

LOCKWOOD GREENE ENGINEERS, INC.

SPARTANBURG, SOUTH CAROLINA 29304
P.O. BOX 491 (803)582-2351

TO Naval Facilities Engineering
Command
Atlantic Division
Norfolk, Va. 23511

DATE Jan. 21, 1980

JOB NO. 77239.16

JOB NAME Naval Regional Medical Center

TRANSMITTAL NO. 94

SHEET 1 OF 1

ORDER NO.

Contract Number

N-62470-77-C-7526

ATTN: Mr. John Grubbs Code 05

WE ARE SENDING YOU THE FOLLOWING DATA xx HEREWITH _____ UNDER SEPARATE COVER

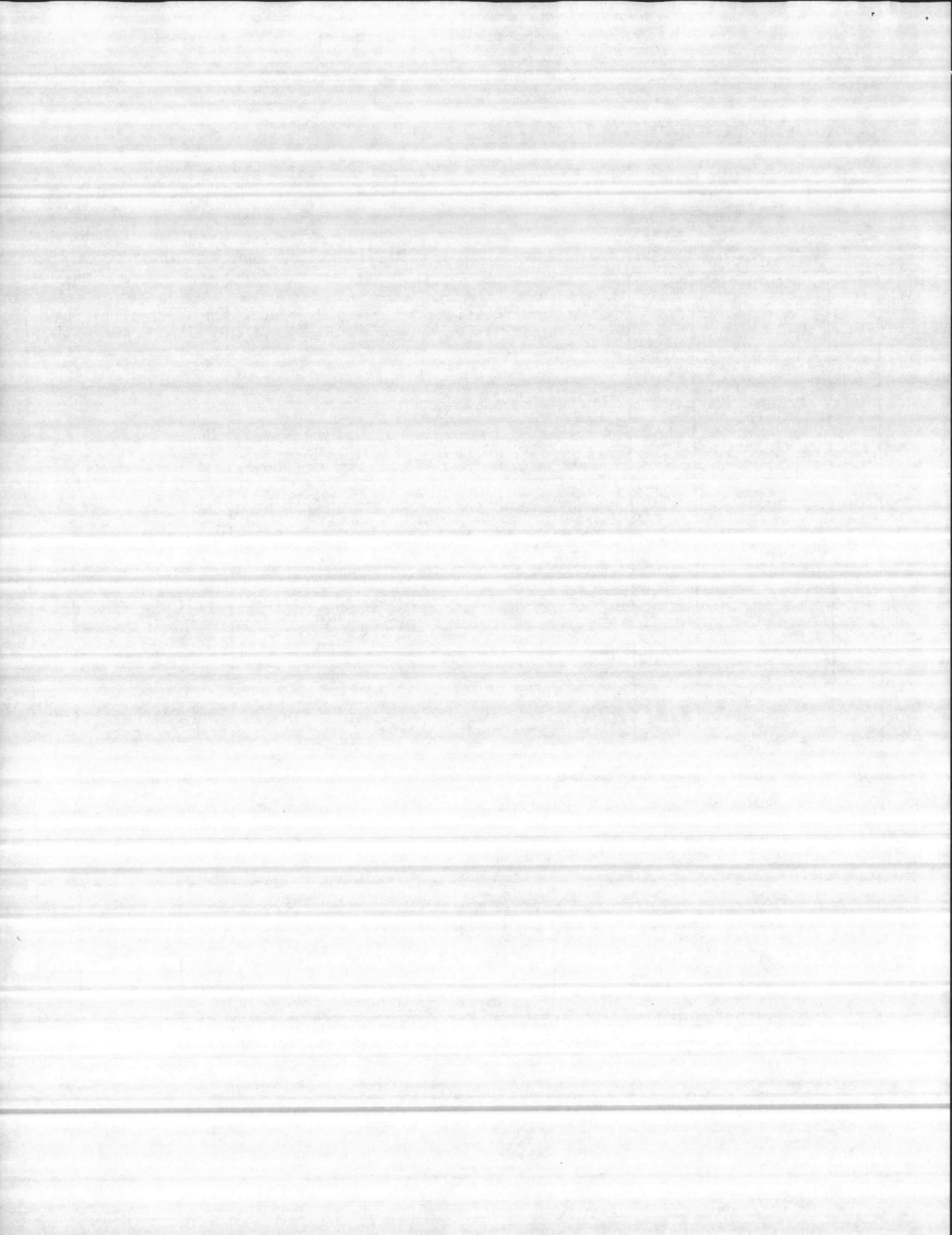
QUAN.	DOCUMENT NO.	REV. NO.	DESCRIPTION	VENDOR	CODE				
1	Brochure		Covering-Insulation, Adhesive, Coating, Mastic, and Accessories	Johns-Manville	AN				
CODE FOR									
LOCKWOOD GREENE DOCUMENTS			VENDOR DOCUMENTS						
A - INFORMATION			E - BID		K - NO CORRECTIONS NOTED				
B - REVIEW			F - CONSTRUCTION		L - MAKE CORRECTIONS NOTED				
C - APPROVAL			G - PURCHASING		M - REVISE AND RESUBMIT				
D - REVISED DWG. (SEE REVISION)			H -		N - REJECTED (SEE REMARKS)				
COPIES TO		QUAN	TRANS ONLY	CODE	COPIES TO		QUAN	TRANS ONLY	CODE
ROICC		2							
Cardinal Contracting		7							

REMARKS

PLEASE ACKNOWLEDGE RECEIPT BY IMMEDIATE RETURN OF SIGNED COPY OF THIS TRANSMITTAL

RECEIVED BY _____

TRANSMITTED BY Richard M. _____



CONTRACTOR'S SUBMITTAL TRANSMITTAL

5ND LANTDIV 4-4355/3 (Rev. 6/76)

SECTION 15160

693-A

file

CONTRACT NO. N62470-77-C-7526	TRANSMITTAL NO. 697-A	DATE 1-4-80
PROJECT TITLE AND LOCATION NAVAL REGIONAL MEDICAL CENTER CAMP LEJEUNE, NORTH CAROLINA 28542		

FROM CONTRACTOR
CARDINAL CONTRACTING CO., INC.

TO
LOCKWOOD - GREENE ENGRS.

CONTRACTOR USE ONLY

*List only one specification division per form.

List only one of the following categories on each transmittal form, and indicate which is being submitted

- Contractor Approved OICC Approval Deviation/Substitution For OICC Approval

REVIEWER USE ONLY

**ACTION CODES

- A-Approved
- D-Disapproved
- AN-Approved as noted
- RA-Receipt acknowledged.
- C-Comments
- R-Resubmit

ITEM NO.	PROJ. SPEC. SECT. & PARA. and/or PROJ. DWG. NO. *	ITEM IDENTIFICATION (Type, size, model no., Mfg. name, dwg. or brochure number)	NO. OF COPIES	ACTION CODES **	REVIEWER'S INITIALS CODE AND DATE
693-A	2.5.1.1A	Insulation	11	AN	<i>mu</i> 1/18/80
694-A	2.5.1.1B	Adhesive	11	AN	<i>mu</i> 1/18/80
695-A	2.5.1.1C	Coating	11	AN	<i>mu</i> 1/18/80
696-A	2.5.1.1D	Mastic	11	AN	<i>mu</i> 1/18/80
697-A	2.5.1.1E	Accessories	11	AN	<i>mu</i> 1/18/80

94

CONTRACTOR'S COMMENTS

Please return a minimum of 6 copies with owners approval.

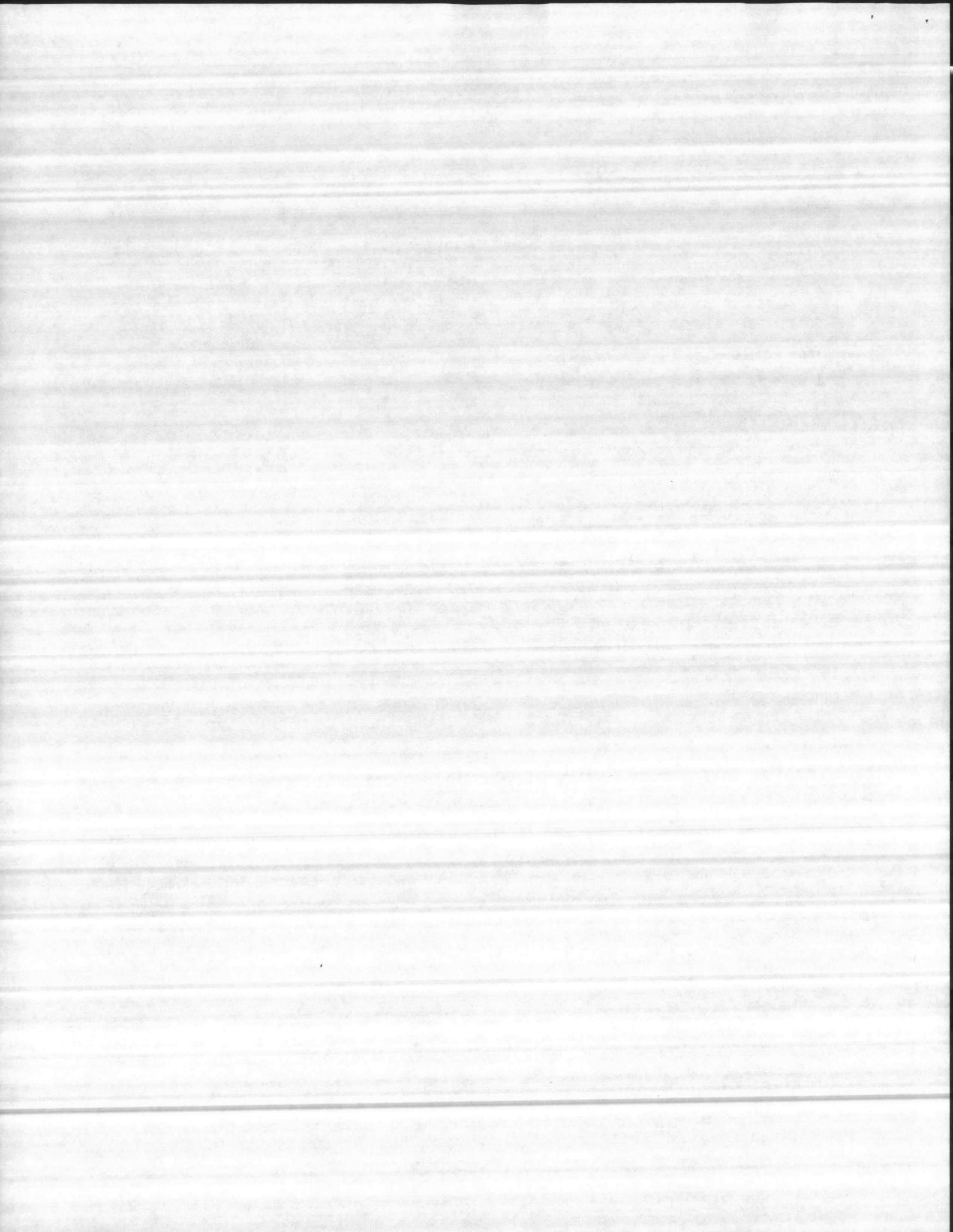
COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC <i>1-5-80</i>		CONTRACTOR REPRESENTATIVE (Signature) <i>(C/M) J. Haywood</i>	
DATE RECEIVED BY REVIEWER	FROM (Reviewer)	TO	

- Submittals are returned with action indicated. Approval of an item does not include approval of any deviation from the contract requirements unless the contractor calls attention to and supports the deviation.
- Submittals are forwarded to LANTDIV with A-E recommendations indicated in REVIEWER USE ONLY Section and in comments below on **ONE COPY** of the transmittal form.

REVIEWER'S COMMENTS

file field
1-28-80
mu

COPIES TO: ROICC (2) LANTDIV (1) A-E (1)	DATE	SIGNATURE
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S
STARR DAVIS COMPANY OF S. C. INC.
D

THERMAL INSULATIONS • ENGINEERS • CONTRACTORS • DISTRIBUTORS

FILE NO. _____
 Lockwood Greene Engineers, Inc.
RECEIVED
 JAN 11 1980
 REF. TO _____
 ACK. _____

Reply to: P.O. Box 2806
 Asheville, N.C. 28802
 Telephone (704) 274-4826

December 20, 1979

Waldinger Corporation
 Box 8363
 Camp Lejeune, N. C. 28542

Attention: Mr. R. J. Welch

Reference: Naval Regional Medical Center
 Camp Lejeune

Gentlemen:

We are pleased to submit the following for your review and approval.

Plumbing Insulation All Areas:

Domestic Hot and cold water and horizontal rain leaders, Johns-Manville Fiberglass pipe covering with factory standard jacket (See Att. #1) 1" thick to 6" and 1 1/2" thick above 6" Fittings shall be premolded PVC as manufactured by Speedline Corporation. (See Att. #2)

6" & above

Chilled Water All Areas:

Same as plumbing except thickness as follows: One inch thick to 3", 2" thick above 3". All systems handling chilled water domestic cold water and horizontal roof drains shall be vapor sealed with a factory applied self-sealing lap and vapor barrier tape on PVC Ells.

Medium Temperature

Hot Piping Systems:

Steam condensate and heating hot water - 1" thick to 6". 1 1/2" thick 6" and above (See Att. one and two for materials).

High Temperature:

Steam - 1 1/2" thick to 1 1/4", 2" thick 1 1/2" and above (See Att. one and two for materials).

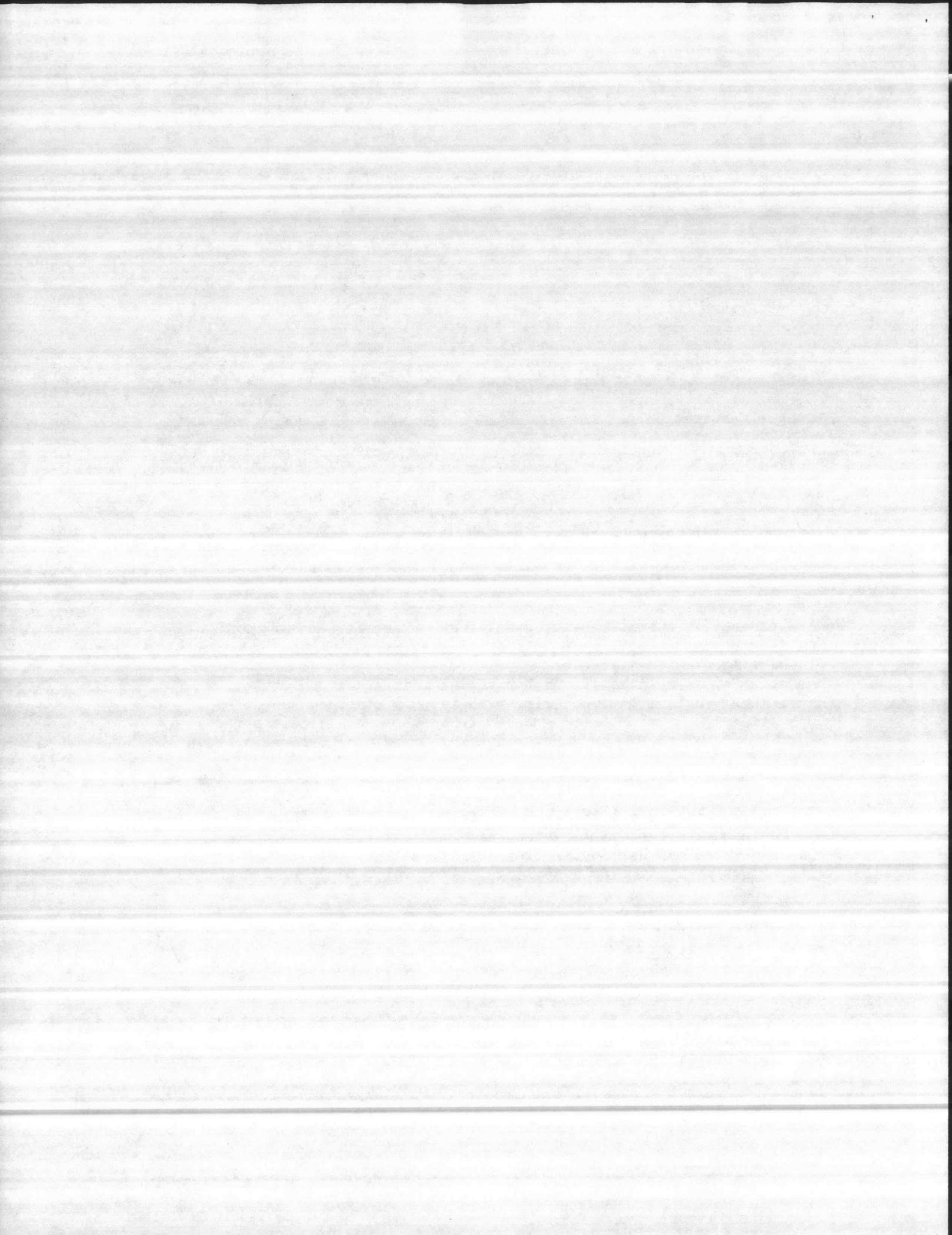
Insulation on hot piping will be secured with flare staples on approximately 4" centers.

"It is hereby certified that the material/equipment shown and marked in this submittal is that approved to be incorporated into Contract Number N62470-77-B-7526, is in compliance with the contract drawings and specifications, and can be installed in the allocated spaces, and is approved for use.

THE WALDINGER CORPORATION

Authorized Reviewer *[Signature]* Date *1-4-80*

Signature CQC Rep *[Signature]* Date *1/8/80*



Ductwork Concealed:

Shall be insulated with 2" thick Blanket 3/4 lbs. density, Johns-Manville duct wrap with a foil-scrim-Kraft Jacket (See Att. #3). Lap all joints 2" staple on 4" centers approximately. Secure to duct with Foster's 85-20 (See Att. #4). Use weld pins as specified to prevent sagging. Vapor seal with Fosters 30-35. (See Att. #5)

Ductwork Exposed:

Shall be insulated with 1" thick rigid Fiberglass board 3 lbs. density, Johns-Manville, with a foil-scrim-Kraft Jacket. (See Att. #6) Secured with weld pins on approximately 12" centers. All joints and punctures in jacket shall be sealed with pressure sensitive tape matching jacket.

2" PER AMEND. #2
SUBMIT DUCT LINER INSULATION - SECT 15802 PAR 4.3.5

Low Temperature Equipment:

Chilled water coolers, tanks, pumps, balancing tanks, liquid precoolers and heat exchangers, 2" thick fiberglass board (See Att. #6, secured with bands, wire or weld pins according to the equipment configuring. Finish where practical with .016 aluminum jacket with vapor barrier. On irregular surfaces, finish with insulation cement, glass fabric and Fosters 30-35. (See Att. #5) Miter or score block, insure tight joints.

Hot Equipment:

Same as cold.

Boiler Breeching:

Shall be insulated with 2" thick mineral fiber secured with weld pins. Fill joints with insulation cement. Block shall be manufactured by 48 Insulation Company. (See Att. #7) Finish inside boilerhouse with Powerhouse cement, (See Att. #8) glass cloth and Fosters 30-36. (See Att. #9) Exhaust system from hoods, kitchen, 2" thick mineral wool, 48 Insulation Company (See Att. #7) Secured with weld pins or bands. This is for protection against burns only.

Plumbing Equipment:

Same as HVAC equipment except material shall be 1 1/2" thick.

Diesel Engine Exhaust:

5" thick mineral wool as manufactured by 48 Insulation Co., secured with bands (See Att. #10). Finish straight portions with .016 aluminum jacket and irregular surfaces with Powerhouse cement, glass fabric and Fosters 30-36.

Please find enclosed certificates from manufacturers attesting that each of the following items conform to all requirements of this specification of referenced publications.

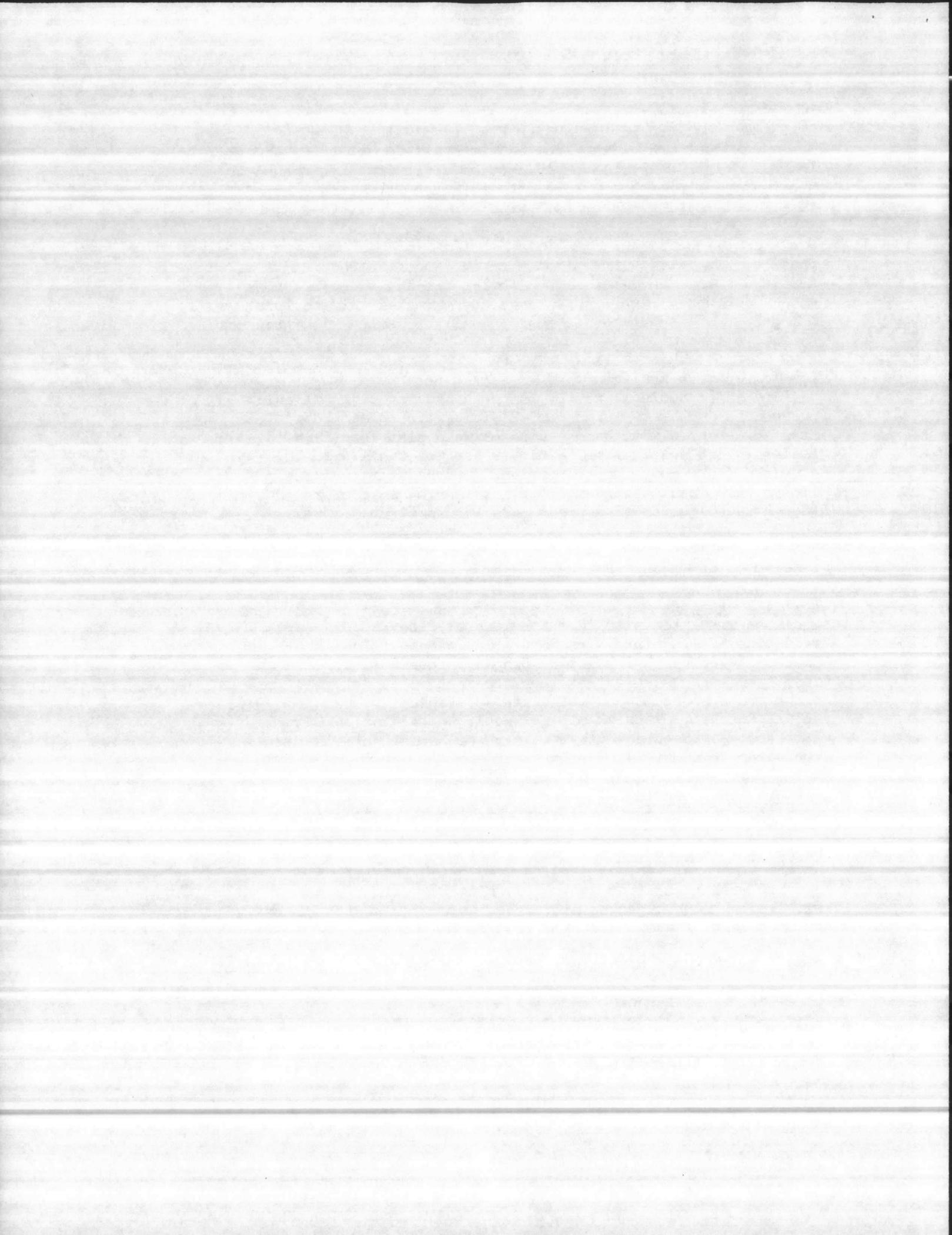
Please return two approved copies for our files.

Respectfully,

Alvin H. Worley

Alvin H. Worley

AHW/eg





**Johns-Manville
Sales Corporation**

Ken-Caryl Ranch
Denver, Colorado 80217
(303) 979-1000

December 12, 1979

Mr. Al Worley
Star-Davis, Inc.
P. O. Box 2806
Ashville, NC 28802

Subject: Specification Compliance

Dear Mr. Worley:

You recently requested information concerning various Johns-Manville products and their compliance to Federal and ASTM specifications. This letter is to advise you that in general, the following products are manufactured in accordance with the requirements of the listed specifications.

However, unless certification is requested on the order, only our standard sampling and inspection procedures are used. Therefore, it is possible that certain properties required in the specification might not be regularly tested.

This letter does not represent a certification of specific product lots to the specifications since testing of each lot at the plant before shipment is required for such a certification.

The following specification compliance data is listed on our product data sheets as well as in our finished product specifications. Our standard quality control procedures are used to assure the manufacture of consistent, high-quality products.

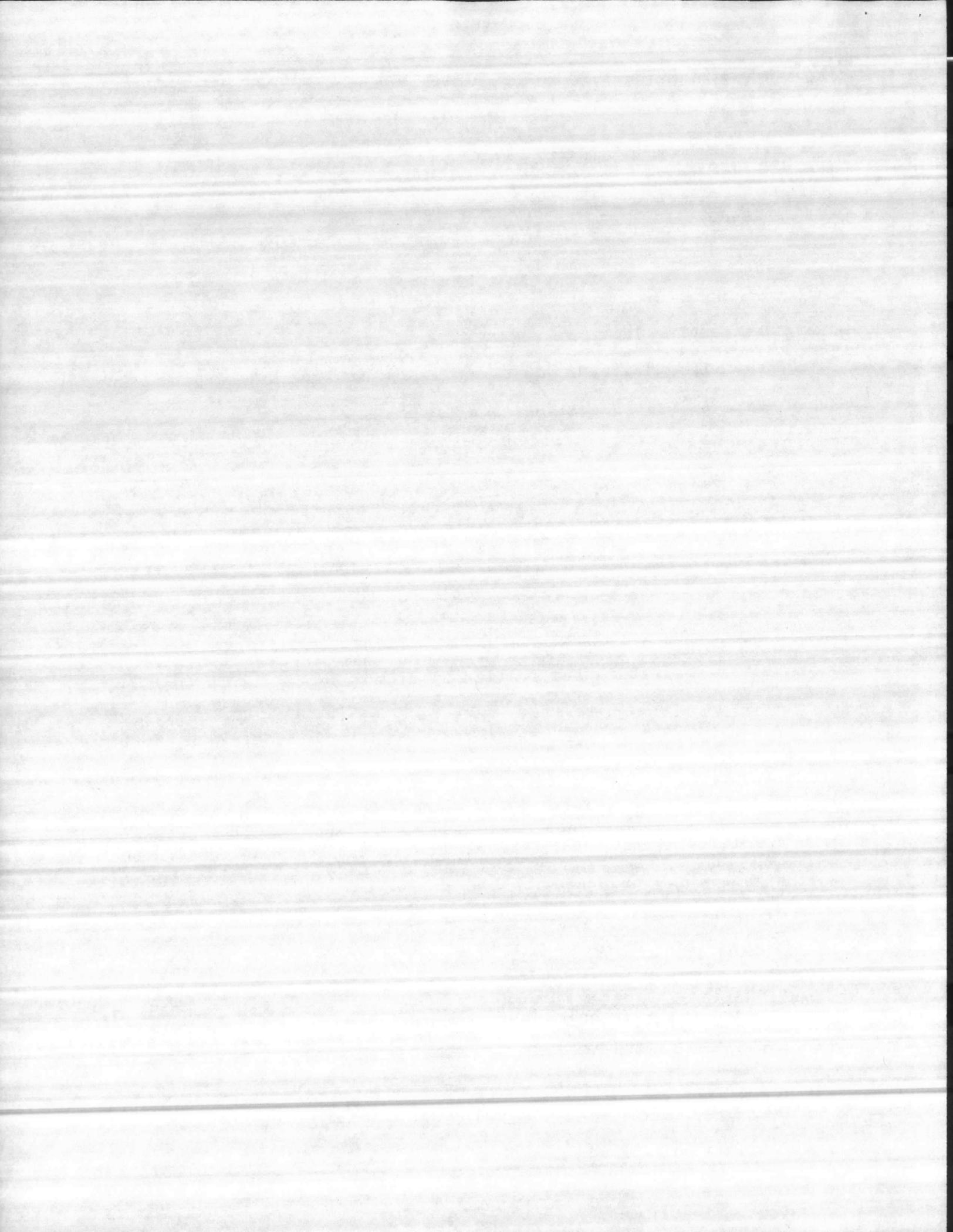
Sincerely,

Michael R. Harrison, Manager
Engineering & Technical Services

MRH/ke

Attachment

cc: W. Bradfield
F/C



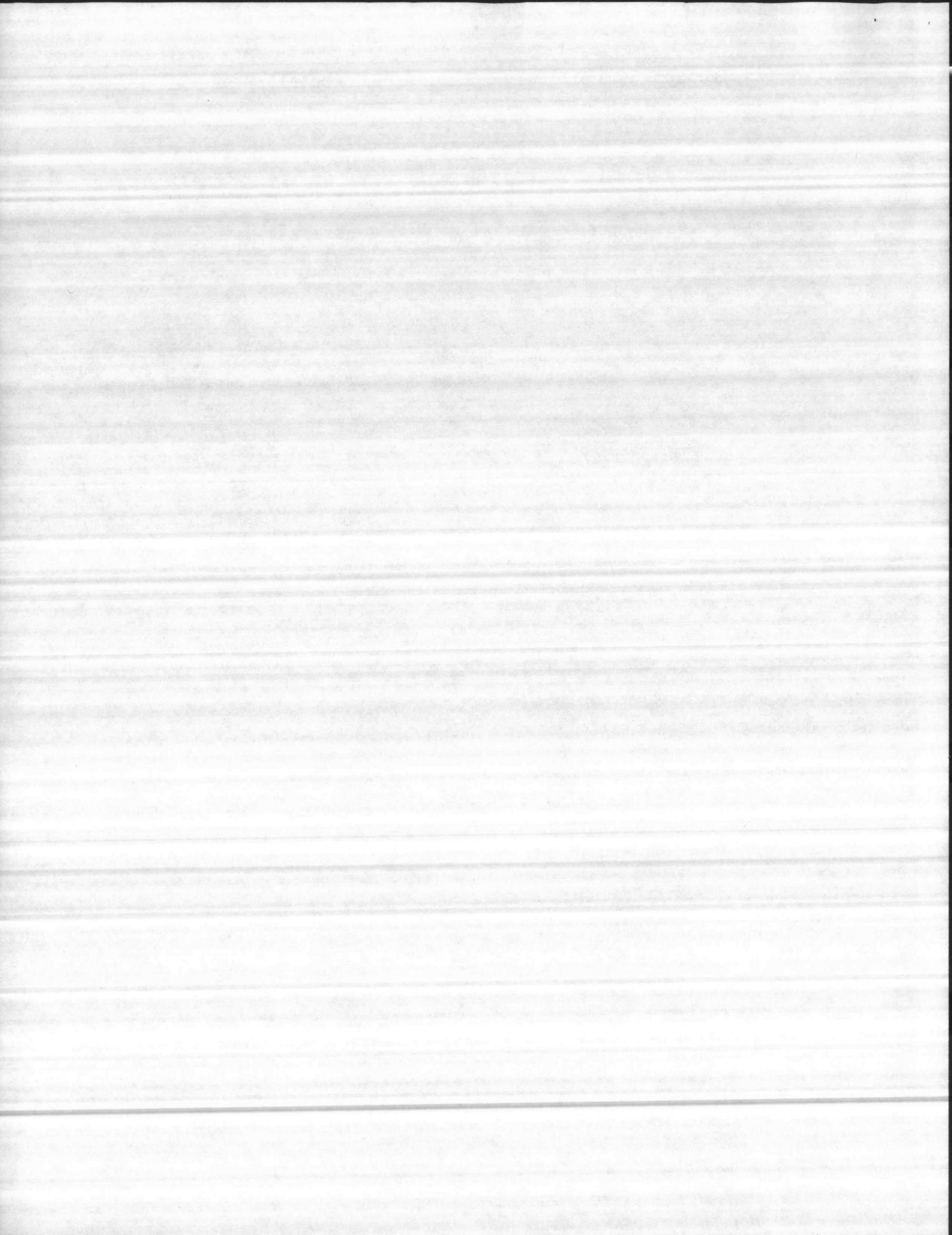
PRODUCT

SPECIFICATION

- | | |
|--|---|
| 1. MICRO-LOK 650 | HH-I-558B Form D
Type III, Class 12
and Class 13 to
650F (to 500F for
less than 2" thick) |
| 2. AP & AP-T JACKET | ASTM E-96
Procedure A; .02 Perms

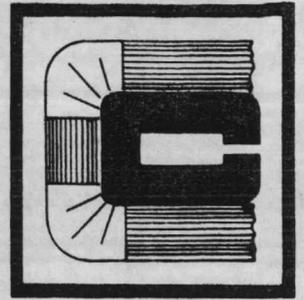
Beach Puncture
ASTM-D-781-63T
50oz.

