

TITLE: SHEET PACKING

- 1.0 Scope: This specification covers compressed sheet packing material.
- 2.0 Materials: The packing shall be made of Clingersil C4400.
- 3.0 Tolerances: Packing under this specification shall be of uniform thickness with a variation of:
 +.005) - 1/64 & under
 -.002) - 1/64 & under
 ±.005 - over 1/64 and under 1/16
 ±.008 - 1/16 and under 3/32
 ± 10% - 3/32 and over
- 4.0 Physical Requirements:
- 4.1 The packing shall be capable of withstanding temperatures up to 750 F.
- 4.2 The tensile strength shall be 2200 psi minimum average of longitudinal and transverse directions.
- 4.3 Compressability and recovery shall be tested as per ASTM D1147. Under a load of 5000 psi the compressability shall be 7 to 17% and the recovery 40% minimum.
- 5.0 Rejection: Failure to conform to this specification shall constitute reason for rejection.

Basic	Process	
Code No.	Specification	Form & Condition
-----	-----	-----
0906 D	As received	Sheet Packing

D - Test report not required to be furnished.

Approved Brand Names & Sources:

	Melrath Gasket Phila. Pa.
Clingersil C4400	
	W.B. Gallagher King of Prussia, Pa.

					FED CODE IDENT 16712
					
					SHT 1 OF 1 DEPT: 206
5	Chg'd to non-asbestos	09/19/86	DLG	7/24	SHEET PACKING
N	ISSUED	10/02/78	DLG	HBG	
CHG	ALTERATIONS	DATE	BY	CHK	DE12-0906

FILE: 09061 DE12

KBMT206

TECH OP RM: DD009 6/84

TX0048

MATERIAL SPECIFICATION - NM-7

Scope: This specification covers compressed asbestos sheet packing material similar to ASTM D-1170 #P1161A.

Materials: The packing shall consist of not less than 70% by weight of chrysotile asbestos fiber, not less than 10% by weight of rubber, natural and/or synthetic, sulphur and suitable mineral fillers.

Tolerances: Packing under this specification shall be of uniform thickness with a variation of:

+ .005) 1/64 & under
- .002)
± .005 - over 1/64 and under 1/16
± .008 - 1/16 and under 3/32
± 10% - 3/32 and over

Physical Requirements:

- (1) The packing shall be capable of withstanding temperatures up to 750°F.
- (2) The tensile strength of material 1/32" and thicker shall be 3500 Psi minimum average of longitudinal and transverse directions. Single ply sheets 1/64" thick shall have a minimum strength of 1200 Psi in the weakest direction and an average tensile strength of both longitudinal and transverse directions of not less than 2000 Psi as determined by ASTM D733.
- (3) Compressability and recovery shall be tested as per ASTM D1147. Under a load of 5000 Psi the compressability shall be 7 to 17% and the recovery 40% minimum.

Rejection: Failure to conform to this specification shall constitute reason for rejection.

Chemical Analysis: Two specimens shall be tested for the percent of asbestos fiber, percent of rubber cement and percent of chemically combined water.

<u>Basic</u>	<u>Material</u>	<u>Process</u>	<u>Form & Condition</u>
<u>Code No.</u>	<u>Specification</u>	<u>Specification</u>	
0906 D	NM-7	As received	Asbestos Sheet

NOTE: Use page 1 only for Purchasing.

D - Test report not required to be furnished.

	Supersedes issue	10/2/78	HG	TITLE NM-7	DELAWARE TRENTON, N.J. 08602 SHEET NO. 1 OF 2 Code 0906
	dated 7/24/70				
CHG	ALTERATIONS	DATE	BY	CHK	

Material Specification - NM-7

Scope: This specification covers compressed asbestos sheet packing material similar to ASTM D-1170 #F1161A.

Materials: The packing shall consist of not less than 70% by weight of chrysotile asbestos fiber, not less than 10% by weight of rubber, natural and/or synthetic, sulphur and suitable mineral fillers.

Tolerances: Packing under this specification shall be of uniform thickness with a variation of:

+ .005)
- .002) 1/64" & under
± .005 - over 1/64" and under 1/16"
± .008 - 1/16" and under 3/32"
± 10% - 3/32" and over

Physical Requirements:

- (1) The packing shall be capable of withstanding temperatures up to 750 F.
- (2) The tensile strength of material 1/32" and thicker shall be 3500 psi minimum average of longitudinal and transverse directions. Single ply sheets 1/64" thick shall have a minimum strength of 1200 psi in the weakest direction and an average tensile strength of both longitudinal and transverse directions of not less than 2000 psi as determined by ASTM D733.
- (3) Compressability and recovery shall be tested as per ASTM D1147. Under a load of 5,000 psi the compressability shall be 7 to 17% and the recovery 40% minimum.

