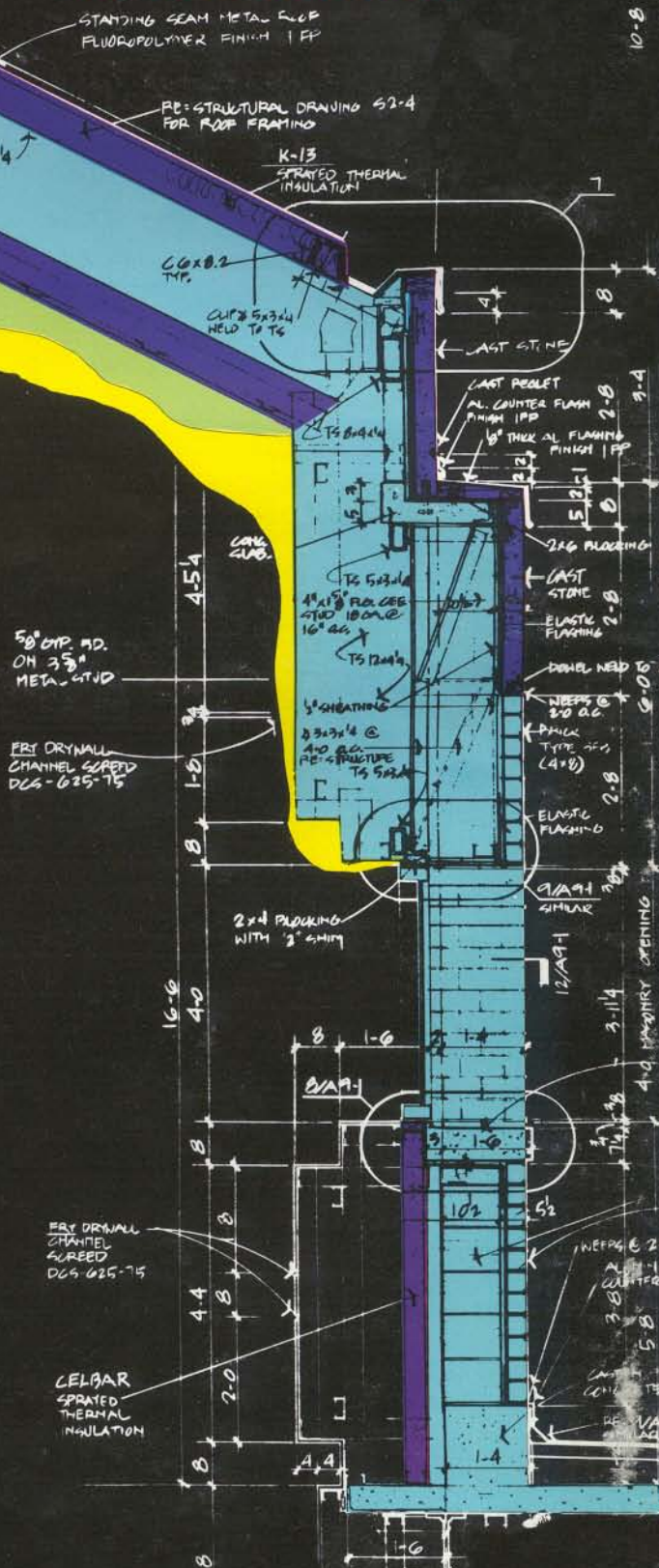
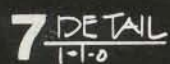


- THERMAL INSULATION
- ACOUSTICAL FINISHES
- STC WALL ASSEMBLIES
- NOISE REDUCTION

- THERMAL INSULATION
- ACOUSTICAL FINISHES
- STC WALL ASSEMBLIES
- NOISE REDUCTION





# Compatible, versatile and economical multi function system

## The Custom Spray System

K-13 is the spray applied cellulose insulation tailored to your specific project requirements for insulation (R value), noise reduction (NRC), color, durability, condensation control, texture, and aesthetics. In addition, it provides these features usually at lower installed prices than many common systems such as rigid board and batt insulations, sprayed plasters, and acoustical ceilings.