Tensil Strength
ASTM-D-826-60
AP 40 lbs., AP-T
40 lbs. |
| 3. R-SERIES MICROLITE
AND MICROLITE D/W | HH-I-558B Form B
Type I Class 6 |
| 4. 814 SPIN-GLAS | HH-I-558B Form A
Class II and Form B
Class VII (must be
crushed) |



Starr Davis Company
P.O. Box 2806
Asheville, N.C., 28802

Attention: Mr. Al Worley



December 11, 1979

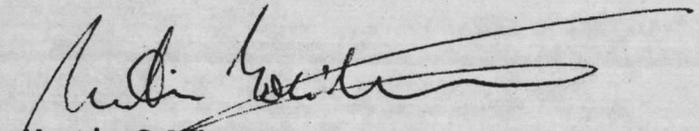
World's Largest and Leading Manufacturer of Products for Protection of Thermal Insulation

Gentlemen:

This letter is to certify that all aluminum material used in manufacturing roll jacketing and fittings, as supplied, to the Starr Davis Company meet ASTM-B-209-77 specification.

Yours very truly,

CHILDERS PRODUCTS COMPANY


Martin Goldberg
Vice President

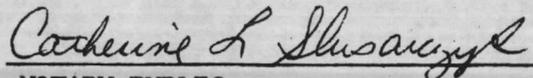
MG/py

cc: Jack Poole

STATE OF Ohio

COUNTY OF Cuyahoga

GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS 11th DAY OF
December 19 79.

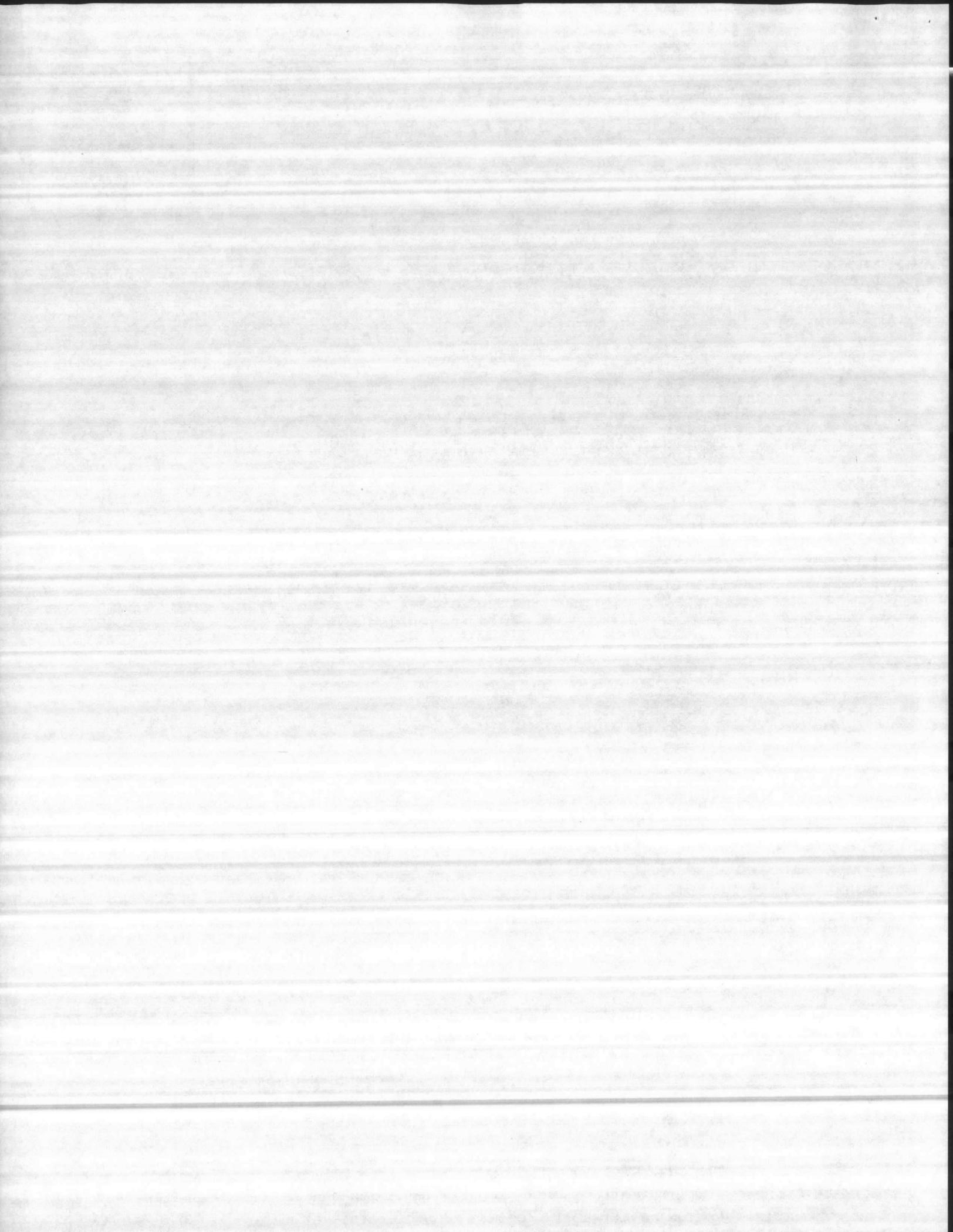


NOTARY PUBLIC
CATHERINE L. SLUSARCZYK
Notary Public For Cuyahoga County, O.
My Commission Expires Aug. 25, 1980

MY COMMISSION EXPIRES _____

CHILDERS PRODUCTS COMPANY

23350 MERCANTILE ROAD • P.O. Box 22228 • CLEVELAND, OHIO 44122 • PHONE: 216/464-8020 • TELEX 98-5497 • CABLE ADDRESS: "CHILPRO"
LOS ANGELES • HOUSTON • PHILADELPHIA • TORONTO, ONTARIO • CALGARY, ALBERTA • CARACAS, VENEZUELA



December 11, 1979

Mr. A. Worley
Starr Davis Company, Inc.
Post Office Box 2806
Ashville, NC 28802

Reference: ETR INSULATION

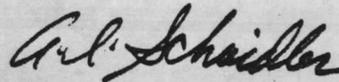
Dear Mr. Worley:

Confirming our telephone conversation with your Greensboro office, we are pleased to enclose several copies of our latest data sheet on ETR INSULATION.

This is to certify that ETR INSULATION conforms to the requirements of Federal Specification HH-I-558B, Form A, Class 4.

Thank you for the opportunity to be of service.

Very truly yours,

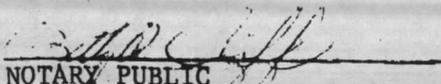


A.D. Schaidler
Director of Marketing Services

cc: G.A. Crooks

ADS:kmw

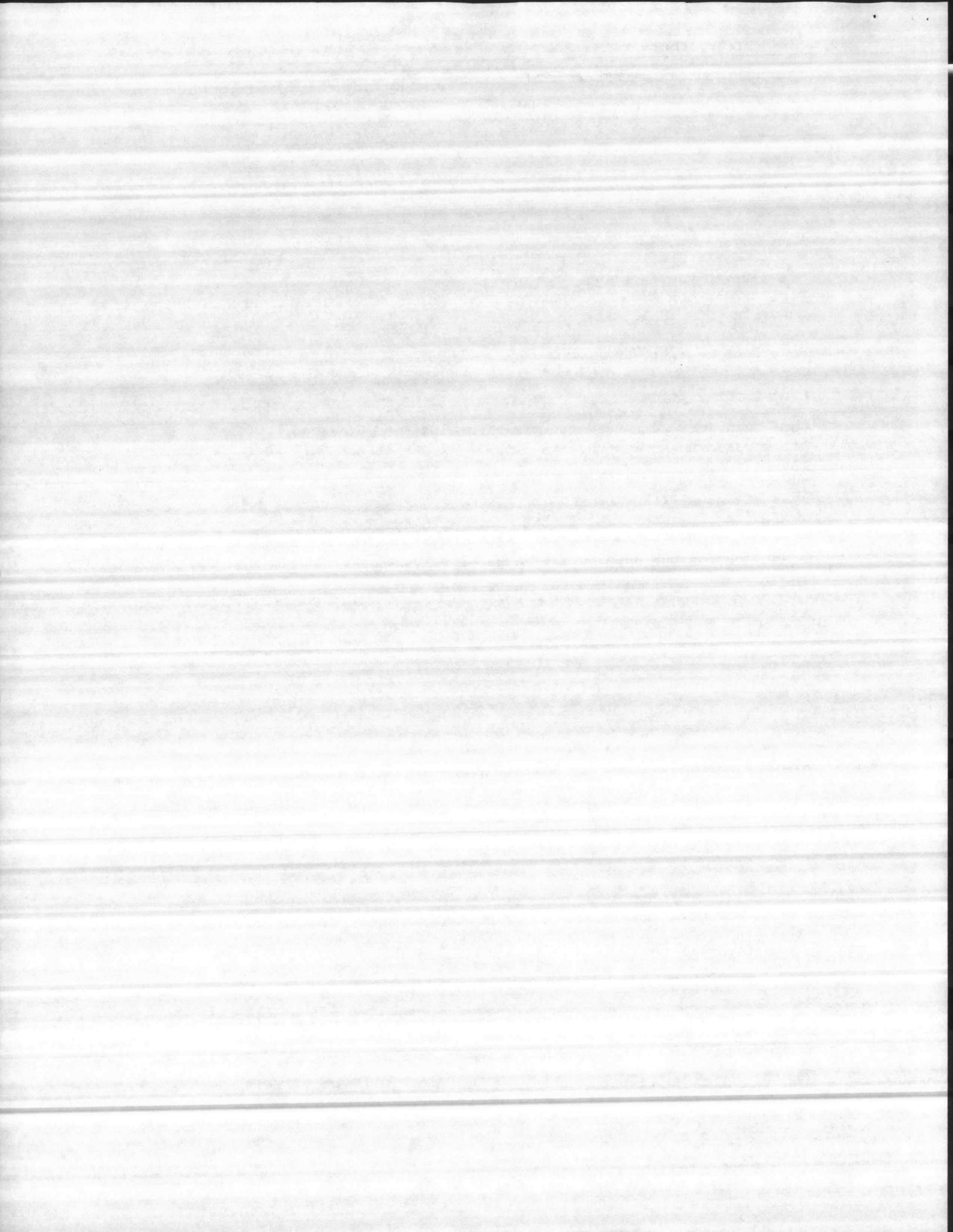
Subscribed and sworn to before me
this 11 day of December 1979.



NOTARY PUBLIC

MY COMMISSION EXPIRES JUNE 5, 1983

94



HB FULLER COMPANY

FOSTER PRODUCTS
ASSEMBLY PRODUCTS DIVISION
6107 INDUSTRIAL WAY, HOUSTON, TX 77011 • TELEPHONE 713/926 3125

December 4, 1979

Starr Davis Co.
P. O. Box 2806
Asheville, North Carolina 28802

Attention: Mr. Al Wurle

Dear Mr. Wurle:

This is to certify that the products listed below are on the Qualified Products list of the given Military Specification:

Foster's 85-20 meets MIL-A-3316B Class II
Foster's 30-36 meets MIL-A-3316B Class I
Foster's 30-35 meets MIL-C-19565 Type II
Foster's 60-25 meets MIL-C-82052

We hereby certify that these products meet the requirements of said military specifications.

Very truly yours,

H. B. FULLER CO.
FOSTER PRODUCTS DIVISION

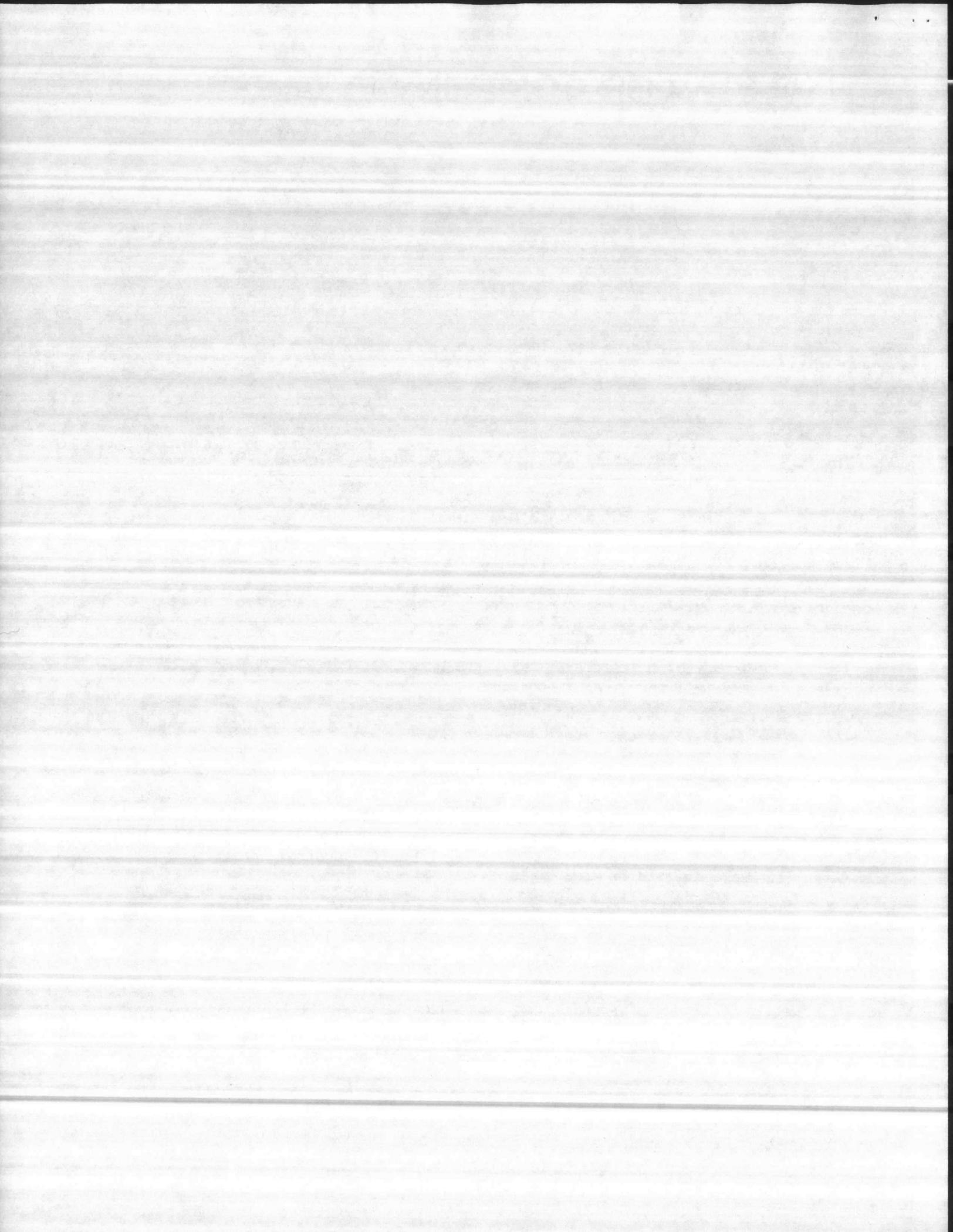
Mark G. Katsaros

Mark G. Katsaros
Quality Control Manager

cc: Irv Steltz

94

Geneva M. Florio
My Commission expires Aug. 27, 1981



KEENE
CORPORATION
BUILDING PRODUCTS DIVISION

1803 FULFORD STREET, - KALAMAZOO, MICHIGAN 49003 - (616) 343-1226

December 12, 1979

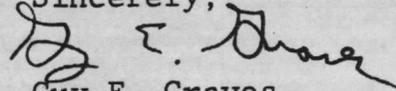
Mr. Al Worley
Starr Davis
P.O. Box 2806
Ashville, N.C. 28802

Dear Mr. Worley,

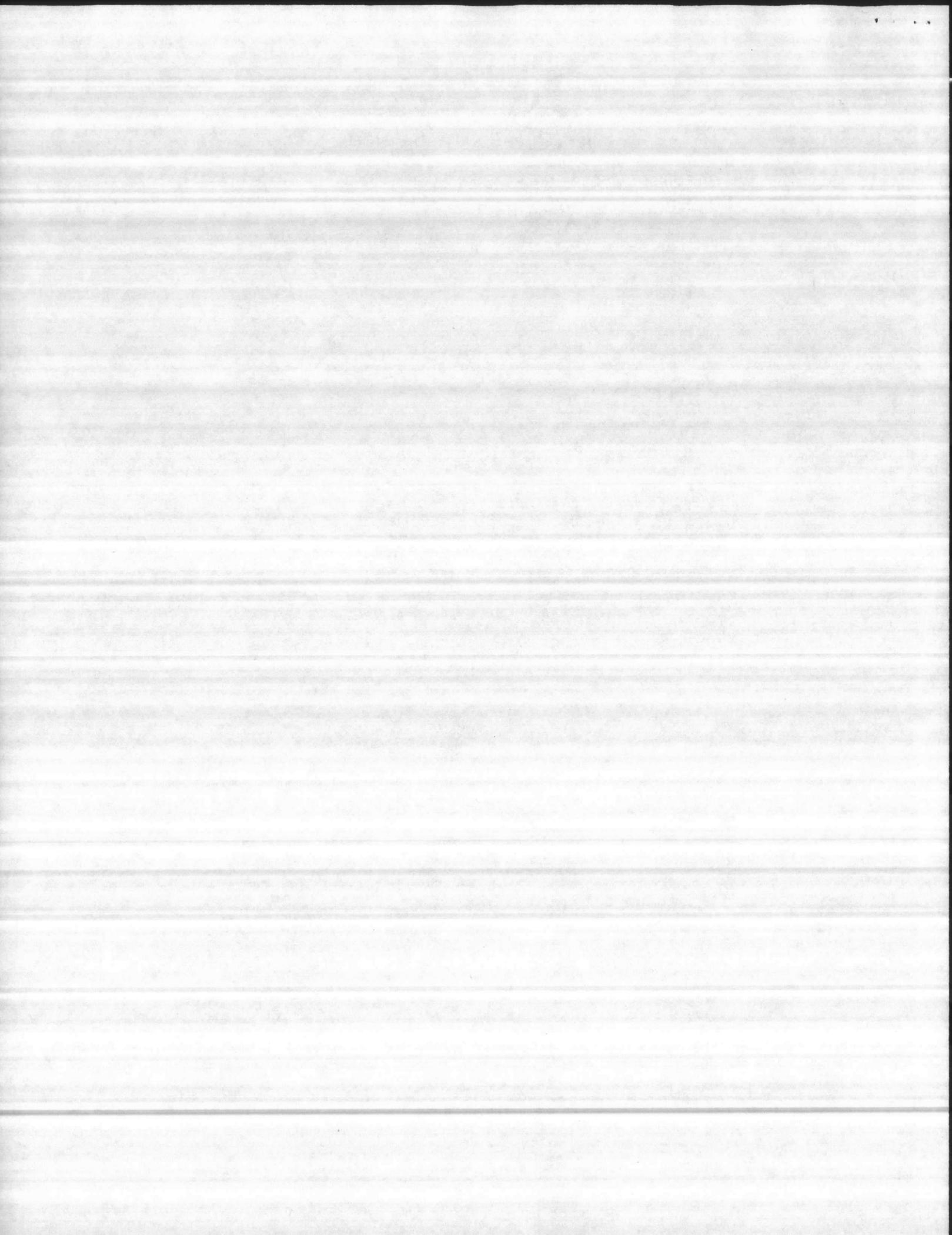
This is to certify that Super Powerhouse Cement,
as manufactured by Keene Corporation, complies
with the requirements set forth in SS-C-160A
Type 111 Grade F.

If you have any questions, please feel free to
contact me.

Sincerely,



Guy E. Graves
Engineering Manager
Insulation Operation



CONTRACTOR'S SUBMITTAL TRANSMITTAL

5ND LANTDIV 4-4305/3 (Rev. 8/78)

file

SECTION 15160
 FROM CONTRACTOR
 CARDINAL CONTRACTING CO., INC.
 TO
 LOCKWOOD-FREEN ENGRS.

CONTRACT NO. H62470-77-7-7525	TRANSMITTAL NO. 693-697	DATE 10/31/79
PROJECT TITLE AND LOCATION Naval Regional Medical Center Camp LeJeune, North Carolina 28542		

CONTRACTOR USE ONLY
 *List only one specification division per form.
 List only one of the following categories on each transmittal form, and indicate which is being submitted

Contractor Approved OICC Approval Deviation/Substitution For OICC Approval

1833

REVIEWER USE ONLY
 **ACTION CODES
 A-Approved
 D-Disapproved
 AN-Approved as noted
 RA-Receipt acknowledged.
 C-Comments
 R-Resubmit

ITEM NO.	PROJ. SPEC. SECT. & PARA. and/or PROJ. DWG. NO. *	ITEM IDENTIFICATION (Type, size, model no., Mfg. name, dwg. or brochure number)	NO. OF COPIES	ACTION CODES **	REVIEWER'S INITIALS CODE AND DATE
693	2	Mgs. Descriptive Data, Insulation	9	C	<i>[Handwritten initials]</i> 11/14/79
694	2.4	" " " Adhesive	9	C	<i>[Handwritten initials]</i> 11/14/79
695	2.4	" " " Coating	9	C	<i>[Handwritten initials]</i> 11/14/79
696	2.4.2	" " " Mastic	9	C	<i>[Handwritten initials]</i> 11/14/79
697	2.4	" " " Accessories	9	C	<i>[Handwritten initials]</i> 11/14/79

CONTRACTOR'S COMMENTS

None: deviation listed on Index Page

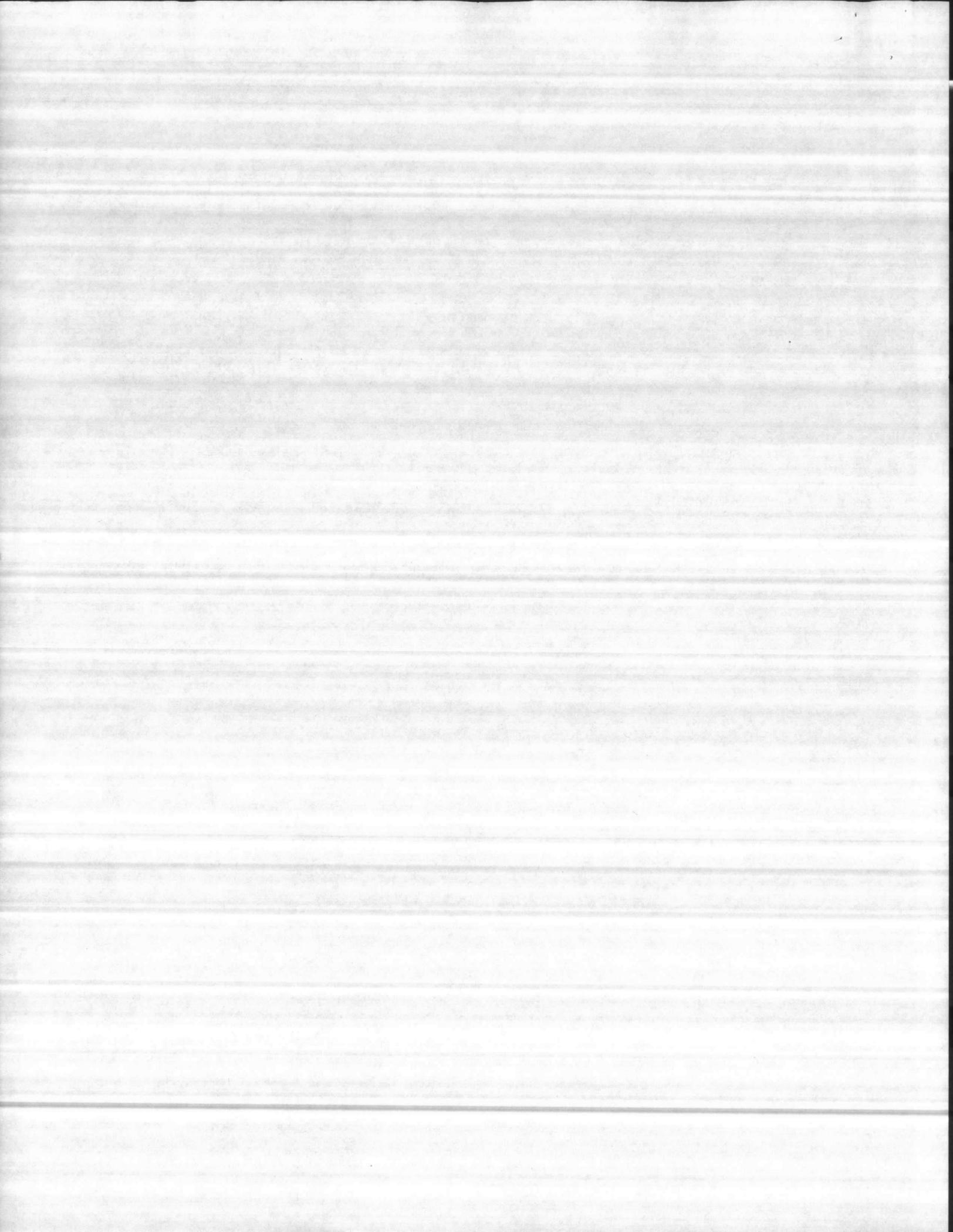
PLEASE RETURN WITH 3 COPIES WITH OWNER'S APPROVAL

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC <i>11/20/79</i>	CONTRACTOR REPRESENTATIVE (Signature) <i>[Signature]</i>
DATE RECEIVED BY REVIEWER	FROM (Reviewer) TO

- Submittals are returned with action indicated. Approval of an item does not include approval of any deviation from the contract requirements unless the contractor calls attention to and supports the deviation.
- Submittals are forwarded to LANTDIV with A-E recommendations indicated in REVIEWER USE ONLY Section and in comments below on ONE COPY of the transmittal form.

REVIEWER'S COMMENTS
Resubmit & indicate what is being submitted & what is the deviation. Indicate what the properties of the materials are - not just "as specified"

COPIES TO: <input checked="" type="checkbox"/> ROICC (2) <input checked="" type="checkbox"/> LANTDIV (1) <input type="checkbox"/> A-E (1)	DATE <i>11/20/79</i>	SIGNATURE <i>[Signature]</i>
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CONTRACTOR'S SUBMITTAL TRANSMITTAL

5ND LANTDIV 4-4355/3 (Rev. 6/76)

SECTION 15160

CONTRACT NO.	TRANSMITTAL NO.	DATE
N62470-77-C-7526	693-697	10/31/79

FROM CONTRACTOR
CARDINAL CONTRACTING CO., INC.

TO
LOCKWOOD-GREEN ENGRS.

PROJECT TITLE AND LOCATION
 Naval Regional Medical Center
 Camp LeJeune, North Carolina 28542

<p>CONTRACTOR USE ONLY</p> <p><i>*List only one specification division per form.</i></p> <p><i>List only one of the following categories on each transmittal form, and indicate which is being submitted</i></p> <p> <input type="checkbox"/> Contractor Approved <input type="checkbox"/> OICC Approval <input checked="" type="checkbox"/> Deviation/Substitution For OICC Approval </p>	<p>REVIEWER USE ONLY</p> <p>**ACTION CODES</p> <p>A-Approved D-Disapproved AN-Approved as noted RA-Receipt acknowledged. C-Comments R-Resubmit</p>
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ITEM NO	PROJ. SPEC. SECT. & PARA. and/or PROJ. DWG. NO. *	ITEM IDENTIFICATION (Type, size, model no., Mfg. name, dwg. or brochure number)	NO. OF COPIES	ACTION CODES **	REVIEWER'S INITIALS CODE AND DATE
693	2	Mgs. Descriptive Data, Insulation	11		
694	2.4	" " " Adhesive	11		
695	2.4	" " " Coating	11		
696	2.4.9	" " " Mastic	11		
697	3.4	" " " Accessories	11		

CONTRACTOR'S COMMENTS

NOTE: Deviation Listed On Index Page

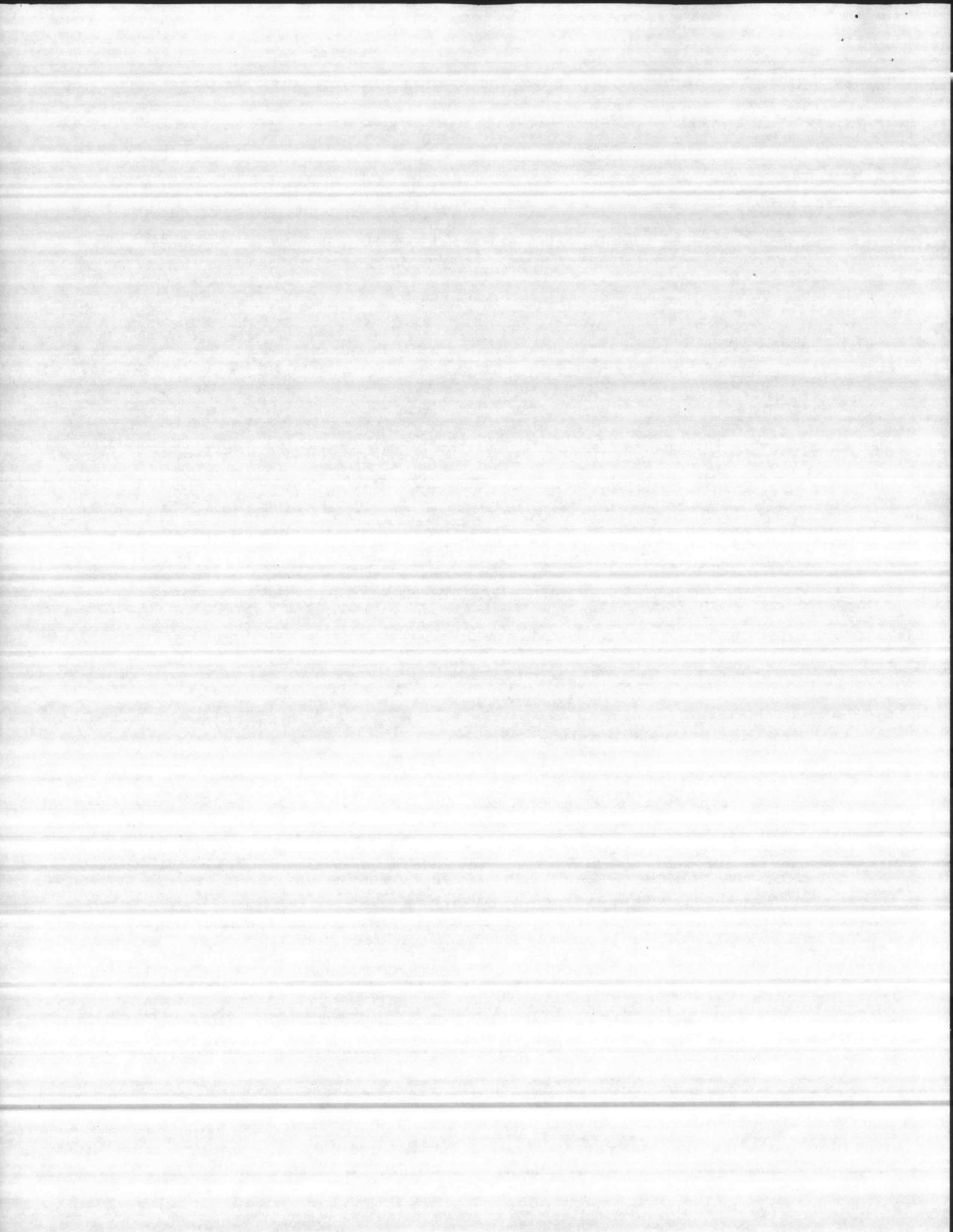
PLEASE RETURN A MINIMUM OF 6 COPIES WITH OWNERS APPROVAL

COPY OF TRANSMITTAL AND SUBMITTALS TO ROICC		CONTRACTOR REPRESENTATIVE (Signature)	
11/2/79		<i>Wm. J. Haymaker</i>	
DATE RECEIVED BY REVIEWER	FROM (Reviewer)	TO	

- Submittals are returned with action indicated. Approval of an item does not include approval of any deviation from the contract requirements unless the contractor calls attention to and supports the deviation.
- Submittals are forwarded to LANTDIV with A-E recommendations indicated in REVIEWER USE ONLY Section and in comments below on **ONE COPY** of the transmittal form.

