FILE NAME: Copeland (COP)

DATE: 1987

DOC#: COP018

DOCUMENT DESCRIPTION: Specifications from Reinz

16.10.1987
VAI Rp/bo

Extraction values for REINZ-AFM 30

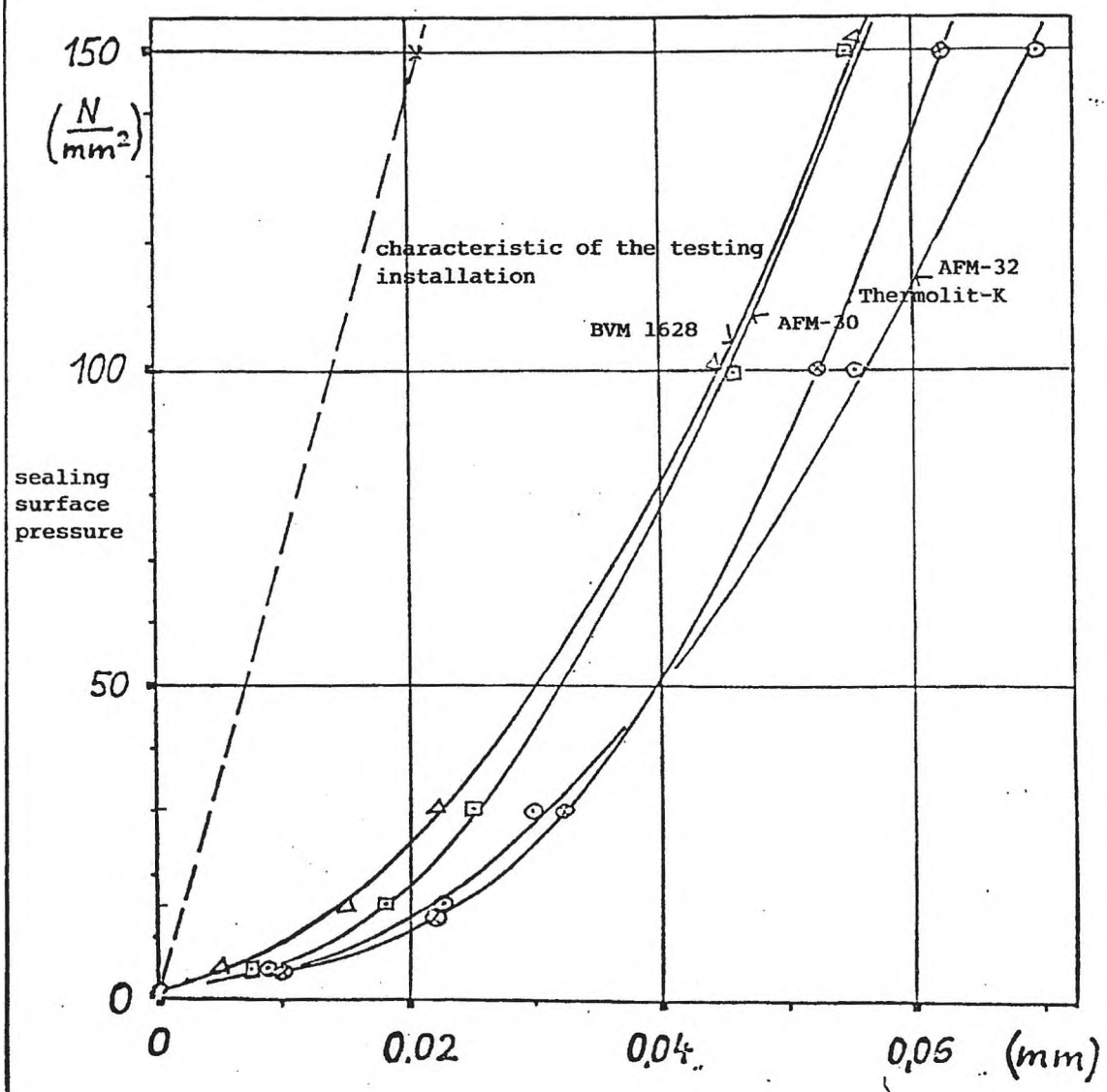
1.)	Chloride contents acc. to REINZ test method		0,016/0,016 %
	KWU-method	20 h	111/128 ppm
		40 h	151/150 ppm
		60 h	155/154 ppm
2.)	Freon extract	F 12	0,05/0,03 %
		F 22	0,11/0,13 %
3.)	Extract with Trichlorethylene		0,52/0,45 %

See Technical Data Sheet for values of REINZ-Thermolit-K

COP 0567

TEST CONDITIONS

- hydraulic testing press
- press plate: steel, ground
- pressure rates - duration: t_H = 1 min
- testing ring size (gasket): Ø 70 x 100 mm
- testing ring thickness (gasket): S_o = 0,25 + 0,05 mm



