A.S.E.



FLEXIBLE FOAM.



RIGID FOAM

CHEMICALS DIVISION
POLYOLS-POLYURETHANES

PRODUCT GUIDE

Carpol® Diols

TYPICAL PROPERTIES

| PRODUCT NAME | COMPOSITION | Approximate Functionality | Hydroxyl Number | Approximate Molecular Weight | Average pH | Water Content (Max) | Viscosity at 25°C | Color APHA (Max) | Density at 25°C | Renewable Content | |
|-----------------|-----------------------------------|---|-----------------|------------------------------|------------|---------------------|-------------------|------------------|-----------------|-------------------|---|
| | | mg KOH/g | Da | % | cP | lb/gal | % | | | | |
| PGP-400 | Propylene Glycol, Propylene Oxide | 2.0 | 264-299 | 400 | 7.0 | 0.02 | 75 | 35 | 8.30 | - | |
| PGP-1000 | Propylene Glycol, Propylene Oxide | 2.0 | 107-117 | 1,000 | 7.0 | 0.02 | 150 | 35 | 8.28 | - | |
| PGP-2000 | Propylene Glycol, Propylene Oxide | 2.0 | 54-57.5 | 2,000 | 7.0 | 0.02 | 300 | 35 | 8.33 | - | |
| PGP-3000 | Propylene Glycol, Propylene Oxide | 2.0 | 35-39 | 3,000 | 7.0 | 0.02 | 600 | 35 | 8.47 | - | |
| PGP-4000 | Propylene Glycol, Propylene Oxide | 2.0 | 26-30 | 4,000 | 7.0 | 0.02 | 890 | 35 | 8.33 | - | |
| REACTIVE | PGP-2012 | Propylene Glycol, Propylene Oxide, 12% Ethylene Oxide cap | 2.0 | 54-58 | 2,000 | 7.0 | 0.04 | 317 | 35 | 8.33 | - |
| | PGP-2208 | Propylene Glycol, Propylene Oxide, 8% Ethylene Oxide cap | 2.0 | 47-53 | 2,200 | 7.0 | 0.04 | 350 | 35 | 8.43 | - |
| | PGP-2740 | Propylene Glycol, Propylene Oxide, 40% Ethylene Oxide cap | 2.0 | 40-44 | 2,700 | 7.0 | 0.04 | 470 | 70 | 8.76 | - |
| | PGP-2816 | Propylene Glycol, Propylene Oxide, 16% Ethylene Oxide cap | 2.0 | 38-42 | 2,800 | 7.0 | 0.04 | 500 | 35 | 8.76 | - |
| | PGP-3815 | Propylene Glycol, Propylene Oxide, 15% Ethylene Oxide cap | 2.0 | 28-31 | 3,800 | 7.0 | 0.04 | 660 | 35 | 8.60 | - |
| | PGP-4025 | Propylene Glycol, Propylene Oxide, 25% Ethylene Oxide cap | 2.0 | 26-30 | 4,000 | 7.0 | 0.04 | 1,000 | 35 | 8.60 | - |

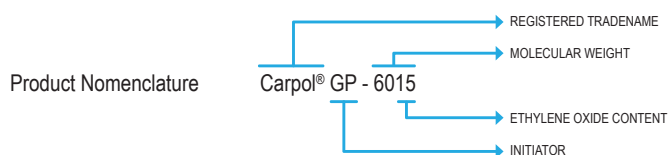
All diols may be acidified to a nominal pH of 5 or 6 upon request