REVIEWER'S COMMENTS

COPIES TO: ROICC (2) LANTDIV (1) A-E (1)	DATE	SIGNATURE
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THE WALDINGER CORPORATION

INSULATION
SPECIFICATION SECTION 15160

- Pg-1 Certificate of Compliance
- Pg-2 Star Davis Submittal Letter Consisting of Pages 2 thru 7
NOTE: Deviation Para. 2.3
- Pg-8 Aluminum Roll Jacketing
- Pg-9 Foster Product Data 85-20, Spark-Fas a Adhesive
- Pg-10 Application Guide, Spark-Fas Adhesive
- Pg-11 Foster Product Data 30-45, Foamseal Sealant
- Pg-12 Application Guide, Foamseal Sealant
- Pg-13 Foster Products Data 30-35, Tite-Fit Coating
- Pg-14 Application Guide, Tite-Fit Coating
- Pg-15 Foster Products Data 30-36, Sealfas Coating
- Pg-16 Application Guide, Sealfas Coating
- Pg-17 Foster Products Data 60-25/26/28, C. I. Mastic
- Pg-18 Application Guide, C. I. Mastic
- Pg-19 Keene Corp. Mineral Wool Insulating and Finishing Cement
Data.
- Pg-20 Keene Corp. Mineral Wool Insulating and Finishing Cement
Data Con't.
- Pg-21 Forty Eight ETR Insulation Data
- Pg-22 Speed-Line Manufacturing Company Inc. Data
- Pg-23 Speed-Line Manufacturing Company Inc. Data Con't.
- Pg-24 J-M R-Series Microlite (R-6, R-8) Data
- Pg-25 J-M R-Series Microlite (R-6, R-8) Data Con't.
- Pg-26 J-M 800 Series Spin-Glas Data
- Pg-27 J-M 800 Series Spin-Glas Data Con't.
- Pg-28 Johns-Manville Micro-Lok 650 Data
- Pg-29 Johns-Manville Micro-Lok 650 Data Con't.

"It is hereby certified that the material/equipment shown and marked in this submittal is that proposed to be incorporated into Contract Number N62470-77-B-7526, is in compliance with the contract drawings and specifications, and can be installed in the allocated spaces, and is (submitted for Government approval).

THE WALDINGER CORPORATION

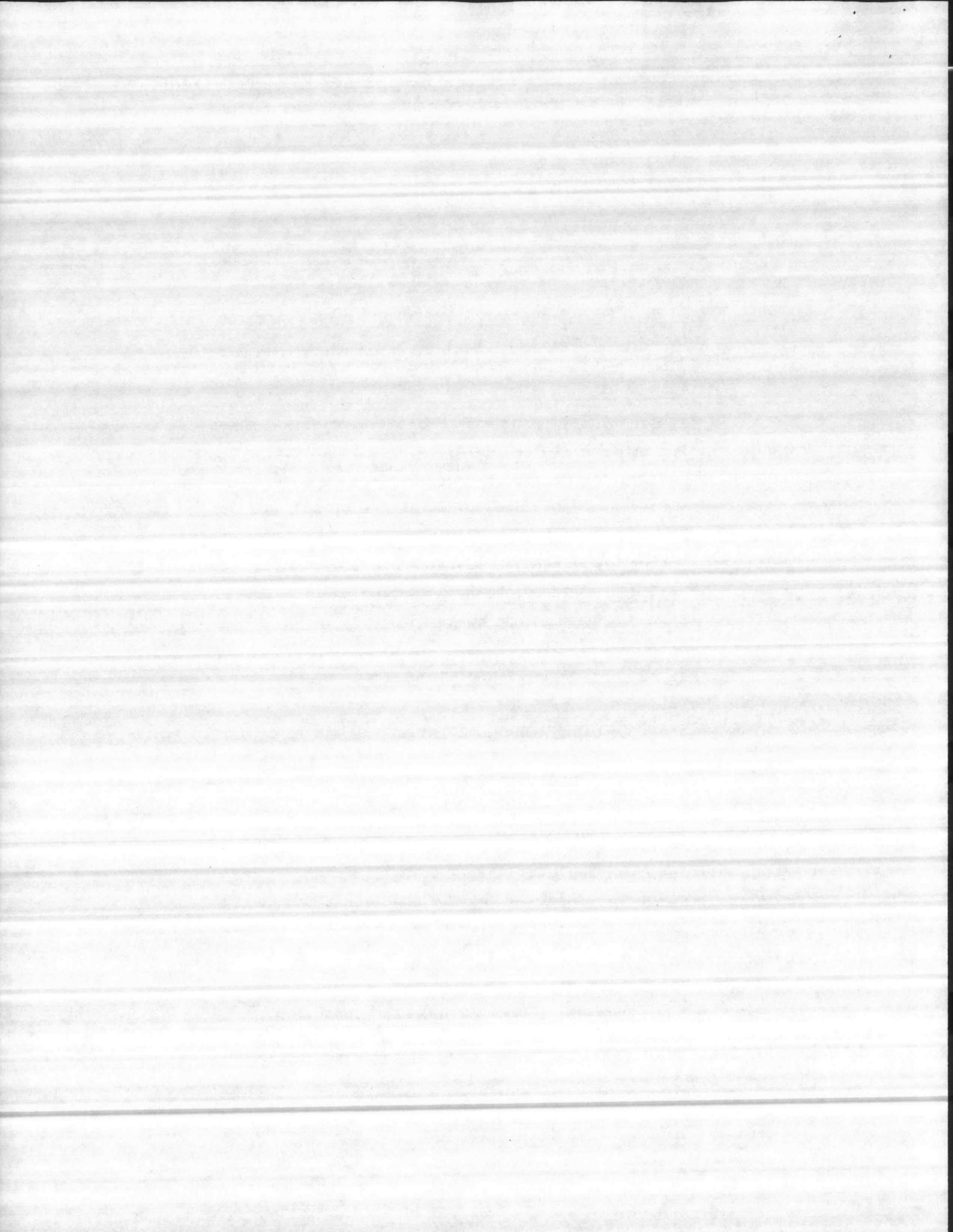
Authorized Reviewer

[Signature]
11/2/79

Date

10/31/79

11/2/79



S
STARR DAVIS COMPANY OF S.C., INC.
D
 THERMAL INSULATIONS • ENGINEERS • CONTRACTORS • DISTRIBUTORS

Reply to: P.O. Box 2806
 Asheville, N.C. 28802
 Telephone (704) 274-4826

October 25, 1979

Waldinger Corporation
 P. O. Box 8363
 Camp Lejeune, North Carolina 28542

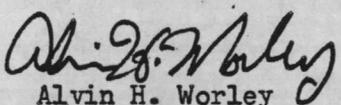
Attention: Mr. R. J. Welch

Reference: Naval Regional Medical Center
 Thermal Insulation

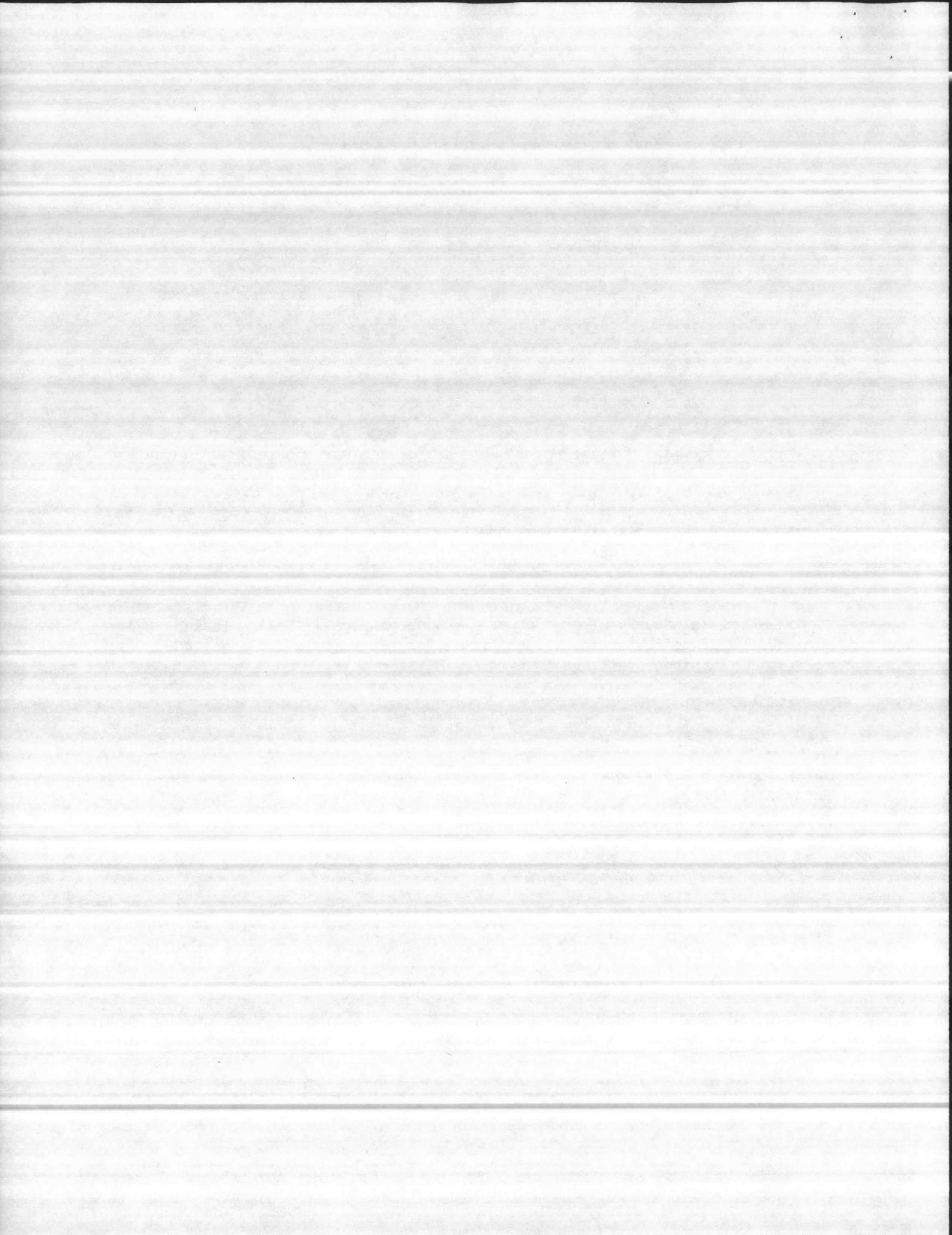
Gentlemen:

The Starr Davis Company of S. C. Inc. certifies that all the insulation materials used on the above Thermal Insulation system will be in accordance with plans and specifications.

Respectfully,


 Alvin H. Worley
 Regional Manager

AHW/eg



S
STARR DAVIS COMPANY OF S.C., INC.
D
 THERMAL INSULATIONS • ENGINEERS • CONTRACTORS • DISTRIBUTORS

Reply to: P.O. Box 2806
 Asheville, N.C. 28802
 Telephone (704) 274-4826

June 18, 1979

Waldinger Corporation
 P. O. Box 1612
 Des Moines, Iowa 50321

Attention: Mr. L. J. Welch

Reference: Regional Medical Center

Gentlemen:

We are pleased to submit the following for your review and approval:

Section 15160 - Insulation of mechanical systems

General Requirements: Section 15011, General Requirements,
 Mechanical applies to this section with the additions and
 modifications specified herein

2. Materials

2.1 Limitations: As specified

2.1.1. As specified

2.1.2. " "

2.1.3. " "

2.2. Fire Resistance: As specified

2.2.1. As specified

2.2.2. The following materials are exempt from fire resistance ratings:

2.2.2.1 Flexible unicellular insulation

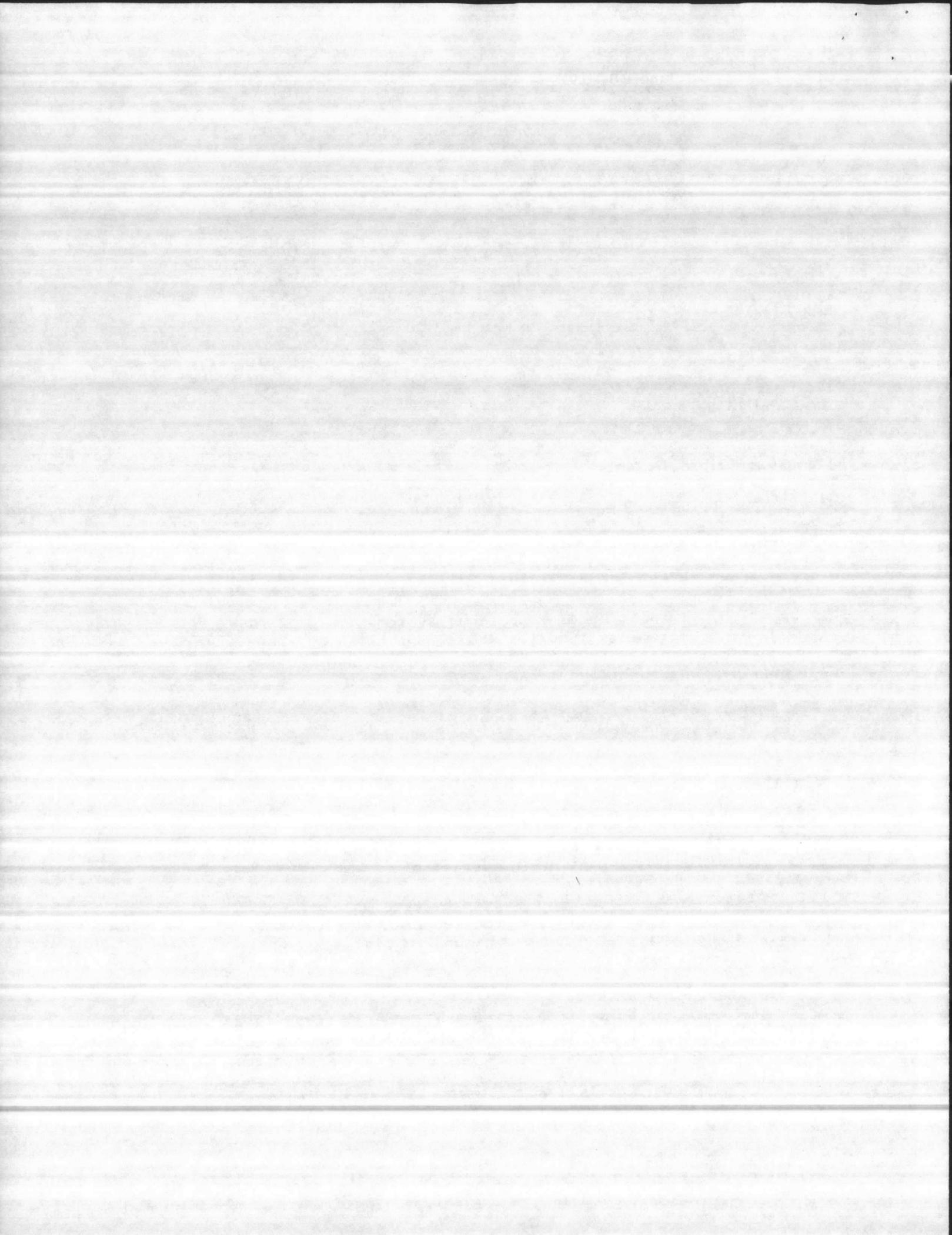
2.2.2.2 Nylon anchors

2.2.2.3 Treated wood inserts used between shields and piping at hangers on low-temperature piping.

2.2.2.4 Factory premolded one piece PVC fittings and valve covers.

2.3. Insulation Jacket:

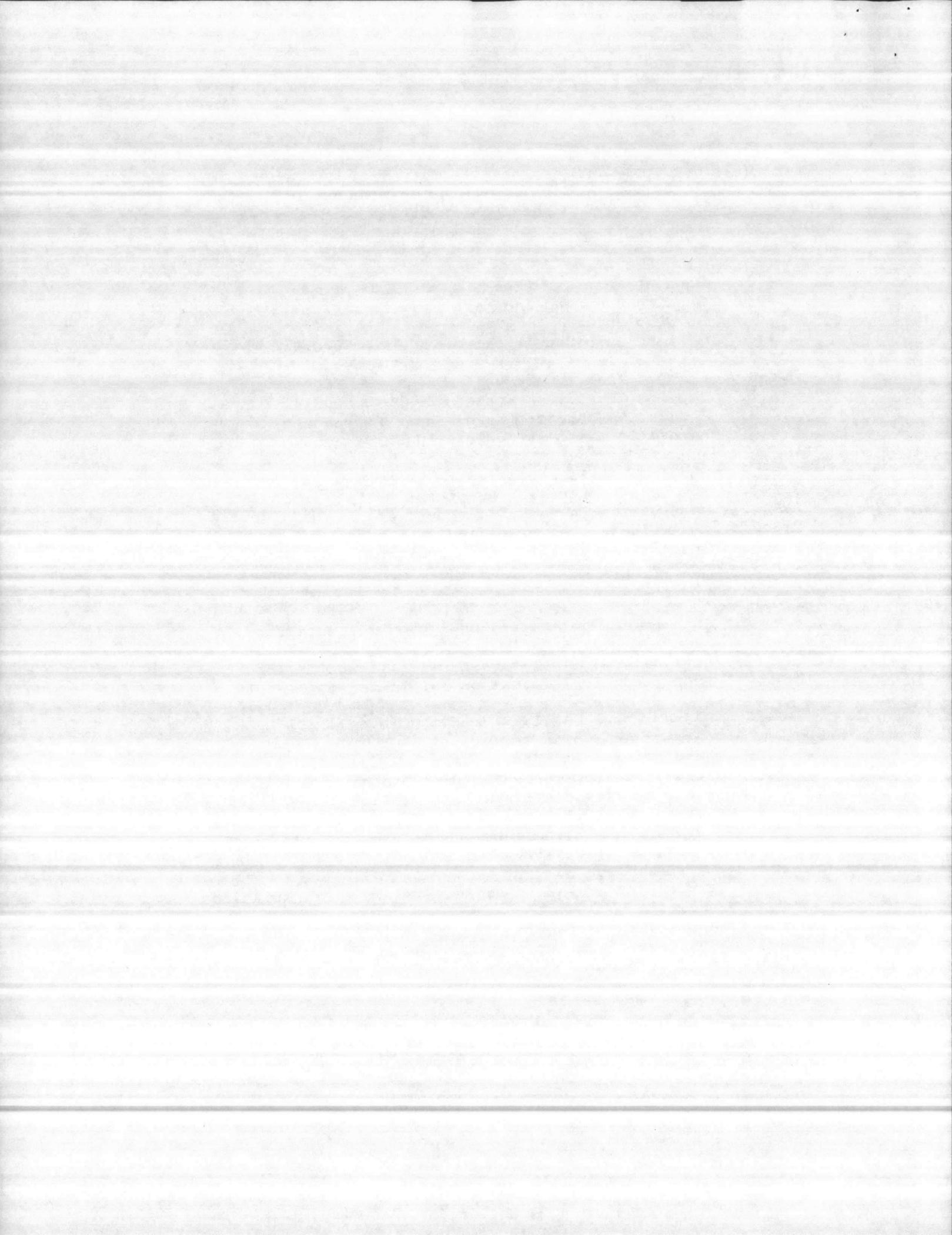
All piping systems shall meet Federal specification HH-B-100B - Type II and ASTM D828. This is white All-purpose Jacket factory applied to pipe covering. Jacket shall be vapor sealed on cold lines and stapled on hot service. All shall be applied according to manufacture instructions.



- 2.3.3. Metal Jackets: As specified
- 2.3.3.1 Aluminum Jackets: As specified
- 2.4 Adhesive, coatings, sealing compounds and protective finishes: As specified
- 2.4.1. Factory applied self sealing lap system will be used; Adhesive where needed. (Fosters 85-20 or equal)
- 2.4.2. Bonding Adhesive (Fosters 85-20 or equal)
- 2.4.3. Bedding Compound and joint sealers: (Fosters 30-45 or equal)
- 2.4.4. Coating Compound (Fosters 30-35 or equal)
- 2.4.5. " " " " "
- 2.4.6. As specified
- 2.4.7. Lagging Adhesive: (Fosters 30-36 or equal)
- 2.4.8. Insulation cement: (Keene Super Powerhouse)
- 2.4.9. Asphaltic Mastic: (Fosters 60-25 or equal)

- 2.5. Submittals: As specified
- 2.5.1. Submittals required: As specified
- 2.5.1.1. Manufacturer's Data: As specified
- 2.5.2. Certificates: As specified
- 2.5.3. Insulation Packaging: As specified
- 2.6. Not used
- 2.7. " "
- 2.8. " "
- 2.9. Chilled and hot water insulation: As specified

- 3. Application: See Tables I, II, III and IV.
- 3.1. Supplementary Information For Tables I, II, III and IV
- ~~3.1.1. Flexible unicellular installed as specified (Armstrong's Armaflex)~~
- 3.1.2. Insulation thickness outside: As specified
- 3.1.3. Insulation for concealed ducts requiring insulation shall be flexible Blanket Insulation with a Foil-scrim-jacket ^{3/4}1-Pound density ~~1 1/2~~ 2" thick. Duct work exposed, board shall be nominal one inch thick 3 lb/cu. ft. density.
- 3.1.4. As specified
- 3.2. Vapor barrier: As specified Section 2.3 Insulation Jacket
- 3.3. Application areas:
- 3.3.1. Insulation for hot pipe: As specified
- 3.3.1.1. As specified
- 3.3.1.2. " "
- 3.3.1.3. " "
- 3.3.1.4. " "
- 3.3.1.5. " "
- 3.3.1.6. " "
- 3.3.1.7. " "
- 3.3.1.8. " "
- 3.3.1.9. " "
- 3.3.1.10 Not used



3.3.2. Insulation for hot equipment: The following heating equipment shall be insulated:

- 3.3.2.1. As specified
- 3.3.2.2. " "
- 3.3.2.3. " "
- 3.3.2.4. " "
- 3.3.2.5. " "
- 3.3.2.6. " "
- 3.3.2.7. " "

3.3.5.3 Exhaust air ducts shall not be insulated except:

3.3.5.3.1. Exhaust duct work specified to be insulated shall be insulated with mineral fiber, Federal specifications HH-1-558, Form A, Class 5 (ETR insulation board as manufactured by 48 Insulation or equal) Installed with .16 Gage Galvanized wire shall be placed over corner angles.

3.4. Insulation Finishes:

3.4.1. Pipe and Fitting Insulation:

3.4.1.1. Exposed in Buildings:

3.4.1.1.1. "Exposed" means mechanical systems, Exposed to view.

3.4.1.1.2. Pipe Insulation: White factory applied All Purpose Jacket. (Johns-Manville or equal)

3.4.1.1.3. Fittings: PVC conforming to Federal Specification L-P-535, Composition A, Type II, with pre-cut insulation insert conforming to Federal Specification HH-1-558, Form B, Type 1, Class 6 shall be used. Installing shall be according to manufacturers instructions.

3.4.1.-1.3.2. Not used

3.4.1.1.3.3. As specified

3.4.1.2. Exposed to weather or shown on drawings.

3.4.1.2.1. Pipe where required shall be jacked with .016 smooth aluminum jacket with moisture barrier lining banded on 9" centers with aluminum bands. Unicellular insulation shall be coated with two coats of vinyl lacquer finish to protect it from deterioration.

3.4.1.2.2. As specified

3.4.1.3. " "

3.4.1.3.1. " "

3.4.1.4. " "

3.4.1.4.1. " "

3.4.2. Duct and Equipment:

3.4.2.1. Exposed in Building"

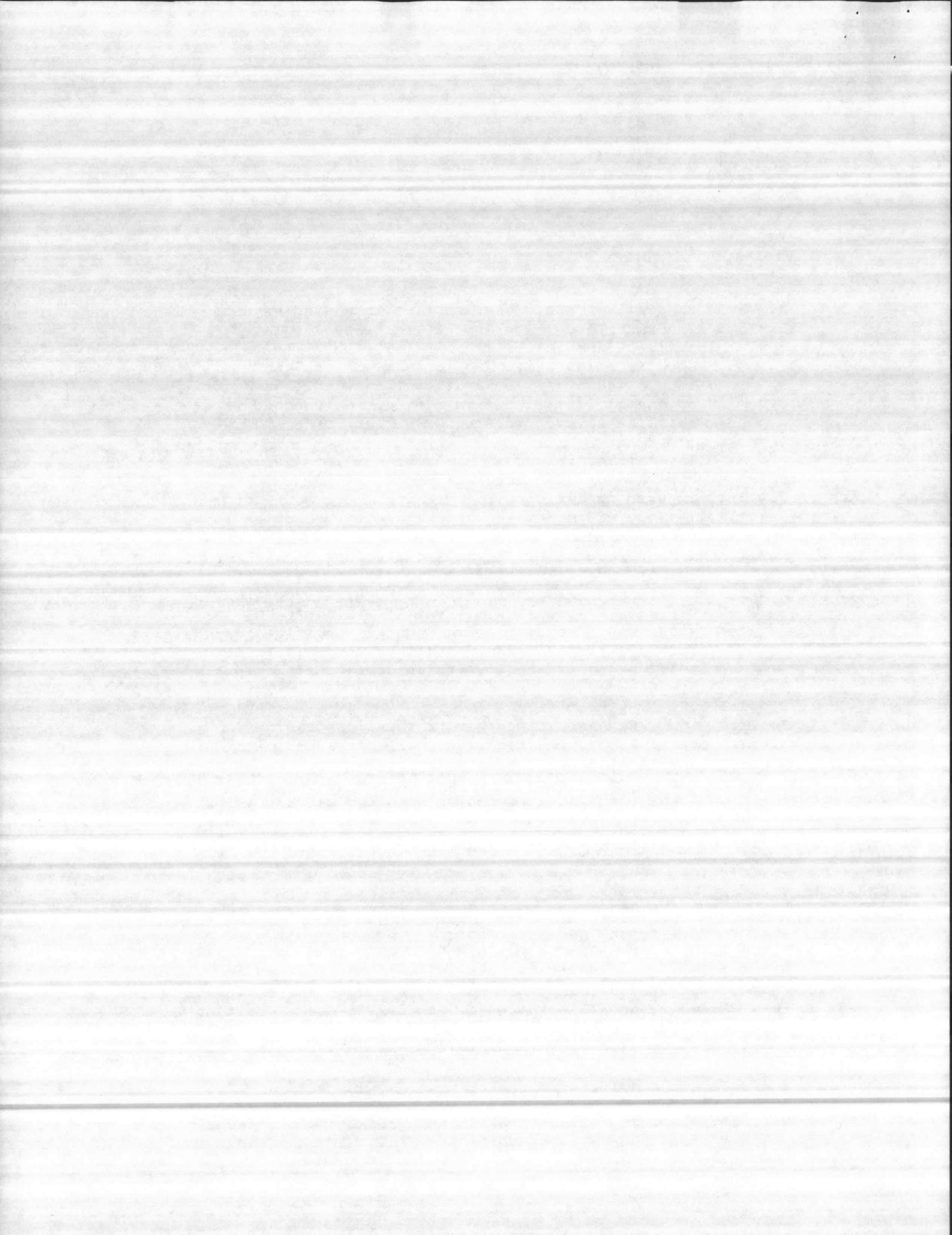
3.4.2.1.1. No additional finish shall be required on exposed plenums, casings, fans, ducts and equipment where an all-purpose jacket of foil-scrim-Kraft is used.

3.4.2.1.2. Presized class cloth shall be used for irregular surfaces:

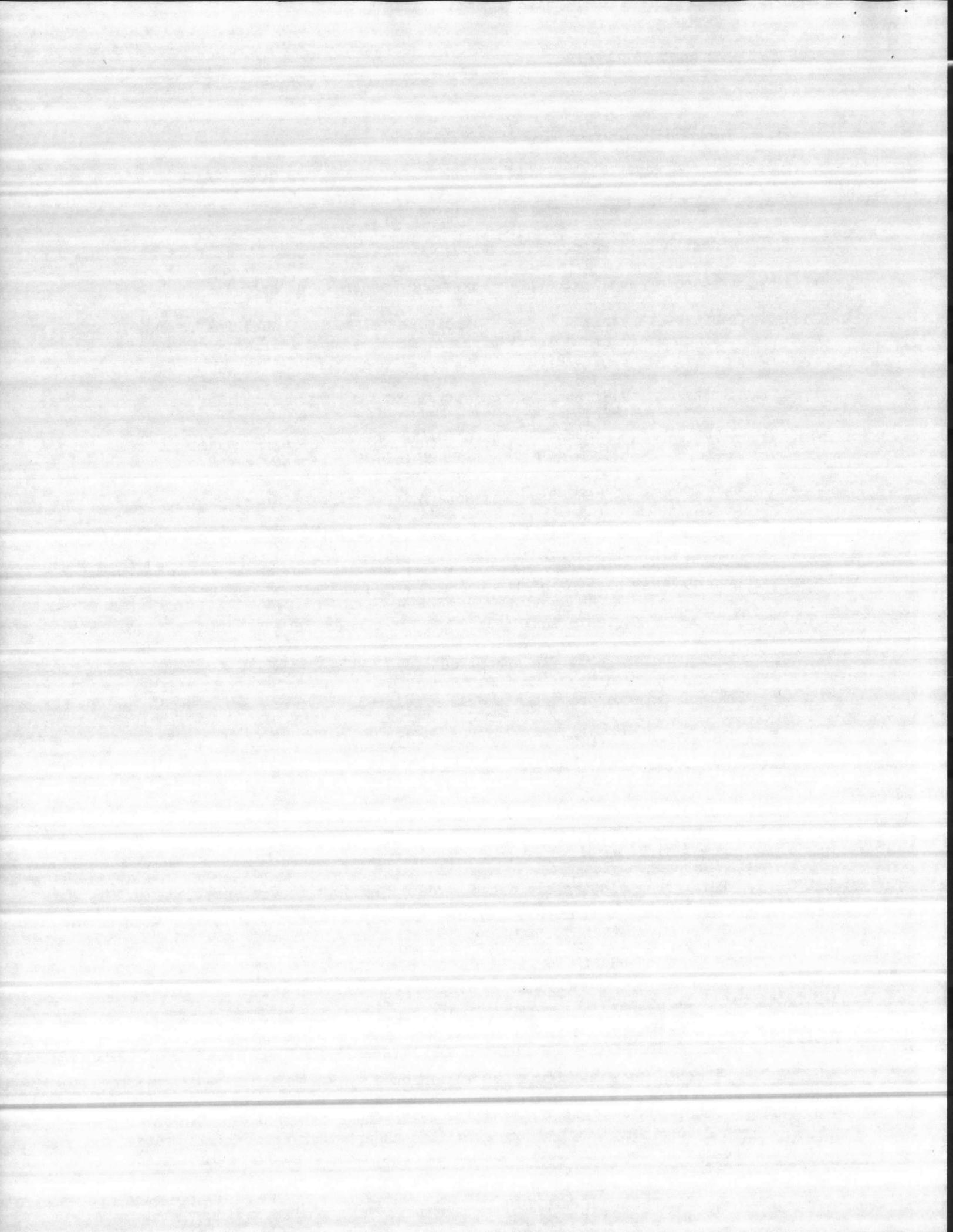
3.4.2.2. Not used

3.4.2.2.1. " "

3.4.2.3. Concealed in buildings, crawl spaces, tunnels and trenches: No additional finish is required.



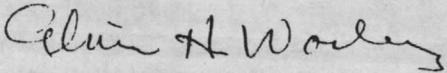
- 3.3.3. Insulation for Low Temperature Pipe:
 - 3.3.3.1. Chilled water - As specified
 - 3.3.3.2. Condensate drain lines - As specified
 - 3.3.3.3. Domestic cold water, service cold water, and treated cold water. As specified
 - 3.3.3.4. Evaporator shell and water boxes and headers - As specified
 - 3.3.3.5. Horizontal runs and offsets, including elbows, of interior downspout piping in all areas above pipe basement. - As specified
 - 3.3.3.6. Chilled water, drinking fountains. - As specified
 - 3.3.3.7. Refrigerant suction - As specified
 - 3.3.3.8. Waste piping from chilled water drinking fountains and electric water coolers from unit to drainage system. - As specified
 - 3.3.3.9. Waste piping located above basement floor from ice making and development equipment, from fixture (including trap) to main vertical waste pipe. - As specified
 - 3.3.3.10. Where motors are the gas-cooled type, insulation shall be provided on the cold-gas inlet connection to the motor. - As specified
 - 3.3.3.11. Water boxes or headers of the chiller shall be so insulated as to provide easy removal of the heads for inspection and repair.
- 3.3.4. Insulation for Cold Equipment:
 - 3.3.4.1. Chilled water pumps: As specified
 - 3.3.4.2. Chilled water storage tanks - As specified
 - 3.3.4.3. Refrigerant intercoolers and manifold subject to condensation - As specified.
 - 3.3.4.4. Water chillers: As specified
 - 3.3.4.4.1. See 3.3.3.11
 - 3.3.4.4.2. See 3.3.3.10
 - 3.3.4.4.3. Refrigerant intercoolers and manifold subject to condensation. - As specified.
- 3.3.5. External Insulation for Ducts, Plenums and Casings (Heating, Ventilating and Air Conditioning Systems):
 - 3.3.5.1. See 3.1.3.
 - 3.3.5.2. External insulation is not required for the following: As specified
 - 3.3.5.2.1. Fibrous glass ductwork - As specified
 - 3.3.5.2.2. Ducts, casings and air handling units where internal insulation or sound absorbing linings are specified under other sections of specifications; factory prefabricated sound absorbers shall be insulated. As specified



- 3.3.5.2.3. Fan name plates, access plates in fan housings and ducts and the like for ventilating and air heating systems, but insulation must be carefully beveled and sealed around same. - As specified
- 3.3.5.2.4. Factory pre-insulated flexible ductwork specified under other sections or specifications. - As specified
- 3.3.5.2.5. Mixing boxes, filter boxes, and combination filter "(I)" boxes. As specified
- 3.3.5.2.6. Air conditioning and heating supply and return ducts located in heated or air conditioned spaces unless otherwise shown on the drawings. Air conditioned and heated spaces shall be defined as those spaces directly supplied with heated or conditioned air or provided with a heating or cooling device such as a fan coil unit. As specified
- 3.3.5.2.7. Air conditioning and heating return ducts in ceiling spaces between occupied floors of a building. - As specified

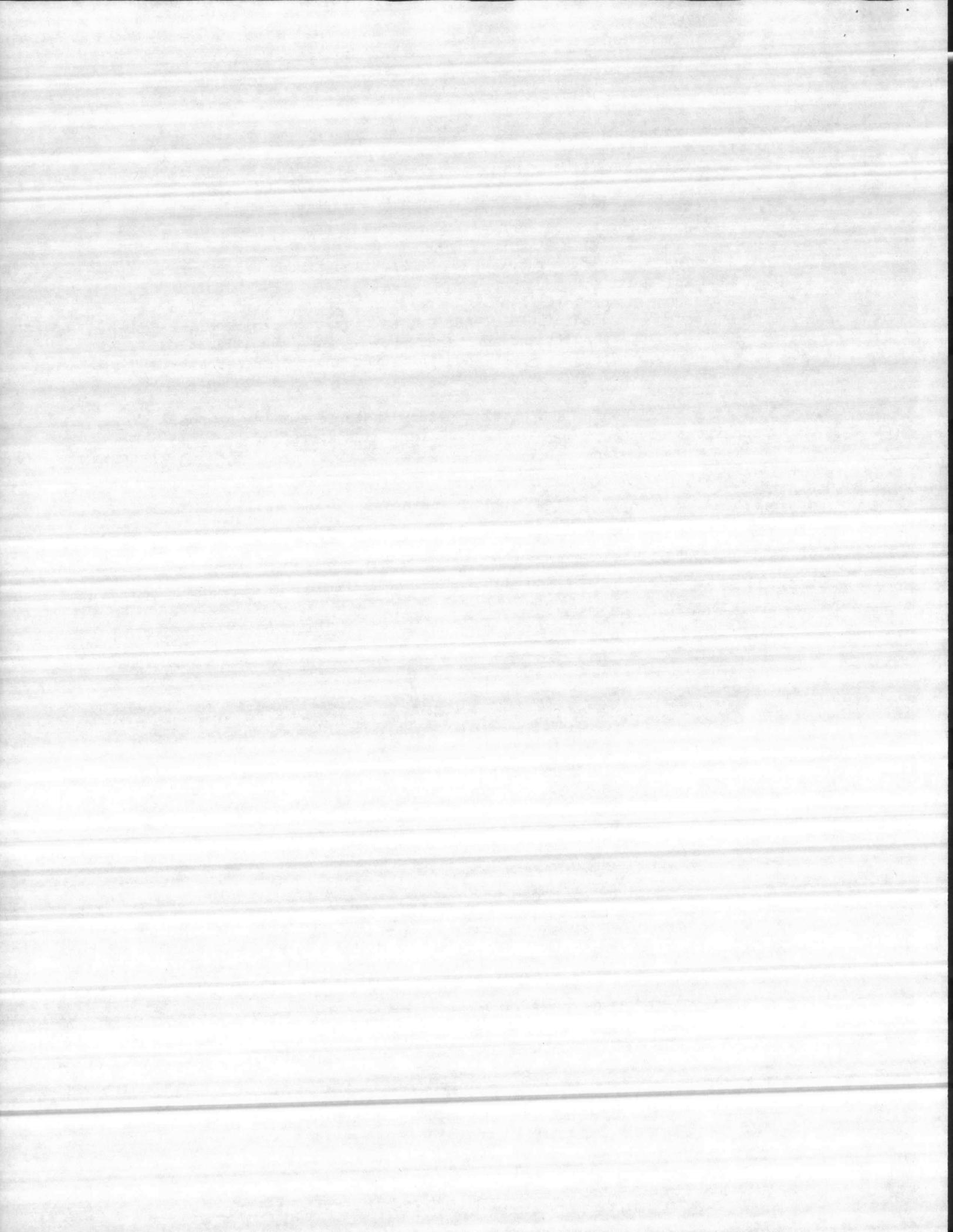
Respectfully,

STARR DAVIS CO OF S. C. INC.