COP 0568

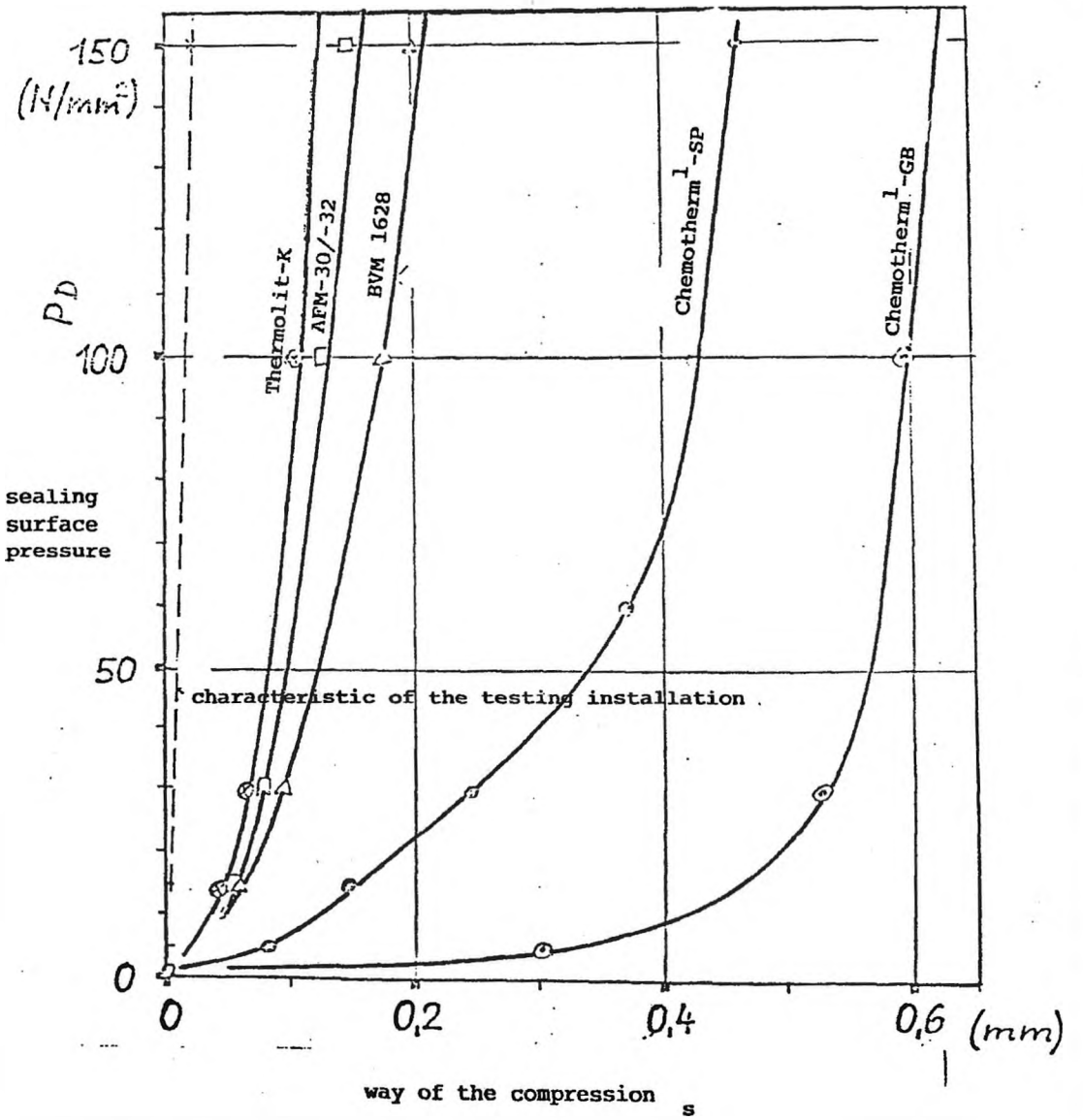
REINZ

characteristic of the deformation
"Chemotherm/AFM-30/-32/Spezial-IT"

figure ...

TEST CONDITIONS

- hydraulic testing press
- press plate: steel, ground
- pressure rates - duration: t_H = 1 min
- testing ring dimensions (gasket): Ø 70 x 100 min
- testing ring thickness (gasket): $s_o \approx$ 1 mm



1) blankable type with rust-free carrier plate 1.4401

COP 0569

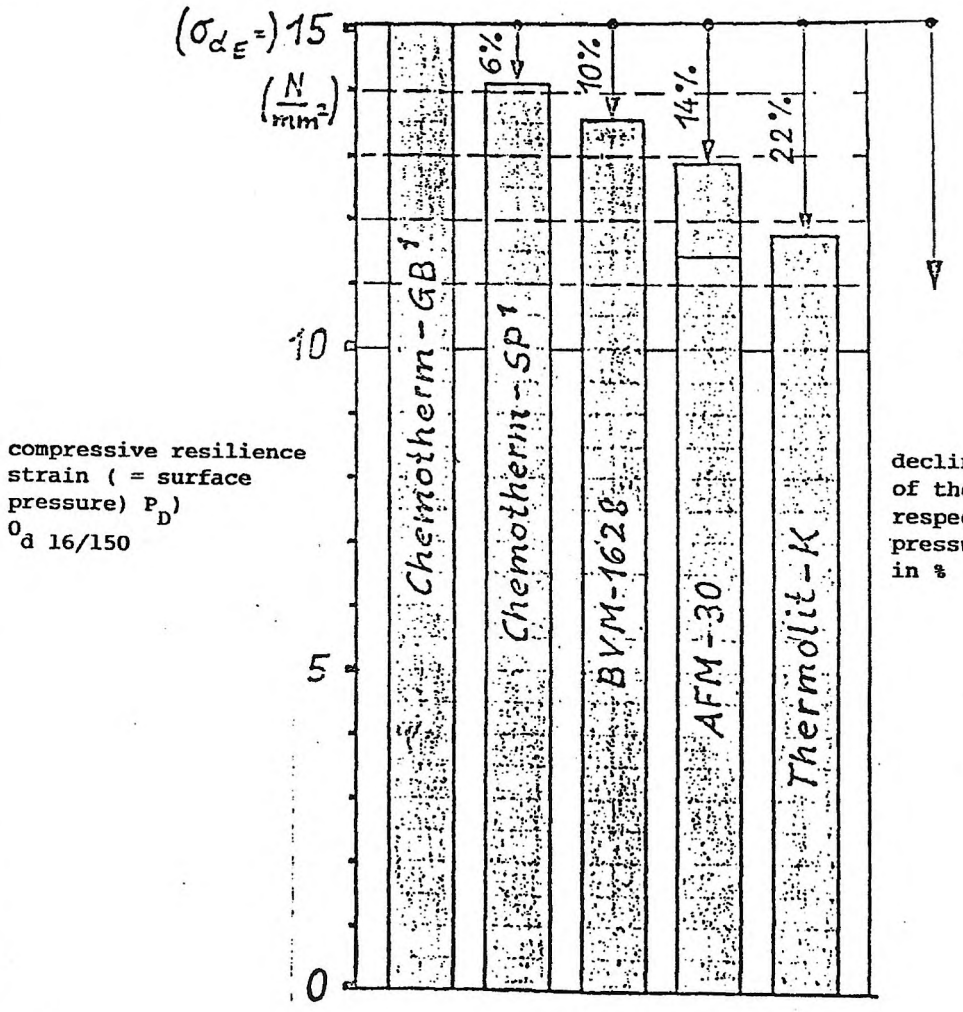
REINZ	characteristic of the deformation "Chemotherm/AFM-30/-32/Spezial-IT"	figure ...

TEST CONDITIONS

- testing installation and procedure acc. DIN 52.913
- testing ring dimensions (gasket): Ø 55 x 75 mm
- testing time: t = 16 h

Further conditions, variant from DIN 52913

- testing ring thickness (gasket): s_o = 1 mm
- compressive resilience strain (= surface pressure) in assembled condition:
  $\sigma_{d_E} = 15 \frac{N}{mm^2}$
- testing temperature: ϑ = 150 °C



compressive resilience strain (= surface pressure) P_D)
^{0}d 16/150

declination of the strain respectively pressure in %

1) blankable type with rust-free carrier plate 1.4401

COP 0570

REINZ

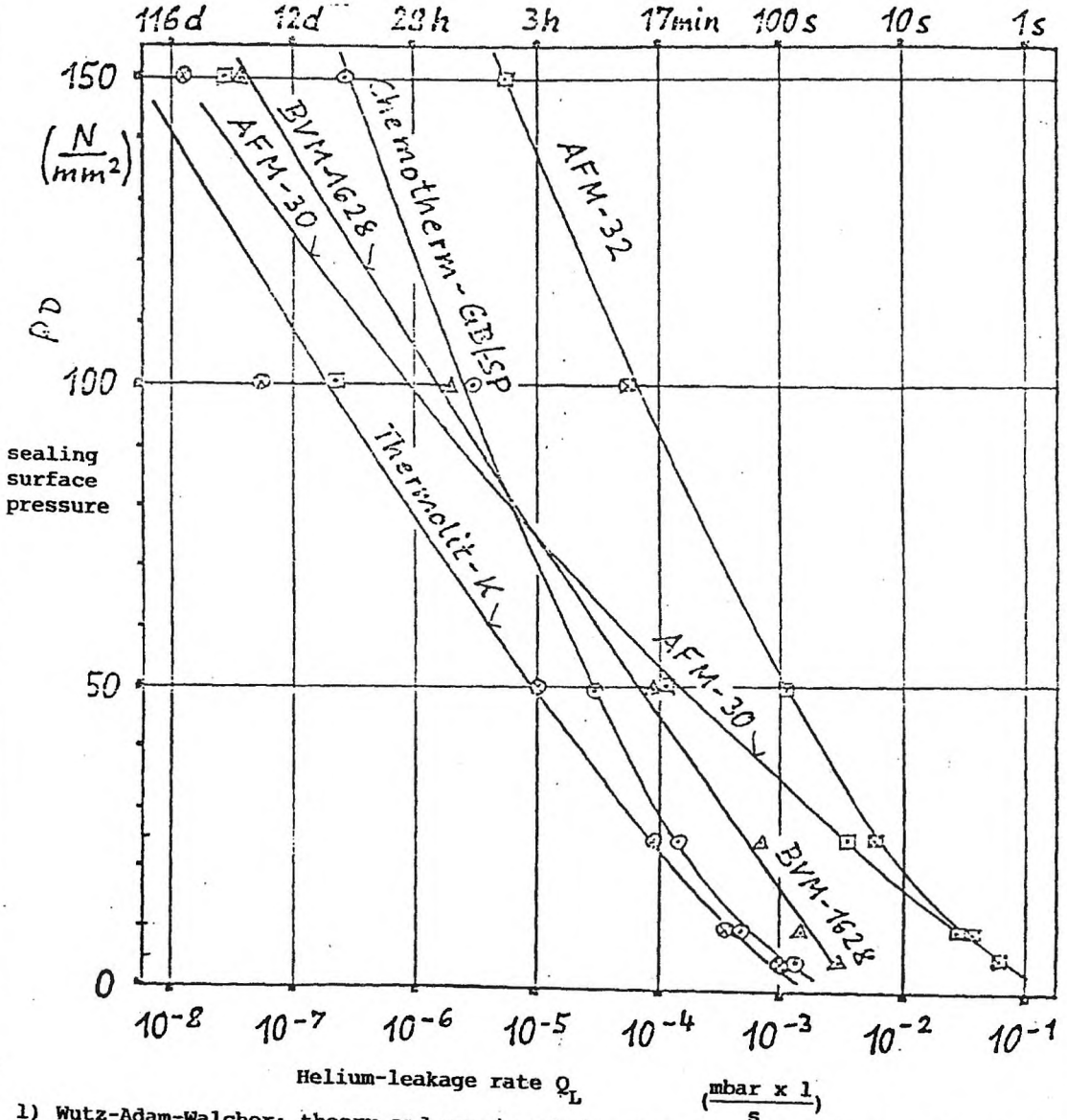
Stress Resistance
"Chemotherm/AFM-30/Spezial-IT"