Rejection: Failure to conform to this specification shall constitute reason for rejection.

Chemical Analysis: Two specimens shall be tested for the percent of asbestos fiber, percent of rubber cement and percent of chemically combined water.

<u>Basic</u> <u>Code No.</u> 0906	<u>Material</u> <u>Specification</u> NM-7	<u>Process</u> <u>Specification</u> As Received	<u>Form and Condition</u> Asbestos Sheet
---	---	---	---

NOTE: Use page 1 only for purchasing.

TX0051

11/8/63		Supersedes issue dated 9/4/63		NM-7	Page 1 of 2
DATE	CK. BY	APPD.	ALTERATIONS		
DE LAVAL TURBINE INC.				Code 0906	
TRENTON 2 NEW JERSEY U S A					

Material Specification - NM-7

Scope: This specification covers compressed asbestos sheet packing material similar to ASTM D-1170 #P1161A.

Materials: The packing shall consist of not less than 70% by weight of chrysotile asbestos fiber, not less than 10% by weight of rubber, natural and/or synthetic, sulphur and suitable mineral fillers.

Tolerances: Packing under this specification shall be of uniform thickness with a variation of:

+0.005) 1/64 & under
-0.002)
±0.005 - over 1/64 and under 1/16
±0.008 - 1/16 and over

Physical Requirements:

(1) The packing shall be capable of withstanding temperatures up to 750 F.
(2) The tensile strength shall be 3,500 psi minimum for sheets 1/32" and thicker. Single ply sheets 1/64" thick shall have a minimum strength of 1200 psi in the weakest direction and an average tensile strength of both longitudinal and transverse directions of not less than 2000 psi as determined by ASTM D733.

(3) Compressability and recovery shall be tested as per ASTM D1147. Under a load of 5,000 psi the compressability shall be 7 to 17% and the recovery 40% minimum.

Rejection: Failure to conform to this specification shall constitute reason for rejection.

Chemical Analysis: Two specimens shall be tested for the percent of asbestos fiber, percent of rubber cement and percent of chemically combined water.

<u>Basic</u>	<u>Material</u>	<u>Process</u>	<u>Form and Condition</u>
<u>Code No.</u>	<u>Specification</u>	<u>Specification</u>	
0906	NM-7	As received	Asbestos Sheet

NOTE: Use page 1 only for purchasing.

TX0053

		Supersedes page 1				Page 1 of 2
		Dated 9/15/58		NM-7		
9/4/63						
DATE	CK. BY	APP'D.	ALTERATIONS	DE LAVAL TURBINE INC. TRENTON 2, NEW JERSEY, U. S. A.		Code 0906

Material Specification - NM-7

Scope: This specification covers compressed asbestos sheet packing material similar to ASTM D-1170 #G-1111-1.

Materials: The packing shall consist of not less than 70% by weight of chrysotile asbestos fiber, not less than 10% by weight of rubber, natural and/or synthetic, sulphur and suitable mineral fillers.

Tolerances: Packing under this specification shall be of uniform thickness with a variation of plus or minus .002 for thicknesses up to 1/32".

Physical Requirements:

- (1) The packing shall be capable of withstanding temperatures up to 750 F.
- (2) The tensile strength shall be 3,500 psi minimum for sheets 1/32" and thicker. Single ply sheets 1/64" thick shall have a minimum strength of 1200 psi in the weakest direction and an average tensile strength of both longitudinal and transverse directions of not less than 2000 psi as determined by ASTM D733.
- (3) Compressability and recovery shall be tested as per ASTM D1147. Under a load of 5,000 psi the compressability shall be 12-20% and the recovery 40% minimum.

Rejection: Failure to conform to this specification shall constitute reason for rejection.

Basic
Code No.
0906

Material
Specification
NM-7

Process
Specification
As Received

Form and Condition
Asbestos Sheet

Handwritten: 7-2-63

NOTE: Use page 1 only for Purchasing.