Alvin H. Worley
Manager

AHW/eg



4. INSTALLATIONS:

4.1. General:

- 4.1.1. Insulation material shall be installed in a first class manner with smooth and even surfaces, with jacket drawn tight and smoothly cemented down on all longitudinal and end laps. Work shall be installed according to standard trade practices.
- 4.1.2. Through 4.7.2.2. shall be according to specifications except 4.5.3. - Blanket insulation shall have a 2" lap stapled on approximately 3" centers, then joints shall be sealed with (Fosters 30-35 Vapor Barrier Mastic or equal).

All insulations shall meet Federal specifications Tables I and III and thickness Tables II and IV.

Please return two approved copies for our files.

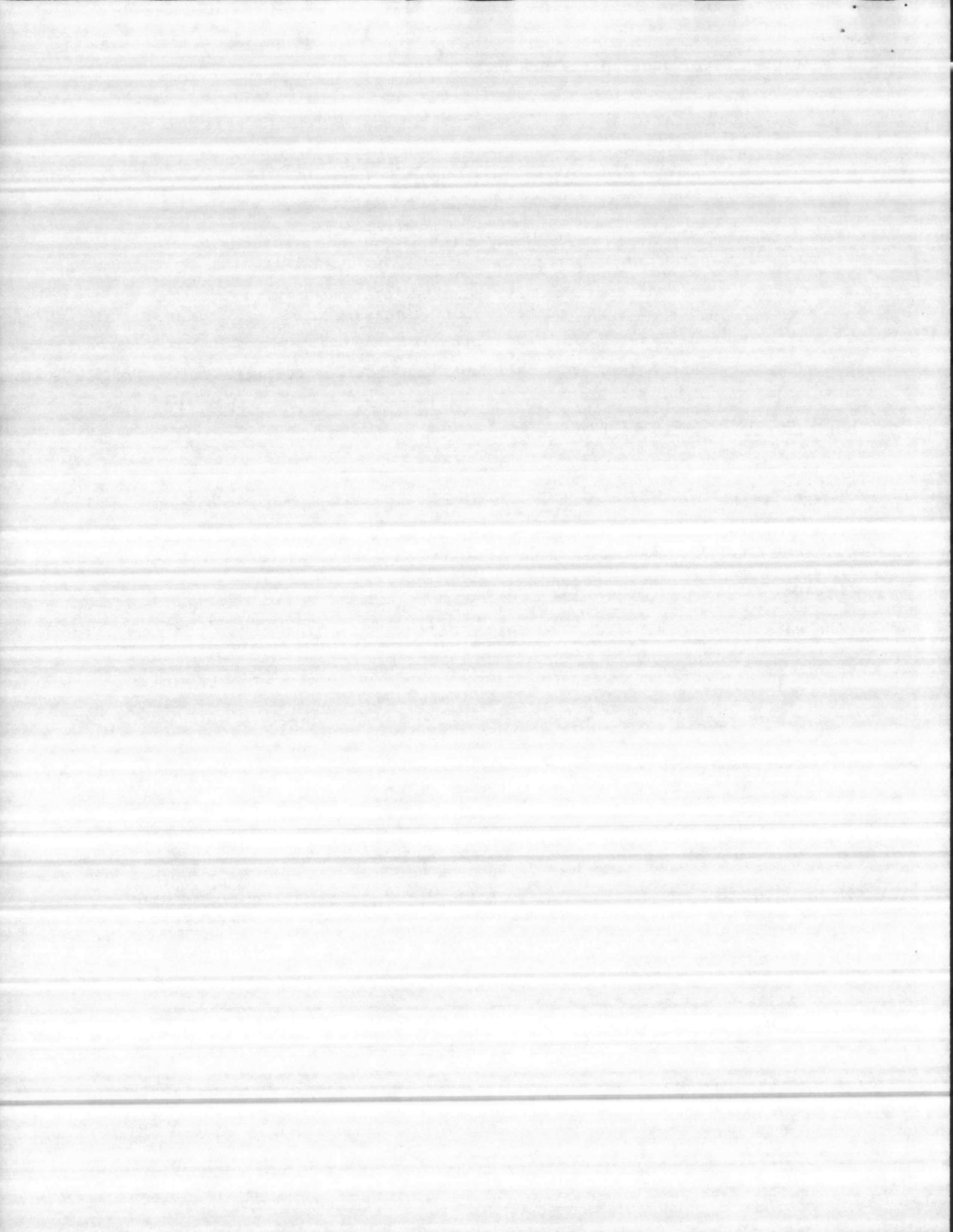
Hoping the above meets with your approval, I remain

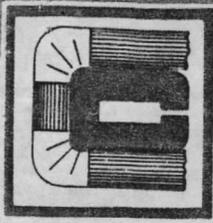
Respectfully,

Alvin H. Worley

Alvin H. Worley
Manager

AHW/eg





ALUMINUM ROLL JACKETING

DESCRIPTION

Childers Aluminum Roll Jacketing is manufactured from type 3003 or 5005 alloys. These alloys are chosen because of their superior corrosion resistance and durable weathering properties. Temper of H-14 to H-19 provides optimum mechanical properties and facilitates field application. Childers uses only specification alloys to produce the highest quality roll goods or fabricated items. Utility or economy grades of Aluminum are not recommended because of their inability to meet the broad range of useage required.

Childers roll jacketing is available in a variety of finishes including smooth, $\frac{3}{16}$ " corrugated, and stucco embossed. It is recommended that the roll jacketing be $\frac{3}{16}$ " corrugated for the following reasons. Corrugated jacketing is stronger than smooth, reduces glare from external light sources, allows for expansion of the jacketing, eliminates "coil break" when applied over small size piping, and does not show dents as readily.

RECOMMENDED USES

GAUGES SUGGESTED APPLICATIONS

- | | |
|------|--|
| .006 | Lightweight. Recommended corrugated and for use on lines up to 20" O.D. including insulation. Specified for use on lines not subject to mechanical abuse, and as an appearance jacketing. |
| .010 | Recommended corrugated for use on lines up to 24" O.D. including insulation. An intermediate weight jacketing that is economical when used in place of .016 when not subject to severe mechanical abuse. |

- | | |
|---------------|--|
| .016 | Selected for industrial use in areas subject to traffic and abuse. Recommended corrugated or smooth over insulated lines, towers, vessels, and tanks. |
| .020 | A heavyweight jacketing used smooth or $\frac{3}{16}$ " corrugated on larger diameter lines and large equipment. |
| .024 | Used for special applications where extra thickness and protection is required such as fabricated tank head covers and other special fabrications. |
| .032 and .040 | Available in rolls where extra heavy gauges are required because of severe mechanical abuse or special fabricating requirements such as flat ducts or precipitators. |

MOISTURE BARRIER

POLYKRAFT MOISTURE BARRIER: Polykraft consists of one layer of one mil polyethylene film with a protective layer of 40# virgin kraft paper. The moisture barrier is attached to the jacketing by continuous lamination across the full width of the jacketing. The moisture barrier is used to prevent corrosive condensate inherent in the atmosphere as well as in the insulation from coming in direct contact with the metal jacketing surface and causing galvanic or chemical corrosion. Several other types of moisture barriers are available including Childers 30-90-30 duplex laminated moisture barrier.

SPECIFICATION #1100

All insulation shall be weatherproofed with Childers Aluminum jacketing. The jacketing is to be manufactured from T/3003 (or T/5005) aluminum with $\frac{3}{16}$ " corrugations (or smooth option), and shall have a factory attached moisture barrier continuously laminated across the full width of the jacketing. A thickness of ___ (.006 to .016) is to be used on piping. A thickness of ___ (.016 to .040) is to be used on tanks, equipment, towers and heat exchangers.

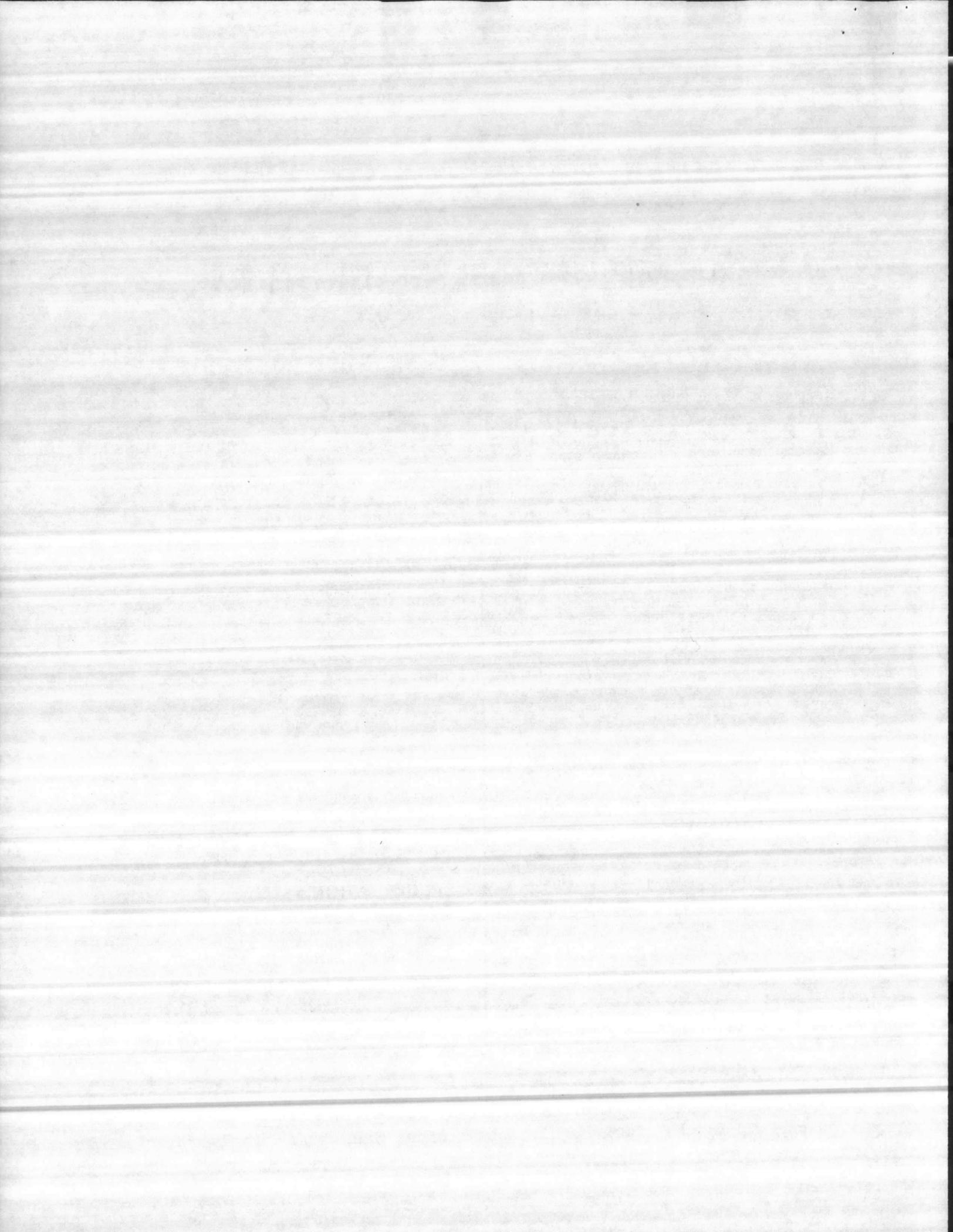
© Copyright 1976 Childers Products Co.

P. O. Box 22228 (23350 Mercantile Rd.) Beachwood, Ohio 44122 (216) 464-8020

OTHER PLANTS AT

Bristol, Pa. 19007 (215) 943 7600 Telex 84 3408	Houston, Texas 77022 (713) 691 3661 Telex 77 5164	Los Angeles, Calif. 90022 (213) 728 6306 Telex 67 3639	Toronto, Ontario, Canada (416) 676 1444 Telex 064 77647	Caracas, Venezuela 61.79.11 Telex 21245	Calgary, Alberta, Canada (403) 276 6638 Telex 038 24793
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ARJE-974
Supersedes
ARJE-174



foster[®] / COATINGS
SEALANTS
ADHESIVES

PRODUCT DATA

85-20

HB FULLER COMPANY ASSEMBLY PRODUCTS DIVISION

FOSTER SPARK-FAS[®] ADHESIVE

PROPERTIES

COLOR

Off-white

APPLICATION

Brush

WEIGHT PER U. S. GALLON (ASTM D1475-60)
11.0 pounds (1.32 kg/litre)

COVERAGE (FSTM 72)

(Subject to type of surface and nature of material being attached)

For insulation attachment:

150 to 200 sq.ft. per gallon
(3.7 to 4.9 m²/litre)
0.012 in. to 0.008 in. wet film thickness (0.3 to 0.2 mm)

For lap sealing:

75 to 100 sq.ft. per gallon
(1.8 to 2.5 m²/litre)
0.020 in. to 0.016 in. wet film thickness (0.5 to 0.4 mm)
Averages 500 lineal feet of 2 in. wide band of adhesive.

BONDING TIME RANGE (FSTM 66)

For insulation attachment:

0 to 15 minutes

For lap sealing:

2 to 10 minutes

SERVICE TEMPERATURE LIMITS (FSTM 70)

(Temperature at coated surface)
Minus 20°F to 180°F (-29°C to 82°C)

HAZARD

Wet Flammability (ASTM D93-73)

No flash to boiling (98°F, 36.5°C)

Surface Flame Spread (dry)

(ASTM E162-67)

5 on 1/4 in. Asbestos Cement Board
Certified to meet GSA Requirements

Surface Flame Spread (dry)

(ASTM E84-70)

15 on 1/4 in. Asbestos Cement Board
(The flame spread may vary at different product thicknesses and/or when applied over surfaces other than asbestos cement board.)

Threshold Limit Value for solvent vapor (FSTM 73) T.L.V. 100 ppm

[®]Trademark

FSTM: Foster Standard Test Method.

10/75-12-BF-559/624/625

H. B. FULLER COMPANY
FOSTER PRODUCTS
5220 Main Street N.E.
Minneapolis, Minnesota 55421
800-328-7307



SPARK-FAS[®] Adhesive 85-20 is a quick-setting, nonflammable, fire-resistant adhesive used to adhere fibrous glass or mineral wool insulations (up to 6 lb. density) to galvanized sheet metal and aluminum air conditioning or hot air ducts, where a fire-resistant dry film is required. Nonflammable solvents which are used in SPARK-FAS Adhesive eliminate explosion and fire hazard during application.

SPARK-FAS[®] Adhesive will adhere insulation to wood, or other materials of construction. In this application the coverage is not as great as shown at left.

SPARK-FAS[®] Adhesive gives superior service when it is used to cement the laps of aluminum foil and vapor barrier paper facings over insulation.

SPARK-FAS[®] Adhesive meets the requirements of NFPA No. 90A Standard for the Installation of Air Conditioning and Ventilating Systems other than Residence Type.

U. S. D. A. (M. I. D.) chemically acceptable.

Meets Military Specification MIL-A-3316B, Class 2.

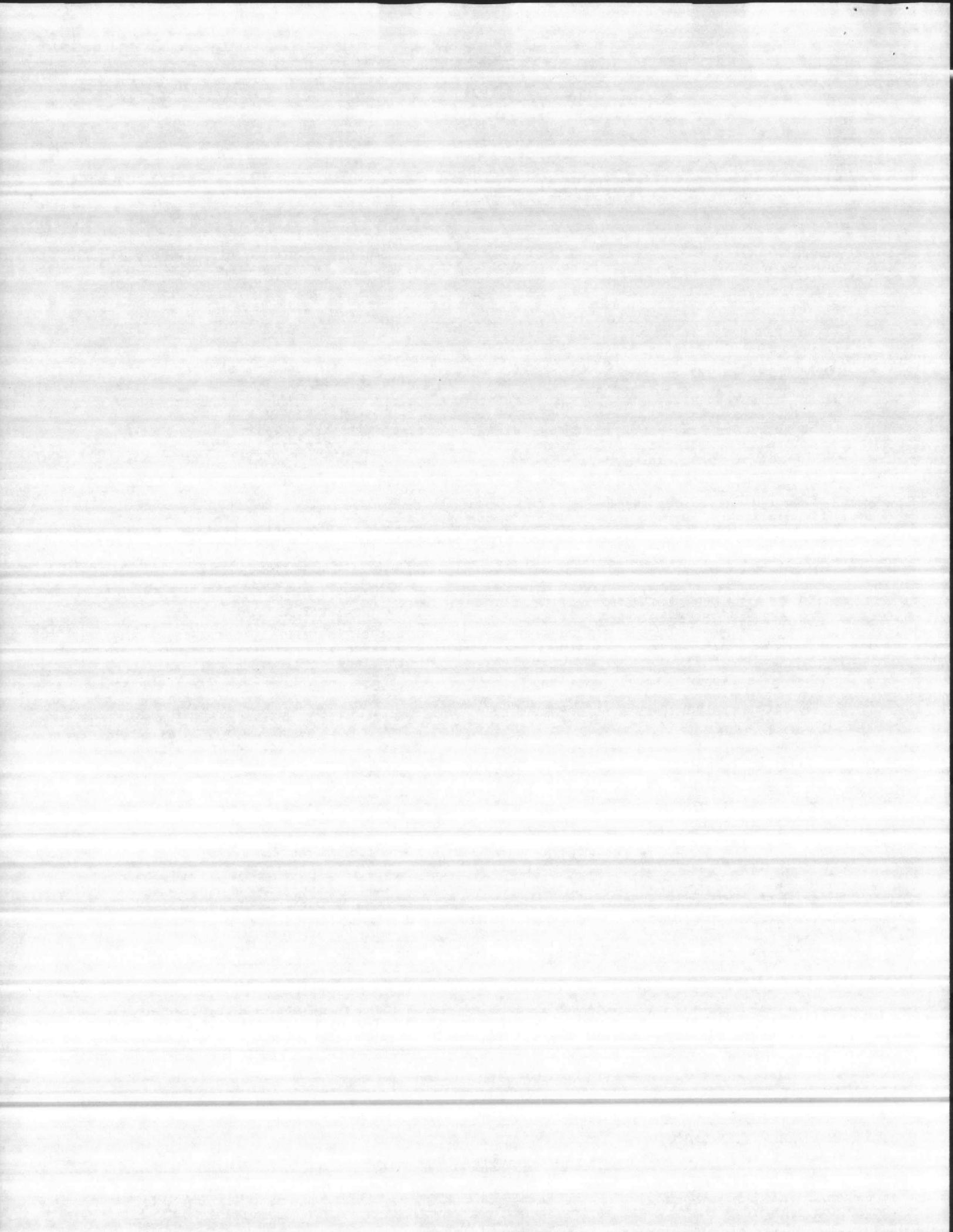
Meets requirements of Adhesive and Sealant Council Standard for Adhesives for Duct Lining No. ASC-A-7001, Type 1.

LIMITATIONS

Do not apply below 40°F (4°C) or above 90°F (32°C).

Some plastic foams and some vinyl films may be attacked by the solvent in this product. User should establish by his own test that this will not occur.

IMPORTANT—LIMITED WARRANTY — The information and data contained in this bulletin are correct to the best of our knowledge and tests. The recommendations and suggestions contained herein are made without guarantee or representation as to results. We recommend that adequate tests be made by the purchaser to determine if a product is suitable for the intended purpose and use. Our only obligation shall be to replace or pay for any material proved defective by our laboratory within our published shelf life period. Beyond the purchase price of materials supplied by us, we assume no liability for damages of any kind and the user accepts the product "as is" and without any other warranties, expressed or implied.



**APPLICATION GUIDE FOR
SPARK-FAS® ADHESIVE 85-20**

WARNING! HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN. WHEN HEATED TO DECOMPOSITION OR ON CONTACT WITH ACIDS, EVOLVES HIGHLY TOXIC CHLORIDE FUMES. Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Use with adequate ventilation. Close container after use. Wash thoroughly after handling.

FIRST AID: Call a physician. If swallowed, dilute by giving several glasses of water or milk and induce vomiting by giving soapy water, salty water (1 tbs. per glass), or by sticking fingers down throat. If vomiting occurs, repeat several times. **EXCEPTIONS:** Never induce vomiting or give anything by mouth to a person who is having convulsions or is unconscious.

If inhaled, remove person to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. If breathing is difficult, give oxygen.

In case of contact, remove contaminated clothing and shoes and immediately flush eyes and skin with plenty of water for at least 15 minutes.

For further information, consult Material Safety Data Sheet.

MATERIAL PREPARATION

Stir well, do not thin. No need to prime aluminum or galvanized metal. Apply only to clean, dry, dust-free surface. Keep container closed when not in use to prevent solvent evaporation.

APPLICATION

A. Lap and Tape Sealing

(Refer to Guide Specification for recommended coverage)

Brush

Use good quality paintbrush. Apply SPARK-FAS® Adhesive uniformly to foil side or underside of overlap. Allow adhesive to set until very tacky (normally 0 to 10 minutes) and press lap or tape firmly into place.

B. Insulation Attachment

(Refer to Guide Specification for recommended coverage)

Brush

Use a clean paintbrush. Apply SPARK-FAS® Adhesive to metal surface uniformly (or in bands if recommended in Guide Specification). Press insulation into place, making sure complete contact is made with applied adhesive. Bond may be made within 0 to 15 minutes.

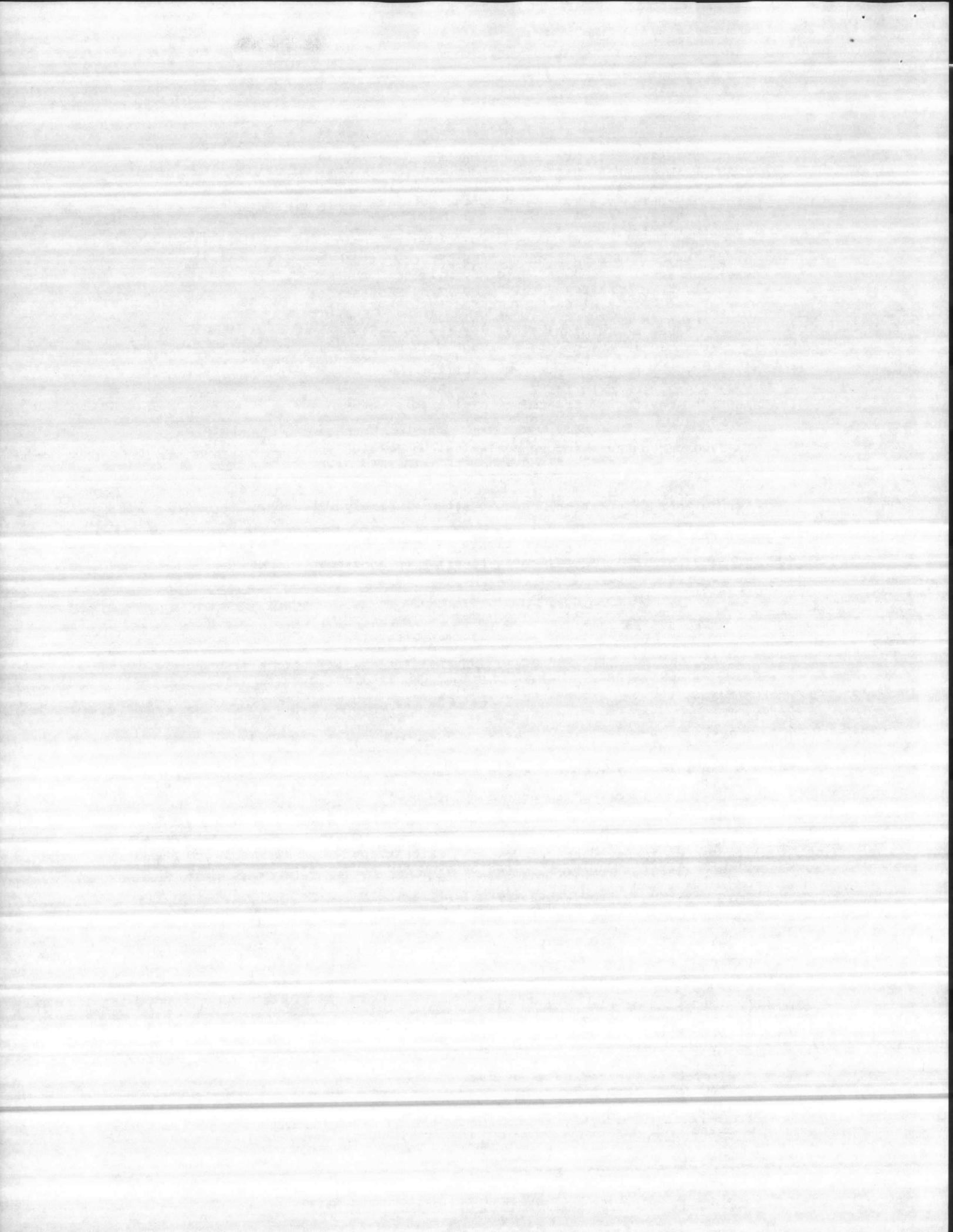
CLEAN-UP

Use a solvent such as Dow Chemical Company "Chlorothene"® (non-flammable); or mineral spirits (flammable) to clean brushes and equipment.

DATA REPRODUCED FROM UNDERWRITERS' LABORATORIES, INC.
BUILDING MATERIALS DIRECTORY

Guide BJLZ Adhesives	October 17, 1974	R4897D
Fire Hazard Classification Applied to Asbestos-Cement Board		
Flame Spread	15	
Fuel Contributed	5	
Smoke Developed	0	
Tested as applied at a coverage of 200 sq.ft. per gal.		
Issued by Underwriters' Laboratories, Inc.®		





foster[®] / COATINGS
SEALANTS
ADHESIVES

PRODUCT DATA

30-45

HB FULLER COMPANY ASSEMBLY PRODUCTS DIVISION

PROPERTIES

COLOR

Gray

APPLICATION CONSISTENCY

Trowel or caulking gun

WEIGHT PER U. S. GALLON (ASTM D1475-60)

11.5 pounds (1.38 kg/liter)

AVERAGE NON-VOLATILE (ASTM C461-64)

94% by volume

COVERAGE (FSTM 71)

Trowel: 12 to 25 sq.ft. per gallon
(0.29 to 0.61 m²/liter)

1/8 in. to 1/16 in. wet film thickness
(3.2 mm to 1.6 mm)

Caulking Gun:

85 lineal feet per 28 fluid oz. tube
(1/4 in. bead)
330 lineal feet per 28 fluid oz. tube
(1/8 in. bead)
30 lineal feet per 10 fluid oz. tube
(1/4 in. bead)
130 lineal feet per 10 fluid oz. tube
(1/8 in. bead)

DRYING TIME (ASTM C461-64)

Touch: 8 hours

Through: 7 to 14 days

(Depending on thickness of application
and temperature.)

SERVICE TEMPERATURE LIMITS (FSTM 70)

(Temperature at coated surface of
filled joints)

Minus 100°F to 300°F (-73°C to 149°C)

WATER VAPOR TRANSMISSION (ASTM E96-66)

0.08 perm-inch (0.05 metric perm-cm)

The water vapor transmission through
1 inch of impermeable insulation in
12 in. X 18 in. blocks with 1/8 in.
joints of FOAMSEAL[®] 30-45 is too small
to measure.

HAZARD

Wet Flammability (ASTM D93-73)

Flash Point 100°F (38°C)

Combustibility (dry) (FSTM 44)

Combustible. Flame spread and fuel
contribution negligible when used
as sealant in 1/8 in. wide joints
of incombustible insulation.

FOR INDUSTRIAL USE ONLY BY TRAINED AND QUALIFIED CRAFTSMEN.

®Trademark

FSTM: Foster Standard Test Method.

Foster FOAMSEAL[®] Sealant 30-45 is a gray vapor barrier sealant designed for use with cellular glass insulation. It remains soft and tough in joints and will not shrink or crack during repeated cycles of high and low temperatures.

FOAMSEAL[®] Sealant thoroughly seals the joints of cellular glass insulation against the entrance of moisture. When used as a bedding compound and joint sealant, FOAMSEAL[®] Sealant provides additional protection to the blocks of insulation and protects metal equipment against corrosion. Damage to the installation due to the migration of moisture is eliminated.

FOAMSEAL[®] Sealant is also used as a joint sealant and vapor barrier in the joints of all cellular foams on cold insulation work.

FOAMSEAL[®] Sealant is water and weather resistant and is often used as a sealant in the laps of metal jacketing and as a flashing compound where structural parts must break an insulation surface.

Meets Military Spec. MIL-B-19564.

U.S.D.A. (M. I. D.) chemically acceptable.

30-45 complies with Rule 66, Los Angeles Air Pollution Control District.