It is applied to virtually any properly prepared surface configuration of wood, steel, concrete, glass and other construction surfaces and is capable of being sprayed three inches thick overhead in one pass. Additionally, K-13 serves as the exposed finish requiring no additional materials.

## A Total System – Fiber, Binder, Application

K-13 is a total system of cellulose fibers, chemical treatment, binding system and application method. K-13 is odorless and non toxic and contains no asbestos. The cellulose fibers are hollow and elastic and absorb energy, trap air and effect thermal resistance. These fibers are blended and treated chemically to add resistance to fire, mold and mildew in a strict, quality-controlled manufacturing process.

K-13 is applied by a nationwide network of licensed applicators through approved fiber machines and nozzles for control of the fiber/binder ratio. A patented adhesive is mixed with the fibers during application. The result is a monolithic coating of predetermined thickness providing a strong, durable finished product. Some surfaces will require priming prior to being sprayed.

## Naturally Tough – Naturally Attractive

With its carpet-like texture and wide variety of colors, K-13 is especially attractive as a surface finish in new construction as well as renovation projects.

K-13 is available in five standard colors in addition to special matched PMS colors upon request. Color selection will affect the final price.



BLACK    GRAY    WHITE    BEIGE    TAN

The texture can be altered to vary in appearance by rolling, tamping, painting, or overspraying. In heavily traveled areas, the surface should be protected from scuffing, mechanical damage, or flammable contaminants by wainscoating or other protective means.

## Thermal Performance

K-13, being a hollow fibered cellulose product insulates by creating dead air spaces between the fibers as well as within them. As the K-13 fibers are sprayed-in-place they fill cracks, seams, voids and holes and form a monolithic coating over the substrate which helps reduce air infiltration. There are no seams, cracks or compressed areas to reduce thermal efficiency as in pre-fabricated insulation. The result is a more efficient in-place product with exceptional heat loss characteristics.

R-Value 4.54 per inch: K Factor 0.22 BTU/hr./°F/sq. ft./1" thick.





## Acoustical Benefits

K-13's superior ability to absorb sound has resulted in its extensive use as an acoustical material. The soft resilient fibers absorb sound energy which reduces sound reverberation time and makes speech and music more audible. Favorable environments are created by applying K-13 to absorb up to 90% of reflected sound and lowering noise levels.

## Sound Absorption Characteristics

### Description Of Tests – ASTM C-423

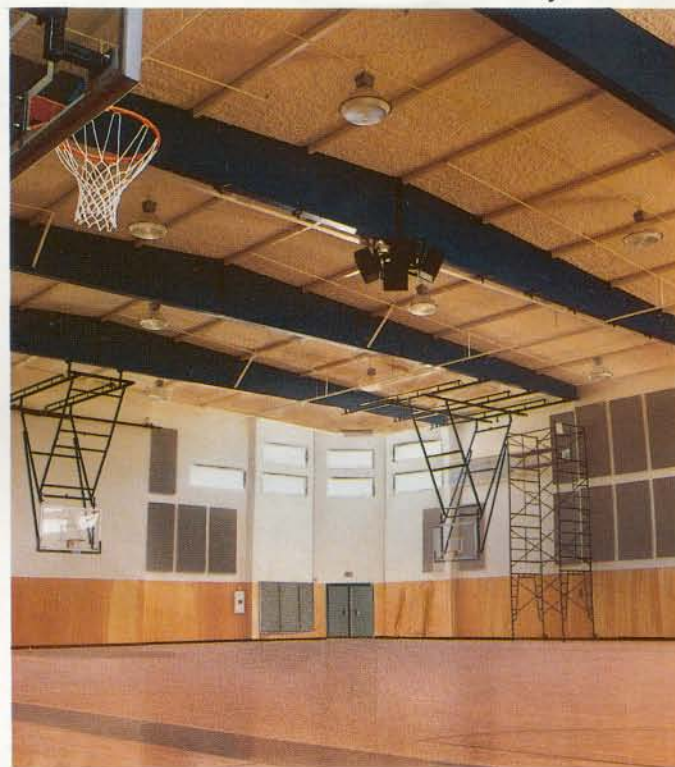
Test	Description
A	5/8" of K-13 sprayed on solid backing
B	1" of K-13 sprayed on solid backing
C	1 1/4" of K-13 sprayed on solid backing, surface painted
D	1" of K-13 on metal lath #4 mounting Coefficients
E	3" of K-13 sprayed on solid backing