Carpol® Triols

TYPICAL PROPERTIES

| PRODUCT NAME | COMPOSITION | Approximate Functionality | Hydroxyl Number | Approximate Molecular Weight | Average pH | Water Content (Max) | Viscosity at 25°C | Color APHA (Max) | Density at 25°C | Renewable Content | |
|-----------------|--|---|-----------------|------------------------------|------------|---------------------|-------------------|------------------|-----------------|-------------------|-------|
| | | mg KOH/g | Da | % | cP | lb/gal | % | | | | |
| GP-700 | Glycerin, Propylene Oxide | 3.0 | 230-250 | 700 | 7.0 | 0.02 | 270 | 35 | 8.56 | 10-15 | |
| GP-1000 | Glycerin, Propylene Oxide | 3.0 | 160-176 | 1,000 | 7.0 | 0.02 | 250 | 35 | 8.55 | 5-10 | |
| GP-1500 | Glycerin, Propylene Oxide | 3.0 | 106-118 | 1,500 | 7.0 | 0.02 | 275 | 35 | 8.48 | 5-10 | |
| GP-3000 | Glycerin, Propylene Oxide | 3.0 | 54-58 | 3,000 | 7.0 | 0.02 | 500 | 35 | 8.36 | < 5 | |
| GP-4000 | Glycerin, Propylene Oxide | 3.0 | 39-42 | 4,000 | 7.0 | 0.02 | 700 | 35 | 8.36 | < 5 | |
| GP-3008 | Glycerin, Propylene Oxide, 8% Ethylene Oxide located internally | 3.0 | 54-58 | 3,000 | 7.0 | 0.04 | 500 | 35 | 8.36 | < 5 | |
| GP-3510 | Glycerin, Propylene Oxide, 10% Ethylene Oxide located internally | 3.0 | 45.5-48.5 | 3,500 | 7.0 | 0.04 | 500 | 35 | 8.52 | < 5 | |
| REACTIVE | GP-725 | Glycerin, Propylene Oxide, 25% Ethylene Oxide cap | 3.0 | 230-250 | 700 | 7.0 | 0.04 | 250 | 35 | 8.36 | 10-15 |
| | GP-4520 | Glycerin, Propylene Oxide, 20% Ethylene Oxide cap | 3.0 | 34.1-37.3 | 4,500 | 7.0 | 0.04 | 833 | 35 | 8.59 | < 5 |
| | GP-5015 | Glycerin, Propylene Oxide, 15% Ethylene Oxide cap | 3.0 | 32-36 | 5,000 | 7.0 | 0.04 | 840 | 35 | 8.43 | < 5 |
| | GP-5171 | Glycerin, Propylene Oxide, 71% Ethylene Oxide | 3.0 | 33-38 | 5,000 | 7.5 | 0.04 | 1,200 | 70 | 8.41 | < 5 |
| | GP-6015 | Glycerin, Propylene Oxide, 15% Ethylene Oxide cap | 3.0 | 26-30 | 6,000 | 7.0 | 0.04 | 1,100 | 35 | 8.44 | < 5 |
| | GP-6307 | Glycerin, Propylene Oxide, 7% Ethylene Oxide | 3.0 | 26-29 | 6,300 | 7.0 | 0.04 | 1,180 | 35 | 8.49 | < 5 |
| GSP-7216 | Mixed Starter, Propylene Oxide, Ethylene Oxide Cap | 4.2 | 29.5-32.5 | 7,200 | 6.5 | 0.05 | 1,250 | 100 | 8.85 | < 5 | |

All triols may be acidified to a nominal pH of 5 or 6 upon request



PG Propylene Glycol
GP Glycerin
SPA Sucrose/Amine DEOA

TEAP Triethanol Amine
EDAP Ethylene Diamine
GSP Glycerin/Sucrose

MX Mannich (Phenol)
SP Sucrose
PES Polyester

Carpol® Amine Polyols

TYPICAL PROPERTIES

| PRODUCT NAME | COMPOSITION | Approximate Functionality | Hydroxyl Number | Approximate Molecular Weight | Average pH | Water Content (Max) | Viscosity at 25°C | Color Gardner (Max) | Density at 25°C | Renewable Content | Total Amine Value |
|--------------|---|---------------------------|-----------------|------------------------------|------------|---------------------|-------------------|---------------------|-----------------|-------------------|-------------------|
| | | mg KOH/g | Da | % | cP | lb/gal | % | mg KOH/g | | | |
| SPA-357 | Sucrose, Diethanol Amine, Propylene Oxide | 5.5 | 335-365 | 880 | 10.3 | 0.08 | 2,500 | 12 | 8.99 | 10-15 | 49.0 |
| SPA-530 | Sucrose, Diethanol Amine, Propylene Oxide | 5.5 | 520-540 | 580 | 11.0 | 0.08 | 11,000 | 12 | 9.16 | 20-25 | 70.0 |
| TEAP-265 | Triethanol Amine, Propylene Oxide | 3.0 | 625-645 | 265 | 11.0 | 0.10 | 465 | 7 | 9.00 | - | 213.0 |
| EDAP-770 | Ethylene Diamine, Propylene Oxide | 4.0 | 757-783 | 290 | 11.0 | 0.05 | 56,000 | 2 | 8.64 | - | 384.0 |
| EDAP-800 | Ethylene Diamine, Propylene Oxide, Ethylene Oxide | 4.0 | 750-815 | 280 | 11.0 | 0.05 | 16,000 | 2 | 8.82 | - | 404.0 |