figure ...

TEST CONDITIONS AND LEAKAGE RATES - RECALCULATIONS

- leakage - testing bench with He-mass spectrograph
- testing flange - sealing surfaces - roughness: R_z = 8 µm, turned
- He-testing pressure: Δp = 1,1 bar
- testing ring dimensions (gasket): Ø 70 x Ø 100 x 1 mm
- 1 m bar x l x s^{-1} (T_n) ≙ 1 cm³/s (T_n, P_n) ≙ 4,3 g air (20 °C)/h ≙ 1,55 x 10^5 g R12/year [1)]
- He : air ≈ 2,7 : 1 at < 10^{-7} mbar x l x s^{-1} and 1 : 1 at > 10^{-6} mbar x l x s^{-1} [1)]

≈ Time for the formation of only one gas bubble of the size V = 0,1 cm³:



1) Wutz-Adam-Walcher: theory and praxis of the vacuum processing. 2. edition 1982

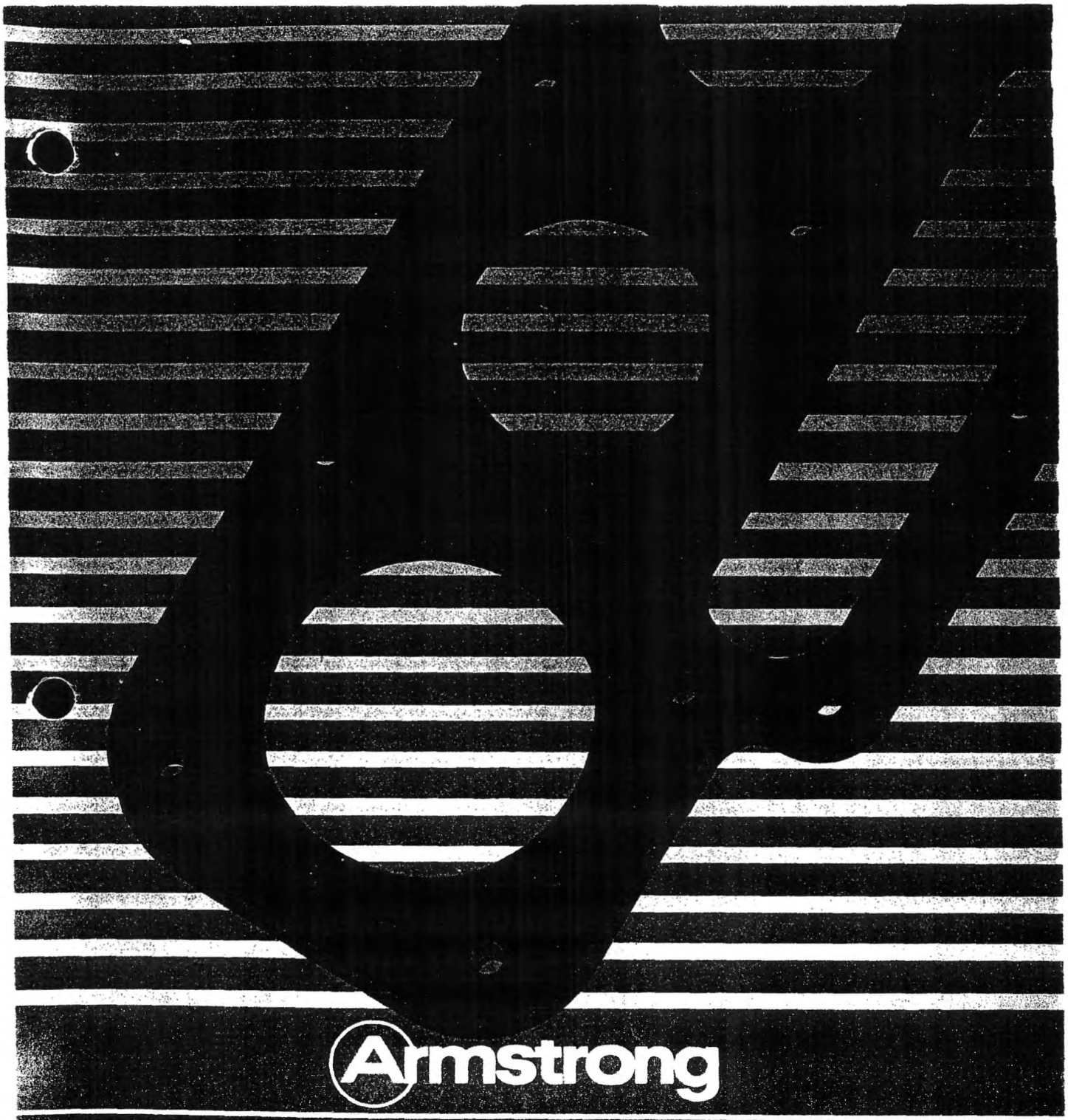
REINZ	leakage "Chemotherm/AFM-30/-32/Spezial-IT"	figure ... COP 0571

Test no. 96
Δp : 1.1 bar = const.
thickness as received: 0.995 mm
thickness after testing: 0.935 mm
testing ring Ø: 100 x 70 mm
testing flange-Rz: 8 µm
sealing surface pressure [N/mm^2]
150
125
100
75
50
25
0
10 5 10 5 10 5 10 5 10 5 10 5 10 5 10 5 10 5 10
-9 -8 -7 -6 -5 -4 -3 -2 -1
Helium leakage rate Q_L [mbar*l/s]
REINZ
HELIUM - SEALING
THERMOLIT-K
03.07.37
96