		Area Tested							
Test	Sq. Ft.	Mounting	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	NRC
A	72	4	0.05	0.16	0.44	0.79	0.90	0.91	0.55
B	72	4	0.08	0.29	0.75	0.98	0.93	0.76	0.75
C	72	4	0.10	0.30	0.73	0.92	0.98	0.98	0.75
D	72	4	0.47	0.90	1.10	1.03	1.05	1.03	0.95
E	72	4	0.70	0.95	1.00	0.85	0.85	0.90	0.90

### K-13 Spray-On-System NRC Values on Solid Backing\*

		125	250	500	1000	2000	4000	NRC
.25	Inches	.03	.06	.18	.33	.35	.41	.25
.625	Inches	.05	.16	.44	.79	.90	.91	.55
1.00	Inches	.08	.29	.75	.98	.93	.76	.75
1.25	Inches	.18	.37	.85	1.13	1.02	.98	.85
1.50	Inches	.26	.45	.87	1.11	.98	.98	.85
2.00	Inches	.41	.62	.93	1.08	.95	.97	.90
2.50	Inches	.55	.78	.96	.97	.90	.94	.90
3.00	Inches	.70	.95	1.00	.85	.85	.90	.90

\*Based on specific and generic tests. Some values interpolated.



## Reduces Reverberation

Use of K-13 provides pleasing sound and acoustic characteristics for sound studios, auditoriums and many other public places. Typical of the improvements possible are these comparative reverberation test results in a geodesic domed gymnasium:

Frequency (Hertz)	125	250	400	1000	2000	4000
Reverberation times, seconds						
Before K-13	7.2	8.6	9.4	8.6	7.7	6.8
After K-13	5.0	4.5	3.5	2.0	1.5	1.2

Significant reduction in ambient noise levels in industrial areas such as factories and machine shops have been achieved as this example of a compressor station in a metal building shows:

Frequency (Hertz)	31.5	63	125	250	500	1000	2000	4000	8000
Noise levels, decibels									
Before K-13	80	78	90	93	94	95	99	106	104
After K-13	76	73	78	75	76	76	80	82	79

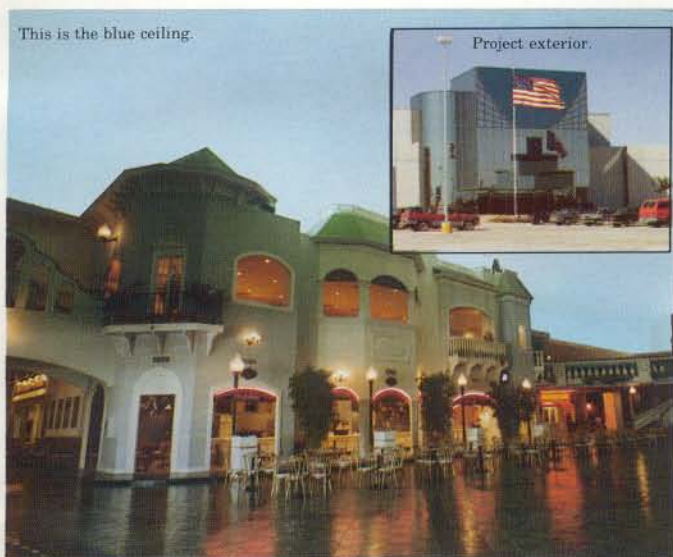
## Bond Strength

Tested in accordance with ASTM-E736. K-13 has a Bond Strength which significantly exceeds industry standards.