Available in caulking cartridges containing 28 fluid ounces or 10 fluid ounces, and in 1, 5, and 55 gallon units.

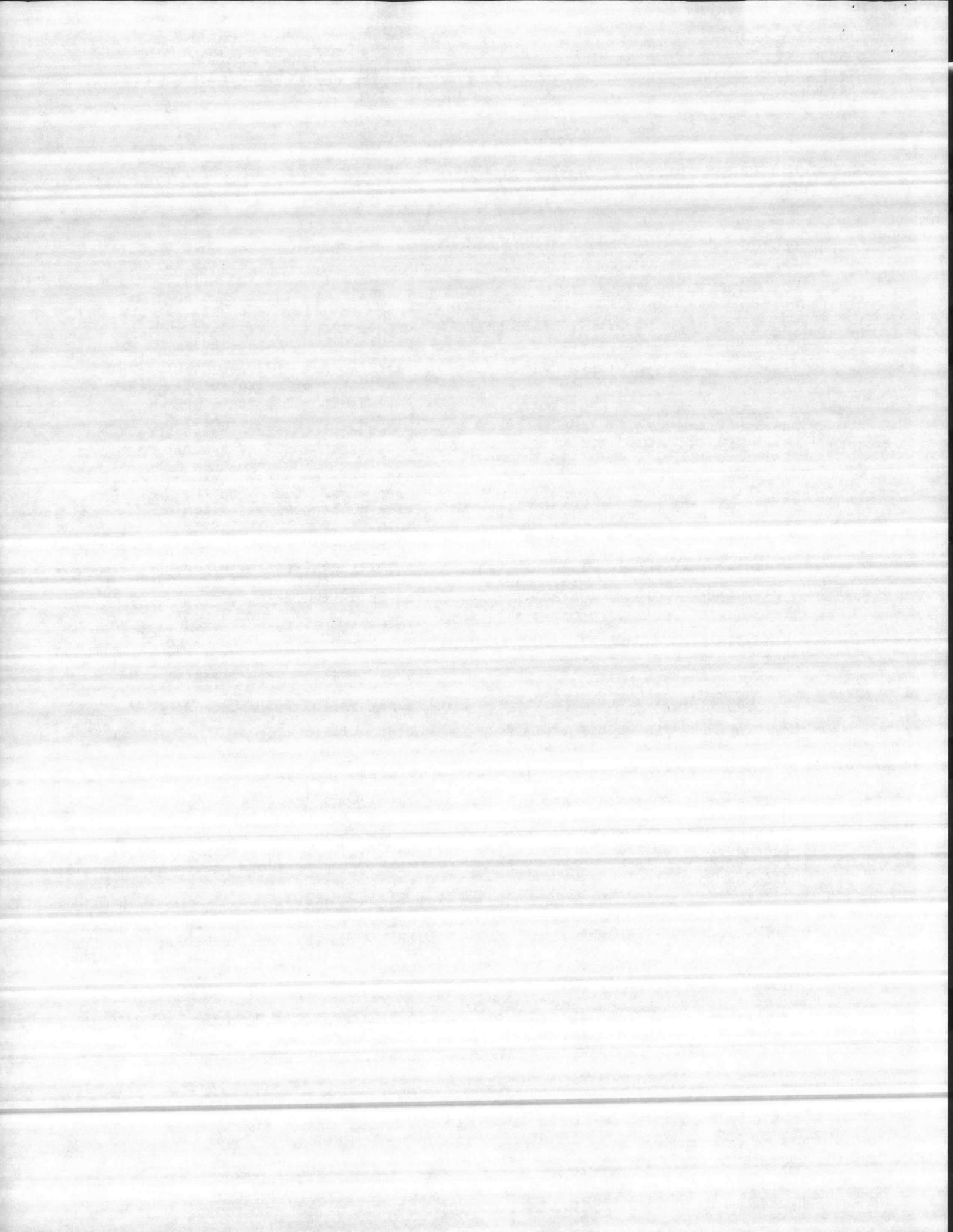
LIMITATIONS

Permit to cure one week before placing in heated service. Do not apply below 50°F (10°C).

Do not use in food storage applications where odor might affect food flavors and tastes.

H. B. FULLER COMPANY
FOSTER PRODUCTS
5220 Main Street N.E.
Minneapolis, Minnesota 55421
800.328.7207

IMPORTANT — The information contained herein is correct to the best of our knowledge and tests. The recommendations and suggestions contained herein are made without guarantee or representation as to results. We recommend that adequate tests be made by the purchaser to determine if a product is suitable for the intended purpose and use. Our only obligation shall be to replace or pay for any material proved defective by our laboratory within our published shelf life period. Beyond the purchase price of materials supplied by us, we assume no liability for damages of any kind and the user accepts the product "as is" and without any other warranties, expressed or implied.



7-75-11

APPLICATION GUIDE FOR

FOSTER FOAMSEAL® SEALANT 30-45

CAUTION: COMBUSTIBLE MIXTURE - Keep away from heat and open flames. For further details of application safety precautions, obtain Material Safety Data Sheet.

MATERIAL PREPARATION

Do not thin. Apply to clean dry surfaces only.

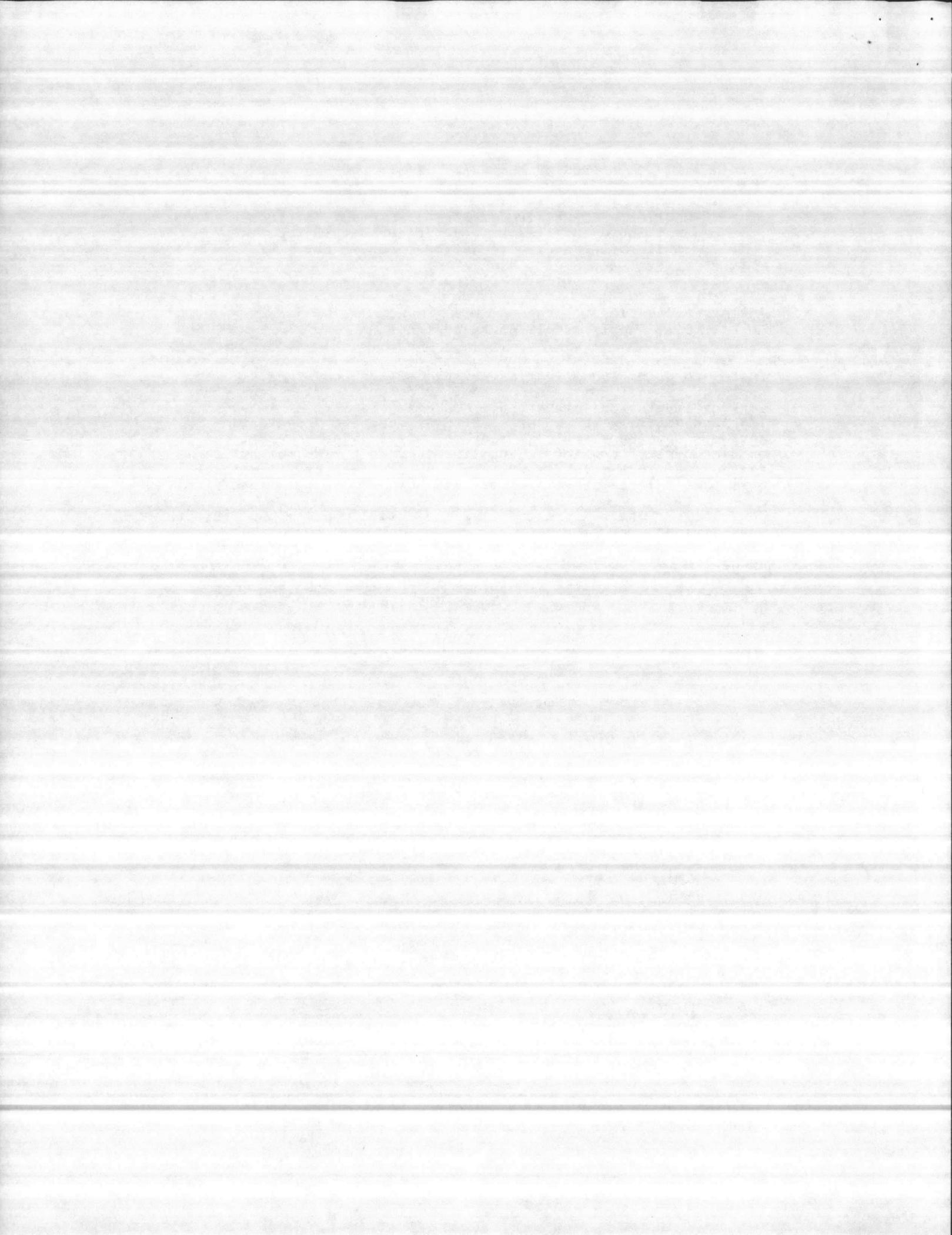
APPLICATION

(Refer to Guide Specification for recommended coverage.)
Apply by trowel, putty knife, hand or power caulking gun. When sealing insulation joints apply FOAMSEAL® Sealant at 1/16 to 1/8 inch wet film thickness (1.6 to 3.2 mm) and press mating surfaces together firmly to squeeze out air bubbles and to obtain complete contact. When flashing, do not trowel out to feather edge but maintain a minimum of 1/8 inch wet film thickness (3.2 mm) in entire area of use. Use membrane as specified.

Consult you Foster Representative for detailed power caulking gun instructions.

CLEAN-UP

Use solvent such as Dow Chemical Company "Chlorothene"® (non-flammable); or mineral spirits (flammable) for cleaning tools and equipment.



foster®

COATINGS
SEALANTS
ADHESIVES

PRODUCT DATA

30-35

HB FULLER COMPANY ASSEMBLY PRODUCTS DIVISION

PROPERTIES

COLOR

White

APPLICATION

Brush, Glove, or Spray

WEIGHT PER U. S. GALLON (ASTM D1475-60)

11.0 pounds (1.3 kg/liter)

AVERAGE NON-VOLATILE (ASTM C461-64)

45% by volume

THICKNESS & COVERAGE (FSTM 71)

(Subject to type of surface and nature of material being coated)
Wet Coverage: 1/16 inch (1.6mm), 4 gallons per 100 sq.ft. minimum (1.6 liter/m²), on smooth, non-porous surface. Porous or rough surfaces may require higher gallonage to attain required dry thickness.

DRYING TIME (ASTM D1640-69)

Set to touch: 4 hours

Dry through: 24 hours

SERVICE TEMPERATURE LIMITS (FSTM 70)

(Temperature at coated surface)
20°F to 150°F (minus 7°C to 66°C)

WATER VAPOR TRANSMISSION (ASTM E398-70)

0.05 perm at 0.055 inch dry film thickness (0.03 metric perm at 1.4mm)

HAZARD

Wet Flammability (ASTM D93-73)

Flash Point 110°F (43°C)

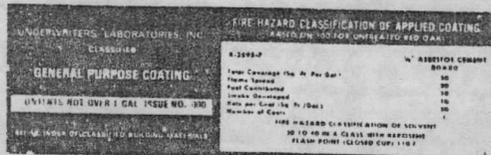
Dry Flame Spread (ASTM E84-70)

20 on 1/4 inch Asbestos Cement Board

(The flame spread may vary at different product thicknesses and/or when applied over surfaces other than asbestos cement board.)

Threshold Limit Value for solvent vapor (FSTM 73) T.L.V. 500 ppm

FOSTER TITE-FIT COATING



Foster TITE-FIT Coating is a flexible, fire resistive vapor barrier coating for rigid thermal insulation. It was designed for coating fibrous glass insulation fittings. It meets the requirements of Military Specification MIL-C-19565B, Type II.

LIMITATIONS

Not recommended for outdoor exposure.

Some plastic foams may be attacked by the solvent in this product. The user should establish by his own test that this will not occur.

Do not use in food storage applications where solvent odor might affect food flavors or taste.

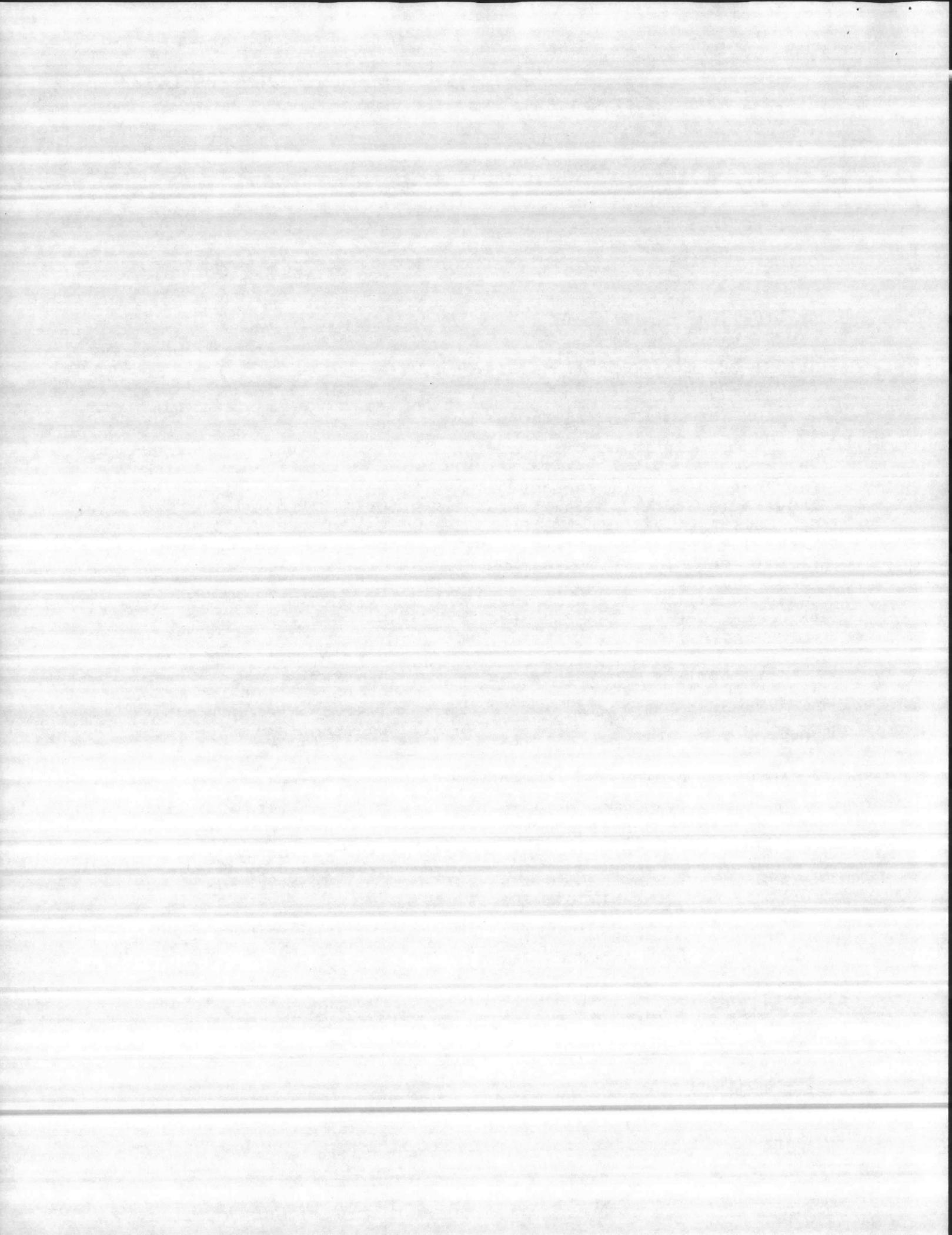
TITE-FIT Coating 30-35 is classified by Underwriters' Laboratories, Inc.

FOR INDUSTRIAL USE ONLY BY TRAINED AND QUALIFIED CRAFTSMEN.

FSTM: Foster Standard Test Method.
Form No. 3155-8c
8/75-14-BF-459

H. B. FULLER COMPANY
FOSTER PRODUCTS
5220 Main Street N.E.
Minneapolis, Minnesota 55421
800-328-7307

IMPORTANT—LIMITED WARRANTY — The information and data contained in this bulletin are correct to the best of our knowledge and tests. The recommendations and suggestions contained herein are made without guarantee or representation as to results. We recommend that adequate tests be made by the purchaser to determine if a product is suitable for the intended purpose and use. Our only obligation shall be to replace or pay for any material proved defective by our laboratory within our published shelf life period. Beyond the purchase price of materials supplied by us, we assume no liability for damages of any kind and the user accepts the product "as is" and without any other warranties, expressed or implied.



APPLICATION GUIDE FOR
FOSTER TITE-FIT COATING

DANGER! MAY BE FATAL IF SWALLOWED. COMBUSTIBLE MIXTURE. Wash thoroughly after handling. Keep away from heat and open flame. Avoid prolonged breathing of vapor. Avoid prolonged or repeated contact with skin. In case of fire use water spray, foam, dry chemical or CO₂.

POISON

IF SWALLOWED CALL A PHYSICIAN IMMEDIATELY.

ANTIDOTE - FIRST AID TREATMENT:

If swallowed, do not induce vomiting. Call a physician immediately. Give four ounces liquid petrolatum followed by gastric lavage with tap water. Give demulcents. If inhaled, promptly remove from exposure and give oxygen by alternating pressure or artificial respiration if necessary.

MATERIAL PREPARATION

Stir well. Do not thin. Apply only to a clean dry surface. Keep container closed when not in use to prevent solvent evaporation.

APPLICATION

(Refer to Guide Specification for recommended coverage.)

Apply TITE-FIT Coating by brush, glove or spray at 1/16 inch wet film thickness with or without membrane as specified. When fitting halves are assembled in the field, use mechanical attachment.

Brush or Glove

Use a good brush, making strokes as long as possible over the surface of a fitting. In glove application wet the glove with clean-up solvent (xylol) occasionally to improve slip and give a smooth appearance to the work.

Spray

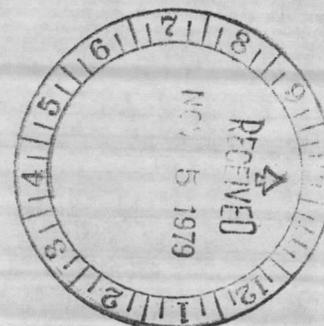
TITE-FIT Coating may be airless spray applied at approximately 50 gallons per hour. Please consult your Foster Representative for spray equipment recommendation, or call:

CLEAN-UP

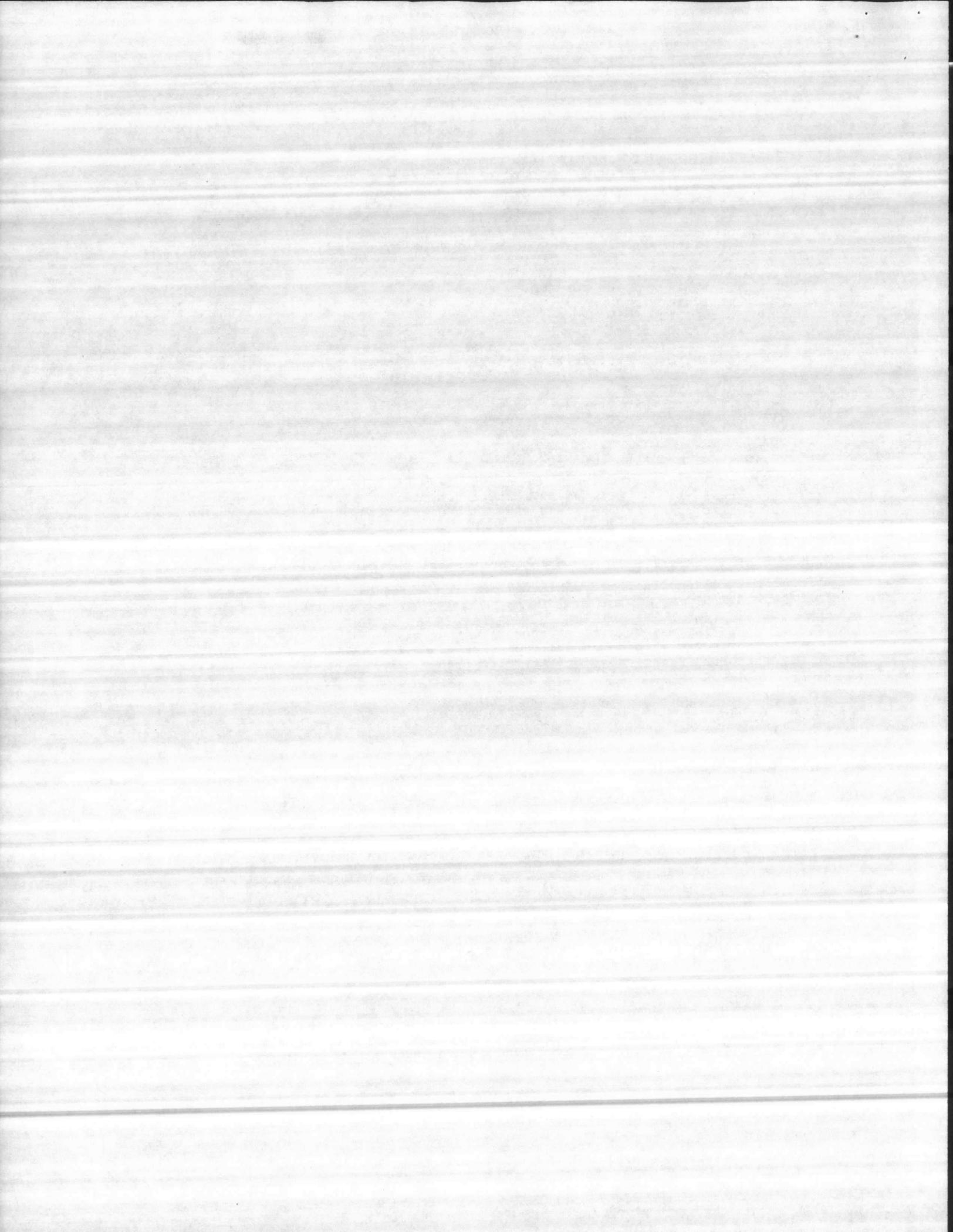
Use a solvent such as Dow Chemical Company "Chlorothene"® (non-flammable) or mineral spirits (flammable) for cleaning brushes and equipment.

DATA REPRODUCED FROM UNDERWRITERS' LABORATORIES, INC. BUILDING MATERIALS DIRECTORY

Guide BNEV.	October 25, 1974	R3593I.
Coatings, General Purpose.		(Continued from H card.)
Vapor-barrier coatings.		
Fire Hazard Classification of Applied Coatings 1/4-in. Asbestos-Cement Board		
Total coverage (sq ft per gal)	50	
Flame spread	20	
Fuel contributed	10	
Smoke developed	10	
Rate per Coat (sq ft per gal)	50	
Number of Coats	1	
Fire Hazard Classification of Solvents 30 to 40 in a class with kerosene Flash point (closed cup) 110 F.		
This card replaces R3593I dated April 27, 1970, filed Foster,		
This card is issued by Underwriters Laboratories Inc. ®		



(continued on J card.)



foster®

COATINGS
SEALANTS
ADHESIVES

PRODUCT DATA

30-36

HB FULLER COMPANY ASSEMBLY PRODUCTS DIVISION

PROPERTIES

COLOR (ASTM D1729-69)
Cream

APPLICATION CONSISTENCY (ASTM D2507-70)
Brush or spray

WEIGHT PER U.S. GALLON (ASTM D1475-60)
11.1 pounds (1.3 kg/liter)

AVERAGE NON-VOLATILE (ASTM C461-64)
46% by volume

COVERAGE (FSTM 71)
(Subject to type of surface being coated)
40 to 80 sq. ft. per gallon (0.9 to 2.0 m²/liter)
0.040 in. to 0.020 in. wet film thickness (1.0 to 0.5 mm)

DRYING TIME (ASTM C461-64)
Touch: 2 hours
Through: 15 hours

SERVICE TEMPERATURE LIMITS (FSTM 70)
(Temperature at coated surface)
0°F to 180°F (minus 18°C to 82°C)

WATER VAPOR TRANSMISSION (ASTM-E96-66)
0.90 perm (two 0.040 in. coats with 8 oz. canvas between)

SAFETY

- Wet Flammability** (ASTM D93-72) Non-flammable
- Dry Flame Spread** (ASTM E162-67) 5 on 1/4 in. Asbestos Cement Board
Certified to meet GSA Requirements
- Dry Flame Spread** (ASTM E84-70) 10 on 1/4 in. Asbestos Cement Board
(The flame spread may vary at different product thicknesses and/or when applied over surfaces other than asbestos cement board.)

© Trademark
FSTM—Foster Standard Test Method

1/76-13-Form No. 3155-33e
BF-475/476/477

FOSTER SEALFAS® COATING



FOSTER SEALFAS® COATING 30-36 is a light-colored, tough, washable, abrasion-resistant coating for thermal insulation. It is also used for cementing laps of canvas or asbestos lagging cloth.

It provides a protective finish for insulation on air conditioning ducts and cold water piping when applied in 2 coats with 20 x 20 white glass cloth embedded between coats. When relative humidity exceeds 75% for continuous periods or where the insulated piping or equipment contains chilled water, ice water, brine or refrigerant, vapor barrier protection is required.

The successful performance of this finish system depends upon application over adequate insulation, so that under service conditions the surface temperature exceeds the dew point temperature.

SEALFAS® COATING is compatible with expanded polystyrene, polyurethane foam, and other plastic foam insulations and can be used as a sealer coat to protect them from attack by solvents in chemical resistant finishes.

U. S. D. A. (M. I. D.) chemically acceptable.

Meets Military Specification MIL-A-3316B, Class 1, superseding MIL-A-3316A, Type I.

Meets requirements of NFPA 90A and NFPA 220A.

30-36 complies with Rule 66 for Los Angeles County Air Pollution Control District.

LIMITATIONS

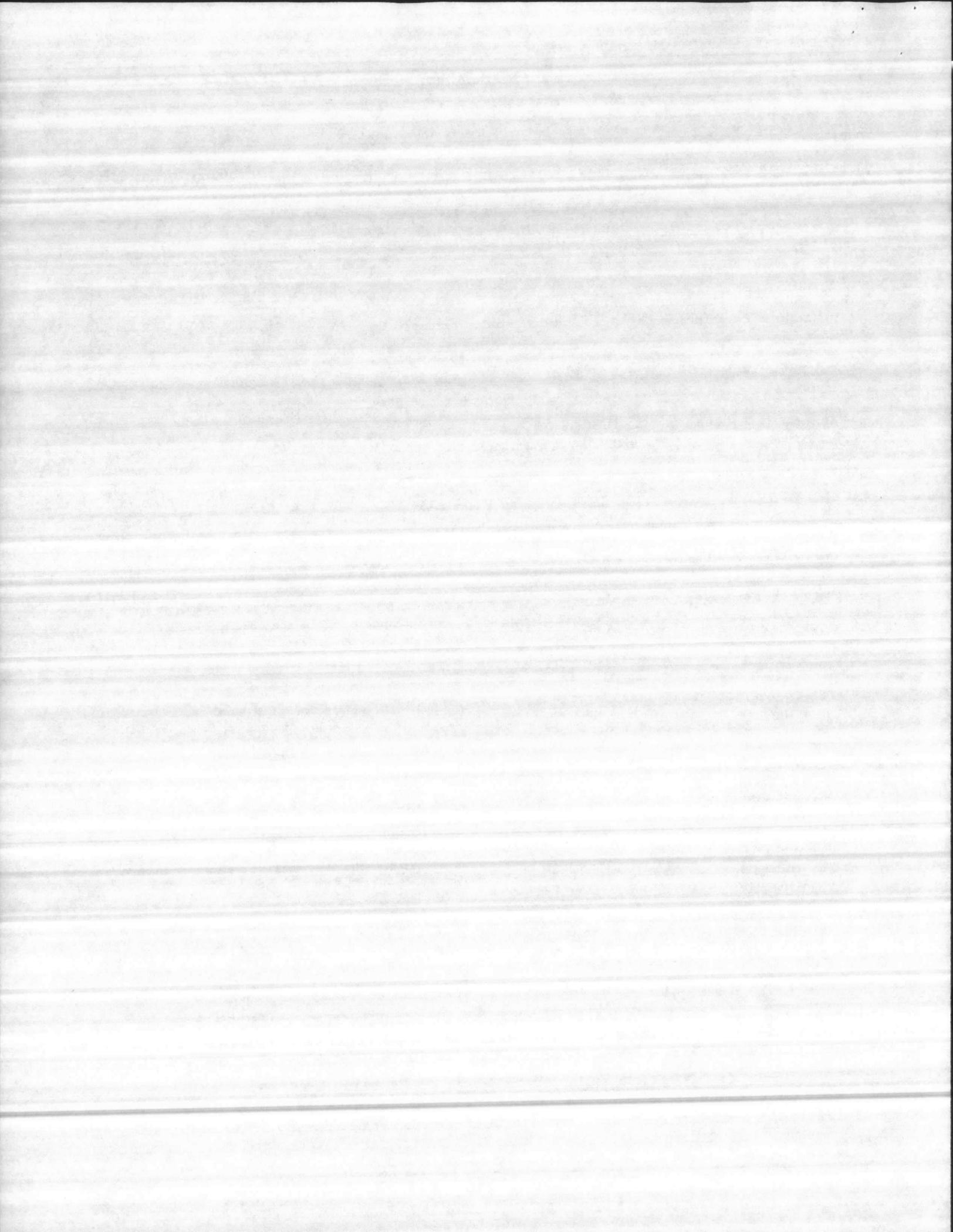
SEALFAS® COATING is a water base product and should not be stored or applied below 40°F (4°C) or above 100°F (38°C).

This product is classified by Underwriters' Laboratories, Inc.

FOR INDUSTRIAL USE ONLY BY TRAINED AND QUALIFIED CRAFTSMEN

H. B. FULLER COMPANY
FOSTER PRODUCTS
5220 Main Street N.E.
Minneapolis, Minnesota 55421
600 229 7207

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Application Guide for SEALFAS® COATING 30-36

MATERIAL PREPARATION

Stir well but do not use sticks or boards which would splinter or otherwise contaminate product. Do not thin.

APPLICATION

(Refer to Guide Specification for recommended coverage)

Brush

Use clean paintbrushes (suitable for water-base paints). Apply with full brush and spread out evenly. Embed 20 x 20 white glass cloth (or other specified membrane) into the wet first coat and smooth out free of wrinkles. A broad trowel is convenient to use for this purpose. Apply second coat over membrane in the same manner. When used as a fabric lap adhesive apply SEALFAS® COATING uniformly to underside of lap or tape. Press lap or tape firmly into place to insure complete contact.

Spray

SEALFAS® COATING 30-36 may be airless spray applied at 50 gallons per hour. Please consult your Foster Representative for spray equipment recommendation.

CLEAN-UP

Use clean fresh water for cleaning brushes and equipment before product dries. Dry product may be removed with hot soapy waer or strong solvent such as Dow Chemical Company "Chlorothene"®(non-flammable); or xylol (flammable).

DATA REPRODUCED FROM UNDERWRITERS' LABORATORIES, INC., BUILDING MATERIALS DIRECTORY

Guide BNEV.
Coatings, General Purpose

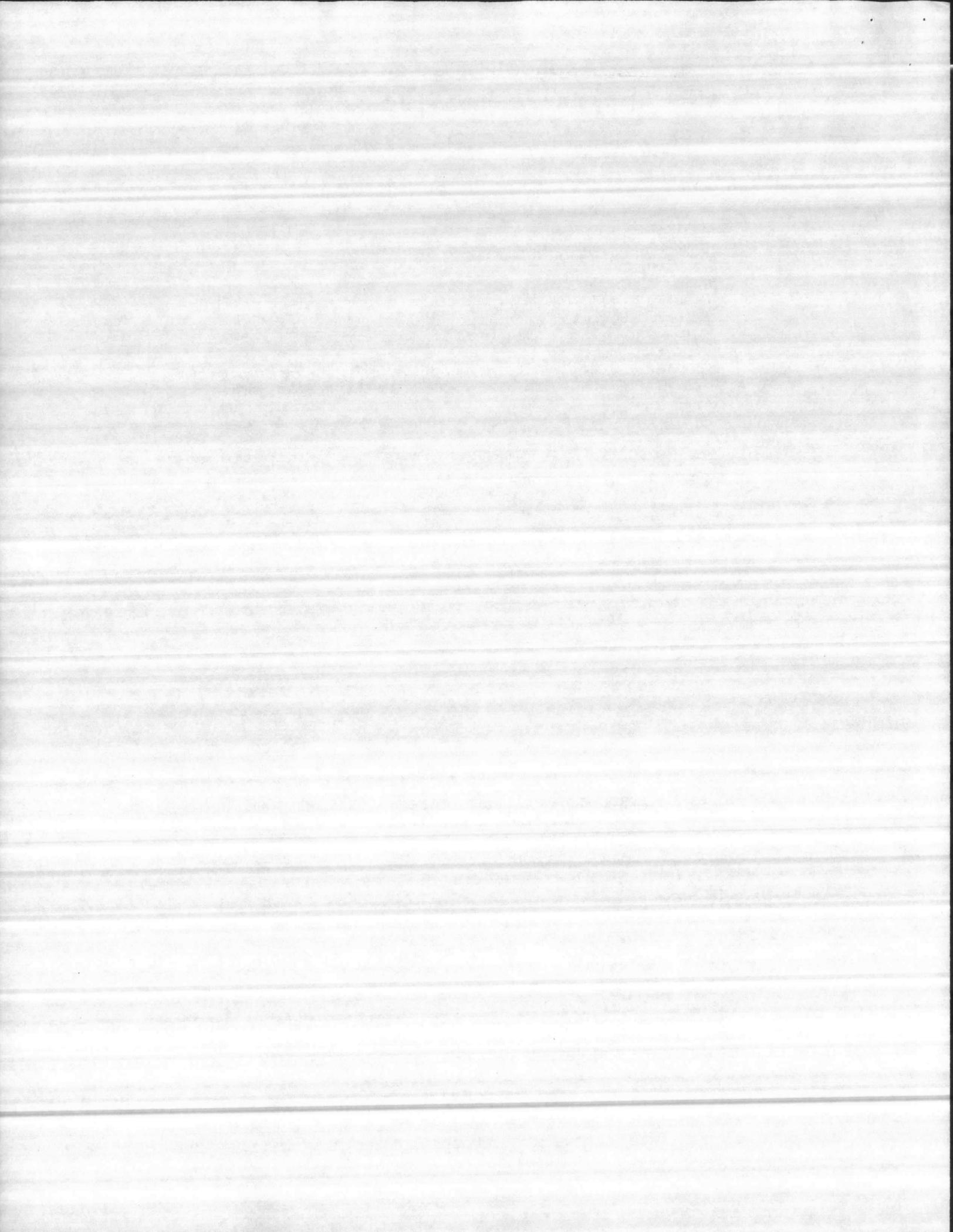
October 18, 1974

R3593E.

