DATA SHEET

3-25CN (12-94)
Supersedes 3-25CN (3-94)

FURNANE FOOD PLANT FLOORS TILESETTER'S METHOD

DESCRIPTION AND USES

FURNANE FOOD PLANT FLOORS were developed and patented by ATLAS specifically for the beverage and food processing industries. FURNANE floors have been installed throughout the world. The dual chemical-resistant mortar construction provides an easily installed flooring system with outstanding structural integrity. The broad range of chemical resistance is typical of ATLAS pioneered furan resin mortars. FURNANE Food Plant Floors are not affected by most food acids, alkalies, cleaning solutions, oils, greases, solvents, detergents, or salts. The proven installation methods save time and simplifies the work. More than 20 million square feet of the FURNANE system have been installed. They have provided structurally sound and aesthetically attractive floors that are both sanitary and long lasting. FURNANE construction, installed using the Tilesetter's Method, utilizes RED FURNANE Setting Bed as the bedding material (bond coat) and BLACK FURNANE/FURATHANE GROUT or CHEMESTER GROUT for grouting the joints. Recommended joint width is 1/4" minimum. The construction can be used with smooth, or non-skid or abrasive surface tile, brick or pavers. The choice is determined by the use for which the floor is intended. FURNANE Floors can also be installed utilizing the Bricklayer's Method. Data Sheet 3-26CN, "FURNANE Food Plant Floors - Bricklayer's Method" describes this method of installation. ATLAS FURNANE Food Plant Floors are recommended for use in dairies, creameries, ice cream plants, breweries, bottling plants, wineries, distilleries, bakeries, canneries, confectionery plants, miscellaneous food processing plants, commercial and institutional kitchens, mess halls, cafeterias and other food handling centers.

CHEMICAL RESISTANCE

FURNANE Food Plant Floors are resistant to most food products, processing materials, by-products and residues as they exist, or the changed chemical or biological state they acquire, such as fermented sugars, alcohols, etc. The FURNANE system is also resistant to a broad range of cleaning agents, detergents, soaps and other alkalies, as well as fats, oils, greases, solvents, salts and acids used in food processing areas and in the maintenance of processing equipment. BLACK FURNANE/FURATHANE GROUT has an upper temperature limit of 380°F (193°C) which makes it virtually indestructible in a multitude of food plant applications. Ultimate thermal resistance of the installed FURNANE System is predicated on the thickness of the brick or tile used. The chemical resistance of BLACK FURNANE to specific reagents is listed in the corrosion resistance chart in Bulletin 3-3.

Grouts differ in their chemical resistance and physical properties. ATLAS' FURATHANE GROUT, the optimum bond strength furan grout, is used where superior bond strength is required. ATLAS manufactures various other grout materials for use in CIP rooms or other locations to resist cleaners or products that contain chemicals to which furan resin products are not resistant. ATLAS CHEMESTER GROUT is resistant to oxidizers such as nitric acid and chlorine compounds. ATLAS' Technical Service Department is available to assist you in making material selections.

BRICK AND TILE

Floor brick or paver brick must comply with the requirements of ASTM C279 and ASTM C410. Smooth surface, abrasive surface or wire cut surface vertical fiber brick may be used. Tile should comply with ANSI A137.1. Smooth, non-skid or abrasive surface tile may be used, depending upon the use for which the floor is intended. In this data sheet, the term "tile" is used to include brick and tile. The estimating table lists various sizes. Tile or brick with scratch bottom, shallow grooved bottom or V-back design are

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recommended. Deep grooved tile can be used and will require 30% to 40% more RED FURNANE SETTING BED MORTAR.

WAXING OF BRICK AND TILE

A coating of paraffin wax must be applied to the surface face of the tile before setting. Water soluble soaps or waxes are unacceptable because of the danger of premature exposure to water during shipping, storage or installation.

Paraffin wax can be applied by the tile manufacturer or at the job site using waxing units available from ATLAS. The coating of wax should never have a milky or cloudy appearance, which indicates the paraffin is being applied too cold or too thick. It should be transparent. The wax should form a continuous coating on the top surface of the tile and must be kept from the sides and bottom. Some surfaces such as textured, abrasive or wire cut may require multiple applications of paraffin wax to insure a continuous film. Waxed units must be stacked back to back, or waxed surface to waxed surface, but never waxed surface to unwaxed surface.

SUB-SURFACES AND THEIR PREPARATION

New Concrete or Concrete Fill - **No air-entraining agents, additives, or film forming curing membranes may be used. Additives of this type may affect the bond, cure or permeability of the protective system to be subsequently applied.** Concrete must be floated free from ridges and depressions. The concrete should have a steel trowel and fine broom finish as described in "American Concrete Institute Guide for Concrete Floor and Slab Construction", ACI302.1 R-80. **It is necessary to provide a sound bondable surface free of all contaminants such as sealers, cleaning compounds, coatings, oil, dirt and dust.** Abrasive grit blasting is the recommended method for removing surface laitance and for providing an adequate profile. Be sure to follow equipment manufacturer's safety precautions and regulations regarding silica dust in the atmosphere.

