



Atlas Minerals & Chemicals, Inc.



# DATA SHEET

5-42PI (8-19)  
Supersedes 5-42PI (1-19)

## CHEMESTER® MORTAR

### DESCRIPTION

CHEMESTER MORTAR is an epoxy novolac based vinyl ester resin mortar for chemical resistant brick and tile vessel construction.

### TYPICAL USES

CHEMESTER MORTAR is an epoxy novolac based vinyl ester mortar designed for use in the pulp and paper industry, as well as the metal working, chemical and food process industries for joining chemical resistant brick and tiles. Applications in the pulp and paper industry include bleach make up tanks, chlorine dioxide towers and preretention tubs, washers and floors.

### CHEMICAL RESISTANCE

CHEMESTER MORTAR has outstanding resistance to many oxidizing and non-oxidizing acids, bleaches, alkalies, solvents and salts. Refer to chemical resistance chart for specific information. CHEMESTER MORTAR meets the requirements of ASTM C395, Standard Specification for Chemical Resistant Resin Mortars.

### AVAILABLE COLORS

CHEMESTER MORTAR is available in white or black.

## PHYSICAL PROPERTIES

PROPERTY	TEST METHOD	TYPICAL VALUE
Density	ASTM C905	124 lb./cu. ft. (1.99 g./cc.)
Bond Strength, 7 days @ 77°F (25°C)	ASTM C321	Brick Fails
Tensile Strength, 7 days @ 77°F (25°C)	ASTM C307	1,750 psi. (12.1 MPa)
Compressive Strength, 7 days @ 77°F (25°C)	ASTM C579	14,200 psi. (97.9 MPa)
Flexural Strength, 7 days @ 77°F (25°C)	ASTM C580	3,950 psi. (27.2 MPa)
Coefficient of Thermal Exp., in./in./°F (cm./cm./°C)	ASTM C531	1.6 x 10 <sup>-5</sup> (2.9 x 10 <sup>-5</sup> )
Water Absorption	ASTM C413	0.47%
Temperature Resistance Immersion ClO <sub>2</sub> Tower	—	220°F (104°C) 180°F (82°C)
Linear Shrinkage	ASTM C531	0.42%

## PACKAGING AND COVERAGE

### CHEMESTER MORTAR

**210 lb. (95.3 kg.) Unit Consisting of:**

- One - 5-gal. pail of Resin (42 lb. [18.1 kg.]
- Three - bags of Powder (56 lb. [27.2 kg.]) ea.

### ATLAS® T-ADDITIVE\*

- One - 6.7 oz. (190 g.) can per 40 lb. unit
  - Five - 6.7 oz. (190 g.) cans per 210 lb. unit
- \*Thixotropic additive for overhead application.

## ESTIMATING TABLES – CHEMESTER MORTAR

### REPOINTING

Mix Ratio: 100 parts Resin to 350 parts Powder

Tile Face Size	210 lb. Unit – Square Feet per Unit						
	1/4" Wide Joint		3/8" Wide Joint		1/2" Wide Joint		
	1/2" Deep	3/4" Deep	1/2" Deep	3/4" Deep	1/2" Deep	3/4" Deep	1" Deep
8" x 2-1/4"	290	190	205	135	160	105	80
8" x 3-7/8"	405	275	285	190	220	145	110
8" x 3-3/4"	409	270	280	185	215	145	105
8" x 4"	425	280	290	195	225	150	110
8" x 4-1/2"	455	300	310	205	240	160	120
9" x 2-1/2"	320	210	225	150	175	115	85
9" x 3"	365	240	250	165	195	130	95
9" x 4-1/2"	475	315	325	215	250	165	125
9" x 4"	440	290	300	200	235	155	115
9" x 6"	560	375	385	255	295	195	145
9" x 12"	790	525	535	355	410	270	205

Material estimating quantities may vary depending on project conditions and application techniques. Material quantities are theoretical and do not include a safety factor.