Surface	Fire Hazard Classification of Applied Coating ¼ in. Asbestos-Cement Board
Flame spread	10
Fuel contributed	0
Smoke developed	5
Number of coats	1
Rate per coat (Sq. ft. per gal.)	40
Flash point of liquid coating: Closed cup, no flash.	

Issued by Underwriters' Laboratories, Inc.®





foster®

COATINGS
SEALANTS
ADHESIVES

PRODUCT DATA

60-25 / 26 / 28

HB FULLER COMPANY ASSEMBLY PRODUCTS DIVISION

PROPERTIES

COLOR

Black

APPLICATION CONSISTENCY

60-25 Trowel

60-26 Spray

60-28 Spray(Low Temperature Grade)

WEIGHT PER U. S. GALLON (ASTM D1475-60)

9.3 to 9.5 pounds (1.12 to 1.14 kg/litre)

AVERAGE NON-VOLATILE (ASTM C461-60)

64% by volume (60-25 & 60-26)

58% by volume (60-28)

THICKNESS & COVERAGE (FSTM 71)

(Subject to nature of material being coated). Wet coverages shown below are for smooth non-porous surfaces. Porous or rough surfaces may require higher gallonage to attain required dry thickness.

TACK COAT: 60-25, 60-26

Dry Thickness: 0.020 to 0.041 inch
(0.5 to 1.0 mm)

Equivalent Wet Coverage: 0.031 to 0.0625 inch(0.8 to 1.6 mm), 2 to 4 gal. per 100 sq.ft.(0.8 to 1.6 liter/m²) on smooth non-porous surface.

FINISH COAT: 60-25, 60-26

Dry Thickness: 0.061 to 0.081 inch
(1.5 to 2.1 mm)

Equivalent Wet Coverage: 0.094 to 0.125 inch(2.4 to 3.2 mm), 6 to 8 gal. per 100 sq.ft.(2.4 to 3.2 liter/m²) on smooth non-porous surface.

NOTE: 60-28 Use 10% more material for equivalent dry thickness.

DRYING TIME (ASTM C461-64)

Touch: 1/2 to 6 hours

Through: 36 hours

SERVICE TEMPERATURE LIMITS(FSTM 70)

(Temperature at coated surface)

Minus 20°F to 200°F (-29°C to 93°C)

WATER VAPOR TRANSMISSION(ASTM E96-66)

0.00 Perm at 1/8 inch dry film thickness

(0.00 metric perm at 3.2 mm)

HAZARD

Wet Flammability (ASTM D93-73)

Flash Point 100°F (38°C)

Surface Flame Spread(dry)(ASTM E162-67)

145 on 1/4 inch(0.63 cm) asbestos cement board.

(The flame spread may vary at different product thicknesses and/or when applied over surfaces other than asbestos cement board.)

Threshold Limit Value for solvent vapor (FSTM 73) T.L.V. 100 ppm

FOSTER C. I. MASTIC®

Foster C.I. MASTIC® is a tough, durable vapor barrier asphaltic coating. Because of its flexibility and low vapor permeance, it is an ideal surface coating for low temperature insulating applications where the insulation used is not affected by mild solvents.

C.I. MASTIC may be used on heated lines, vessels and equipment in intermittent or dual temperature service to prevent the entrance of water vapor into the insulation during off periods or on cold cycles. Porous, dusty insulation surfaces should be primed with STACKFAS® Concrete Curing Agent 51-06 prior to application of mastic. Insulation must be dry before mastic application.

C.I. MASTIC is an effective protective coating for metal. Priming is not necessary but adequate surface preparation is always desirable to obtain optimum results. A coat of an industrial oxide-chromate primer will prevent spread of rust from points of physical damage.

C.I. MASTIC 60-25 may be used as adhesive for vapor barrier jackets on pipe and duct insulation.

C.I. MASTIC 60-25 meets the requirements for water proofing mastics in the TRI-SERVICE SPECIFICATION for UNDERGROUND HEAT DISTRIBUTION CONDUIT SYSTEMS.

C.I. MASTICS 60-25 and 60-26 meet Military Specification MIL-C-82052.

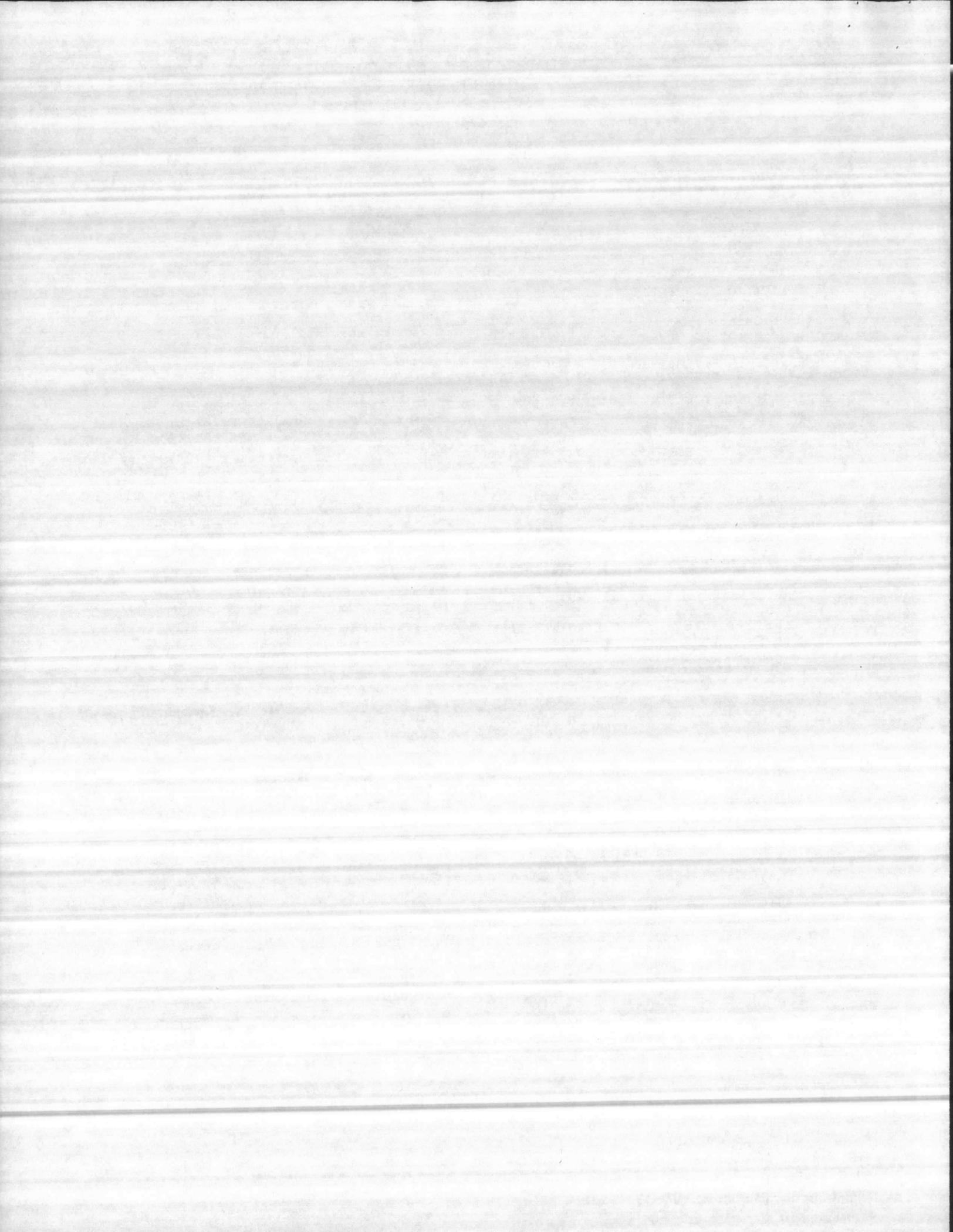
LIMITATIONS

Do not use in food storage applications where odor might affect food flavors and tastes. Do not use on polystyrene foam. Allow at least 30 days curing before top coating with water base coatings.

FOR INDUSTRIAL USE ONLY BY TRAINED AND QUALIFIED CRAFTSMEN.

H. B. FULLER COMPANY
FOSTER PRODUCTS
5220 Main Street N.E.
Minneapolis, Minnesota 55421
800-328-7307

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APPLICATION GUIDE
for
FOSTER C.I. MASTIC®

CAUTION: COMBUSTIBLE MIXTURE - Keep away from heat and open flame. Use with adequate ventilation. Avoid prolonged breathing of vapor. Avoid prolonged or repeated contact with skin.

MATERIAL PREPARATION

Stir well with paddle, but do not use sticks or boards which would splinter or otherwise contaminate product. Do not thin. Keep container closed when not in use to prevent solvent evaporation.

APPLICATION

(Refer to Guide Specification for Recommended Thickness.) Apply only to clean, dry surface. Use Foster STACKFAS® Concrete Curing Agent 51-06 on dusty surfaces. Apply tack coat by desired method at specified thickness and imbed Foster MAST-A-FAB® White Membrane into wet tack coat, smoothing out to avoid wrinkles. Overlap all edges of cloth at least 3 inches (7.6 cm). Apply top or finish coat before tack coat has set through.

Trowel

Use clean tools and equipment and work in long, even strokes to insure uniform thickness. Wet tools in mineral spirits occasionally to prevent build up of dried mastic.

When aluminum asphalt coatings or mastics are applied over black asphalt mastics, avoid overworking to insure retaining aluminum color.

Spray

C.I. MASTIC 60-26 and 60-28 may be sprayed by the heated airless method at 50 to 60 gallons per hour. Please consult your Foster Representative for spray equipment recommendation, or call:

CLEAN-UP

Clean tools and equipment with mineral spirits (flammable); or Dow Chemical Company "Chlorothene"® (non-flammable).

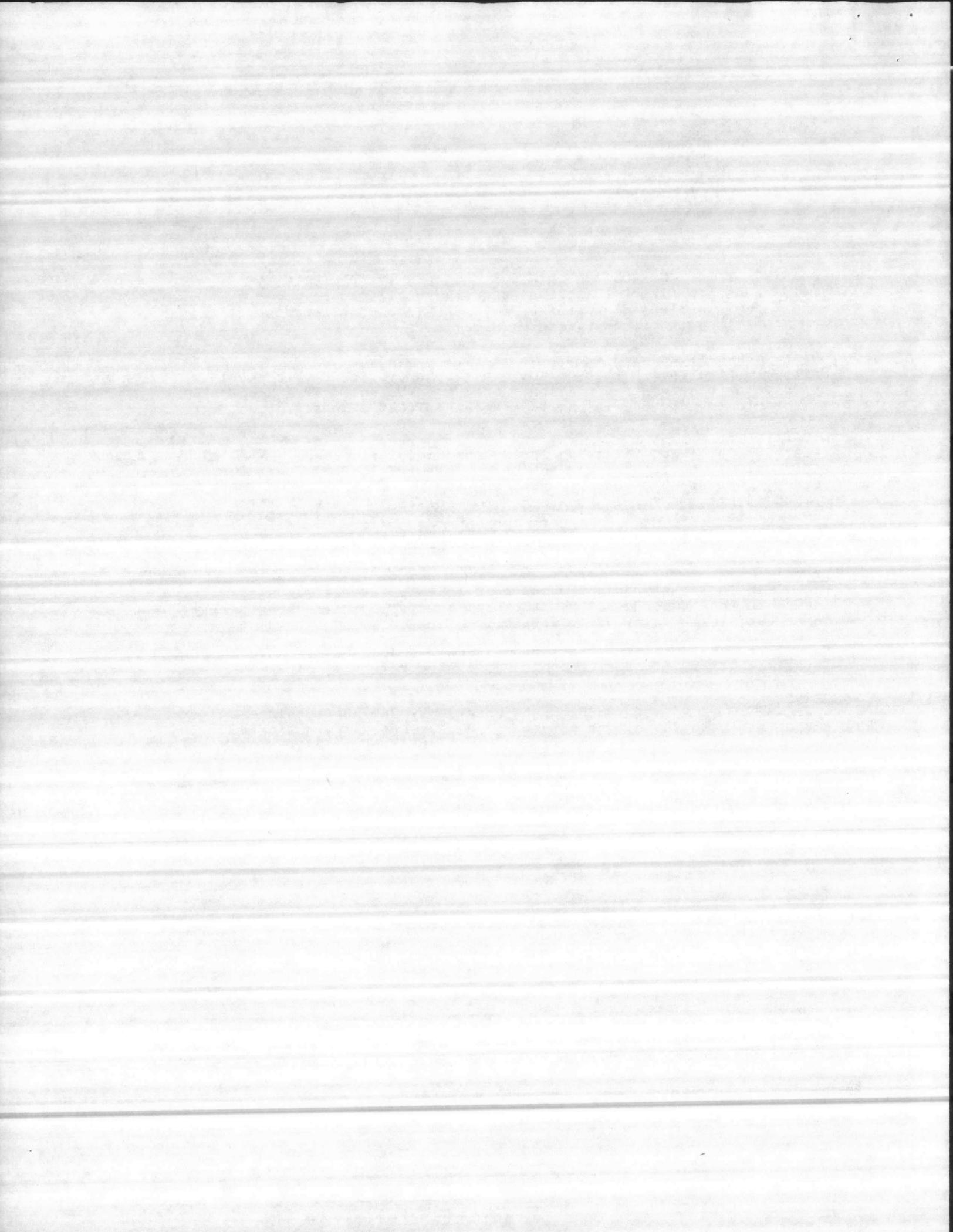
C. I. MASTIC, MAST-A-FAB, and STACKFAS

FSTM: Foster Standard Test Method.

Form No. 3155-35c

8/75-11-BF-260/297/214/00101;FN-839/1167/1168





SUPER POWERHOUSE

Asbestos Free

Mineral Wool Insulating and Finishing Cement - For Service to 1200°F

DESCRIPTION:

SUPER POWERHOUSE is a high temperature mineral fiber cement with a hydraulic-setting binder. Mixed with water, it can be troweled on any surface with little effort. It sets quickly to form a smooth, white, hard surface. After drying, it may be painted without further treatment. Weatherproofing may be applied directly for outdoor service. SUPER POWERHOUSE cement incorporates the qualities of easy troweling, application of finish in one coat, quick hydraulic set, no drying shrinkage cracks, and excellent adhesive qualities.

USES:

SUPER POWERHOUSE is used as a surface layer over insulation blocks, blankets, pipe insulation and other insulating cements.

It is also widely used over irregular surfaces and provides on-site pipe fittings.

SPECIFICATION COMPLIANCE:

Federal: SS-C-160A Type III Grade F
Military: MIL-I-24244A*
ASTM: C-449-64

*Indicate on order when specification compliance is required.

PACKAGING:

50 lb. bags

FEATURES:

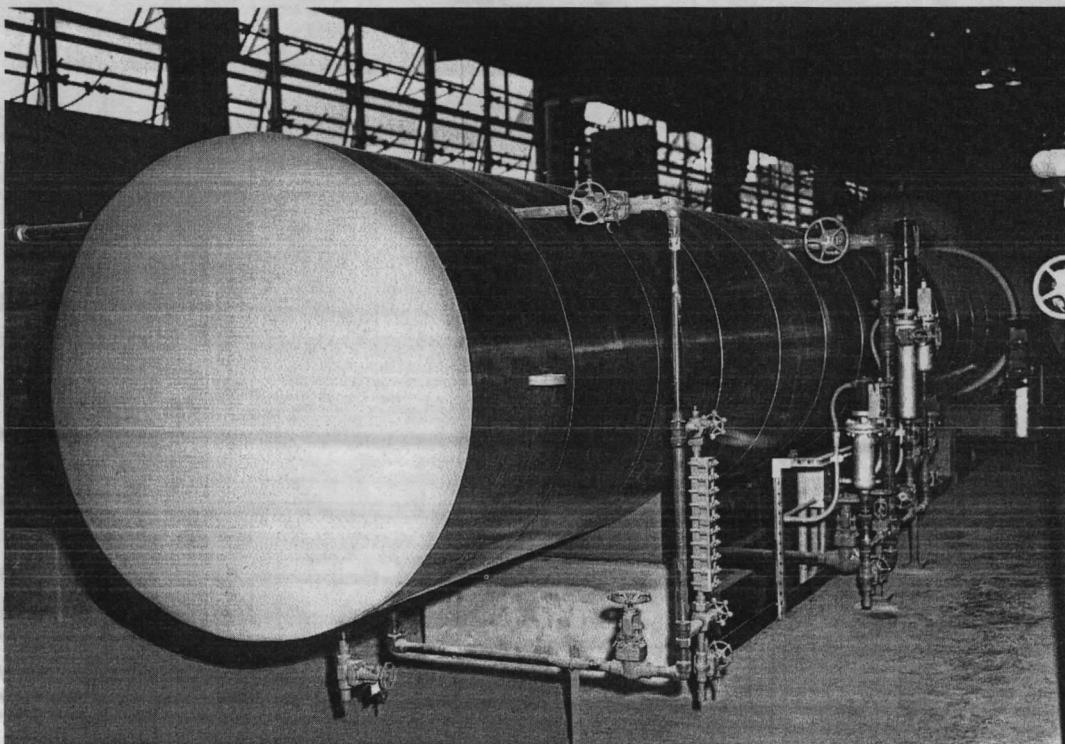
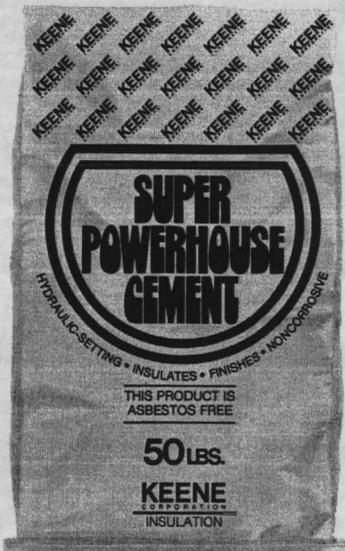
- Smooth White Finish
- Rapid Setting
- Single Coat Application
- Easy Mixing
- Resists Wetting
- Low Shrinkage
- Can be Painted
- Noncorrosive

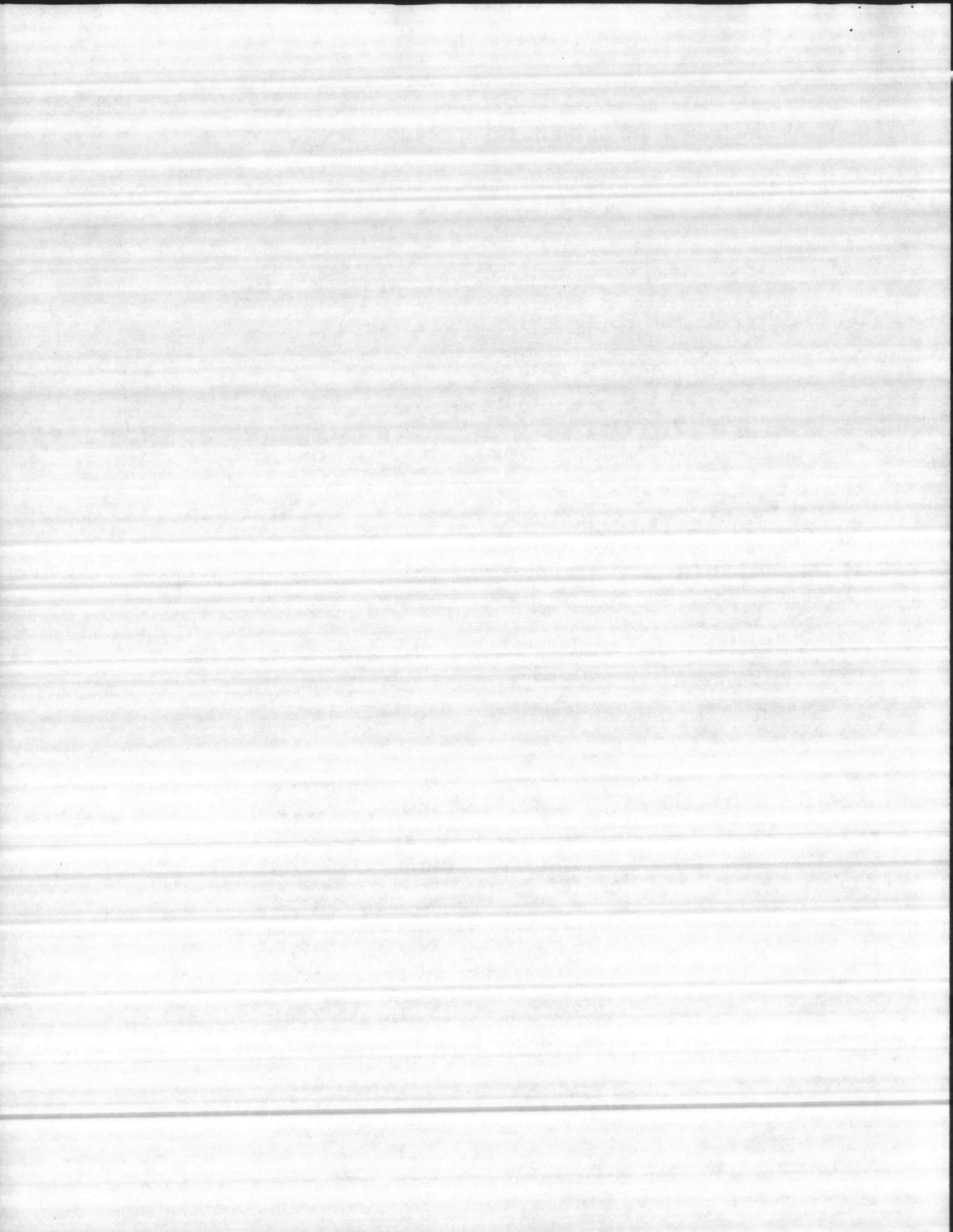
PHYSICAL PROPERTIES:

Temperature Limit — 1200°F
Recommended Water Ratio — 5-6 gal. potable water/50 lb. bag
Dry Coverage — 25 sq. ft. (min.)/100 lb. at 1" thick
Linear Shrinkage after 24 hrs. soaking heat at 1200°F — 2% maximum

THERMAL CONDUCTIVITY:

Mean Temp. °F	200	400	600
K	.86	.97	1.075





SUPER 1900

Mineral Wool Insulating Cement - For Service to 1900°F - Asbestos Free

DESCRIPTION:

SUPER 1900 Insulating Cement is a dry mix composed of spun mineral wool nodules and clay. It is an improved, easier mixing cement which applies better with improved adhesion and less cracking. The resilient fibers and special binder produce a cement which handles easier and sets faster with a white finish.

After mixing with water, SUPER 1900 can be applied with a trowel and forms a rust inhibiting, noncorrosive insulation for heated and other surfaces.



USES:

SUPER 1900 is used primarily as a leveling material over insulating blocks, as a complete insulation on irregular surfaces, as a patching or repair material, or for general insulating and maintenance work.

FEATURES:

- Excellent Thermal Stability
- Good Wet Adhesion
- Good Dry Strength
- Easy Mixing
- Lightweight
- Easy Application
- Noncorrosive
- Less Cracking

PHYSICAL PROPERTIES:

Temperature Limit — 1900°F

Recommended Water Ratio — 8-9 gal. potable water/50 lb. bag

Dry Coverage — 30 sq. ft. (min.)/100 lbs. at 1 inch thick

Dry Density — 27 lbs./cu. ft.

Linear Shrinkage after 24 hrs. soaking heat at 1900°F — 3% maximum

THERMAL CONDUCTIVITY:

Mean Temp. °F	200	400	600	800	1000
K	.54	.62	.69	.80	1.00

SPECIFICATION COMPLIANCE:

Federal: SS-C-160A Type III Grade U

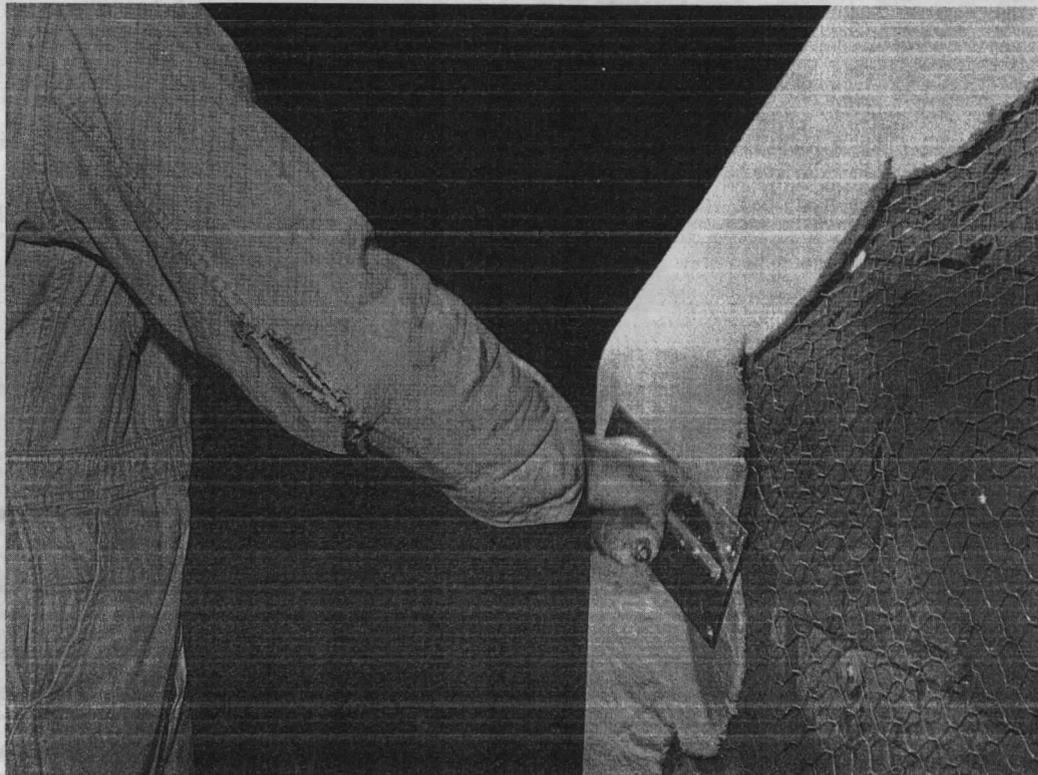
Military: MIL-1-24244A*

ASTM: C195-64

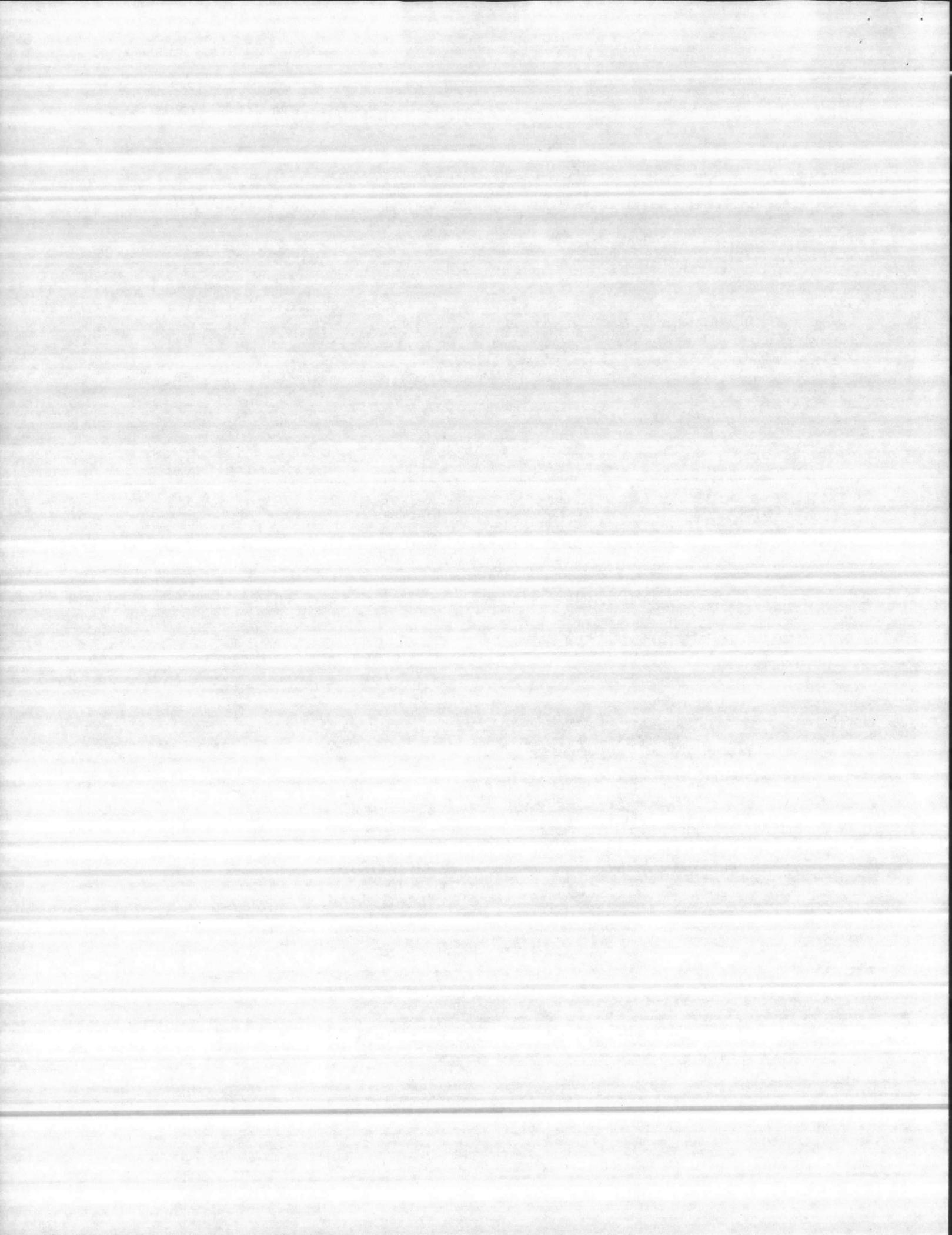
*Indicate on order when specification compliance is required.

PACKAGING:

50 lb. bags


KEENE
 CORPORATION
 INSULATION

1603 FULFORD STREET, KALAMAZOO, MICHIGAN 49003
 TELEPHONE: (616) 343-1226/TELEX: 8102771023





1003
May 1976

FORTY EIGHT ETR INSULATION

FORTY-EIGHT ETR INSULATION, for extended temperature ranges, is manufactured from resilient refractory fibers which are processed to form a durable, highly efficient and economical insulation. ETR INSULATION is water repellent and incombustible. It is designed for surface temperatures up to 1000°F with a more than adequate safety factor. Completely asbestos free.

ETR INSULATION is dimensionally stable and easily cut, if required, to provide a close fitting and more efficient installation. ETR fits snugly over irregular surfaces and will not crack or disintegrate on expanding and contracting equipment.

Ideal acoustical or thermal insulation for power generators, package boilers, ducts, breechings, petroleum and chemical process equipment. Attach with weld pins and finish with metal jacketing or metal mesh, cement and/or weatherproofing.