<i>Handwritten initials</i>			NM-7		Code 0906	Page 1 of 2
DATE	CK. BY	APP'D.	ALTERATIONS	DE LAVAL TURBINE INC. TRENTON 2, NEW JERSEY U.S.A.		DE 12-911

DESCRIPTION: A premium "navy grade" sheet composed of graded asbestos fibers and bonded with an SBR Elastomer. Intended as a full service gasketing material where high bolt torques, temperatures and pressures will be encountered.

APPLICATIONS: Especially suited for sealing against steam, air, water, and many chemical solutions. Typical applications have been flange gaskets for paper making equipment and combustion gases.

Color: Black

Specifications: Meets ASTM D1170, P1161A, SAE J90b, P1161A, MIL G 12803, P1161A, HH-P-0046 D Class I, MIL-A-17472B and MIL-A-7021-B Class 2. Is listed on QPL 17472.

Typical Weights:

NOMINAL THICKNESS	POUNDS PER SQ. YD.	WEIGHT OF STOCK SHEETS - LBS.	
		50" x 50"	50" x 150"
1/64"	1.23	2.37	7.11
1/32"	2.46	4.74	14.22
1/16"	4.92	9.48	28.44
1/8"	9.84	18.96	56.88

PHYSICAL PROPERTIES:

Original

Density, lbs./cu.ft.	105
Longitudinal tensile strength, psi (typical)	7,000
Transverse tensile strength, psi (typical)	3,000
Compressibility, @ 5000 psi, %	7-17
Recovery, min., %	40
Flexibility factor, longitudinal, max.	10T
Flexibility factor, transverse, max.	8T
Sealability, ASTM fuel A, @ 70°F, 30" HG, 2000 psi., ML/HR	0.5

FLUID IMMERSIONS

ASTM No. 3 oil, 5 hrs. @ 300°F	
Thickness increase, %	20-50
Tensile loss max., %	70
ASTM Fuel B, 5 hrs. @ 70-85°F	
Weight increase, max., %	40
Thickness increase, %	15-35

NOTES:

Tests in accordance with ASTM designations F36, F37, F104, F146 and F152. Properties based on 1/32" thickness. See Page PK-41 for General Production information.

Added to 6906

9-27-76



**Johns-Manville
Sales Corporation**

Packings and Friction Materials Division

The Mall Building
Chestnut Street at Fourth
Philadelphia, Pa. 19106
(215) 922-5000

December 4, 1970

DeLaval Turbine Inc.
Turbine Division
Trenton, New Jersey 08602

Attention: H. L. Hudson
Metallurgist

Re: Your Code 0906
Your Letter November 20th

File

Gentlemen:

This is to advise that we have not changed the formulation or physical properties of J-M #60 Material.

Our letter of October 22nd did comment with regards to the military specification only to point out that the latest specification is -B. Our J-M #60 Material meets this revision in specification.

Very truly yours,

W. C. Campbell
W. C. Campbell
Special Representative

WCC/ab

TX0058

DE LAVAL
TURBINE INC.

TURBINE DIVISION
TRENTON, NEW JERSEY 08602 • TELEPHONE 609-587-5000
CABLE ADDRESS TURBINCO - TRENTON

November 20, 1970

Mr. W. C. Campbell
Special Representative
Johns-Manville Sales Corporation
The Mall Building
Chestnut Street at Fourth
Philadelphia, Pa. 19106

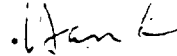
Re: Our Specification Code 0906 and Your Letter
of November 17, 1970

Dear Mr. Campbell,

We thank you for your letter. The subject De Laval
Specification was approved by Navsec March 6, 1964.
Since then we have had no trouble with the specification.
Has any change taken place in the JM#60 that would require
our review?

Thank you very much.

Yours very truly,



H. L. Hutson
Metallurgist

HLH:sj

Ltr. Ser. ME-414

TX0059



**Johns-Manville
Sales Corporation**

Packings and Friction Materials Division

The Mall Building
Chestnut Street at Fourth
Philadelphia, Pa. 19106
(215) 922-5000

November 12, 1970

De Laval Steam Inc.
Turbine Division
Trenton, New Jersey 08602

Attention: Mr. H. Hudson

Re: Your Specification 0906
J-M Specification #60

Gentlemen:

We understand that our letter of October 22nd with regards to this specification has been forwarded to you for review.

We wish to supplement the previous letter to state that our #60 material does meet your specification.

We would like to make a firm comment on the military specification and as soon as we receive your reply, we can complete the confirmation of #60 material for your specification 0906.

Very truly yours,

W. C. Campbell
Special Representative

WCC/ab

Mr. T. W. ...