COP 0572

Test No. 96
Δp: 1.1 bar
thickness as received: 1.00 mm
thickness after testing: 0.925 mm
testing ring Ø: 100 x 70 mm
testing flange-Rz: 8 µm
sealing surface pressure p_D [N/mm^2]
150
125
100
75
50
25
0
10^{-9} $5\,10^{-8}$ $5\,10^{-7}$ $5\,10^{-6}$ $5\,10^{-5}$ $5\,10^{-4}$ $5\,10^{-3}$ $5\,10^{-2}$ $5\,10^{-1}$
Helium leakage rate Q_L [mbar*l/s]
REINZ
HELIUM - SEALING
AFM 30
test no. : 57
date 08.07.87
page
figure

COP 0573



Armstrong

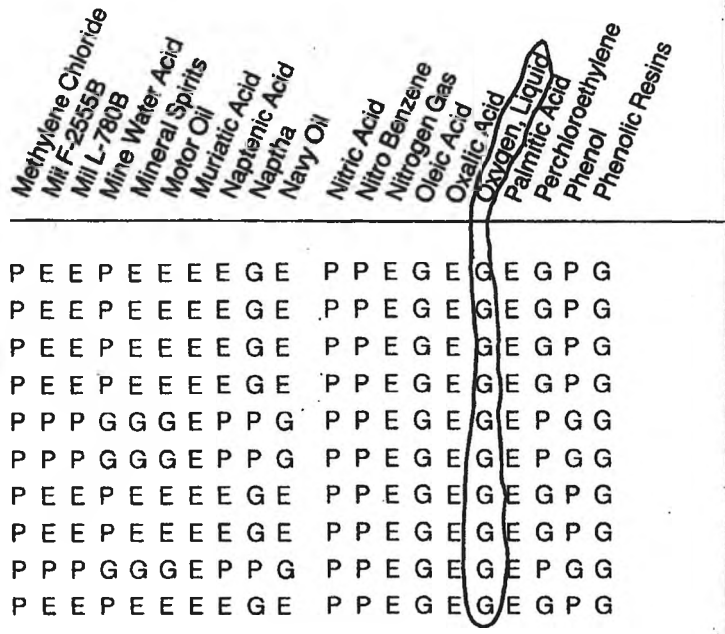
SYNTHESEAL® GASKET MATERIALS CHEMICAL—RESISTANCE TABLES

COP 1759

oda	Caustic Sulphide	Caustic Zinc Chloride	Chloride of Lime	Chlorinated Solvents	Chlorine	Chloroacetic Acid	Chloroacetone	Chlorobenzene	Chloroform	Chlorosulfonic Acid	Chromic Acid	Citric Acid	Clorox	Coconut Acid	Condensate Water	Copper Chloride	Copper Nitrate	Copper Sulfate	Creosol	Creosote
	G	E	G	P	G	G	P	P	P	P	P	E	E	E	E	E	G	E	G	E
	G	E	G	P	G	G	P	P	P	P	P	E	E	E	E	E	G	E	G	E
	G	E	G	P	G	G	P	P	P	P	P	E	E	E	E	E	G	E	G	E
	G	E	G	P	G	G	P	P	P	P	P	E	E	E	E	E	G	E	G	E
	G	E	G	G	P	G	G	P	P	P	P	E	G	P	G	E	G	E	P	P
	G	E	G	G	P	G	G	P	P	P	P	E	G	P	G	E	G	E	P	P
	G	E	G	P	G	G	P	P	P	P	P	E	E	E	E	E	G	E	G	E
	G	E	G	P	G	G	P	P	P	P	P	E	E	E	E	E	G	E	G	E
	G	E	G	G	P	G	G	P	P	P	P	E	G	P	G	E	G	E	P	P
	G	E	G	P	G	G	P	P	P	P	P	E	E	E	E	E	G	E	G	E

ol	Isopropyl Acetate	Isopropylamine	Kerosene	Lactic Acid	Linseed Oil	Liquid Oxygen	Liquified Petroleum Gas	Lubricating Oil	Lye, Caustic	Magnesium Hydroxide	Magnesium Sulphate	Maleic Acid	Methane	Methanol	Methyl Butyl Ketone	Methyl Dichloride	Methyl Ethyl Ketone	Methyl Isobut. Ketone	Methyl Isopro. Ketone	Methylacetate
	P	E	E	E	E	P	E	E	E	E	E	G	E	E	P	P	P	P	G	P
	P	E	E	E	E	P	E	E	E	E	E	G	E	E	P	P	P	P	G	P
	P	E	E	E	E	P	E	E	E	E	E	G	E	E	P	P	P	P	G	P
	P	E	E	E	E	P	E	E	E	E	E	G	E	E	P	P	P	P	G	P
	G	G	P	E	P	G	P	G	E	E	E	E	P	E	P	P	P	P	P	P
	G	G	P	E	P	G	P	G	E	E	E	E	P	E	P	P	P	P	P	P
	P	E	E	E	E	P	E	E	E	E	E	G	E	E	P	P	P	P	G	P
	P	E	E	E	E	P	E	E	E	E	E	G	E	E	P	P	P	P	G	P
	G	G	P	E	P	G	P	G	E	E	E	E	P	E	P	P	P	P	P	P
	P	E	E	E	E	P	E	E	E	E	E	G	E	E	P	P	P	P	G	P