# Approvals and Ratings

These fire ratings are derived from product tests per ASTM standards and are used solely to measure and describe properties of materials and products in response to heat and flame under controlled laboratory conditions. They are not intended to reflect hazards presented by these or any other materials under actual fire conditions.



*Sky Blue K-13 used as acoustical treatment in this modern indoor amusement center.*

## Fire Performance Ratings

K-13 has been rated and approved by Factory Mutual Research Corporation for use in the following categories:

- **Category I:** As an interior finish material of low fire hazard (Class I Building Material) over noncombustible surfaces not requiring automatic sprinkler protection in and of itself.
- **Category II:** As a protective coating to delay the ignition and reduce the surface burning rate of combustible wood and cellulosic fiber building materials.
- **Category III:** As a protective coating to delay the ignition and reduce the surface burning rate of low melting, combustible cellular plastic building materials and to protect their dimensional stability for a brief period.
- **Category IV:** As a protective coating for building structural steel to supplement automatic sprinkler protection in preventing structural failure temperatures of the steel in high fire hazard occupancies.
- **Category V:** As a protective coating to the underside of Class II insulated steel roof deck construction to sufficiently lower the rate of fuel contribution from the Class II deck components to qualify the construction as Class I allowing automatic sprinkler protection to be omitted where permissible under Factory Mutual Standards.

## Surface Burning Characteristics

K-13 applied to asbestos cement board to a thickness of four inches. Rated Class 1 Product.

Flame spread . . . . .	15
Smoke developed . . . . .	0
Underwriters' Laboratories — Ref. #R5499	

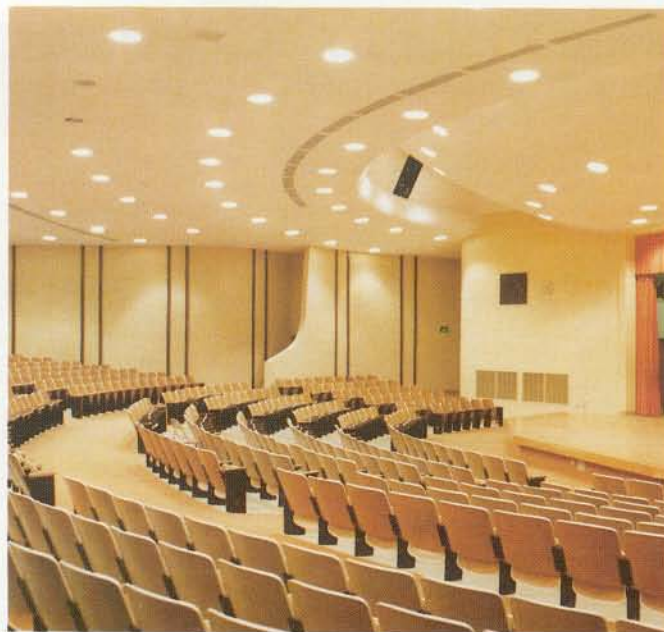
## One-Hour Firewall Fire Endurance Tests

Wall assemblies tested in accordance with full scale ASTM E-119-65 including hose stream test.

## ASTM Standards Compliance

ASTM-C-177	Thermal Conductivity
ASTM E-119	Full Scale Fire Wall Test, including Hose Stream Test
ASTM E-84	Surface Burning Characteristics
ASTM C-423	Noise Reduction Coefficients
ASTM C-523	Light Reflectance
ASTM E-736	Bond Strength
ASTM E-859	Air Erosion
ASTM C-739	Moisture Absorption
ASTM E-90	Sound Transmission Loss
ASTM E-413	Sound Transmission Loss
ASTM E-1042	Acoustical Absorption

\*Test reports available upon request.