The four profiles described and depicted in the American Concrete Institute (ACI) recommended practice 303 R-24 are brush, light, medium and heavy grit-blast finish.

Most ATLAS Flooring systems will bond well to a light to medium finish. The product Data Sheet or ATLAS' Technical Service Department should be consulted for a description of the needed profile for a particular system.

Since the final floor will follow the contours of the substrate, the smoothness of the finished floor will be no better than the slab beneath it. Care must be taken to establish proper elevations with a pitch of about 1/4 inch per foot to all drains and trenches. Allowance should be made for the thickness of the brick being used plus 3/32" for the setting bed. More detailed information is given in ATLAS Data Sheet "Specification for Concrete Floor Slab".

Old Concrete - must be free of loose particles, oils, greases, chemical contaminants and any previously applied paint or floor topping. Commercial detergents or mechanical scarifiers can be used to remove surface contaminants. Acid soaked concrete must be neutralized with household ammonia, sodium hydroxide or trisodium phosphate and thoroughly flushed with water removing all puddles. After floor has been cleaned, make required repairs. Follow Surface Preparation procedures as described under new concrete to improve the surface profile when required.

Portland Cement Mortar Leveling Bed - installed and cured as required in the ANSI "American National Standard Specifications for the Installation of Ceramic Tile." This construction is occasionally used as a leveling bed prior to the installation of the FURNANE Floor System.

TEMPERATURE DURING APPLICATION

The best temperature range for the application of RED FURNANE and BLACK FURNANE/FURA-THANE GROUT is between 70°F (21°C) and 85°F (29°C). Do not apply when room temperature is below 60°F (16°C) or above 100°F (38°C) or in direct sunlight. Refer to ATLAS data sheets on low temperature curing materials if a minimum installation temperature of 60°F (16°C) cannot be maintained.

MIXING OF RED FURNANE

Unit Packaging - To the contents of the one-gallon can (8 lb. 6 oz. [3.8 kg.]) of RED FURNANE LIQUID Resin, add the contents of one pint can (14 oz. [397 g.]) of RED FURNANE Hardener. Stir thoroughly. Then add the 27 lb. 12 oz. (12.6 kg.) bag of RED FURNANE Powder and mix thoroughly.

Bulk Packaging - When working with bulk packages of material, it will be convenient to measure out the above quantities by weight and then mark the measuring containers at the appropriate level for repeated use. When smaller quantities are required, mix 2 lb. 11 oz. (1.2 kg.)

RED FURNANE LIQUID Resin with 4-1/2 oz., by weight, of RED FURNANE Hardener and add 9 lb. (4.1 kg.) of RED FURNANE Powder to the mixture. Mechanical mixing is recommended to thoroughly wet out the powder. The amount of powder may be varied slightly to obtain the desired consistency. **Under no circumstances should powder variance exceed 5%.** RED FURNANE will remain workable for about 45 minutes at 77°F (25°C). It will attain its initial set within six hours at 77°F (25°C).

APPLICATION OF RED FURNANE

The substrate must be thoroughly dry. Place and apply sufficient RED FURNANE to achieve the bed thickness specified after the tiles are pressed in place. Set the previously waxed tiles immediately in the bed leaving joints approximately 1/4" wide. When deep grooved tile are used, trowel the grooves full of RED FURNANE before setting the tile. The area must be kept free from traffic, all liquids and contamination during the installation and until the joints are grouted and cured hard.

MIXING OF BLACK FURNANE/ FURATHANE GROUT

Thoroughly mix, by weight, 13 lb. (5.9 kg.) of BLACK FURNANE/FURATHANE GROUT Powder with 10 lb. (4.5 kg.) of BLACK FURNANE/FURATHANE GROUT Resin. When smaller quantities are required, mix 1.3 parts powder with one part liquid by weight. Mechanical mixing with a 60 to 70 rpm KOL mixer is recommended to thoroughly wet out the powder. BLACK FURNANE/FURATHANE GROUT will remain workable for about 20 minutes at 77°F (25°C). It will obtain its initial set within five hours at 77°F (25°C). The grout cannot be used after it begins to set.