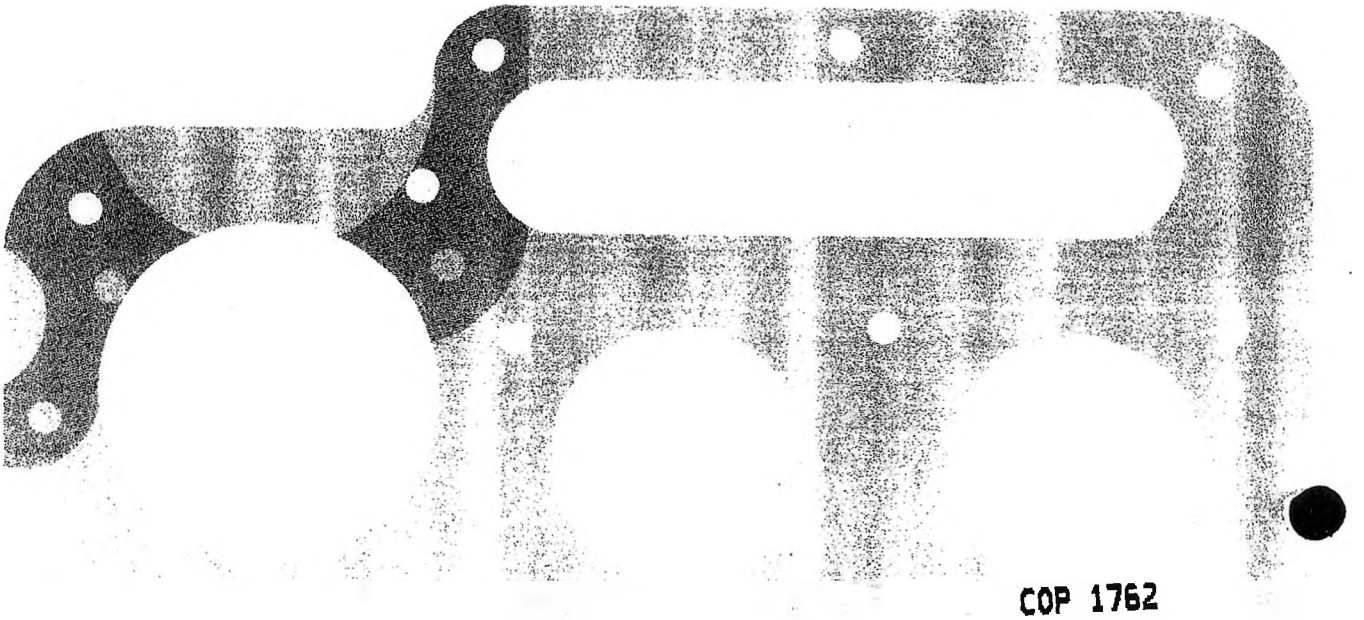
COP 1760


Methylene Chloride
Mil F-2555B
Mil L-780B
Mine Water Acid
Mineral Spirits
Motor Oil
Muriatic Acid
Naptienic Acid
Naptha
Navy Oil
Nitric Acid
Nitro Benzene
Nitrogen Gas
Oleic Acid
Oxalic Acid
Oxygen, Liquid
Palmitic Acid
Perchloroethylene
Phenol
Phenolic Resins
P E E P E E E E G E P P E G E G E E G P G
P E E P E E E E G E P P E G E G E E G P G
P E E P E E E E G E P P E G E G E E G P G
P E E P E E E E G E P P E G E G E E G P G
P P P G G G E P P G P P E G E G E E P G G
P P P G G G E P P G P P E G E G E E P G G
P E E P E E E E G E P P E G E G E E G P G
P E E P E E E E G E P P E G E G E E G P G
P P P G G G E P P G P P E G E G E E P G G
P E E P E E E E G E P P E G E G E E G P G

COP 1761

ARMSTRONG SYNTHESEAL PRODUCTS	CHEMICAL	Phosphoric Acid	Picric Acid	Plasticizer	Poly Glycols	Poly Vinyl Acetate	Propane	Propylene Glycol	Salt	Sea Water	Silicone Grease	Silicone Oil	Soap Solutions	Soda Ash	Sodium Bicarbonate	Sodium Chloride	Sodium Hydroxide	Sodium Hypochlorite	Sodium Silicate	Sodium Tetraborate	Steam	Stearic Acid	Styrene Monomer	Sulphuric Acid	Sulphurous Acid	Tannic Acid	Tartartic Acid	Tetra Ethyl Lead	Tetrahydrofuran	Toluene	Trisodium Phosphate	Turpentine	Urea	Vinegar	Vinyl Chloride	Vinylidene Chloride	Water	Zinc Chloride
TN-9000		P	E	G	E	G	E	P	E	E	E	E	E	E	E	E	E	E	E	E	E	E	P	P	E	E	E	E	G	P	E	E	G	E	G	G	E	E
TN-9001		P	E	G	E	G	E	P	E	E	E	E	E	E	E	E	E	E	E	E	E	E	P	P	E	E	E	E	G	P	E	E	G	E	G	G	E	E
TN-9004		P	E	G	E	G	E	P	E	E	E	E	E	E	E	E	E	E	E	E	E	E	P	P	E	E	E	E	G	P	E	E	G	E	G	G	E	E
TN-9005		P	E	G	E	G	E	P	E	E	E	E	E	E	E	E	E	E	E	E	E	E	P	P	E	E	E	E	G	P	E	E	G	E	G	G	E	E
TS-9003		P	E	G	G	G	P	G	E	E	E	E	E	E	E	E	G	E	E	E	E	E	P	P	E	E	E	P	P	P	G	P	G	E	G	G	E	E
TS-9006		P	E	G	G	G	P	G	E	E	E	E	E	E	E	E	G	E	E	E	E	E	P	P	E	E	E	P	P	P	G	P	G	E	G	G	E	E
N-8090		P	E	G	E	G	E	P	E	E	E	E	E	E	E	E	E	E	E	E	E	E	P	P	E	E	E	E	G	P	E	E	G	E	G	G	E	E
N-8092		P	E	G	E	G	E	P	E	E	E	E	E	E	E	E	E	E	E	E	E	E	P	P	E	E	E	E	G	P	E	E	G	E	G	G	E	E
S-8091		P	E	G	G	G	P	G	E	E	E	E	E	E	E	E	G	E	E	E	E	E	P	P	E	E	E	P	P	P	G	P	G	E	G	G	E	E
KN-9007		P	E	G	E	G	E	P	E	E	E	E	E	E	E	E	E	E	E	E	E	E	P	P	E	E	E	E	G	P	E	E	G	E	G	G	E	E

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COP 1762

Chemical Resistance

"All technical information and recommendations listed in these tables are based upon technical data to be reliable; but no representations, guarantees, or warranties, of any kind, are made as to the accuracy thereof and the suitability for any applications or any results to be obtained therefrom."

TABLE RATING SYSTEM

E–EXCELLENT RESISTANCE; Materials should be suitable for use with these fluids.

G–GOOD RESISTANCE; Acceptable performance of materials depends on the concentration and temperature of the fluids.

P–POOR RESISTANCE; Materials would not normally be suitable for these fluids, but in some cases the materials may be acceptable, depending on application parameters.

NOTE: In all cases, thorough testing and evaluation of the material, in the actual application, should be conducted and the material approved based upon its successful performance.

ARMSTRONG SYNTHESEAL PRODUCTS \ CHEMICAL	Acetaldehyde	Acetate Solvents	Acetic Acid, Cold	Acetic Acid, Hot	Acetic Anhydride	Acetone	Acetylene Gas	Acrylonitrile	Alkanes	Alkyl Benzene
TN-9000	P	G	G	P	G	P	E	P	E	P
TN-9001	P	G	G	P	G	P	E	P	E	P
TN-9004	P	G	G	P	G	P	E	P	E	P
TN-9005	P	G	G	P	G	P	E	P	E	P
TS-9003	P	G	G	P	E	E	E	G	P	P
TS-9006	P	G	G	P	E	E	E	G	P	P
N-8090	P	G	G	P	G	P	E	P	E	P
N-8092	P	G	G	P	G	P	E	P	E	P
S-8091	P	G	G	P	E	E	E	G	P	P
KN-9007	P	G	G	P	G	P	E	P	E	P

ARMSTRONG SYNTHESEAL PRODUCTS	Alkyl Chloride	Alum Solution	Aluminum Chloride	Aluminum Hydroxide	Aluminum Sulphate	Ammonia, Aqueous	Ammonia, Gas	Ammonium Bicarbonate	Ammonium Carbonate	Ammonium Chloride
TN-9000	P	E	E	E	E	P	E	E	P	E
TN-9001	P	E	E	E	E	P	E	E	P	E
TN-9004	P	E	E	E	E	P	E	E	P	E
TN-9005	P	E	E	E	E	P	E	E	P	E
TS-9003	P	E	E	E	E	P	E	E	E	E
TS-9006	P	E	E	E	E	P	E	E	E	E
N-8090	P	E	E	E	E	P	E	E	P	E
N-8092	P	E	E	E	E	P	E	E	P	E
S-8091	P	E	E	E	E	P	E	E	E	E
KN-9007	P	E	E	E	E	P	E	E	P	E

ARMSTRONG SYNTHESEAL PRODUCTS	Ammonium Hydroxide	Ammonium Nitrate	Ammonium Phosphate	Ammonium Sulphate	Amyl Acetate	Amyl Alcohol	Amyl Nitrate	Aniline	Antifreeze	Argon Gas
TN-9000	P	E	E	E	P	E	P	P	E	E
TN-9001	P	E	E	E	P	E	P	P	E	E
TN-9004	P	E	E	E	P	E	P	P	E	E
TN-9005	P	E	E	E	P	E	P	P	E	E
TS-9003	P	E	E	E	G	E	G	P	E	E
TS-9006	P	E	E	E	G	E	G	P	E	E
N-8090	P	E	E	E	P	E	P	P	E	E
N-8092	P	E	E	E	P	E	P	P	E	E
S-8091	P	E	E	E	G	E	G	P	E	E
KN-9007	P	E	E	E	P	E	P	P	E	E