*K-13 "FC" acoustical treatment.*



## Aids in Condensation Control

For areas such as indoor pools and ice arenas, K-13 aids in condensation control. The proper combination of K-13 and ventilation prevents condensation on metal, concrete and other surfaces. K-13 actually reduces ventilation requirements and results in savings in ventilation equipment investment and operation costs. Check with your mechanical engineer for proper design.



*Thermal & acoustics provided by K-13 in this attractive indoor pool.*



*K-13 sprayed to concrete parking deck provided thermal control to the office above.*



*Dramatic thermal, acoustical, and lighting improvement by the addition of K-13 in this industrial renovation project.*

## Miscellaneous Approvals and Specifications

ICBO – No. 2262  
SBCCI – No. 8646  
Underwriters Laboratories – Ref. No. R5499  
Los Angeles – RR-24311  
New York – 79-73-SM  
Dade County – 86-0114.2R, 86-0114.3R2  
Federal Defense Logistics Agency Code  
Houston Plant – No. 1GZ49  
Ohio Plant – No. 1HC56  
Department of the Navy Guide Specifications – NFGS-07218  
Corps of Engineers Guide Specifications – CE-201.01  
Federal Specification – SS-S-111C  
Factory Mutual Research – Report Nos. 19678, 20399, and 24703  
Meets California Bureau of Home Furnishings Standards



*K-13 "FC" provides a pleasing ceiling finish for this airport.*



## Acoustical Finish

K-13 "FC" Ceiling System is designed for exposed finished surface application to virtually any substrate, while providing many extra advantages:

- Aesthetically textured surface
- Durable and scuff resistant
- Exceptional acoustical properties
- Improved thermal insulation efficiency
- Higher performance and lower installed cost than other systems
- Ideal for new construction or renovation projects
- Excellent light reflectivity
- Class 1 fire resistance rating
- Reduces or eliminates concrete surface preparation
- Matched colors available
- Excellent replacement for removed asbestos

### SYSTEM DESCRIPTION

K-13 "FC" is the complete product for application to ceilings and/or walls for acoustical treatment, thermal insulation, surface coating and other beneficial properties.

K-13 "FC" is the unique, economical and effective performance alternate to plasters, painting, tile and other products that do not have multi-functional capabilities.

### ENHANCED DURABILITY AVAILABLE

A harder, more durable, more scratch and scrape resistant application for low areas where abuse is likely, may be obtained by specifying **K-13 "FC" Dura-K**. Complete specification/application details available from International Cellulose Corporation.

### REDUCES SURFACE PREPARATION

K-13 "FC" thorough coverage and bridging capability reduces or alleviates previously required concrete preparation, by covering rough spots, divits, joints and other problem areas. It also provides exceptional hide and leveling qualities because of the variable thickness application ability, including outstanding light reflectivity and fire performance characteristics. These benefits as well as others are inherently provided in a single pass "FC" System application.

Some surfaces and substrates that are to be applied with K-13 "FC" must be primed/sealed prior to "FC" application, in order to prevent substrate bleed through/color contamination. Such primer/sealer shall be an oil based alkyd primer and applied at a proper rate in order to prevent any bleed through/dilution of "FC".

### ASBESTOS REPLACEMENT

K-13 "FC" is a popular replacement for removed asbestos in schools and other buildings.

**LIGHT REFLECTIVITY:** White 70%, arctic white 85%

**ACOUSTICAL RATING:** .55 NRC - 5/8" thickness sprayed onto solid backing



**THERMAL INSULATION:** 1.85 R-Value at 1/2-inch

CHARACTERISTIC MEASURED	MATERIAL PERFORMANCE	PERFORMANCE STANDARD	TEST REFERENCE
Bond Strength	1.2 lbs./sq. in.	0.04 lbs./sq. in. (min.)	ASTM E-736
Air Erosion	0.018 gms./ft <sup>2</sup>	0.025 gms./ft <sup>2</sup> (max.)	ASTM E-859
Water Absorption	13%	18% (max.)	ASTM C-739

### FIRE HAZARD CLASSIFICATION

Flame Spread	15
Smoke Developed	0

[Underwriters' Laboratories - Reference R5499]

Refer to warnings and limitations section in this brochure. For a comprehensive spec guide, etc. contact International Cellulose Corp.