**NOTE: ATLAS makes it a practice to continuously update and enhance our CCM (Corrosion Resistant Construction Materials) products. For the most recent version of any Data Sheet, please visit our Web site at [www.atlasmin.com](http://www.atlasmin.com).**

**FLOORS / WALLS****Mix Ratio: 100 parts Resin to 350 parts Powder**

Brick Size	Installed Thickness	Pieces Per Sq. Ft.	1/8" Wide x Full Depth Joint Square Feet per Unit	1/8" Setting Bed & 1/8" Wide x Full Depth Joint Square Feet per Unit
			210 lb. Unit	210 lb. Unit
6" x 6" x 3/4"	3/4"	3.838	610 sq. ft.	NR
8" x 3-7/8" x 1"	1"	4.431	3,400 sq. ft.	NR
8" x 3-7/8" x 1-3/16"	1-3/16"	4.431	335 sq. ft.	100 sq. ft.
8" x 3-7/8" x 1-3/8"	1-3/8"	4.431	290 sq. ft.	95 sq. ft.
8" x 4" x 1-3/8"	1-3/8"	4.297	295 sq. ft.	95 sq. ft.
8" x 4" x 1-1/2"	1-1/2"	4.297	270 sq. ft.	95 sq. ft.
8" x 3-3/4" x 2-1/4"	2-1/4"	4.574	175 sq. ft.	80 sq. ft.
8" x 3-3/4" x 2-1/4"	3-3/4"	7.462	70 sq. ft.	45 sq. ft.
8" x 3-3/4" x 4-1/2"	3-3/4"	3.832	115 sq. ft.	65 sq. ft.
8" x 3-3/4" x 4-1/2"	4-1/2"	4.574	85 sq. ft.	55 sq. ft.
9" x 4-1/2" x 2-1/2"	2-1/2"	3.412	180 sq. ft.	80 sq. ft.
9" x 4-1/2" x 2-1/2"	4-1/2"	4.574	65 sq. ft.	45 sq. ft.
9" x 4-1/2" x 3"	3"	4.574	150 sq. ft.	75 sq. ft.
9" x 4-1/2" x 3"	4-1/2"	4.574	75 sq. ft.	50 sq. ft.

**COVE BASE****Mix Ratio: 100 parts Resin to 350 parts Powder**

Brick Size	Installed Thickness	Pieces Per Sq. Ft.	1/8" Wide x Full Depth Joint Square Feet per Unit	1/8" Setting Bed & 1/8" Wide x Full Depth Joint Square Feet per Unit
			210 lb. Unit	210 lb. Unit
5" H x 6" L x 3/4"	3/4"	1.96	1,175 lin. ft.	NR
5" H x 8" L x 1-3/16"	1-3/16"	1.48	700 lin. ft.	150 lin. ft.
5" H x 8" L x 1-3/8"	1-3/8"	1.48	605 lin. ft.	145 lin. ft.
3-7/8" H x 8" L x 1-3/8"	1-3/8"	1.48	865 lin. ft.	290 lin. ft.
8" H x 3-3/4" L x 2-1/4"	2-1/4"	3.10	250 lin. ft.	110 lin. ft.

Bed Joint over membrane at 1/8": 28 sq. ft. per 40 lb. unit / 148 sq. ft. per 210 lb. unit

**TILE CHEST****Mix Ratio: 100 parts Resin to 400 parts Powder**

Tile Size	Installed Thickness	Pieces Per Sq. Ft.	1/4" Wide x Full Depth Joint Square Feet per Unit	3/8" Wide x Full Depth Joint Square Feet per Unit
			210 lb. Unit	210 lb. Unit
9" x 12" x 1-1/4"	1-1/4"	1.2	346 sq. ft.	235 sq. ft.

**KEY:** NR = Not Recommended

Material estimating quantities may vary depending on project conditions and application techniques. Material quantities are theoretical and do not include a safety factor.

**ATLAS BARRIER SEALANT Base\*\***

1-gallon (6 lb. [2.7 kg.]) can

Coverage: Approx. 300 sq. ft. (27.9 m<sup>2</sup>) per can

5-gallon (29 lb. 10 oz. [13.4 kg.]) pail

Coverage: Approx. 1,480 sq. ft. (137 m<sup>2</sup>) per pail

\*\*Barrier coat over asphalt membrane.