APPLICATION OF BLACK FURNANE/ FURATHANE GROUT

Before grouting with BLACK FURNANE/ FURATHANE, all metal drains, pipes and exposed concrete must be isolated to receive an expansion joint since the BLACK FURNANE/ FURATHANE will not adhere to these surfaces. BLACK FURNANE/FURATHANE GROUT is formulated to be used with RED FURNANE. If BLACK FURNANE/FURATHANE is used to grout tile set directly into a Portland Cement Mortar Bed, the joints must be acid washed, rinsed, and allowed to dry prior to grouting. Immediately after mixing, place the BLACK FURNANE/FURATHANE GROUT on the surface of the waxed tile. Use a KR Groutmaster or steel trowel for grouting. Several passes may be necessary to make certain that the joints are full. On the last pass, hold the trowel at nearly a right angle to the tile surface and pull diagonally across the joints. Leave as little grout as possible on the surface of the tile. When using a steel trowel, it is recommended that a final pass be made using a rubber squeegee to insure full joints with a minimum of grout residue remaining on the surface of the tile. This technique permits ease of steam cleaning. When floor brick, pavers or tile thicker than 3/4" are used, a double pass grouting system is recommended to insure full joints. On the first pass, leave the grout approximately 1/4" below the surface of the tile. Allow to stand for two to four hours, then apply a second layer of grout, filling the joints completely. Occasional voids or pockets formed by entrapped air rising to the surface should be filled upon discovery and preferably while the joints are still soft. The floor area should be allowed to remain undisturbed, free from traffic, all liquids, dirt and contamination, until the BLACK FURNANE/FURATHANE GROUT is completely hard. This will require about 24 hours at 77°F (25°C). The floor is then cleaned, using steam to melt the coating of wax and remove excess grout from the tile surface. Use steam with a minimum pressure of 60 lb. (27.2 kg.)/sq. in. at the nozzle. When steam is not available, very hot water and a wide blade putty knife may be used.

If some of the tiles are stained because they were not completely coated with wax, the stain may be removed using a rotary power brush, sharp sand and water. If mechanical cleaning fails, paint remover containing methylene chloride can be used. The paint remover must be carefully applied to the stain and not contact the joints. The methylene chloride will remove the gloss from the joint and may attack the grout joint if allowed to lay on the surface.

CAUTION: Follow the paint remover manufacturer's safety precautions.

CHEMESTER GROUT - If required for the service conditions, refer to Data Sheet 3-28PI for application instructions.

COVE BASE

When cove base is required, it should be set in RED FURNANE. Use CARBO-ALKOR or FURATHANE MORTAR for the joints. Instructions for use are in the data sheet for each product.

EXPANSION JOINTS
Compensation must be made for movement in FURNANE construction. Typical locations for expansion joints are over construction joints in the structural slab, around the perimeter of the room, at crowns, around columns, pump pads, piers and drains, and wherever else movement may be anticipated. ATLAS' Engineering Department will assist you in the proper layout of such joints. The joint should consist of a suitable back-up material and expansion joint sealant. The depth of the sealant should not be greater than the width of the joint and preferably only half as deep as the width. The back-up material suggested is polyethylene foam rod or strip which also serves as a bond breaker.
ATLASTIC 20, OXYDUR U-HTD and CHEMJOINT are recommended for non-traffic areas. REZKLAD E-JOINT SEALANT is recommended for traffic areas.

CLEANING OF EQUIPMENT
Equipment may be cleaned with soap and water before materials begin to set. Methyl ethyl ketone can be used for the RED FURNANE and either methyl ethyl ketone or ethyl alcohol for the BLACK FURNANE/FURATHANE GROUT. **CAUTION:** Methyl ethyl ketone and ethyl alcohol are volatile and toxic solvents. Consult Material Safety Data Sheets and container labels before using.

PACKAGING
MORTARS:
RED FURNANE
37 lb. (16.8 kg.) unit consisting of:
One - 8 lb. 6 oz. (3.8 kg.) can Resin
One - 14 oz. (397 g.) can Hardener
One - 27 lb. 12 oz. (12.6 kg.) bag Powder

Bulk unit consisting of:
One - 45 lb. (20.4 kg.) pail Resin
One - 4 lb. 11 oz. (2.1 kg.) can Hardener
One - 75 lb. (34.0 kg.) bag Powder

BLACK FURNANE/FURATHANE GROUT
43 lb. 12 oz. (19.8 kg.) unit consisting of:
Two - 9 lb. 8 oz. (4.3 kg.) cans Resin
Two - 12 lb. 6 oz. (5.6 kg.) bags Powder

Bulk unit consisting of:
One - 50 lb. (22.7 kg.) pail pail or
500 lb. (227 kg.) drum Resin
One - 50 lb. (22.7 kg.) bag Powder

CARBO-ALKOR/FURATHANE MORTAR
50 lb. (22.7 kg.) pail or
500 lb. (227 kg.) drum Resin
50 lb. (22.7 kg.) bag of Powder

EXPANSION JOINT MATERIALS:
REZKLAD E-JOINT SEALANT
One-gallon unit consisting of:
One - 7 lb. 8 oz. (3.4 kg.) can of Resin
One - 3 lb. 12 oz. ((1.7 kg.) can of Hardener