Carpol® Sucrose Polyols

TYPICAL PROPERTIES

| PRODUCT NAME | COMPOSITION | Approximate Functionality | Hydroxyl Number | Approximate Molecular Weight | Average pH | Water Content (Max) | Viscosity at 25°C | Color Gardner (Max) | Density at 25°C | Renewable Content | Total Amine Value |
|--------------|--|---------------------------|-----------------|------------------------------|------------|---------------------|-------------------|---------------------|-----------------|-------------------|-------------------|
| | | mg KOH/g | Da | % | cP | lb/gal | % | mg KOH/g | | | |
| GSP-280 | Glycerin, Sucrose, Propylene Oxide, Ethylene Oxide | 7.0 | 270-290 | 1400 | 7.0 | 0.08 | 2,600 | 7 | 9.22 | 25-30 | n/a |
| GSP-355 | Glycerin, Sucrose, Propylene Oxide | 4.5 | 350-370 | 800 | 7.0 | 0.08 | 3,700 | 7 | 9.11 | 25-30 | n/a |
| GSP-370 | Glycerin, Sucrose, Propylene Oxide | 7.0 | 360-380 | 1,060 | 10.0 | 0.10 | 27,000 | 12 | 9.32 | 25-30 | 1.0 |
| GSP-520 | Glycerin, Sucrose, Propylene Oxide | 5.0 | 510-530 | 540 | 10.0 | 0.10 | 34,000 | 12 | 9.08 | 25-30 | 2.0 |
| SP-477 | Sucrose, Propylene Oxide | 5.0 | 450-490 | 600 | 7.0 | 0.10 | 33,000 | 7 | 9.42 | 25-30 | 1.0 |

