Atlas Minerals & Chemicals, Inc.

DATA SHEET

5-33PI (6-03²)
Supersedes 5-33PI (7-02)

FURATHANE MORTAR

DESCRIPTION
FURATHANE MORTAR is a 100% carbon filled, specially formulated furan mortar for chemical resistant brick and tile construction.

TYPICAL USES
FURATHANE MORTAR is recommended for floors, containment dikes, sumps, trenches and tanks requiring the chemical, physical or thermal resistance of masonry construction.
With its broad range of chemical resistance and 350°F (177°C) temperature resistance, FURATHANE MORTAR is ideal for the chemical processing and metal treatment industries. It is an excellent mortar for food processing, food preparation and beverage and pharmaceutical facilities that sanitize with caustic and acid-based solutions.

CHEMICAL RESISTANCE
FURATHANE MORTAR is resistant to food and food by-products, organic acids, solvents, oils, greases and salts. It is also resistant to many inorganic acids and alkalies including hydrofluoric acid, phosphoric acid and sodium hydroxide. Refer to the chemical resistance chart for specific information. FURATHANE MORTAR complies with the specifications of ASTM C395 and ANSI A118.5 for chemical resistant furan resin mortars.

AVAILABLE COLORS
FURATHANE MORTAR is available in black only.

PACKAGING
FURATHANE MORTAR
139 lb. 4 oz. (63.2 kg.) Unit Consisting of:
One - 5-gal. pail of Resin (48 lb. [21.8 kg.])
Two - bags of Powder (45 lb. 10 oz. [20.7 kg.]) ea.

FURAN CATALYST LT Powder
20 lb. (9.1 kg.) bag

TEMPERATURE DURING APPLICATION
Store FURATHANE 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, masonry units and FURATHANE MORTAR components are between 70°F (21°C) and 85°F (29°C). The minimum temperature for installation is 60°F (16°C).

PHYSICAL PROPERTIES

PROPERTY	TEST METHOD	TYPICAL VALUE
Density	ASTM C905	98 lb./cu. ft. (1.57 g./cc.)
Bond Strength, 7 days @ 77°F (25°C)	ASTM C321	Brick fails
Bond Strength, Figure 8 Briquet, 7 days @ 77°F (25°C)	ATM No. 37	670 psi. (4.62 MPa)
Tensile Strength, 7 days @ 77°F (25°C)	ASTM C307	900 psi. (6.21 MPa)
Compressive Strength, 7 days @ 77°F (25°C)	ASTM C579	7,700 psi. (53.1 MPa)
Flexural Strength, 7 days @ 77°F (25°C)	ASTM C580	2,300 psi. (15.9 MPa)
Coefficient of Thermal Exp., in./in./°F (cm./cm./°C)	ASTM C531	1.5×10^{-5} (2.7×10^{-5})
Water Absorption	ASTM C413	0.2%
Temperature Resistance Continual		350°F (177°C)
Linear Shrinkage	ASTM C531	0.5%

FURAN CATALYST LT Powder is required for installations when the temperature of the substrate, air and masonry units are between 34°F (1°C) and 60°F (16°C).

WAXING OF THE BRICK
For applications where staining would be objectionable, paraffin wax must be applied to the surface face of the brick. Factory waxed brick are available. 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. Refer to the "Typical Working & Setting Times" chart for the minimum cure time before steam cleaning.
For most industrial applications, such as tanks, sumps and containment dikes, a wax coating is not applied to the surface face of the brick. The residual material does not affect the performance of the brick lining system.