ARMSTRONG SYNTHESEAL PRODUCTS	Arochlor 1248	Aromatic Fuels	Arsenic Acid	Asphalt	Barium Chloride	Barium Nitrate	Benzene	Benzoic Acid	Benzol	Black Liquor
TN-9000	G	G	E	E	E	E	P	P	P	P
TN-9001	G	G	E	E	E	E	P	P	P	P
TN-9004	G	G	E	E	E	E	P	P	P	P
TN-9005	G	G	E	E	E	E	P	P	P	P
TS-9003	P	P	E	P	E	E	P	G	P	P
TS-9006	P	P	E	P	E	E	P	G	P	P
N-8090	G	G	E	E	E	E	P	P	P	P
N-8092	G	G	E	E	E	E	P	P	P	P
S-8091	P	P	E	P	E	E	P	G	P	P
KN-9007	G	G	E	E	E	E	P	P	P	P

ARMSTRONG SYNTHESEAL PRODUCTS	Bleach	Boiler Water	Borax	Boric Acid	Brine	Bromine	Bunker C Fuel Oil	Bunker Oil	Butadiene	Butane
TN-9000	P	E	E	E	E	P	E	E	P	E
TN-9001	P	E	E	E	E	P	E	E	P	E
TN-9004	P	E	E	E	E	P	E	E	P	E
TN-9005	P	E	E	E	E	P	E	E	P	E
TS-9003	P	G	E	E	E	G	G	G	P	P
TS-9006	P	G	E	E	E	G	G	G	P	P
N-8090	P	E	E	E	E	P	E	E	P	E
N-8092	P	E	E	E	E	P	E	E	P	E
S-8091	P	G	E	E	E	G	G	G	P	P
KN-9007	P	E	E	E	E	P	E	E	P	E

ARMSTRONG SYNTHESEAL PRODUCTS	Butanol	Butyl Acetate	Butylamine	Butyric Acid	Calcium Carbonate	Calcium Chloride	Calcium Hydroxide	Calcium Hypochlorite	Calcium Phosphate	Carbolic Acid
TN-9000	E	P	G	P	E	E	E	G	E	G
TN-9001	E	P	G	P	E	E	E	G	E	G
TN-9004	E	P	G	P	E	E	E	G	E	G
TN-9005	E	P	G	P	E	E	E	G	E	G
TS-9003	E	G	P	G	E	E	E	P	G	P
TS-9006	E	G	P	G	E	E	E	P	G	P
N-8090	E	P	G	P	E	E	E	G	E	G
N-8092	E	P	G	P	E	E	E	G	E	G
S-8091	E	G	P	G	E	E	E	P	G	P
KN-9007	E	P	G	P	E	E	E	G	E	G

ARMSTRONG SYNTHESEAL PRODUCTS	Carbon Bisulphide	Carbon Dioxide	Carbon Disulphide	Carbon Monoxide	Carbon Tetrachloride	Carbonate of Soda	Carbonic Acid	Caustic	Caustic Pota...	Causti...
TN-9000	P	E	P	E	G	E	E	E	E	E
TN-9001	P	E	P	E	G	E	E	E	E	E
TN-9004	P	E	P	E	G	E	E	E	E	E
TN-9005	P	E	P	E	G	E	E	E	E	E
TS-9003	G	E	G	E	P	E	E	E	E	E
TS-9006	G	E	G	E	P	E	E	E	E	E
N-8090	P	E	P	E	G	E	E	E	E	E
N-8092	P	E	P	E	G	E	E	E	E	E
S-8091	G	E	G	E	P	E	E	E	E	E
KN-9007	P	E	P	E	G	E	E	E	E	E

ARMSTRONG SYNTHESEAL PRODUCTS \ CHEMICAL	Cresylic Acid	Crude Oil	Cupric Sulphate	Cutting Oil	Cyanide	Cyclohexane	Cyclohexanone	DDT in Kerosene	DDT in Toluene	Diacetone Alcohol
TN-9000	G	G	E	E	G	E	P	E	P	P
TN-9001	G	G	E	E	G	E	P	E	P	P
TN-9004	G	G	E	E	G	E	P	E	P	P
TN-9005	G	G	E	E	G	E	P	E	P	P
TS-9003	P	P	E	P	G	P	G	P	P	P
TS-9006	P	P	E	P	G	P	G	P	P	P
N-8090	G	G	E	E	G	E	P	E	P	P
N-8092	G	G	E	E	G	E	P	E	P	P
S-8091	P	P	E	P	G	P	G	P	P	P
KN-9007	G	G	E	E	G	E	P	E	P	P

ARMSTRONG SYNTHESEAL PRODUCTS	Dibutyl Adipate	Dibutyl Amine	Dibutyl Ether	Dibutyl Phthalate	Dichlorobenzene	Dichloroethane	Diesel Fuel	Diesel Oil	Diethanolamine	Diethylene Glycol
TN-9000	G	P	G	P	P	P	E	E	G	E
TN-9001	G	P	G	P	P	P	E	E	G	E
TN-9004	G	P	G	P	P	P	E	E	G	E
TN-9005	G	P	G	P	P	P	E	E	G	E
TS-9003	G	P	P	P	P	G	P	G	G	E
TS-9006	G	P	P	P	P	G	P	G	G	E
N-8090	G	P	G	P	P	P	E	E	G	E
N-8092	G	P	G	P	P	P	E	E	G	E
S-8091	G	P	P	P	P	G	P	G	G	E
KN-9007	G	P	G	P	P	P	E	E	G	E

ARMSTRONG SYNTHESEAL PRODUCTS	Diethylether	Dimethyl Phthalate	Dinitrotoluene	Dioctyl Phthalate	Distilled Water	DOW Silicone Fluid	Dowtherm, A	Dowtherm, E	Epsom Salt	Ethane
TN-9000	P	P	P	P	E	E	E	E	E	E
TN-9001	P	P	P	P	E	E	E	E	E	E
TN-9004	P	P	P	P	E	E	E	E	E	E
TN-9005	P	P	P	P	E	E	E	E	E	E
TS-9003	P	P	P	G	E	E	E	E	E	P
TS-9006	P	P	P	G	E	E	E	E	E	P
N-8090	P	P	P	P	E	E	E	E	E	E
N-8092	P	P	P	P	E	E	E	E	E	E
S-8091	P	P	P	G	E	E	E	E	E	P
KN-9007	P	P	P	P	E	E	E	E	E	E