PRODUCT DATA SHEET

THERMAL PERFORMANCE:

<u>Mean Temperature</u>	<u>K-factor</u>
200°F	.31
400°F	.42
600°F	.61

ACOUSTICAL PERFORMANCE:

<u>Effective *dB(A) Reductions</u>	
2" thickness 13
3" thickness 21
4" thickness 26

SERVICE TEMPERATURE: Up to 1000°F.

*Provides a first approximation of performance.

DENSITY: Nominal 8 lbs. per cubic foot.

NON-CORROSIVE: Will not cause or aggravate corrosion.

MOISTURE ADSORPTION: Less than 1%.

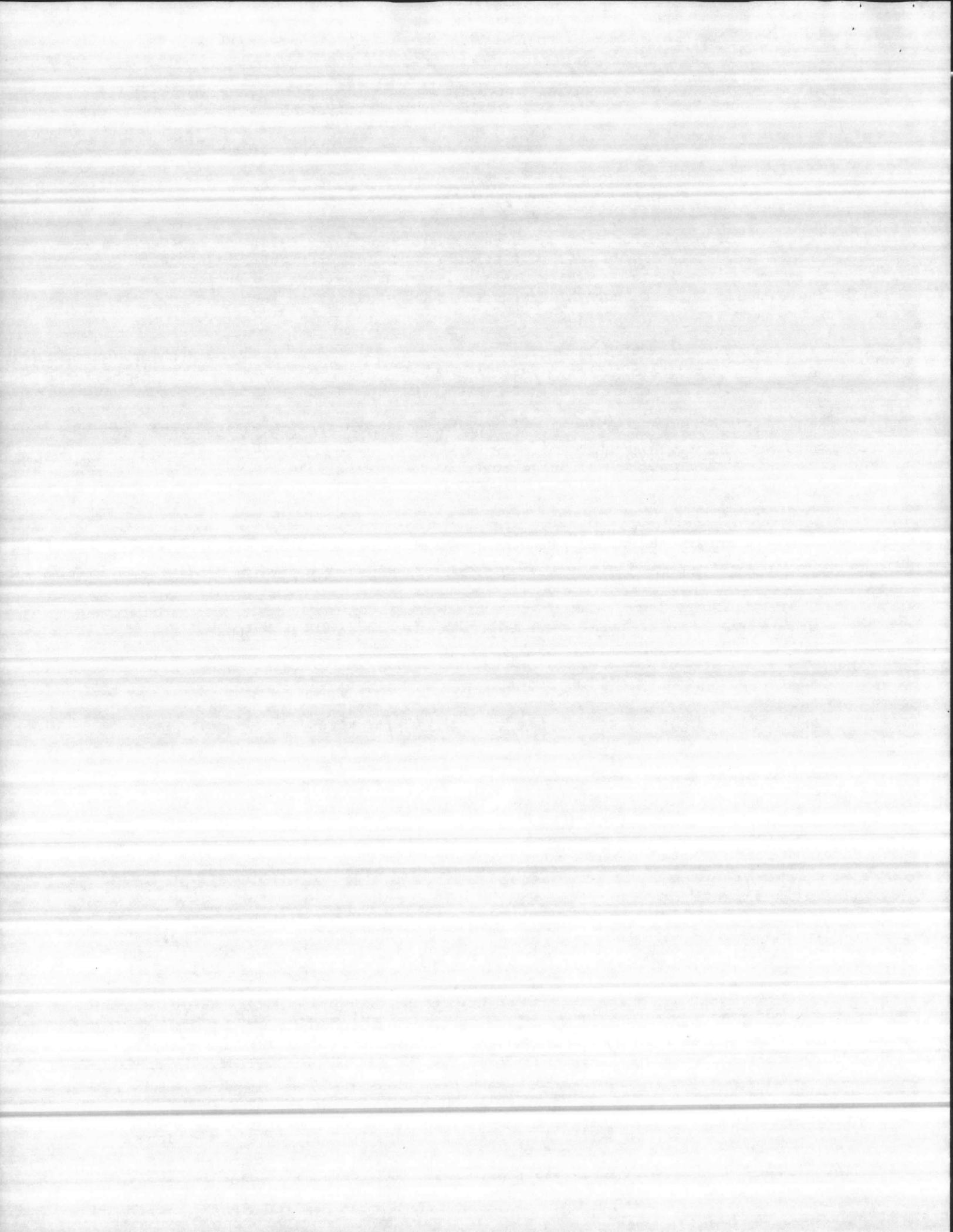
SPECIFICATIONS: Federal: HH-I-558B, Form A, Class 4
MIL-I-24244 (SHIPS)*
A.S.T.M.: C-262; C-612, Class 4; C-553, Type III, Class F-2.

SIZES: Standard size is 24" x 48". Other sizes available upon request.
Thicknesses: 1" through 4".

The information shown is representative of ETR INSULATION, but will vary with manufactured and testing tolerances. Reported thermal performance values were measured in accordance with A.S.T.M. C-177 at an independent testing laboratory.

*Contact us for conditions and details for complete compliance.

NOTE: Fibrous insulations are vapor permeable, and bonded with organic resin for ease of handling. Avoid direct exposure to hot gases or flame.



SPEED-LINE Manufacturing Company Inc.

P. O. Box 6143

Phone 1 919-275-8603

GREENSBORO, N. C. 27405

APPLICATION — Zip Jackets are formed from high impact poly Vinyl chloride material which resists rough treatment and repeated washing.

SEALING — The jackets are formed in two pieces which are cleverly heat sealed on the outside with the throat portion left open. The throat may be sealed with the Speed-Line vinyl adhesive, staples, zip tacks or banded depending upon application.

ULTRA-VIOLET RESISTANCE — Good U.V. Resistance, however they should be painted with Latex paint for outdoor use.

ADAPTABILITY — odorless, tasteless, will not support bacteria growth. Perfect for applications such as food processing plants, meat packing, etc.

FLAMMABILITY — Meets most Federal and Military specifications for flame spread and fuel contribution. Self-extinguishing - will not support flame.

INSULATION PROPERTIES — S-L Fittings of fiberglass, polystyrene, polyurethane, or high temperature blanket inserts provide an excellent insulation and positive vapor seal when used with Zip Jackets.

APPEARANCE — When used with our PVC Jacketing material it forms a continuous line with elbows, tees, and 45's that mold in for the neatest appearance possible.

AVAILABILITY — S-L Zip Jackets are now available from stock in most sizes up to # 21. Elbows up to 12 x 1 1/2 Tube Turns, Tees and 45 Ells, as well as a matching jacketing material, .010 x 35 1/2" for pipe covering in rolls of 600 sq.ft. to 3,000 sq.ft. per roll. Vinyl tape, Zip Tacks and S-L Solvent Weld Cement is also available.

GOVERNMENT ACCEPTANCE — S-L fitting covers and PVC jackets have been accepted by the Corps of Engineers, GSA, and other Governmental agencies.

INSTALLATION

HOT WATER, LOW PRESSURE STEAM*, NON-VAPOR BARRIER METHODS

- a. 1 or 2 Speed-Line Zip Tacks in the throat
- b. 1" wide vinyl tape in the throat
- c. Small amount of vinyl adhesive in the throat
- d. Aluminum bands around each end

* We don't recommend PVC Zip Jackets where the surface temperature exceeds 175°.

CHILLED WATER, VAPOR BARRIER METHODS

- a. 1" to 1 1/2" wide vinyl tape in the throat and around each end
- b. Vinyl adhesive in the throat and where it joins with pipe covering

FEDERAL AND MILITARY SPECIFICATIONS MET BY POLY VINYL CHLORIDE

L-V-351

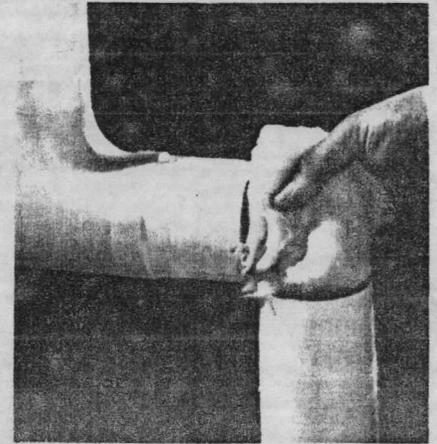
L-P-510

L-P-535

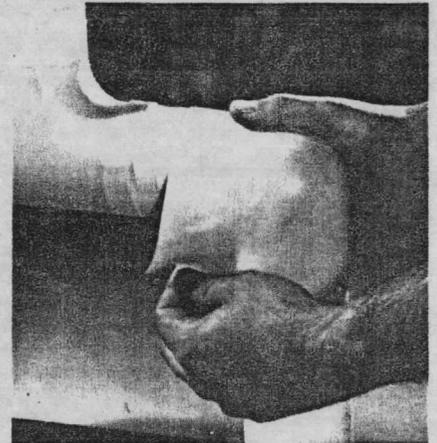
Vinyl Chloride Polymer and Copolymer Sheet (Rigid)

Comp A - Poly Vinyl Chloride Sheet, High Impact

Comp A - Type II Rigid Vinyl Film and Sheeting



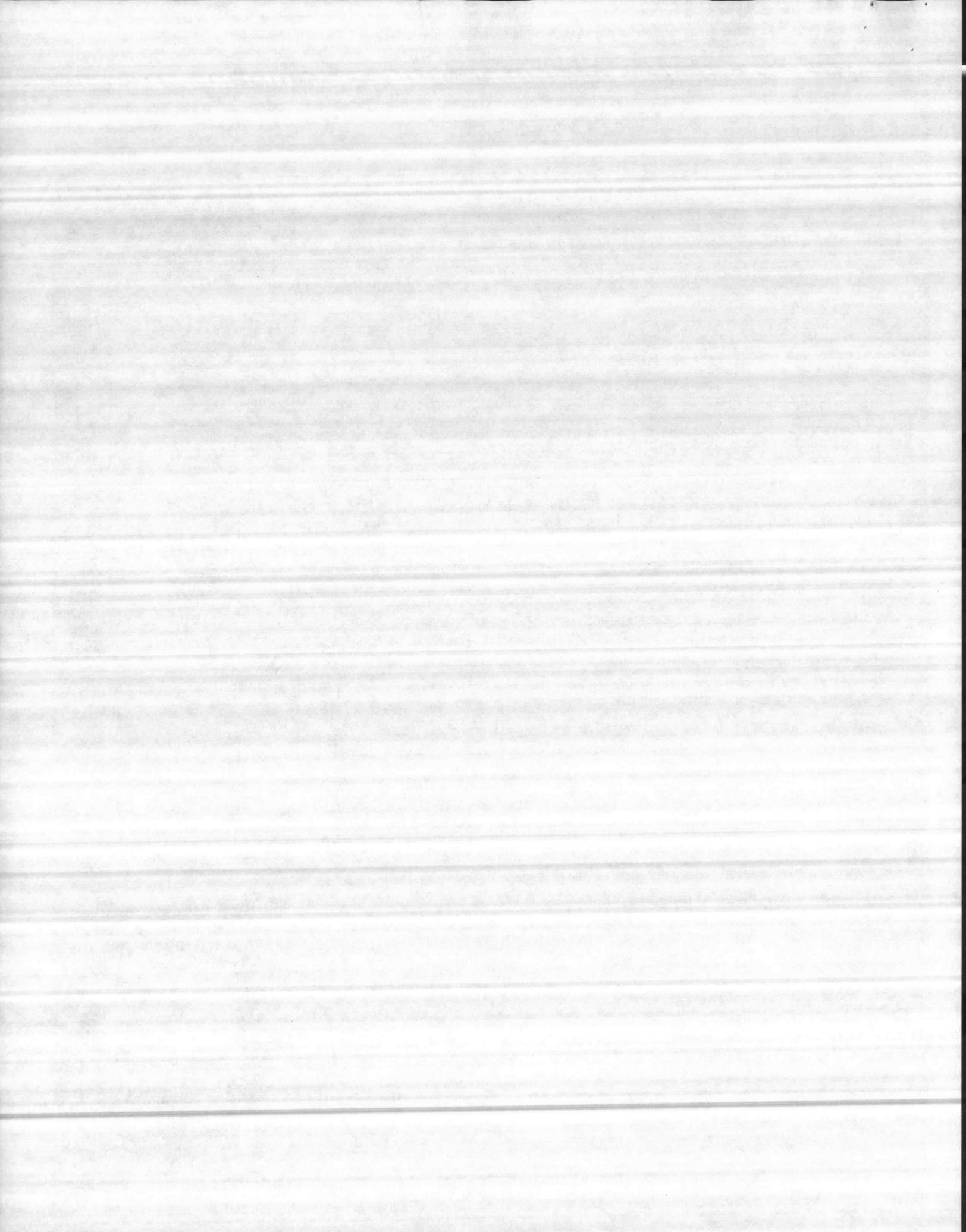
INSTALL HIGH TEMP INSERT



PULL THROAT PORTION OPEN AND SLIP ON ELBOW, OVERLAPPING PIPE COVERING.



WRAP EACH END OF FITTING AND THROAT PORTION WITH MATCHING WHITE TAPE.



SPEED-LINE MANUFACTURING CO., INC.
ZIP JACKETS
CHEMICAL RESISTANCE POLYVINYL CHLORIDE

INORGANIC ACIDS

Sulfuric, nitric, hydrochloric, hydrofluoric
 Dilute.....Excellent
 Concentrated.....Excellent

ORGANIC ACIDS

Formic, acetic, propionic acids, etc.,.....
 Generally poor - concentrated acids soften

ALKALIES

Sodium or potassium hydroxides - All solution
 strengths..... Excellent
 Ammonium hydroxide..... Excellent
 Caustic Soda..... Excellent
 Soda Ash..... Excellent

MISCELLANEOUS CORROSIVE CHEMICALS

Phenol, resorcinol, cresol, etc.....Poor
 Iodine, crystals.....Fair
 Iodine, tincture.....Excellent
 Chlorine water, bromine water..... Excellent
 Potassium dichromate..... Excellent
 Silver Nitrate..... Excellent
 Mercurchrome.....Excellent
 Hydrogen Peroxide..... Excellent
 Tannic acid..... Excellent

SOLVENTS AND DILUENTS

Alcohols and polyalcohols, including ethyl alco-
 hol, methanol, butanol, isopropyl alcohol.....
 Excellent - no effect

KEYTONES

Lower boiling ketones.....Dissolve readily
 Higher boiling ketones.....Swell or dissolves

Aldehydes..... Soften or dissolves
 Esters..... Soften or dissolves

ETHERS, POLYETHERS AND ETHER-TYPE COMPOUND

Ethyl.....Slight softening
 Dichlorethyl ether..... Swells
 Diethyl Cellosolve..... Swells
 Dioxane.....Dissolves
 Propylene oxide..... Dissolves

Carbon Disulphide..... Swells, but on solvent action

CARBON TETRACHLORIDE..... Good

Chlorinated Hydrocarbons, such as ethylene, dichloride,
 Monochlor benzene, etc.....Dissolve or swell

GLYCOL - ETHERS.....Swells

HYDROCARBONS

Aromatics - Benzene, toluene, etc.....Swells
 Aliphatics - Gasoline, kerosene, petroleum oils and
 waxes, petrolatum, greases.....Excellent-no effect

OILS, FATS, AND WAXES

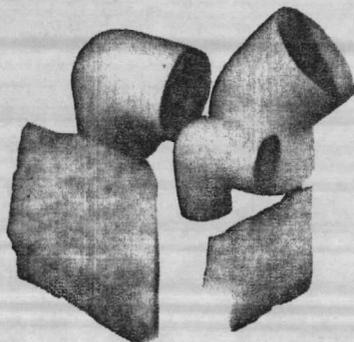
Animal, mineral, and vegetable..... Excellent-no effect

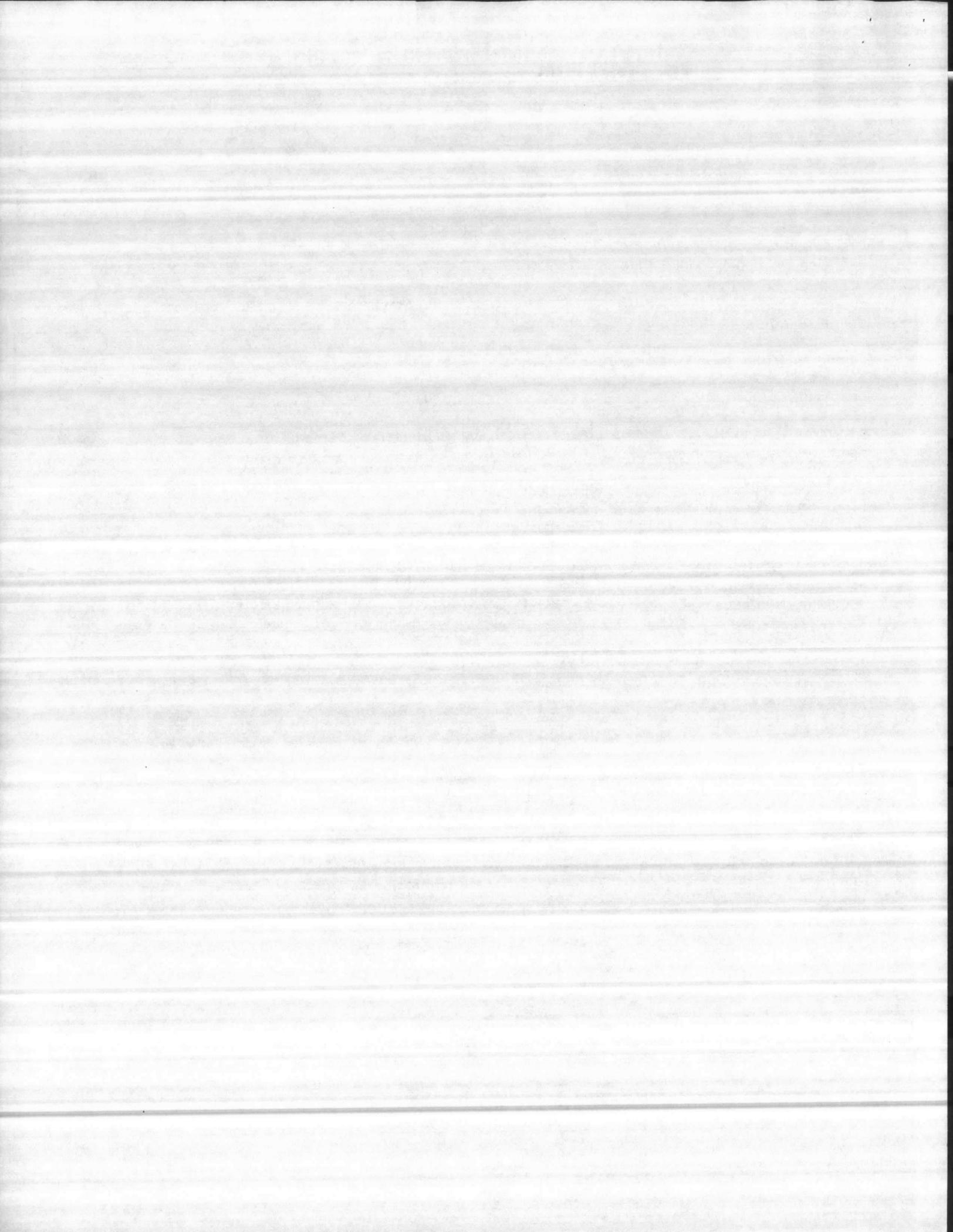
TECHNICAL DATA - PVC MATERIAL

Specific Gravity.....	1.41	Modulus of Elasticity in Flexure PSI.....	425,000
Water Absorbtion.....	.05	Izod impact strength, Ft. lbs./inch of notch.....	10.00
Tensil Strength PSI.....	7,000	Flammability.....	Self-Ext.
Flexural Strength PDI.....	11,000	Heat Distortion Temp. @ 264 lb. sq. in.....	69°C
Modulus of Elasticity in tension PSI	400,000	Moisture vapor transmission, Gm/Mil/100 in. 2/24 hrs.	4.4
Melt Point.....	250°-175°C	Self Ignition.....	526°C
Flash Point.....	260°C	Moisture Transmission.....	Less than .05 perms

ASTM E-84 TEST RESULTS:

Flame Spread..... 23 Fuel Contribution..... 0





INSULATION SYSTEMS

TYPE: FLEXIBLE BLANKET
TEMP. LIMIT: 250F*



J-M R-Series Microlite® (R-6, R-8) Fiber Glass Duct Insulations

DESCRIPTION: The J-M R-Series Microlite duct insulations represent a modern and more realistic concept of rating thermal performance. This principle eliminates the guess-work regarding density, thickness, fiber diameter, etc., in specifying insulation, and establishes assurance that the requirements for thermal performance are met. The designation "R" stands for thermal "resistance" (excluding facings) and is calculated from the formula $R = \frac{L}{\kappa}$ (where "L" is thickness and "κ" is the thermal conductivity).

Made of extremely fine, flame-attenuated glass fibers, bonded with a thermosetting resin, the R-Series, blanket-type insulations are lightweight, highly resilient and flexible.

AVAILABLE FORMS: R-Series Microlite is available in two performance-rated types, R-6 and R-8, indicating the thermal resistance of each as shown on the reverse side. It is supplied in roll form and with any of three factory-applied vapor barrier facings. Information on sizes and facings is also shown on the back of this sheet.

USES: For the control of heat loss or gain, or the prevention of condensation, these R-Series insulations offer maximum thermal performance at low cost. They are ideal for use on round or rectangular sheet metal ducts in cooling and heating systems, plenums or other surfaces where temperature control is essential.

*For service temperatures above those stated, consult the local Johns-Manville Industrial Insulations representative.

ADVANTAGES:

High Thermal Performance Performance is considerably more effective than most $\frac{3}{4}$ pcf., 1", 1½" and 2" thick fiber glass blanket insulations commercially available.

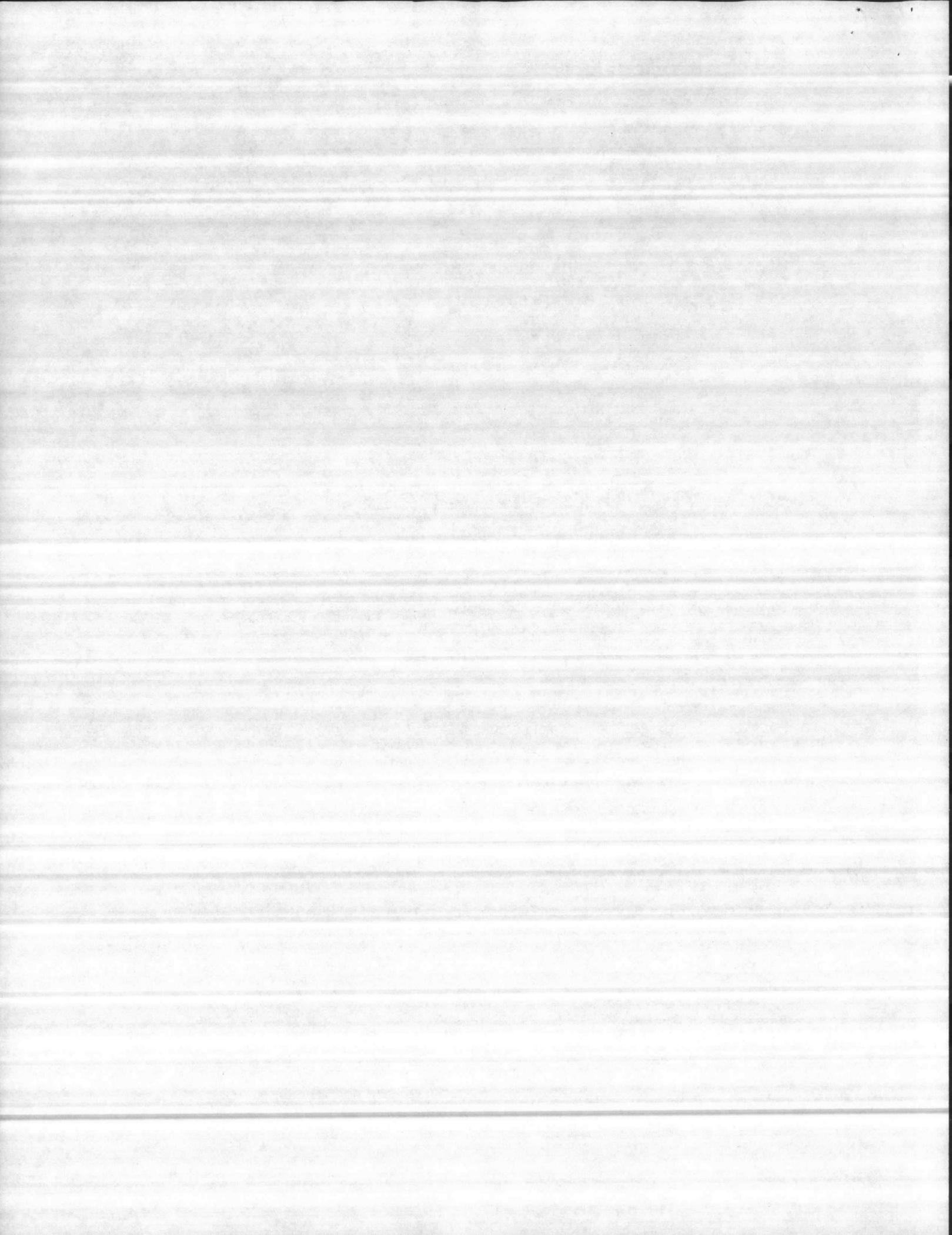
Resilient and Flexible Resists settling, breakdown or sagging from vibration. Yields readily to impact; protects facings from puncturing and tearing. Easy to form around corners and curved surfaces. Resilience helps to prevent undue compression at duct corners. Fits snugly around hangers and fittings.

Fire Safety R-Series Microlite, with certain facings, meets the requirements of NFPA 90A and 90B Standards and FHA on a *composite* basis (insulation, adhesive and facing). The UL fire hazard ratings are shown on the other side.

Strong Long glass fibers give high tensile strength to blankets. They won't pull apart during normal application and won't sag when properly applied.

Easy to Handle and Apply Light weight and flexibility of blanket makes it easy to wrap around ducts or to conform to surface irregularities. Easily cut with ordinary knife. Can be applied with adhesives or mechanical fasteners.

Durable Glass fibers are incombustible. They resist the effects of moisture; will not decompose, mildew, sustain vermin or fungi.



R-Series Microlite (R-6, R-8) Specification Data **

THERMAL RESISTANCE

$$R = \frac{L}{k}$$

- R-6 6.0 at 75F mean temp.
- R-8 8.0 at 75F mean temp.
(Facing not included)

FACING INFORMATION

- FSK** Reinforced Foil and Paper (Foil-Scrim-Kraft)
Aluminum foil reinforced with fiber glass yarn mesh and laminated to 32-lb. kraft. Meets NFPA 90A & 90B, UL rated.
- FSKL** Aluminum Foil reinforced with fiber glass yarn scrim laminated to 40-50 lb. kraft.
- CLS 1 V** Class 1 Vinyl*
.004" thick. Gray pigmented. Meets NFPA 90A and 90B. UL rated.

All R-Series Microlite insulations have one 2-inch sealing tab on facings.
*Available only from Defiance, Ohio and Cleburne, Texas.

PACKAGING INFORMATION

TYPE	BLANKET WIDTH (INCHES)	ROLL LENGTH (FEET)
R-6	24, 48	100
R-8	24, 48	50

Available faced only.

UNDERWRITERS' LABORATORIES FIRE HAZARD CLASSIFICATION

The following products meet the Fire Hazard Classification requirements of NFPA 90A and 90B Standards and FHA as tested by UL as a composite product (insulation, adhesive and facing). UL Guide No. 40 U8.3. Card R3711A.

- R-Series Microlite with FSK
 - R-Series Microlite with Class 1 Vinyl
- } FHC 25/50

GENERAL PROPERTIES

- Temperature (maximum)** 250 F*
- Moisture Absorption** Less than 0.2% by volume
- Alkalinity** Less than 0.6% expressed as Na₂O
- Corrosivity** (with steel, copper or aluminum) Does not cause or accelerate
- Odor** None
- Capillarity (after 24 hours)** Negligible
- Shrinkage** None
- Resistance to fungi and bacteria** Does not promote

*See footnote on other side.

**The physical and chemical properties of Johns-Manville R-Series Microlite represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Numerical flame spread rating is not intended to reflect hazards presented by this or any other materials under actual fire conditions. Check the Johns-Manville district office to assure current information.

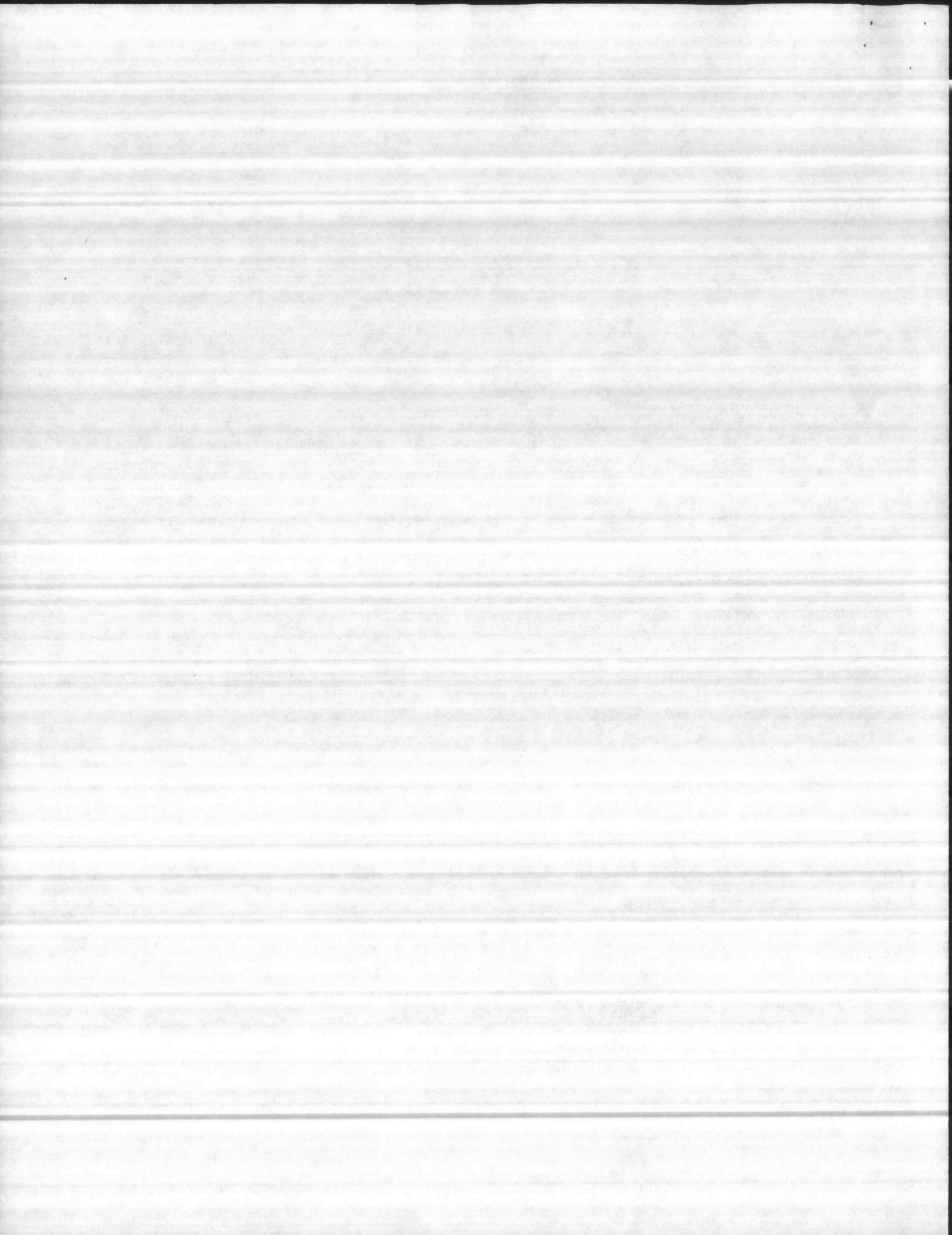
For Information on other J-M Thermal Insulations and Systems, Write the Johns-Manville Insulation Center, Drawer 17L, Denver, Colorado 80217 or Call (303) 979-1000.