MIXING OF THE FURATHANE MORTAR
Mixing of the components should be with a KOL type mixer with a 5-gallon capacity. The mixing speed should be between 60 and 75 RPM.
Stir the contents of the resin container prior to blending. The amount of the powder may be varied slightly to obtain the desired consistency. Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

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ESTIMATING TABLE - FURATHANE MORTAR

FLOOR AREA

Brick Size	Installed Thickness	Pieces per Sq. Ft.	1/8" Wide x Full Depth Joint Square Feet per Unit 139 lb. 4 oz. Unit	1/8" Setting Bed & 1/8" Wide x Full Depth Joint Square Feet per Unit 139 lb. 4 oz. Unit
6" x 6" x 3/4"	3/4"	3.838	562 sq. ft.	NR
8" x 3-7/8" x 1"	1"	4.431	365 sq. ft.	NR
8" x 3-7/8" x 1-3/16"	1-3/16"	4.431	310 sq. ft.	90 sq. ft.
8" x 3-7/8" x 1-3/8"	1-3/8'	4.431	265 sq. ft.	90 sq. ft.
8" x 4" x 1-3/8"	1-3/8"	4.297	270 sq. ft.	90 sq. ft.
8" x 4" x 1-1/2"	1-1/2"	4.297	250 sq. ft.	85 sq. ft.
8" x 3-3/4" x 2-1/4"	2-1/4"	4.574	160 sq. ft.	70 sq. ft.
8" x 3-3/4" x 2-1/4"	3-3/4"	7.462	65 sq. ft.	45 sq. ft.
8" x 3-3/4" x 4-1/2"	3-3/4"	3.832	105 sq. ft.	60 sq. ft.
8" x 3-3/4" x 4-1/2"	4-1/2"	4.574	80 sq. ft.	50 sq. ft.

Bed Joint over membrane at 1/8": 135 sq. ft. per 139 lb. 4 oz. unit

COVE BASE

Cove Size	1/8" Wide x Full Depth Joint Linear Feet per Unit 139 lb. 4 oz. Unit	1/8" Setting Bed & 1/8" Wide x Full Depth Joint Linear Feet per Unit 139 lb. 4 oz. Unit
5" H x 6" L x 3/4"	1,175 lin. ft.	NR
5" H x 8" L x 1-3/16"	640 lin. ft.	135 lin. ft.
5" H x 8" L x 1-3/8"	555 lin. ft.	130 lin. ft.
3-7/8" H x 8" L x 1-3/8"	790 lin. ft.	265 lin. ft.
8" H x 3-3/4" L x 2-1/4"	225 lin. ft.	105 lin. ft.

KEY: NR = Not Recommended

Material estimating quantities may vary depending on job conditions and application techniques. Material quantities above are theoretical and don't include a safety factor.

The following instructions are for a batch size between 11 lb. (5.0 kg.) to 11 lb. 10 oz. (5.3 kg.):

a. Place 52 fluid ounces (1.54 liters) of the FURATHANE MORTAR Resin in the 5-gallon capacity mechanical mixer.
b. Slowly add 7 lb. (3.2 kg.) to 7 lb. 10 oz. (3.5 kg.) of FURATHANE MORTAR Powder to obtain the desired consistency.

FURATHANE MORTAR Powder

Weight	Approximate Volume
7 lb. (3.2 kg.)	119 fluid ounces (3.5 liters)
7 lb. 10 oz. (3.5 kg.)	130 fluid ounces (3.8 liters)

c. Mix the combined components for approx. two minutes or until all the powder is thoroughly dispersed.

APPLICATION OF THE FURATHANE MORTAR

FURATHANE MORTAR can be used as a mortar for chemical resistant brick construction, a bed joint over an impervious membrane or with RED FURNANE® SETTING BED (Data Sheet 5-55PI).

BED JOINT: 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 20 to 30 minutes at 75°F (24°C) or before the mortar begins to set. Refer to the "Typical Working & Setting Times" chart.

BRICK AND TILE JOINTS: Install the mortar using conventional bricklaying techniques. Apply the mortar to two sides of the brick forming a "V" profile. Place the 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.