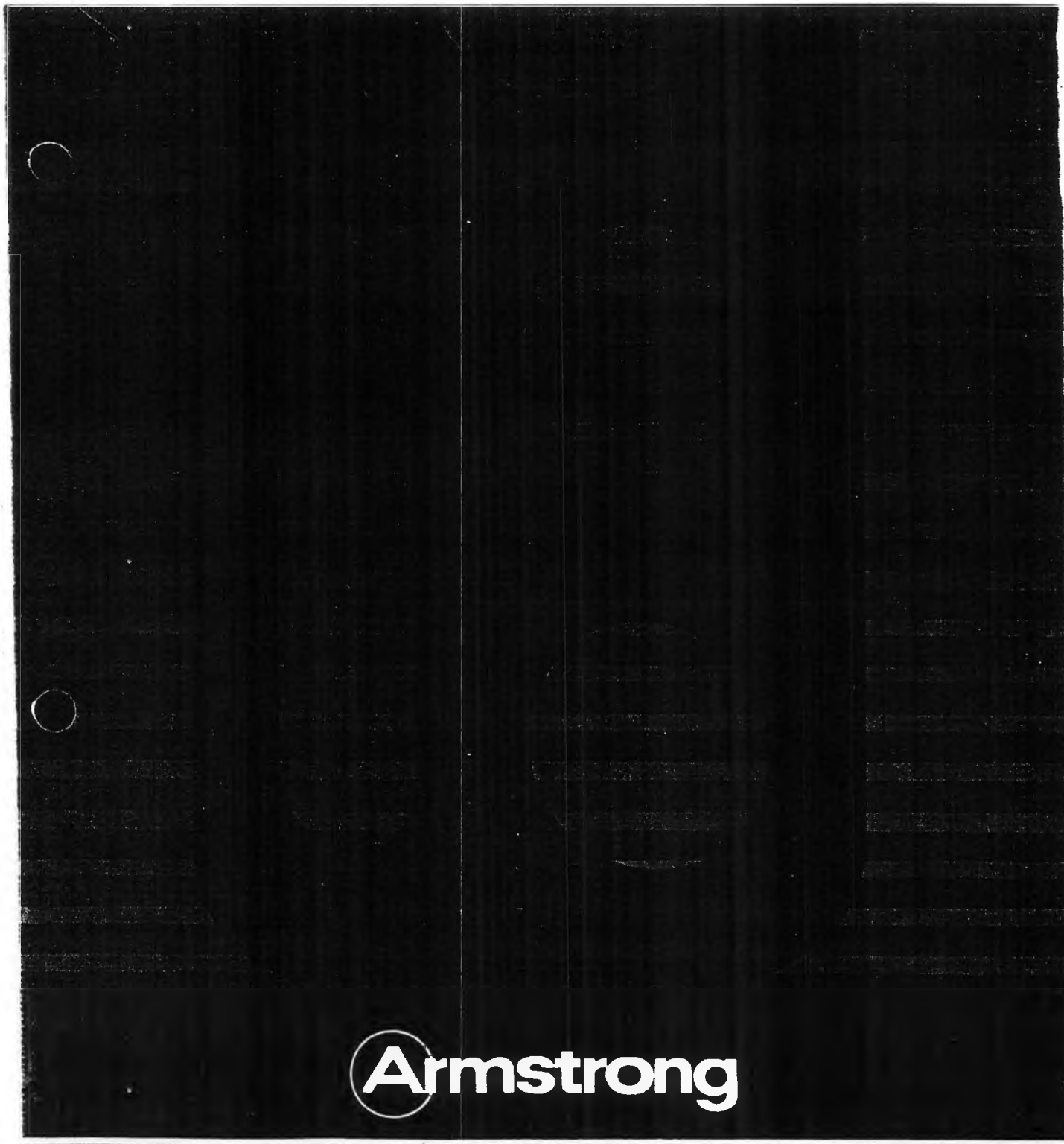
ARMSTRONG SYNTHESEAL PRODUCTS	Ethanol	Ethyl Alcohol	Ethyl Benzene	Ethyl Chloride	Ethyl Ether	Ethylene Diamine	Ethylene Glycol	Ethylene Oxide	Ferric Chloride	Ferric Sulphate
TN-9000	E	E	P	E	G	E	E	P	E	E
TN-9001	E	E	P	E	G	E	E	P	E	E
TN-9004	E	E	P	E	G	E	E	P	E	E
TN-9005	E	E	P	E	G	E	E	P	E	E
TS-9003	E	E	P	E	G	E	E	G	E	E
TS-9006	E	E	P	E	G	E	E	G	E	E
N-8090	E	E	P	E	G	E	E	P	E	E
N-8092	E	E	P	E	G	E	E	P	E	E
S-8091	E	E	P	E	G	E	E	G	E	E
KN-9007	E	E	P	E	G	E	E	P	E	E

ARMSTRONG SYNTHESEAL PRODUCTS	Fluorolube	Formaldehyde	Formic Acid	Freon 11 & Oil	Freon 113 & Oil	Freon 12 & Oil	Freon 22 & Oil	Fuel Oil	Gasoline	Glucose
TN-9000	E	E	E	E	E	E	P	E	E	E
TN-9001	E	E	E	E	E	E	P	E	E	E
TN-9004	E	E	E	E	E	E	P	E	E	E
TN-9005	E	E	E	E	E	E	P	E	E	E
TS-9003	P	G	E	P	E	E	E	P	P	E
TS-9006	P	G	E	P	E	E	E	P	P	E
N-8090	E	E	E	E	E	E	P	E	E	E
N-8092	E	E	E	E	E	E	P	E	E	E
S-8091	P	G	E	P	E	E	E	P	P	E
KN-9007	E	E	E	E	E	E	P	E	E	E

ARMSTRONG SYNTHESEAL PRODUCTS	Glycerin	Glycols	Helium	Heptane	Hexane	Hexene	Hydrazine	Hydrobromic Acid	Hydrocyanic Acid	Hydrofluoric Acid
TN-9000	E	E	E	E	E	E	E	P	E	P
TN-9001	E	E	E	E	E	E	E	P	E	P
TN-9004	E	E	E	E	E	E	E	P	E	P
TN-9005	E	E	E	E	E	E	E	P	E	P
TS-9003	E	E	E	P	P	P	G	G	E	P
TS-9006	E	E	E	P	P	P	G	G	E	P
N-8090	E	E	E	E	E	E	E	P	E	P
N-8092	E	E	E	E	E	E	E	P	E	P
S-8091	E	E	E	P	P	P	G	G	E	P
KN-9007	E	E	E	E	E	E	E	P	E	P

ARMSTRONG SYNTHESEAL PRODUCTS	Hydrogen Fluoride	Hydrogen Peroxide	Hydroxyacetic Acid	Hypochlorous Acid	Insecticides, Aromat.	Insecticides, Nonaro.	Iodine	Isooctane	Isobutyl Alcoh...	Isopr...
TN-9000	P	P	G	P	P	E	G	E	E	E
TN-9001	P	P	G	P	P	E	G	E	E	E
TN-9004	P	P	G	P	P	E	G	E	E	E
TN-9005	P	P	G	P	P	E	G	E	E	E
TS-9003	P	P	G	E	G	G	G	P	E	E
TS-9006	P	P	G	E	G	G	G	P	E	E
N-8090	P	P	G	P	P	E	G	E	E	E
N-8092	P	P	G	P	P	E	G	E	E	E
S-8091	P	P	G	E	G	G	G	P	E	E
KN-9007	P	P	G	P	P	E	G	E	E	E

COP 1763



Armstrong

NONASBESTOS GASKET MATERIAL ENGINEERING DESIGN FEATURES

• Syntheseal® • Thermo-Tork® • Tufgraph™

THE EXPERTS EXPERTS DEPEND ON

COP 1764

Syntheseal Product Line

Fully Cured Binder System

Nitrile Binder
N-8092
Reinforced Cellulose Fiber System
350 °F
(177 °C)

Latent-Cure Binder System

Nitrile Binder
N-8090
Reinforced Cellulose Fiber System
350 °F
(177 °C)

Controlled Swell Binder System

Styrene Binder
S-8091
Reinforced Cellulose Fiber System
350 °F
(177 °C)

Features:

- Higher densities than traditional cellulose materials.
- Sealability characteristics similar to asbestos-containing materials.
- Dimensional stability vastly superior to traditional cellulose materials. In fact, dimensional stability of Syntheseal materials closely replicates that exhibited by asbestos-containing materials.
- Specialized binder systems designed to meet the various demands of difficult-to-seal applications below 350 °F (177 °C)