Johns-Manville

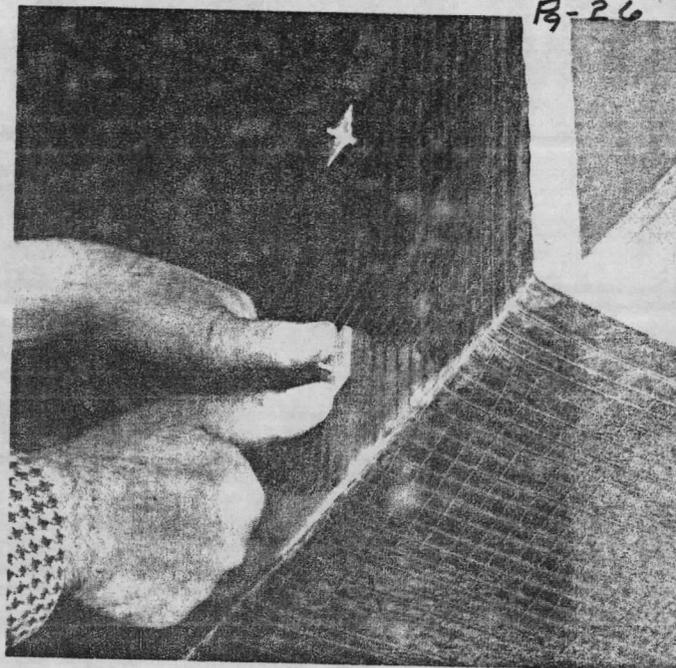
P.O. Box 5108 • Denver, Colorado 80217

Sales Offices in Principal Cities



INSULATION SYSTEMS

TYPE: FLEXIBLE & NON-FLEXIBLE
TEMP. LIMIT:*450°F Unfaced 350°F Faced



J-M 800 Series Spin-Glas® Fiber Glass Duct Insulations

DESCRIPTION: J-M 800 Series Spin-Glas duct insulation is manufactured from long, extremely fine inorganic glass fibers bonded by a thermosetting resin. Light, strong and resilient, it is easier to apply than most heavier density duct insulations.

AVAILABLE FORMS: Made in sheet and roll form, it is available in a variety of densities and with a choice of vapor barrier facings for a wide range of service requirements. Please refer to the table of Densities, Thicknesses and Facings, on the reverse side.

USES: 800 Series Spin-Glas can be used in plain form for heating ducts or with faced surfaces for below ambient applications. It is ideal for most commercial and industrial systems.

ADVANTAGES:

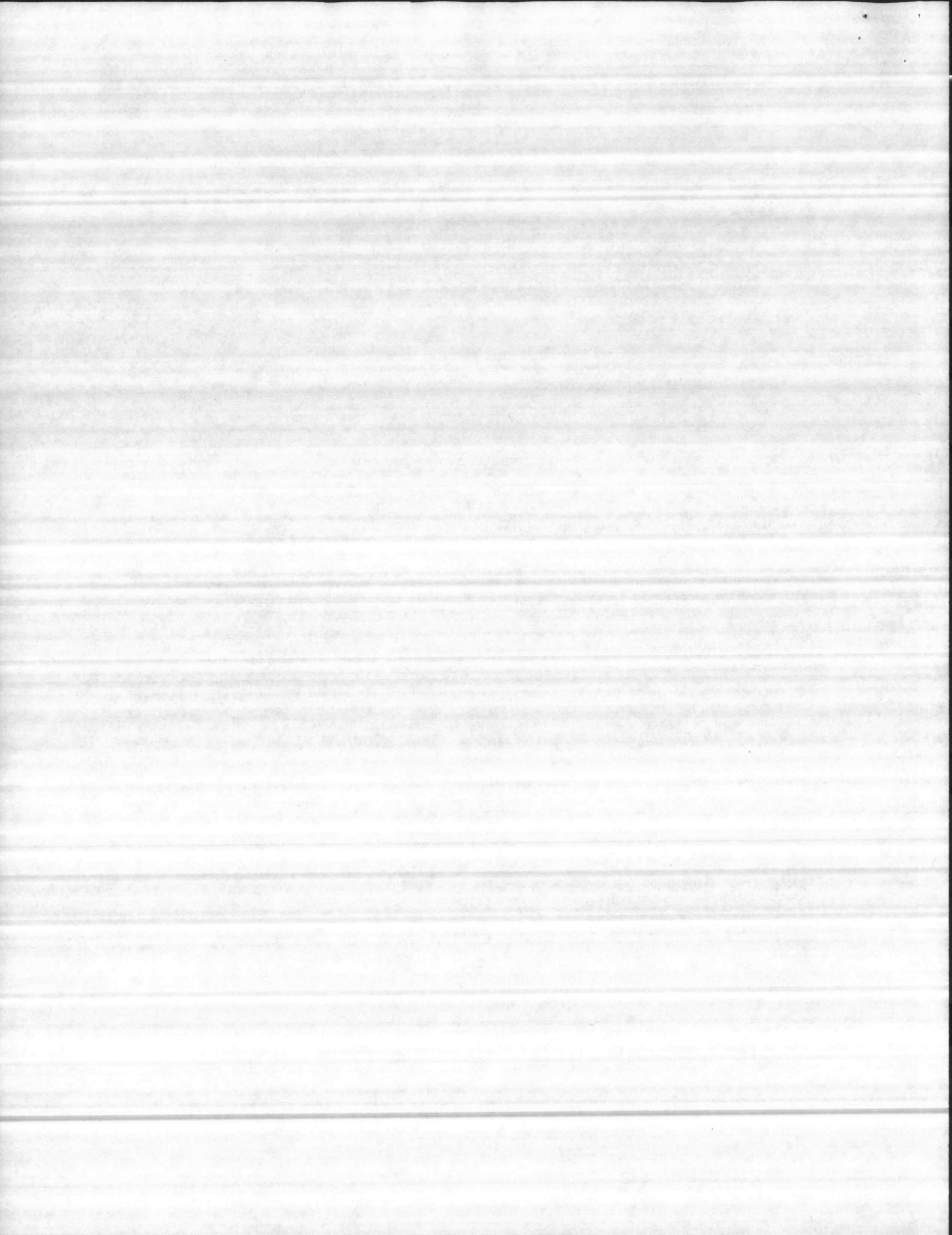
High Thermal Performance Because the glass fibers in Spin-Glas are extremely fine they create an enormous number of minute air spaces, making the insulation highly resistant to the passage of heat.

Fire Safety 800 Series Spin-Glas, with certain facings, meets the requirements of NFPA 90A and 90B Standards and FHA on a *composite* basis (insulation, adhesive and facing) as well as the plain form. The kraft paper used in the FSK laminate is permanently treated rather than salt treated to assure permanent fire safety and prevention of possible corrosion caused by salt. The fire hazard ratings are shown on the other side.

Strong and Durable Glass fibers are incombustible and resistant to the effects of moisture, oil, grease and most acids. The highly resilient glass fibers resist settling, breakdown or sagging from vibration; yield readily to impact; protect facings from puncture or tearing. Types 814 and 817 provide neat, square corners for improved, finished appearance of duct systems.

Easy to Handle and Apply The inherent physical properties of 800 Series Spin-Glas assure ease of application. It can be readily cut with an ordinary knife, easily placed around the duct and secured with mechanical fasteners or J-M adhesives.

*For service temperatures above those stated, consult the local Johns-Manville Industrial Insulations representative. Temperature limit is 350°F for 812.



800 Series Spin-Glas Specification Data **

GENERAL PROPERTIES

Temperature (maximum)	Unfaced 450F* Faced 350F
Moisture Absorption	Less than 0.2% by volume
Alkalinity	Less than 0.6% expressed as Na ₂ O
Corrosivity (with steel, copper or aluminum)	does not accelerate
Odor	None
Capillarity (after 24 hours)	Negligible
Shrinkage	None
Resistance to fungi and bacteria	Does not breed or promote

*See footnote on other side.

FACING INFORMATION

- FSK** Reinforced Foil and Paper (Foil-Scrim-Kraft)
Aluminum foil (minimum .7 mil thick) reinforced with fiber glass yarn mesh and laminated to 40-lb. permanently treated, fire-resistant kraft.
- AP** All-Purpose
A facing material consisting of high intensity, white, bleached, chemically-treated kraft paper, fiber glass yarn reinforcement and aluminum foil laminated together with a nonflammable-type adhesive. The kraft paper is embossed to impart desirable surface characteristics.

COMPLIANCE WITH GOVERNMENT SPECS

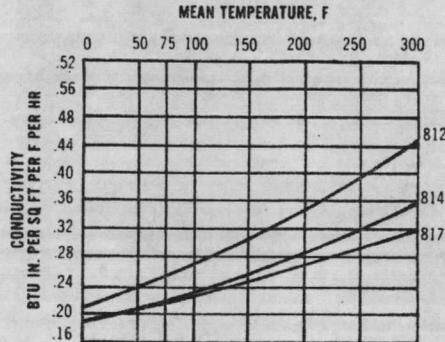
When ordering material to comply with any Government Specification, a statement of that fact must appear on the purchase order. Government regulations prohibit the certification of compliance after shipment has been made.

- HH-I-558B (GSA-FSS) Form A
Class 1 (Spin-Glas type 812)
Class 2 (Spin-Glas types 814, 817)
- HH-I-558B (GSA-FSS) Form B
Class 6 (Spin-Glas type 812)
Class 7 (Spin-Glas type 814)

**The physical and chemical properties of Johns-Manville 800 Series Spin-Glas represent typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Numerical flame spread rating is not intended to reflect hazards presented by this or any other materials under actual fire conditions. Check the Johns-Manville district office to assure current information.

For Information on other J-M Thermal Insulations and Systems, Write the Johns-Manville Insulation Center, Drawer 17L, Denver, Colorado 80217 or Call (303) 979-1000.

THERMAL CONDUCTIVITY



COMPOSITE FIRE HAZARD CLASSIFICATION

All Spin-Glas products meet the Fire Hazard Classification requirements of NFPA 90A and 90B Standards and FHA.

FHC 25/50

DENSITIES, THICKNESSES AND FACINGS

TYPE	DENSITY (pcf)	THICKNESS, Inches (In 1/2" increments)	
		Faced	Unfaced
812	1.60	FSK, AP 1-3	1-4
814	3.0	FSK, AP 1-3	1-4
817	6.0	FSK, AP 1-2	1-2

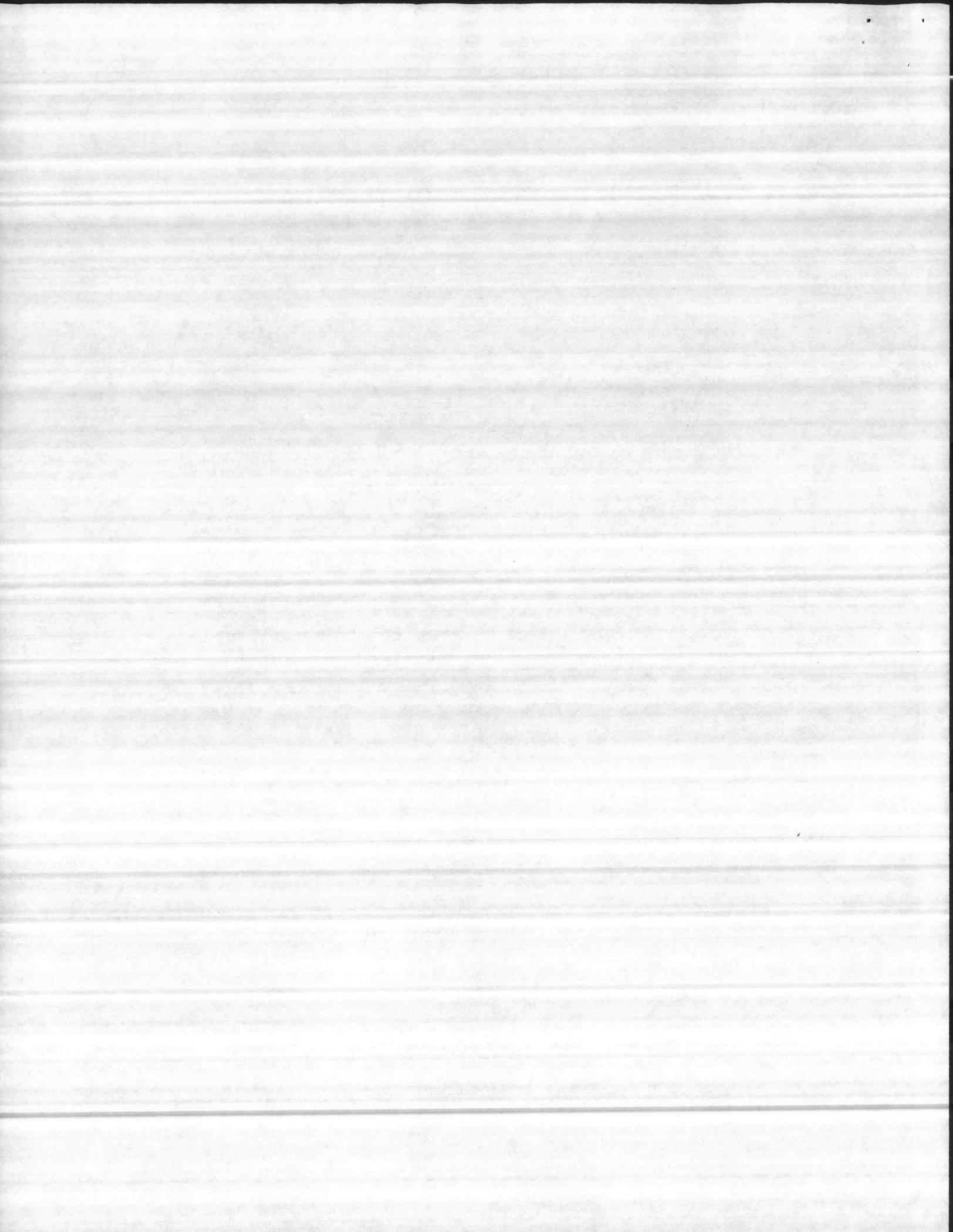
STANDARD SIZE: 24" x 48" (Type 812 available in rolls. Plain only.)
Non-standard sizes available upon request.



Johns-Manville

Ken Caryl Ranch • Denver, Colorado 80217

Sales Offices in Principal Cities



Johns-Manville



Micro-Lok™ 650

Type: Pipe Insulation
Temp: 650°F

Heavy Density Fiber Glass Pipe Insulation

OP/Overall Product in Place

Description

Micro-Lok 650 is a rigid fiber glass pipe insulation that offers superior insulating capabilities in applications to 650°F. It is made from long, flame-attenuated glass fibers bonded with a thermosetting resin. It is lightweight, easy to work with, and has a one-piece "hinged" construction for easy installation.

Jacket Types and Available Forms **AP (All Purpose) and AP-T (Pressure Sensitive Closure System) Jackets**

A high density, white kraft bonded to aluminum foil, reinforced with fiber glass yarn. The kraft paper is permanently treated to assure permanent fire and smoke safety and to prevent corrosion of foil. An adhesive is needed to seal the AP Jacket.

The longitudinal lap of the AP-T Jacket has a pressure sensitive tape closure system. The tape is protected by a strip of release paper which is pulled off prior to pressure sensitive tape butt strips are also furnished in order to totally seal the system. Both AP and AP-T jackets are produced in 3-foot sections for IPS 1/2" to 30" and CT sizes from 5/8" to 12" depending on thickness.

ML Jackets

A polished metal jacket is available in .016" aluminum, .010" stainless steel, or in .010" aluminum on special order. It has a longitudinal seam closure with special Z-joint construction that locks the insulation and jacket quickly and securely in place. Aluminum "snap-straps", containing a permanent plastic sealing compound, Albaseal®, are snapped around circumferential butt joints to seal out weather. Other types of aluminum jackets are available upon request.

ML jackets are produced in 3-foot sections in a complete range of IPS and CT sizes where outside diameter of the insulation is at least 3 1/2" and no more than 28". Above 28" O.D., jackets are supplied, but not factory attached.

Uses

Micro-Lok 650 pipe insulation is suitable for all heating applications up to 650°F (See qualifications for use). Jacket types AP and AP-T are designed for use on commercial, power or process lines where fire-safety, resistance to physical abuse and the utmost in appearance is desired. Micro-Lok 650, with AP or AP-T Jackets can also be used on cold and chilled water lines; brine, refrigerant and special process lines if the joints are sealed to prevent condensation migration.

Type ML jacket is designed for use on all hot lines and piping systems exposed to weather and subject to heavy physical abuse. It too is ideal for systems where good appearance is essential.

Advantages

High Insulating Efficiency. Micro-Lok 650 heavy density pipe insulation has a k factor of only 0.23 at 75°F. This means that a much lesser thickness of insulation is required with Micro-Lok 650 insulation than with most other insulations. Its low conductivity also cuts fuel costs significantly.

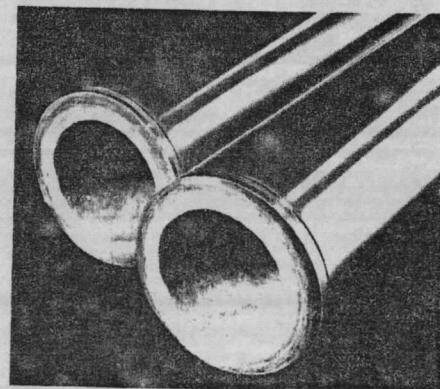
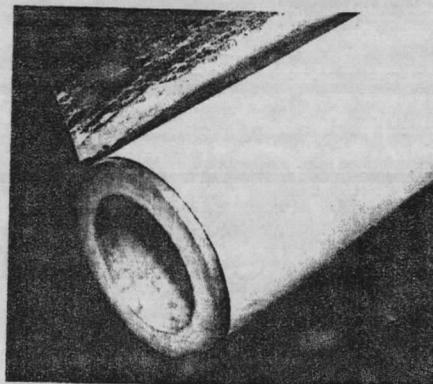
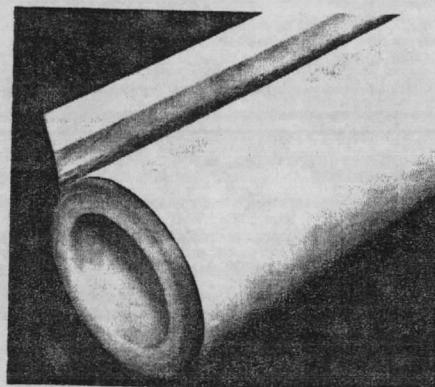
Economical to Apply. Lightweight, simplicity of design and easily fabricated, one piece construction speeds on-the-job handling and application.

Strong and Durable. The combination of resilient fiber glass insulation and tough jackets offers the highest degree of resistance to mechanical abuse during and after installation, insuring superior installed appearance.

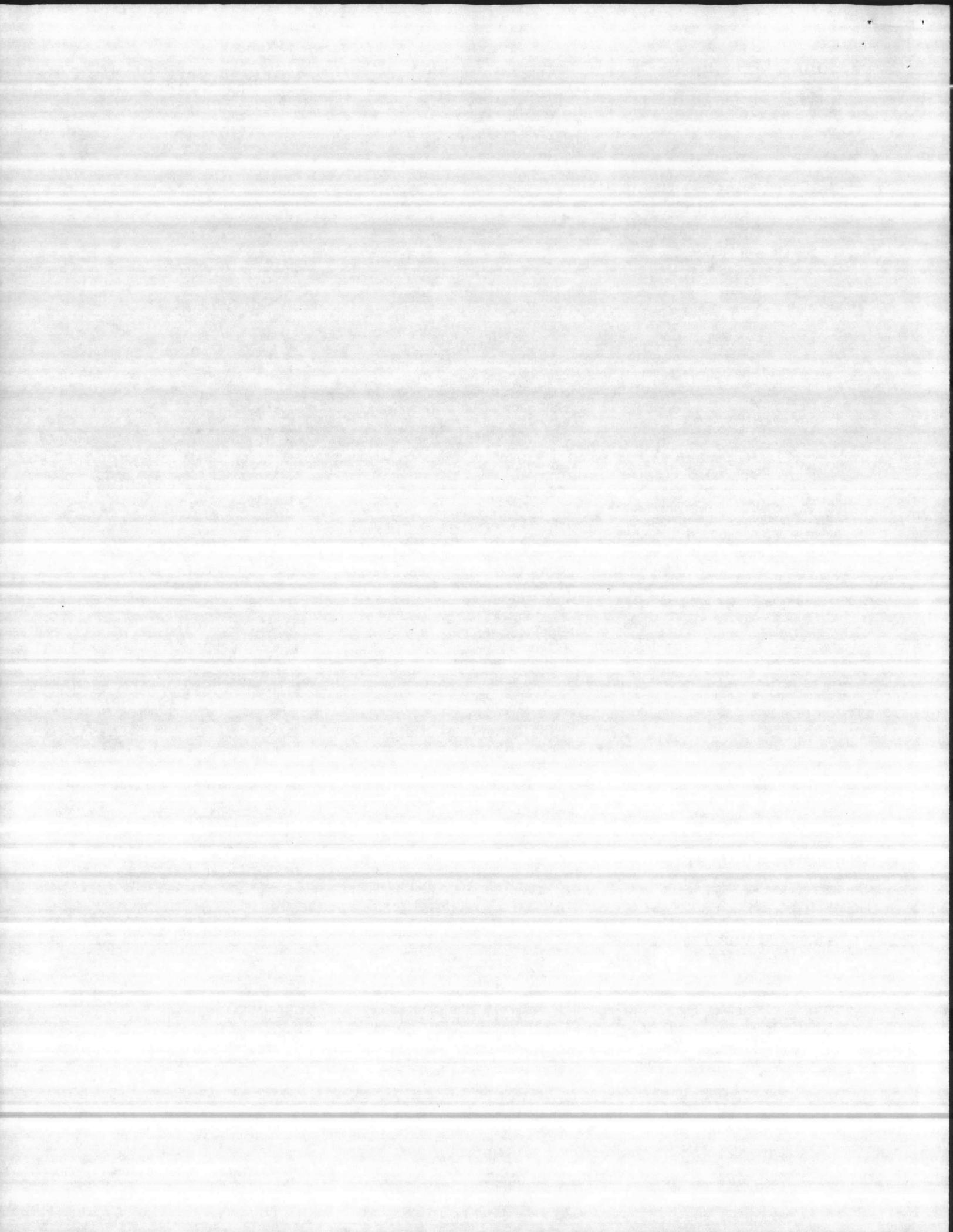
Ready to Paint. Types AP and AP-T jackets may be painted with a latex or water base paint after installation.

Dependable Weather Protection.

When using Micro-Lok 650 insulation with ML jacket, the insulation stays dry during installation, thus avoiding electrolytic corrosion of aluminum through direct contact with wet insulation which might occur when jacket is applied as a separate operation at the job site.



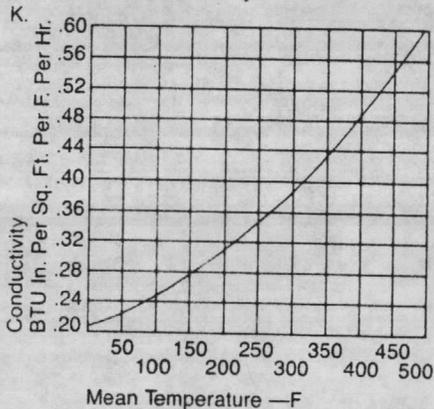
Qualifications for Use
At temperatures above 500°F, Micro-Lok 650 heavy density pipe insulation must be applied in a minimum thickness of 2". During initial heat-up, an acrid odor and some smoke may be given off. If this should occur, caution should be exercised to well-ventilate the area. If natural ventilation is not adequate, forced ventilation should be provided.



Physical Properties of Insulation

Temperature Limit	650°F
Moisture absorption	less than 0.2% by volume
Alkalinity	less than 0.6% expressed as Na ₂ O
Corrosivity (with steel, copper, aluminum)	does not accelerate
Capillarity (after 24 hrs)	negligible
Shrinkage	none
Resistance to fungi and bacterial	does not breed or promote

Thermal Conductivity



ASTM Specification Guidelines

- C-356 Linear Shrinkage
- C-335 Thermal Conductivity
- C-411 Hot Surface Performance
- C-585 Measurement of Inner and Outer Pipe Diameter

Physical Properties of Jackets AP and AP-T

Water Vapor Permeability (ASTM E-84)	.02 perm
Beach Puncture (ASTM-D-781-63T)	50 oz. in./in. tear
Tensile strength (ASTM-D-818-60)	AP-40 lbs./in. width AP-T 40 lbs./in. width
Mullen Burst (ASTM-D-774-67T)	70 psi

Application Recommendations
Type ML Jacket. Refer to brochures IND-3104 and IND-3098 for "Installation Tips".

AP-T Jacket & Butt Strips

1. Do not apply Micro-Lok 650 insulation with AP-T jacketing if air temperature is below 40°F or above 110°F due to the effect of temperature on tape performance. Recommend AP Jacket when application falls in these temperature ranges.
2. If stored below 40°F or above 110°, insulation cartons should stand within the recommended temperature range for 24 hours prior to application.
3. Once release paper is removed, both adhesive and lap must be kept free of dirt and water, and the lap sealed immediately.
4. When adhered, the lap **must** be pressurized by rubbing hard with the back of a knife blade or other hard surface several times to assure positive closure.
5. Outward clinch staples may be used on both hot and cold AP-T systems. On cold systems where a vapor barrier must be maintained staples should be coated or sealed with a vapor barrier mastic.

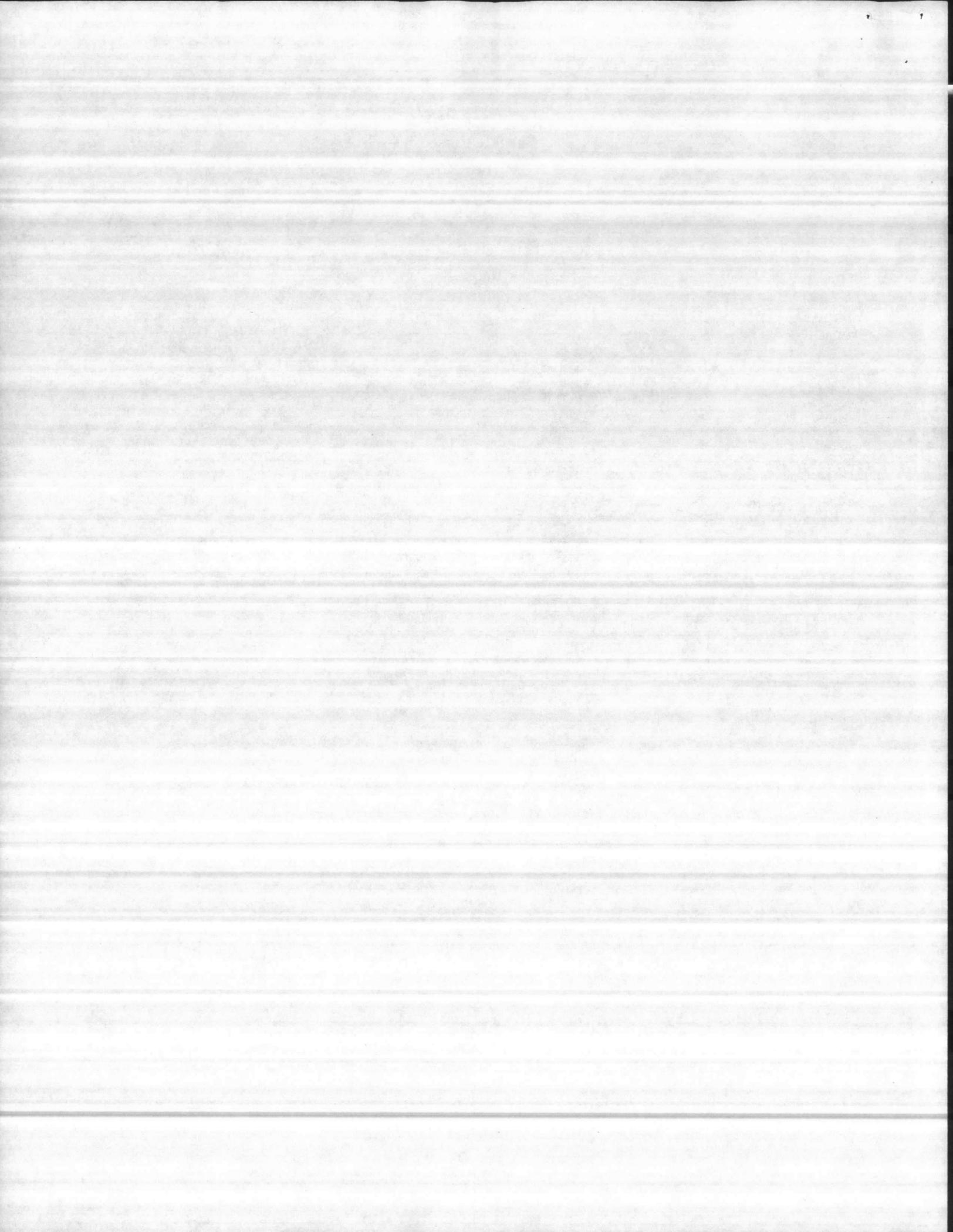
Compliance with Codes and Standards

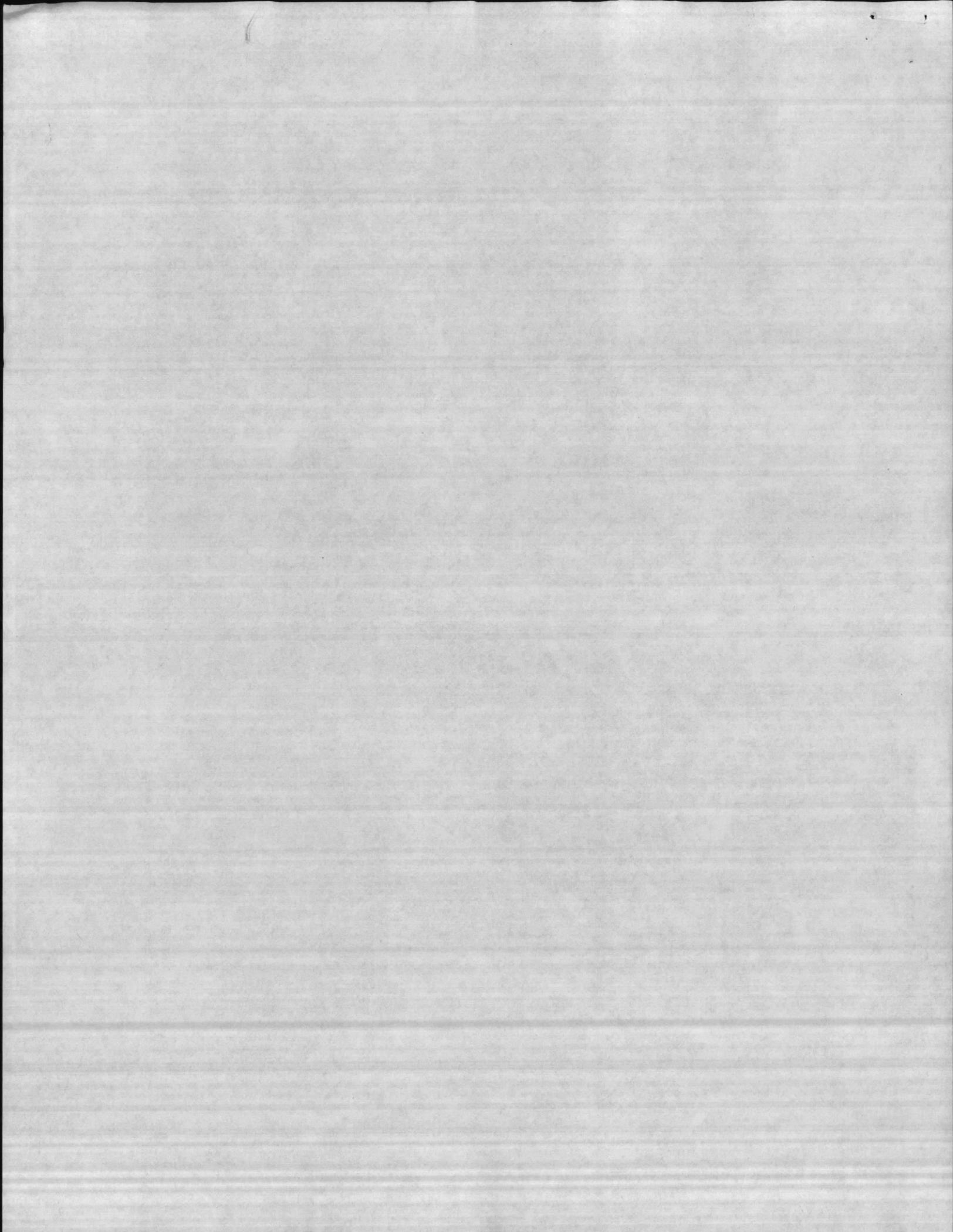
All Micro-Lok 650 pipe insulations are tested for Fire and Smoke Hazard Classification ratings on a COMPOSITE basis — insulation, jacket and adhesive used to secure jacket to insulation — in accordance with ASTM-E-84, ASTM-C-547, NFPA 255 and UL 723. Ratings do not exceed FHC 25/50. More explicit data available on request.

Compliance With Government Specs
MIL-I-22344B
HH-I-558B Form D, Type III, Class 12 and Class 13

MIL-I-24244. Please check with Johns-Manville Headquarters before order placement.
HH-B-100B, Type I and Type II







15-6

1910

1911

1912

1913



1914

1915