FURAN CATALYST LT

FURAN CATALYST LT Powder blended with FURATHANE MORTAR Powder is required for installations when the temperature of the substrate, air and masonry units are between 34°F (1°C) and 60°F (16°C). The FURATHANE MORTAR components and FURAN CATALYST LT Powder should be stored at the working conditions for a maximum of 24 hours

MIX RATIO CHART - FURATHANE MORTAR **Batch Size:** 0.119 cu. ft. (3.4 liters)

FURATHANE MORTAR	Parts by Weight	Weight	Volume
FURATHANE MORTAR Resin	100	4 lb. (1.8 kg.)	52 fl. oz. (1.54 liters)
FURATHANE MORTAR Powder	175 to 190	7 lb. (3.2 kg.) to 7 lb. 10 oz. (3.5 kg.)	119 fl. oz. (3.5 liters) to 130 fl. oz. (3.8 liters)

TYPICAL WORKING & SETTING TIMES OF THE FURATHANE MORTAR

Temperature	Working Time	Support Foot Traffic	Cure Before Steam Cleaning
60°F (16°C)	20-25 min.	8-10 hours	48 hours
75°F (24°C)	15-20 min.	3-4 hours	24 hours
85°F (29°C)	10-15 min.	2-3 hours	18 hours

prior to use. The minimum temperature for installation is 34°F (1°C).

Refer to the "Typical Mix Ratios" chart. Quantities listed in the chart are starting points and may be slightly modified to conform to job site conditions. **NEVER MIX FURAN CATALYST LT POWDER DIRECTLY WITH THE FURATHANE MORTAR RESIN**.

MIXING OF THE FURATHANE MORTAR WITH FURAN CATALYST LT POWDER

The following mixing instructions are for a batch size of 11 lb. (5.0 kg.):

a. Determine the ambient temperature and corresponding amounts of FURATHANE MORTAR Powder and FURAN CATALYST LT Powder from the "Typical Mix Ratios" chart.
b. In a clean, dry 5-gallon plastic pail combine FURAN CATALYST LT Powder and FURATHANE MORTAR Powder. Mix thoroughly for approximately two minutes.
c. Place 52 fluid ounces (1.54 liters) of FURATHANE MORTAR Resin in a second 5-gallon plastic pail in the 5-gallon capacity mechanical mixer.
d. Slowly add the blended powder as prepared in Step (b).
e. Mix the combined components for approximately two minutes or until all the powder is thoroughly dispersed.

CLEANING OF TOOLS AND EQUIPMENT

Solvents, such as methyl ethyl ketone, toluene, xylene or ethyl alcohol, will remove the materials referred to in this Data Sheet from mixing tools and equipment if

TYPICAL MIX RATIOS - FURAN CATALYST LT

Temperature	FURATHANE MORTAR Resin	FURATHANE MORTAR Powder	FURAN CATALYST LT Powder
34°F (1°C)	4 lb. (1.8 kg.) 52 fl. oz. (1.54 liters) 100 parts by weight	5 lb. 4 oz. (2.4 kg.) 89 fl. oz. (2.6 liters) 131 parts by weight	1 lb. 12 oz. (794 g.) 30 fl. oz. (0.9 liters) 44 parts by weight
40°F (4°C)	4 lb. (1.8 kg.) 52 fl. oz. (1.54 liters) 100 parts by weight	5 lb. 10 oz. (2.5 kg.) 89 fl. oz. (2.6 liters) 140 parts by weight	1 lb. 7 oz. (635 g.) 24 fl. oz. (0.7 liters) 35 parts by weight
50°F (10°C)	4 lb. (1.8 kg.) 52 fl. oz. (1.54 liters) 100 parts by weight	5 lb. 15 oz. (2.7 kg.) 101 fl. oz. (3.0 liters) 149 parts by weight	1 lb. (454 g.) 18 fl. oz. (0.5 liters) 26 parts by weight
60°F (16°C)	4 lb. (1.8 kg.) 52 fl. oz. (1.54 liters) 100 parts by weight	6 lb. 5 oz. (2.8 kg.) 107 fl. oz. (3.5 liters) 157 parts by weight	12 oz. (317 g.) 12 fl. oz. (0.4 liters) 18 parts by weight

TYPICAL WORKING & SETTING TIMES OF THE FURAN CATALYST LT

Temperature	Working Time	Support Foot Traffic	Cure Before Steam Cleaning
34°F (1°C)	15-20 min.	20-24 hours	48 hours
40°F (4°C)	15-20 min.	14-18 hours	48 hours
50°F (10°C)	15-20 min.	8-10 hours	24 hours
60°F (16°C)	15-20 min.	5-7 hours	24 hours

cleaning is done immediately after use. Fully hardened material will have to be removed by mechanical means. Dispose of residues and solvent wastes in accordance with the directions in the Material Safety Data Sheets and government regulations.