TX0060



**Johns-Manville
Sales Corporation**

Packings and Friction Materials Division

The Mall Building
Chestnut Street at Fourth
Philadelphia, Pa. 19106
(215) 922-5000

November 17, 1970

DeLaval Turbine Inc.
Turbine Division
Trenton, New Jersey 08602

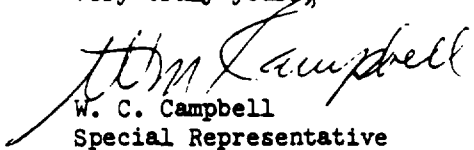
Attention: H. Hutson

Re: Your Specification 0906
J-M Specification 60

Gentlemen:

As requested of this office last week, we are attaching a copy of
our letter of October 22nd.

Very truly yours,


W. C. Campbell
Special Representative

WCC/ab

Enclosure

TX0061



**Johns-Manville
Sales Corporation**

Packings and Friction Materials Division

The Mall Building
Chestnut Street at Fourth
Philadelphia, Pa. 19106
(215) 922-5000

October 22, 1970

DeLaval Turbine Inc.
Turbine Division
Trenton, New Jersey 08602

Attention: Mrs. A. Twyan
Turbine Division

Re: Your Specification 0906
J-M Specification 60

Gentlemen:

We have tentatively reviewed this specification and find that our 60 material will meet your specifications. However, there are several minor points we wish to have our Quality Control Department review and have forwarded your specification to them.

We note that you referred to a specification MIL-A-7021-A. We note that the most recent specification is MIL-A-7021-B Amendment I dated November 4, 1964. Should this be changed? We will then comment as to our ability to meet this portion of your specification.

Very truly yours,

W. C. Campbell
Special Representative

WCC/ab

TX0062

TO

F. R. HOFFMAN

FROM

J. H. MILLER
DE LAVAL TURBINE INC.

355 Washington Way

Toronto 2, N.J.

Telephone: 609-387-3000

SUBJECT MATERIAL SPEC. NM-7(0906)

FOLD HERE

DATE

1-8-63

MESSAGE

THE SUBJECT SPECIFICATION WILL BE CHANGED
AS NOTED ON THE ATTACHED LETTER &
IN ACCORDANCE WITH THE PHYSICAL
REQUIREMENTS STATED BY J.M. ON THE
ATTACHED LETTER.

PLEASE RETURN A COPY OF LETTER (ATTACHED
FOR OUR FILES.

Dick C. - Please handle

11/11/63

SIGNED

J. H. Miller

DATE

REPLY

SIGNED

JOHNS-MANVILLE

SALES CORPORATION

PACKINGS AND FRICTION MATERIALS DIVISION

CHESTNUT ST. AT FOURTH • PHILADELPHIA 6, PA • PHONE WALNUT 2-5000 • AREA CODE 215



The MC Building

October 30, 1963

De Laval Turbine, Inc.
Trenton 2, New Jersey

ATTENTION: Mr. P. H. Hoffman,
Purchasing Agent

RE: Material Specification NM-7
Code 0906
Compressed Asbestos Sheet Packing

Gentlemen:

Replying to your letter of October 7th, your subject specification has been reviewed by our Manville, N. J. and Waukegan, Ill. Factory, Quality Control Departments, and they advised us that our Style #60 Service Compressed Asbestos Sheet Packing will comply but with the following exceptions..

TOLERANCES: THICKNESS

YOUR SPECIFICATION

+ .005)
- .002)

± .005 - over 1/64" & under 1/16"

± .008 - 1/16" ~~over~~ *over 3/32"*
± 10% - 3/32" & over

J-M STANDARD

1/64"	.012"	- .020"
1/32"	.026"	- .036"
3/64"	.042"	- .052"
1/16"	.055"	- .067"
3/32"	.083"	- .099"
1/8"	.111"	- .131"
5/32"	.143"	- .168"
3/16"	.172"	- .200"
1/4"	.229"	- .263"

PHYSICAL REQUIREMENTS:

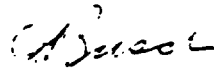
- (2) The tensile strength of material 1/32" and greater shall be 3500 PSI minimum average of longitudinal and transverse directions.

TX0064

De Laval Turbine, Inc.

Unless advised by you to the contrary, we will continue to fill your orders for Johns-Manville Style #60 Service Sheet Packing and gaskets conforming to your specification but with the exceptions noted in the foregoing.