## Sound Transmission and Noise Control for Partition Walls and Plumbing Thermal Insulation One Hour Firewall

Celbar is a blend of specially prepared cellulose fibers, organic in nature, treated with adhesive and fire resistant chemicals. When sprayed in place the interlocking fibers result in a mass which produces excellent sound and thermal properties.

Celbar is pneumatically spray applied in wall and ceiling cavities to form a monolithic coating. This process seals cracks and holes in the wallboard, around plumbing and electrical outlets, vent ducts and other irregularities. There are no compressed areas or voids to allow sound leaks, R value reductions, or air infiltration.

### PERFORMANCE WHERE IT COUNTS

Celbar provides superior sound transfer control demanded by building designers, owners and occupants. Celbar assemblies perform closer to lab tested STC ratings in the field than do other conventional batt and sound board systems. This is due to the complete coverage and the sealing action of Celbar.

The performance of Celbar compared to other identically constructed wall systems as documented by laboratory tests, is shown below:

The base system and results are as follows:

2-1/2" Metal Studs With 1/2" Gypsum Wallboard - both sides.		
TEST	RESULT	
A. No sound control material used	31	STC
B. 2-1/2" sound barrier batt	33	STC
C. 2-1/2" sound barrier batt and 1/2" cellulux board	37	STC
D. 1-1/2" Celbar Spray	49	STC

### Celbar Thermal Performance

Celbar's R value of 3.8 per inch allows you to design exterior wall systems with higher total R values. However R value alone is not the only measure of a product's thermal effectiveness. To obtain maximum thermal efficiency air infiltration must be minimized. Sprayed in place Celbar conforms to any substrate, around pipes, obstructions, and over cracks, reducing air infiltration and forming a highly efficient and effective thermal barrier. It can be sprayed to virtually any exterior stud or furred cavity and in most cases the wall can be closed up the same day.

### Savings Example

In a series of tests five identical buildings were monitored for KWH usage over an eleven month period. One building utilized sprayed cellulose in the walls, and the other four utilized fiberglass batt insulation. Upon conclusion the cellulose insulated building saved 32% of the KWH usage of the other buildings.

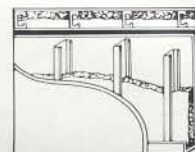
### METAL STUD ASSEMBLIES

STC  
RATING

55

#### Construction Detail

3 5/8" Metal Studs 16" O.C. Faced Both Sides with 5/8" Gypsum Wallboard: 3 5/8" Celbar



53

2 1/2" Metal Studs 16" O.C. Faced Both Sides with 5/8" Gypsum Wallboard: 2 1/2" Celbar

51

2 1/2" Metal Stud 24" O.C. Faced Both Sides with 5/8" Gypsum Wallboard: 1 1/2" Celbar\*

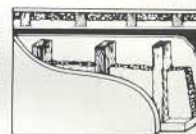
### WOOD STUD ASSEMBLIES

STC  
RATING

60

#### Construction Detail

2 x 4 Stud on a 2 x 6 Plate Spaced 16" O.C. and staggered on opposite sides, faced on both sides with 5/8" gypsum wallboard: 2 1/2" Celbar



58

2 x 4 Stud on a 2 x 6 Plate Spaced 16" O.C. and staggered on opposite sides, faced on both sides with 5/8" gypsum wallboard: 1 1/2" Celbar\*

56

2 x 4 Stud 16" O.C. on Two Separate 2 x 4 Plates with 1" Separation. Faced on One Side with 5/8" gypsum wallboard and 1/2" gypsum wallboard other side: 1 1/2" Celbar\*

\*

Increase Thickness of Celbar 1" Will Add 2 dB to STC in Above Assemblies.