**TEMPERATURE DURING APPLICATION**

Store CHEMESTER MORTAR at 70°F (21°C) to 80°F (27°C) for 24 hours prior to use. The best working characteristics of the materials will be attained when the temperature of the substrate, air and CHEMESTER MORTAR are between 65°F (18°C) and 85°F (29°C).

Minimum temperature for installation is 60°F (16°C).

**MIXING OF THE CHEMESTER MORTAR**

The mix ratio of CHEMESTER MORTAR varies depending upon the application:

- A ratio of 100 parts Resin to 350 parts Powder, by weight, is suggested for repointing joints and as a setting bed or full joint mortar for masonry floors and walls.
- A ratio of 100 parts Resin to 400 parts Powder, by weight, is suggested for new construction of tile chest / towers.
- A ratio of 100 parts Resin to 300 parts Powder to 5 parts ATLAS T-ADDITIVE, by weight, is suggested for any overhead pointing, full joint and bed joint installations. The ATLAS T-ADDITIVE enhances the holding characteristics without affecting the working time of the mortar.

Stir the contents of the resin container prior to blending. Mix components by hand using a clean, dry, plastic or metal container and a mason's trowel. For larger batch sizes, a KOL type mixer with a 5-gallon capacity may be used. The mixing speed should be between 60 and 75 RPM. Proportionally increase or decrease resin and powder quantities to attain larger or smaller batch sizes.

**Note:** The amount of the powder may be varied slightly to obtain the desired consistency. Decreasing the powder component will decrease the estimated unit coverage and will affect the cure times of the mortar. The amount of powder must be within 5%, by weight, of the suggested amount.

**Mix Ratio of 100 parts Resin to 350 parts Powder**, by weight, is suggested for repointing joints and as a setting bed or full joint mortar for masonry floors and walls.

The following mixing instructions are for a batch size of 4 lb. 8 oz. (2.0 kg.) or 0.04 ft<sup>3</sup> (1.1 liters).

- Place 1 lb. (454 g.) or 14.2 fluid ounces (0.42 liters) of CHEMESTER MORTAR Resin in a mixing container.
- Add approximately 3 lb. 8 oz. (1.6 kg.) or 46 fluid ounces (1.36 liters) of CHEMESTER MORTAR Powder.
- Mix the components for approximately two minutes or until all the powder is thoroughly dispersed.

**Mix Ratio, by Weight**

Chemester Mortar Resin	100 parts	1 lb. (454 g.)
Chemester Mortar Powder	350 parts	3 lb. 8 oz. (1.6 kg.)

**Mix Ratio, by Volume**

Chemester Mortar Resin	100 parts	14.2 fl. oz. (0.42 liters)
Chemester Mortar Powder	323 parts	46 fl. oz. (1.36 liters)

**Mix Ratio of 100 parts Resin to 400 parts Powder**, by weight, is suggested for new construction of tile chest / towers.

The following mixing instructions are for a batch size of 5 lb. (2.3 kg.) or 0.04 ft<sup>3</sup> (1.1 liters).

- Place 1 lb. (454 g.) or 14.2 fluid ounces (0.42 liters) of CHEMESTER MORTAR Resin in a mixing container.
- Add approximately 4 lb. (1.8 kg.) or 53 fluid ounces (1.56 liters) of CHEMESTER MORTAR Powder.
- Mix the components for approximately two minutes or until all the powder is thoroughly dispersed.

**Mix Ratio, by Weight**

Chemester Mortar Resin	100 parts	1 lb. (454 g.)
Chemester Mortar Powder	400 parts	4 lb. (1.8 kg.)

**Mix Ratio, by Volume**

Chemester Mortar Resin	100 parts	14.2 fl. oz. (0.42 liters)
Chemester Mortar Powder	371 parts	53 fl. oz. (1.56 liters)

**Mix Ratio of 100 parts Resin to 300 parts Powder to 5 parts ATLAS T-ADDITIVE**, by weight, is suggested for any overhead pointing, full joint and bed joint installations.

The following mixing instructions are for a batch size of 4 lb. 1 oz. (1.8 kg.) or 0.03 ft<sup>3</sup> (0.9 liters).