Very truly yours,



C. BUSCH
DISTRICT SALES MANAGER

OB:hr

TX0065

MATERIAL SPECIFICATION - ASBESTOS FIBER

Scope: This specification covers asbestos fiber gasket material (Armstrong AN-8017).

Material: This material shall be made of asbestos fiber with an oil resistant synthetic rubber binder made by the modified beater-saturation process before being formed into sheets. The synthetic rubber binder shall be nitrile.

Tolerances:

<u>Nominal</u>	<u>Lot Variation</u>
1/64	.031 - .018
1/32	.028 - .034
1/16	.057 - .067

Physical Requirements: On cut gaskets thickness variation shall not exceed .002 up to 1/32 and .003 up to 1/16 on nominal.

- 1.) Tensile Strength 2,500 psi min.
- 2.) Compressibility (%) @ 5,000 psi - 7 - 17
- 3.) Recovery % - 40 min.

* This material is Armstrong Accobest AN8017 Code 0910 with Nitrile-Butadiene rubber binder.

<u>Basic Code</u>	<u>Material Spec.</u>	<u>Process Spec.</u>	<u>Form & Condition</u>
0910 D*	Asbestos	As Received	Sheet - Fiber

D* - Test Report not required to be furnished.

* CHANGE - ADDITION.

void as of 4/23/91

TX0066

2-23-78	ARM	Supersedes issue	ASBESTOS FIBER	Page 1 of 1	
	ARM	dated 8-19-70			
	H31	Title changed.			
DATE	CK. BY	APP'D.	ALTERATIONS	DE LAVAL TURBINE INC. TRENTON, NEW JERSEY 08646	Code 0910

MATERIAL SPECIFICATION - ASBESTOS FIBER

Scope: This specification covers asbestos fiber gasket material (Armstrong AN-8017).

Material: This material shall be made of asbestos fiber with an oil resistant synthetic rubber binder made by the modified beater-saturation process before being formed into sheets. The synthetic rubber binder shall be nitrile.

Tolerances:

<u>Nominal</u>	<u>Lot Variation</u>
1/64	.031 - .018
1/32	.028 - .034
1/16	.057 - .067

Physical Requirements: On cut gaskets thickness variation shall not exceed .002 up to 1/32 and .003 up to 1/16 on nominal.

- 1.) Tensile Strength 2,500 psi min.
- 2.) Compressibility (%) @ 5,000 psi - 7 - 17
- 3.) Recovery % - 40 min.

This material is Armstrong Accobest AN8017 Code 0910.

<u>Basic Code</u>	<u>Material Spec.</u>	<u>Process Spec.</u>	<u>Form & Condition</u>
0910 D*	Asbestos	As Received	Sheet - Fiber

D* - Test Report not required to be furnished.

Superseded 2-23-78

8/19/70	AHM	Supersedes issue	Cellulose Fiber	Page 1 of 1	
	Aim	dated 10/29/68.			
	HJB	Suffix "D" added.			
DATE	CK. BY	APP'D.	ALTERATIONS	DE LAVAL TURBINE INC. TRENTON, NEW JERSEY 08611	Code 0910

MATERIAL SPECIFICATION - ASBESTOS FIBER

Scope: This specification covers asbestos fiber gasket material (Armstrong AN-8017).

Material: This material shall be made of asbestos fiber with an oil resistant synthetic rubber binder made by the modified beater-saturation process before being formed into sheets. The synthetic rubber binder shall be nitrile.

Tolerances:

<u>Nominal</u>	<u>Lot Variation</u>
1/64	.031 - .018
1/32	.028 - .034
1/16	.057 - .067

Physical Requirements: On cut gaskets thickness variation shall not exceed .002 up to 1/32 and .003 up to 1/16 on nominal.

- 1.) Tensile Strength 2,500 psi min.
- 2.) Compressibility (%) @ 5,000 psi - 7 - 17
- 3.) Recovery % - 40 min.

This material is Armstrong Accobest AN8017 Code 0910.

<u>Basic Code</u>	<u>Material Spec.</u>	<u>Process Spec.</u>	<u>Form & Condition</u>
0910	Asbestos	As Received	Sheet - Fiber

10/29/68 AHM							Page 1 of 1
	A4m					Cellulose Fiber	
DATE	CK. BY	APP'D.	ALTERATIONS	DE LAVAL TURBINE INC. TRENTON, NEW JERSEY 08602		Code 0910	