STORAGE AND SHELF LIFE

Store all components in a cool, dry environment. Keep out of direct sunlight. Ideal storage temperature is 75°F (24°C.). Protect from freezing. In unopened original containers, the materials referred to in this Data Sheet have a shelf life of approximately one year.

PRODUCT SPECIFICATION

The mortar shall be FURATHANE MORTAR as manufactured by Atlas Minerals & Chemicals, Inc. and be certifiable for use in USDA inspected facilities and comply with the requirements of ASTM C395 and ANSI A118.5. The mortar shall consist of a furfuryl alcohol (furan) resin binder with 100% carbon powder and be resistant to organic acids, organic solvents, sodium hydroxide and hydrofluoric acid.

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 Material Safety Data Sheets and the container labels for complete precautionary information.

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.**

Note: Atlas makes it a practice to continuously update and enhance our CCM (Corrosion Resistant Construction Materials) products. This may result in slight discrepancies between our printed Data Sheets and the current version. For the most recent version of any Data Sheet, please visit our Web site at www.atlasmin.com

CHEMICAL RESISTANCE OF FURATHANE MORTAR (5-33PI)

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

	80°F	H
Formaldehyde	R	R
Formic Acid	R	R
Gasoline	R	R
Glycerine	R	R
Gold Cyanide	R	R
Hexane	R	R
Hydrobromic Acid	N	N
Hydrochloric Acid	R	R
Hydrocyanic Acid	R	R
Hydrofluoric Acid	R	R
Hydrofluosilicic Acid	R	R
Hydrogen Peroxide	N	N
Hydrogen Sulfide Gas, Dry or Wet	R	R
Iron Chloride, Nitrate, Sulfate	R	R
Isopropyl Ether	R	R
Kerosene	R	-
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	R
Methyl Alcohol	R	R
Methyl Ethyl Ketone	R	R
Methyl Sulfate	R	R
Mineral Oil	R	R
Mineral Spirits	R	R
Muriatic Acid	R	R
Nickel Chloride, Nitrate, Sulfate	R	R
Nitric Acid	N	N
Nitrobenzene	R	R
Oleic Acid	R	R
Oxalic Acid	R	R
Perchloric Acid	N	N
Phenol	N	N
Phosphoric Acid	R	R
Phosphorous Acid	R	R
Phosphorous Trichloride	C	N
Phthalic Acid	R	R
Picric Acid	N	N
Potassium Bicarbonate, Carbonate	R	R
Potassium Chloride, Nitrate, Sulfate	R	R
Potassium Cyanide	R	R
Potassium Ferricyanide, Ferrocyanide	R	R
Potassium Hydroxide	R	R

	80°F	H
Pyridine	C	N
Rochelle Salt	R	R
Salicylic Acid	R	R
Silver Nitrate	R	R
Sodium Acetate	R	R
Sodium Bicarbonate, Carbonate	R	R
Sodium Chloride, Nitrate, Sulfate	R	R
Sodium Cyanide	R	R
Sodium Hydroxide, to 50%	R	R
Sodium Hypochlorite, to 3%	C	N
Sodium Hypochlorite, above 3%	N	N
Sodium Sulfide, Sulfite	R	R
Sodium Thiosulfate	R	R
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	N	N
Sulfuric Acid, to 50%	R	R
Sulfuric Acid, above 50%	N	N
Sulfurous Acid	R	R
Tannic Acid	R	R
Tartaric Acid	R	R
Tin Chloride, Sulfate	R	R
Toluene	R	R
Trichloroethylene	R	R
Trisodium Phosphate	R	R
Tung Oil	R	R
Urea	R	R
Xylene	R	R
Zinc Chloride, Nitrate, Sulfate	R	R

(6-03[2])

KEY

R - Recommended
N - Not Recommended
C - Conditional; May be serviceable if the contaminant is immediately removed or washed off the surface.
H - Up to temperature limitations of the mortar. When the chemical boils below this point, resistance is shown to the boiling point.

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. 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.