- Place 1 lb. (454 g.) or 14.2 fluid ounces (0.42 liters) of CHEMESTER MORTAR Resin in a mixing container.
- Add approximately 3 lb. (1.4 kg.) or 40 fluid ounces (1.17 liters) of CHEMESTER MORTAR Powder.
- Mix the components for approximately two minutes or until all the powder is thoroughly dispersed.
- Slowly add approximately 0.8 oz. (22 g.) or 5 fluid ounces (0.15 liters) of ATLAS T-ADDITIVE. The amount of ATLAS T-ADDITIVE may be increased or decreased to attain desired working characteristic or consistency.
- Continue mixing for approximately two minutes or until all the ATLAS T-ADDITIVE is thoroughly dispersed.

**Mix Ratio, by Weight**

Chemester Mortar Resin	100 parts	1 lb. (454 g.)
Chemester Mortar Powder	300 parts	3 lb. (1.4 kg.)
Atlas T-Additive	5 parts	0.8 oz. (22 g.)

**Mix Ratio, by Volume**

Chemester Mortar Resin	100 parts	14.2 fl. oz. (0.42 liters)
Chemester Mortar Powder	278 parts	40 fl. oz. (1.17 liters)
Atlas T-Additive	36 parts	5 fl. oz. (0.15 liters)

**WAXING OF BRICK FOR FLOORS**

CHEMESTER MORTAR can stain red shale brick during installation. Paraffin wax can be applied to the surface face of the brick to eliminate staining. The wax coating and excess mortar are removed from the surface of the brick by steam cleaning. Use a minimum 60 psi. nozzle pressure for cleaning. Allow approximately 24 hours at 65°F (18°C) or 12 hours at 85°F (29°C) minimum cure time before steam cleaning.

**APPLICATION OF THE CHEMESTER MORTAR**

**POINTING MORTAR:** Use standard wall pointing techniques for both new construction, as well as repair of old joints. For new construction with portland cement joints, rake out the joints to a depth of 1/4" (6.4 mm.) minimum and point with CHEMESTER MORTAR. For repointing work, remove deteriorating mortar down to sound substrate or a minimum depth of 1/4" (6.4 mm.) and point with CHEMESTER MORTAR.

**SETTING BED:** When using CHEMESTER MORTAR as a bed joint over an asphalt membrane, apply a coat of ATLAS BARRIER SEALANT Base (without accelerator) over the membrane and allow it to dry. Typical drying times of ATLAS BARRIER

SEALANT Base are 2-1/2 hours at 65°F (18°C) or 1 hour at 85°F (29°C). Apply the mortar with a 3/16" V-notched trowel held at a 45 degree angle. Place a sufficient amount of mortar to provide a continuous bond coat to the specified thickness. Do not apply more mortar than can be covered in 10 to 15 minutes at 75°F (24°C).

**TILE AND BRICK JOINTS:** Install the mortar using conventional bricklaying techniques. Apply mortar to two sides of the brick forming a "V" profile. Place brick on the setting bed and slide it into place to attain a 1/8" (3.2 mm.) wide joint. Strike excess mortar before the mortar begins to set.

**FULL JOINT TILE CHESTS AND WALLS:** Install the mortar using conventional techniques. Apply mortar to the sides of the tile or brick forming a "V" profile. Place tile or brick to attain a 1/4" (6.4 mm.) to 3/8" (9.5 mm.) wide joint. Strike excess mortar before the mortar begins to set.

**OVERHEAD:** Install the mortar using conventional techniques.

#### TYPICAL WORKING & SETTING TIMES OF THE CHEMESTER MORTAR

Temperature	Working Time	Setting Time
60°F (16°C)	45-55 min.	60-80 min.
70°F (21°C)	25-30 min.	40-45 min.
80°F (27°C)	18-22 min.	25-35 min.
90°F (32°C)	5-10 min.	15-20 min.

#### CLEANING OF TOOLS AND EQUIPMENT

Solvents, such as methyl ethyl ketone, toluene or xylene will remove the materials referred to in this Data Sheet from mixing tools and equipment if cleaning is done immediately after use. Fully hardened material will have to be removed by mechanical means.

Dispose of residues and wastes in accordance with the directions in the Safety Data Sheets and government regulations.