OXYDUR U-HTD
One-gallon unit consisting of:
One - 4 lb. 8 oz. (2.0 kg.) can Component A
One - 1 lb. 8 oz. (680 g.) can Component B

OXYDUR U-520C PRIMER
1 lb. 11 oz. (765 g.) unit consisting of:
One - 1 lb. 15 oz. (879 g.) Component A
One - 11 oz. (312 g.) bottle Component B

1-1/3 gallon unit consisting of:
One - 7 lb. 14 oz. (3.6 kg.) can Component A
One - 2 lb. 12 oz. (1.2 kg.) can Component B

CHEMJOINT
12 x 10.3 fluid ounce cartridges/ctn.

ATLASTIC 20
One-gallon unit consisting of:
One - 6 lb. (2.7 kg.) can Component A
One - 1 lb. 8 oz. (680 g.) can Component B

ATLASTIC 20 PRIMER
One-quart can or One-gallon can

STORAGE LIFE
Store all materials in a cool, dry place. Keep out of direct sunlight. In unopened original containers, RED FURNANE and BLACK FURNANE/FURATHANE GROUT components can be stored for a minimum of one year.

PRECAUTIONS
RED FURNANE, BLACK FURNANE, CARBO-ALKOR, ATLASTIC 20, OXYDUR U-HTD, REZKLAD E-JOINT SEALANT and FURATHANE GROUT and MORTAR and the Cleaning Solvents 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 before use.

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 any difficulties on any job with the use of ATLAS materials, the job should be stopped immediately and ATLAS' Technical Service Department consulted for assistance.

OTHER PERTINENT INFORMATION

Other pertinent information can be found in the following Data Sheets:

- "FURNANE Food Plant Floors" (3-3)
- "RED FURNANE Specification" (3-26PS)
- "BLACK FURNANE Specification" (3-25PS)
- "FURATHANE Grout" (3-17CN)
- "REZKLAD E-JOINT SEALANT" (3-64PI)
- "Waxing of Brick or Tile" (3-20CN)
- "CARBO-ALKOR" (5-31PI)
- "FURATHANE MORTAR" (5-33PI)
- Expansion Jt. Sealants Data Sheet (PFD-701DS)
- "ATLASTIC 20" (3-44PI)
- "CHEMJOINT Silicone Sealant" (3-65PI)
- "CHEMESTER GROUT" Data Sheet (3-28PI)
- "CHEMESTER MORTAR" Data Sheet (5-42PI)

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 AND CONSEQUENTIAL DAMAGES DURING THE WARRANTY PERIOD OR THEREAFTER. **ATLAS WARRANTY IS VOIDED IF PAYMENT FOR PRODUCT IS NOT RECEIVED IN FULL.**

ESTIMATING TABLES

TILESETTER'S METHOD — MATERIAL/1,000 SQ. FT.

Tile or Paver Size	Tile/ Paver Joint Width	Tiles/ Pavers Per M. Sq. Ft.	RED FURNANE SETTING BED at 3/32" Thickness		BLACK FURNANE/ FURATHANE GROUT	
			Bulk Containers	Units	Bulk Containers	Units
6" x 6" x 1/2"	1/4"	3,686	891 lb.	24	314 lb.	7
6" x 6" x 3/4"	1/4"	3,686	891 lb.	24	470 lb.	11
8" x 3-7/8" x 1-3/16"	1/4"	4,231	891 lb.	24	846 lb.	19
8" x 3-7/8" x 1-3/8"	1/4"	4,231	891 lb.	24	980 lb.	22
8" x 4" x 1/2"	1/4"	4,107	891 lb.	24	349 lb.	8
8" x 4" x 1-1/2"	1/4"	4,107	891 lb.	24	1,048 lb.	24
Mix Ratio - Powder to Resin to Hard. (by weight)			331/100/10.4		1.3/1	

COVE BASE — MATERIAL/1,000 LINEAL FT.

Size	Vertical Joint Width	Pieces/M Lineal Feet	Depth of FURATHANE/CARBO-ALKOR MORTAR Joint			
			1/2"	3/4"	1-3/16"	1-3/8"
1/2" Quarry	1/4"	1,920	81 lb.			
3/4" Quarry	1/4"	1,920		110 lb.		
1-3/16" Paver	1/4"	1,460			201 lb.	
1-3/8" Paver	1/4"	1,460				238 lb.

Estimating tables are based on theoretical coverages and cannot be guaranteed by ATLAS nor do we assume liability for its use. Contact ATLAS for specific information. Estimated material for the joints is based on the full depth of the joint. The RED FURNANE SETTING BED does not include the necessary lbs./sq. ft. to fill the grooves on the bottom of the pavers/tiles.