\*

Above assemblies are based on specific and generic tests. Many other assemblies possible.







*The complete sealing provided by Celbar is unobtainable with other types of insulation resulting in higher field performance.*

## ASTM E-119 FIRE RATING - ONE HOUR

Celbar has been tested in accordance with ASTM E-119 including hose stream test and is accepted for use in fire rated wall assemblies as a one hour wall.

## CELBAR USES:

Party Walls	Around Baths	Plumbing Chases
Exterior Walls	Corridor Walls	Between Floors

Typical structures:

Homes	Hotels/Motels	Theaters
Condominiums	Apartments	Restaurants
Townhouses	Shopping Malls	Office Buildings

## PHYSICAL PROPERTIES

<b>Thermal:</b>		R Value 3.8 / inch		
Thickness	1"	2.5"	3.5"	
R Value	3.8	9.5	13.3	

**Fire Hazard Classification:** Flame Spread 15  
Smoke Developed 0.

Classified by Underwriters Laboratories  
Reference #R-5499.

- Listings**
- ICBO - Approval Number 2262
  - Southern Building Code - Approval Number 8646
  - HUD-FHA-VA-Permits the use of Celbar in projects they finance - based on Celbar's compliance with UMB-80

## PRODUCT LIMITATIONS

K-13, K-13 "FC", and Celbar Spray should not be used in areas where there is prolonged exposure to water or heat in excess of 150°F (65°C). Nor should it be applied in areas requiring a washable surface, or where contaminants such as dust, oil, etc. exist. Accumulations of these contaminants may become hazards to the insulation. These contaminants will provide a fuel source and will burn when ignited and fire may spread.

## SPECIAL PRECAUTIONS

The fire retardant chemicals used in K-13, K-13 "FC", and Celbar Spray are water soluble. When the insulation is used in areas where condensation will form or where it is in contact with water, a periodic fire retardant over-spray may be necessary.

Celbar is applied with water and should not be sprayed on laminated wood paneling as it could cause warping. Celbar should not be used in areas where vinyl or foil wall covering or other vapor barriers are used on both sides of the wallboard, unless Celbar is allowed to dry completely before closing up the wall.

Surfaces receiving K-13 should be checked for possible contaminants, i.e., rust, dirt, water stains, etc. prior to application. These areas should be primed to prevent bleed through.

**For further information on limitations and precautions see I.C.C. Warning Bulletin SF-387.**

## WARRANTY

International Cellulose Corporation (I.C.C.) warrants its products to be free from defects in materials and workmanship at the time of shipment. Application warranties are provided by the approved contractor.

It is the responsibility of the user to determine compliance of the product with local building codes and other regulatory bodies.

I.C.C. is herein publishing information and data based on specific and generic tests. I.C.C. believes this data is as reliable as the present state of the art in fire, thermal, and acoustical testing, and can be used only as a guide for design. I.C.C. is not responsible for building design, appearance, or workmanship and makes no guarantee of performance.

I.C.C. specifically disclaims any warranty of merchantability or fitness for a particular purpose. In no event shall I.C.C. be liable for special, indirect or consequential damage.

---

**Specification sheets, technical data, and test reports available upon request.**

---



INTERNATIONAL CELLULOSE CORP.  
P.O. BOX 450006  
12315 ROBIN BLVD.  
HOUSTON, TX. 77245-0006  
713/433-6701  
TWX 910 881-3719

© 1987 by International Cellulose Corp. Printed in U.S.A.  
All rights reserved. K/13, K/13 "FC", & Celbar Trademark of  
International Cellulose Corporation  
K-13 6/87 44

Manufacturing facilities are located at Houston, Texas; Monroe, Ohio; Vancouver, British Columbia.