#### STORAGE AND SHELF LIFE

Store all materials in a cool, dry environment. Keep all materials out of direct sunlight. CHEMESTER MORTAR Resin must be stored between 40°F (4°C) and 60°F (16°C). Protect from freezing. In unopened original containers, CHEMESTER MORTAR Resin has a shelf life of approximately four months. CHEMESTER MORTAR Powder has a shelf life of approximately six months. ATLAS T-ADDITIVE has a shelf life of approximately one year.

#### PRODUCT SPECIFICATION

The mortar shall be CHEMESTER MORTAR as manufactured by Atlas Minerals & Chemicals, Inc. The mortar shall comply with the requirements of ASTM C395. The mortar shall consist of an epoxy novolac vinyl ester resin with a silica filler and be resistant to chlorine dioxide.

#### PRECAUTIONS

The materials referred to in this Data Sheet are for Industrial Use Only. They contain materials that present handling and potential health hazards. Consult Safety Data Sheets and the container labels for complete precautionary information.

**Note:** Odors from uncured CHEMESTER MORTAR will contaminate certain food, beverage and pharmaceutical products. Removal of these products is necessary during the installation and cure of the material. Evacuate odors to exterior environment and restrict odors from circulating throughout the building.

#### TECHNICAL SERVICES

ATLAS maintains a staff of Technical Service Representatives who are available to assist you with the use of ATLAS products. In the event of difficulties with the application of ATLAS materials, the installation should be stopped immediately and ATLAS' Technical Service Department consulted for assistance.

#### WARRANTY

ATLAS warrants that its products will be free from defects in workmanship and materials under normal use for a period of one (1) year from the date of shipment by ATLAS (provided the products are installed before the expiration of the shelf life). THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR THE PURPOSE FOR THIS PRODUCT WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. ATLAS' LIABILITY FOR ALLEGED BREACH OF THIS WARRANTY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT (BUT NOT INCLUDING REMOVAL OF THE DEFECTIVE PRODUCT OR INSTALLATION OF REPLACEMENT PRODUCTS). ATLAS SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES DURING THE WARRANTY PERIOD OR THEREAFTER. **ATLAS' WARRANTY IS VOIDED IF PAYMENT FOR PRODUCT IS NOT RECEIVED IN FULL.**

## CHEMICAL RESISTANCE OF CHEMESTER<sup>®</sup> MORTAR (5-42PI)

	80°F	H
Acetaldehyde	N	N
Acetic Acid, to 10%	R	R
Acetic Acid, Glacial	N	N
Alum or Aluminum Sulfate	R	R
Aluminum Chloride, Nitrate	R	R
Ammonium Chloride, Nitrate, Sulfate	R	R
Ammonium Hydroxide, to 25%	R	C
Amyl Acetate	R	C
Amyl Alcohol	R	C
Aniline	C	N
Aqua Regia	N	N
Barium Chloride, Nitrate, Sulfate, Sulfide	R	R
Barium Hydroxide	R	C
Benzene	R	N
Benzene Sulfonic Acid, 30%	R	R
Benzoic Acid	R	R
Boric Acid	R	R
Bromine Water	N	N
Butyl Acetate	C	N
Butyl Alcohol, normal	R	C
Butyric Acid	R	C
Cadmium Chloride, Nitrate, Sulfate	R	R
Calcium Bisulfite	R	R
Calcium Chloride, Nitrate, Sulfate	R	R
Calcium Hydroxide, to 25%	R	R
Carbon Disulfide	N	N
Carbon Tetrachloride	R	R
Chlorine Dioxide, Water Solution	R	R
Chlorine, Dry or Wet	R	R
Chlorine Water	R	R
Chloroacetic Acid, to 10%	R	C
Chlorobenzene	R	C
Chloroform	N	N
Chromic Acid, up to 20%	R	R
Chromic Acid, 20% to 50%	R	C
Chromic Acid, above 50%	N	N
Citric Acid, to 10%	R	R
Copper Chloride, Nitrate, Sulfate	R	R
Dichloroacetic Acid, 10%	R	C
Dichlorobenzene	R	C
Diethyl Ether	N	N
Ethyl Acetate	N	N
Ethyl Alcohol	R	C
Ethyl Sulfate	R	C
Ethylene Dichloride	N	N
Ethylene Glycol	R	R
Fluosilicic Acid, 30%	R	C
Formaldehyde	R	R
Formic Acid	R	C