Carpol® Mannich Polyols

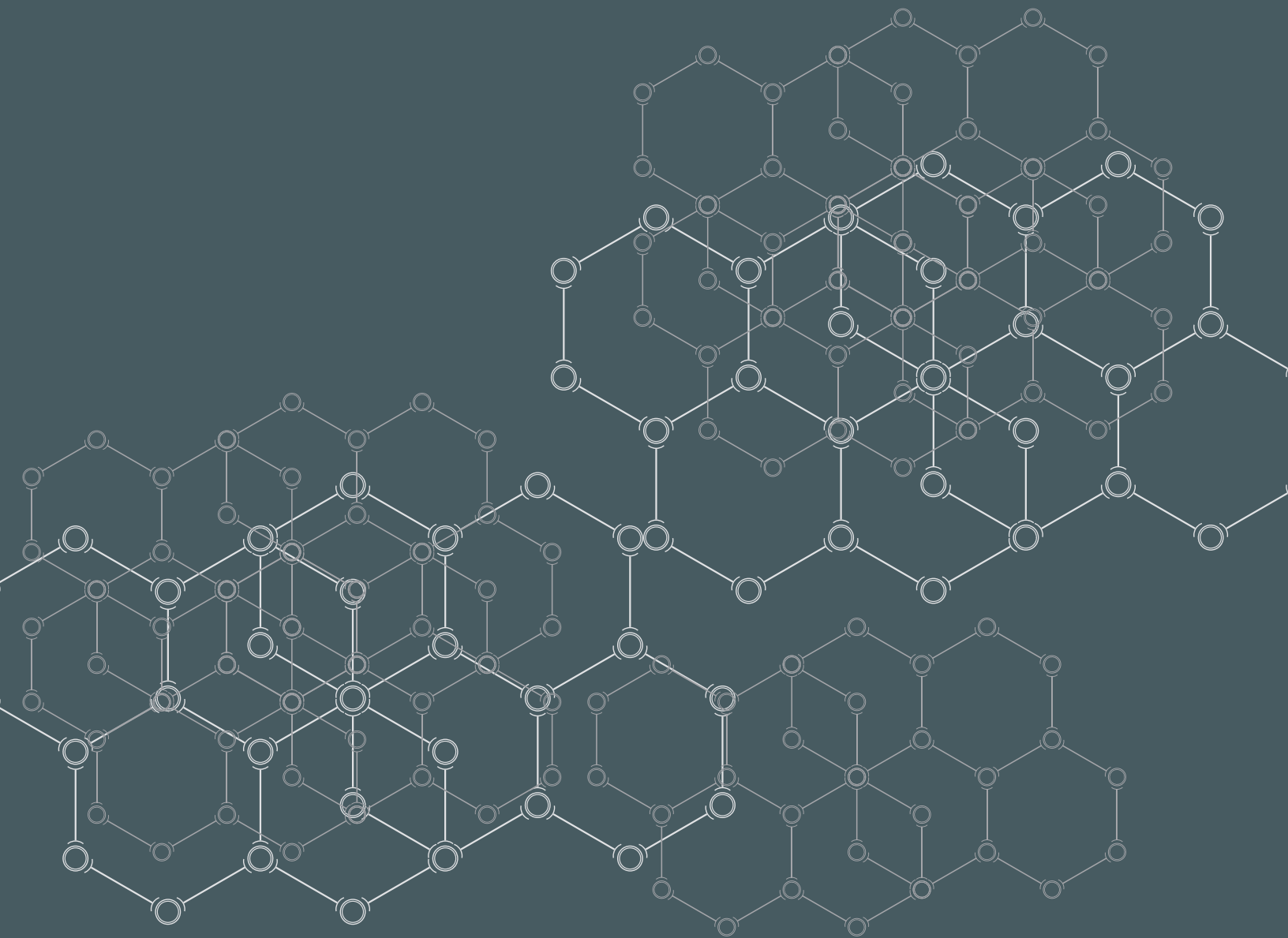
TYPICAL PROPERTIES

| PRODUCT NAME | COMPOSITION | Approximate Functionality | Hydroxyl Number | Approximate Molecular Weight | Average pH | Water Content (Max) | Viscosity at 25°C | Color Gardner (Max) | Density at 25°C | Renewable Content | Total Amine Value |
|--------------|---|---------------------------|-----------------|------------------------------|------------|---------------------|-------------------|---------------------|-----------------|-------------------|-------------------|
| | | mg KOH/g | Da | % | cP | lb/gal | % | mg KOH/g | | | |
| MX-425 | Mannich Base, Propylene Oxide, 20% Ethylene Oxide cap | 4.0 | 415-435 | 530 | 11.0 | 0.10 | 5,200 | 6 | 9.30 | - | 147.5 |
| MX-470 | Mannich Base, Propylene Oxide, 20% Ethylene Oxide cap | 4.0 | 450-490 | 480 | 11.0 | 0.10 | 10,000 | 6 | 9.35 | - | 165.5 |

Carpol® Aromatic Polyester Polyols

TYPICAL PROPERTIES

| PRODUCT NAME | COMPOSITION | Approximate Functionality | Hydroxyl Number | Approximate Equivalent Weight | Acid Value (Max) | Water Content (Max) | Viscosity at 25°C | Density at 25 °C | Aromatic Content | Recycled Content |
|--------------|-----------------------------|---------------------------|-----------------|-------------------------------|------------------|---------------------|-------------------|------------------|------------------|------------------|
| | | mg KOH/g | Da | mg KOH/g | % | cP | lb/gal | % | % | |
| PES-240 | Aromatic Acid, Mixed Glycol | 2.0 | 235-265 | 229.0 | 2.0 | 0.20 | 6,500 | 10.43 | 39.5 | 49 |
| PES-265 | Aromatic Acid, Mixed Glycol | 2.3 | 255-275 | 211.7 | 2.0 | 0.20 | 9,500 | 10.43 | 37.5 | 44 |
| PES-295 | Aromatic Acid, Mixed Glycol | 2.4 | 295-315 | 183.9 | 2.0 | 0.20 | 10,500 | 10.43 | 38.5 | 47 |
| PES-305 | Aromatic Acid, Mixed Glycol | 2.2 | 285-315 | 187.0 | 1.5 | 0.20 | 5,000 | 10.35 | 35.8 | 43 |
| PES-352 | Aromatic Acid, Mixed Glycol | 2.2 | 335-365 | 160.3 | 2.0 | 0.20 | 3,000 | 10.35 | 33.9 | 41 |



SAMPLES & INFORMATION

CUSTOMER SERVICE

800.260.5373

NORTH AMERICA

chemical.division@carpenter.com

OUTSIDE NORTH AMERICA

chemdivintl@carpenter.com

SAMPLE SIZE

| | | |
|-----------|-------|----------|
| 1 Quart | 2 LB | (~ 1 KG) |
| 1 Gallon | 8 LB | (~4 KG) |
| 5 Gallons | 40 LB | (~20 KG) |

PRODUCTS PACKAGED/SHIPPED

| | | |
|---------------|------------|-----------|
| Drum | 460 LB | (~208 KG) |
| Totebin (IBC) | 2300 LB | (1043 KG) |
| Tank Truck | ~44400 LB | (~20 MT) |
| Flexitank | ~44400 LB | (~20 MT) |
| Railcar | ~185000 LB | (~84 MT) |