	80°F	H
Gasoline	R	R
Glycerine	R	R
Gold Cyanide	R	R
Hexane	R	R
Hydrobromic Acid	R	R
Hydrochloric Acid	R	R
Hydrocyanic Acid	R	R
Hydrofluoric Acid	RA	N
Hydrofluosilicic Acid	RA	N
Hydrogen Peroxide	R	C
Hydrogen Sulfide Gas, Dry or Wet	R	R
Iron Chloride, Nitrate, Sulfate	R	R
Isopropyl Ether	N	N
Kerosene	R	C
Lactic Acid	R	R
Lead Acetate, Nitrate	R	R
Linseed Oil	R	R
Magnesium Chloride, Nitrate, Sulfate	R	R
Magnesium Hydroxide	R	R
Maleic Acid	R	R
Mercuric Acetate	R	R
Methyl Acetate	R	C
Methyl Alcohol	R	C
Methyl Ethyl Ketone	C	N
Methyl Sulfate	C	N
Mineral Oil	R	R
Mineral Spirits	R	R
Muriatic Acid	R	R
Nickel Chloride, Nitrate, Sulfate	R	R
Nitric Acid, to 20%	R	R
Nitric Acid, 20% to 50%	R	C
Nitric Acid, above 50%	N	N
Nitrobenzene	R	C
Oleic Acid	R	R
Oxalic Acid	R	R
Perchloric Acid, to 30%	R	C
Phenol, to 5%	R	R
Phosphoric Acid, to 80%	R	R
Phosphorous Acid	R	R
Phosphorous Trichloride	N	N
Phthalic Acid	R	R
Picric Acid, to 10%	R	R
Potassium Bicarbonate, Carbonate	R	R
Potassium Chloride, Nitrate, Sulfate	R	R
Potassium Cyanide	R	R
Potassium Ferricyanide, Ferrocyanide	R	R
Potassium Hydroxide, to 25%	R	C
Potassium Hydroxide, above 25%	R	C
Pyridine	N	N

	80°F	H
Rochelle Salt	R	R
Salicylic Acid	R	R
Silver Nitrate	R	R
Sodium Acetate, Bicarbonate, Carbonate	R	R
Sodium Chloride, Nitrate, Sulfate	R	R
Sodium Cyanide, 10%	R	R
Sodium Hydroxide, to 25%	R	R
Sodium Hydroxide, above 25%	R	C
Sodium Hypochlorite, to 15%	R	R
Sodium Hypochlorite, above 15%	R	C
Sodium Sulfide, Sulfite, Thiosulfate	R	C
Soya Oil	R	R
Stearic Acid	R	R
Sulfur Dioxide Gas, Dry or Wet	R	R
Sulfur Trioxide Gas, Dry	R	R
Sulfur Trioxide Gas, Wet	R	R
Sulfuric Acid, to 50%	R	R
Sulfuric Acid, to 70%	R	C
Sulfurous Acid, to 10%	R	R
Tannic Acid	R	R
Tartaric Acid	R	R
Tin Chloride, Sulfate	R	R
Toluene	R	C
Trichloroethylene	N	N
Trisodium Phosphate	R	R
Tung Oil	R	R
Urea	R	R
Xylene	C	N
Zinc Chloride, Nitrate, Sulfate	R	R

(8-19)

### KEY

H - Up to temperature limitations of the mortar; when the chemical boils below this point, resistance is shown to the boiling point.

R - Recommended

RA - Carbon filled material to be used.

N - Not Recommended

C - Conditional; May be serviceable if the contaminant is immediately removed or washed off the surface.

**Note** - The information presented in the chemical resistance tables is based on judgments derived from laboratory testing and field service performance. The tables have been prepared as a guide to performance. No guarantee of results is made or implied and no liability in connection with this information is assumed. Contact with free chlorine and chlorine bleaches may cause the surface of CHEMESTER MORTAR, Black, to turn white. This color change will not affect the chemical resistance. The information presented herein should be supplemented by in-service testing. The data furnished in the tables may be revised on the basis of further testing.