Thermo-Tork Product Line

Fully Cured Binder System

Nitrile Binder

TN-9000
(High Aramid Fiber Content)
750 °F
(399 °C)

TN-9004
(Reduced Aramid Fiber Content)
650 °F
(343 °C)

TN-9014
(Cellulose & Aramid Fiber System)
550 °F
(288 °C)

Styrene Binder

TS-9006
(Reduced Aramid Fiber Content)
650 °F
(343 °C)

TS-9016
(Cellulose & Aramid Fiber System)
550 °F
(288 °C)

Latent-Cure Binder System

Nitrile Binder

TN-9001
(High Aramid Fiber Content)
750 °F
(399 °C)

TN-9005
(Reduced Aramid Fiber Content)
650 °F
(343 °C)

TN-9015
(Cellulose & Aramid Fiber System)
550 °F
(288 °C)

Controlled Swell Binder System

Styrene Binder

TS-9003
(Reduced Aramid Fiber Content)
650 °F
(343 °C)

TS-9013
(Cellulose & Aramid Fiber System)
550 °F
(288 °C)

Tufgraph Product Line

KN-9007
(Fiber Reinforced Graphite)
1000 °F
(538 °C)

NOTE: Suggested useful upper temperature limits are to be used as guidelines only. Many factors inherent to a particular application will influence a material's temperature resistance in that specific application.

Fully Cured Binder Products

These materials are either formulated or secondarily converted in a hydraulic press to further the state of cure and increase the density. The higher density and fully cured binder system work together to improve interstitial sealability.

Advantages

1. Improved Compressive Strength
2. Increased Tensile Strength
3. Improved Creep Relaxation Properties
4. Superior Fluid Resistance

Fully Cured Materials From Armstrong

Aramid Fiber:
TN-9000, TN-9004, TS-9006, TN-9014, TS-9016
Formulated Cellulose Materials With Fully Cured Binder: N-8092

Compressive Strength

300°F, Load Applied @ 10,000 lbs/min

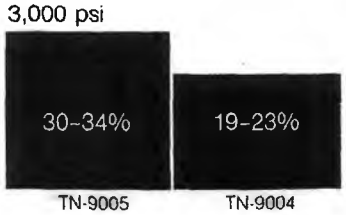


Typical Values

TN-9005 Compressive Strength 15,000 PSI
TN-9004 Compressive Strength 30,000 PSI

Percent Creep Relaxation

ASTM F-38, 212°F, 22 Hrs, 3,000 psi



Typical Values

TN-9005 Creep Relaxation 30–34%
TN-9004 Creep Relaxation 19–23%

Latent-Cure Products

This material is specially formulated to allow for initial conformability which aids in seating rougher flanges in the material, thereby checking interfacial leakage. In the presence of application heat, a cure package is activated that crosslinks the latex rubber molecules, providing the inherent toughness and fluid resistance of fully cured binder gasketing materials.

Advantages

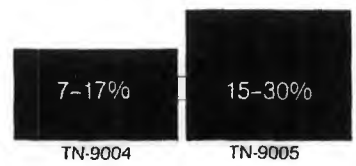
1. More Compressibility.
   - Ideal for lower flange pressure application.
   - Allows for good flange seating into gasket material.
2. Provides In-Application Performance Of Fully Cured Binder System Materials.
   - Superior fluid resistance.
   - Excellent compressive strength.

Latent-Cure Materials From Armstrong

Aramid Fiber:
TN-9001, TS-9003, TN-9005, TS-9013, TN-9015
Reinforced Cellulose Fiber:
N-8090, S-8091

Fully Cured vs Latent Cured

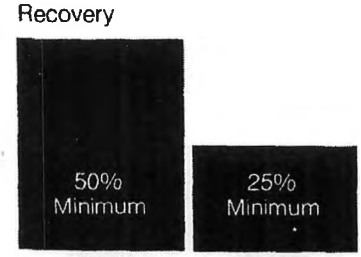
Initial Compressibility @ 5,000 psi



Typical Values

TN-9004 Compressibility 7–17%
TN-9005 Compressibility 15–30%

Recovery



Typical Values

TN-9004 Recovery 50% Minimum
TN-9005 Recovery 25% Minimum

Controlled Swell Products

These are beater-addition materials blended with styrene butadiene latex rubber binders that incorporate a latent-cure package. The SBR binder interacts with the internal fluid, causing a swell action to occur in regions of low flange pressures. In the presence of application heat, the latent-cure package crosslinks the binder to inhibit further swelling.

Advantages

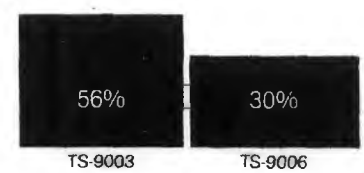
1. Initial Swelling Action.
   - Improves sealing performance of gasket in regions of less than ideal flange pressures.
   - Improves material's ability to provide interfacial sealability in applications with rough, as-cast flanges.
2. Improved Fluid Resistance.
   - After the binder crosslinks in application, the material exhibits superior fluid resistance.

Controlled Swell Materials From Armstrong

Aramid Fiber: TS-9003, TS-9013
Cellulose Fiber: S-8091

Controlled Swell Material

Percent Thickness Increase (ASTM Oil 3)

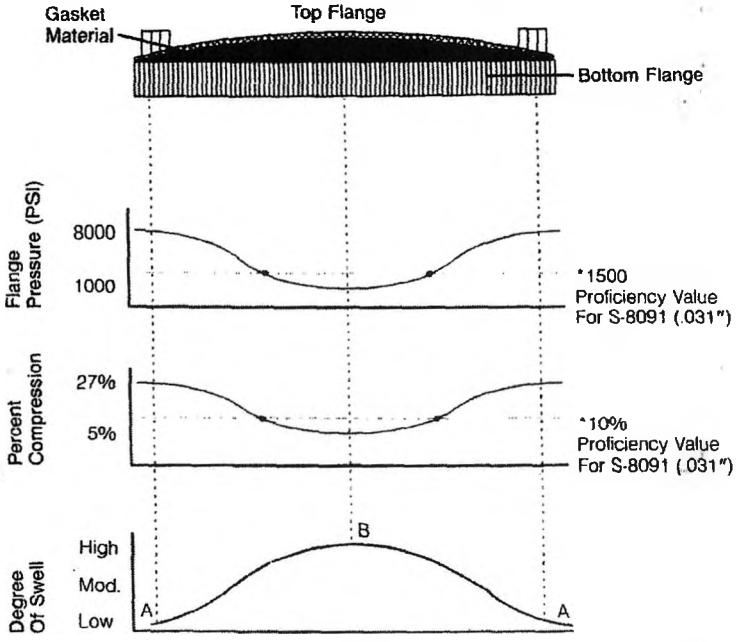


Typical Values

TS-9003 56% Thickness Increase
TS-9006 30% Thickness Increase

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Controlled Swell: In Application Performance



POINTS A:
Very little effect of internal fluid on binder (internal edge of gasket). Flange pressure sufficiently high to seat or imbed flange surfaces into gasketing material to create an interfacial seal. Flange pressure is sufficient to compress the material at this point, eliminating interstitial leakage.

POINT B:
Internal fluid swells binder, enhancing both interfacial seal between the flange surface and material surface, as well as the through-material or interstitial sealability.

Evolution Of Armstrong Nonasbestos Product Line

1980
TN-9000
TN-9001

1981
N-8090
S-8091

1982
N-8092

1984
TN-9004
TN-9005
TS-9003
TS-9006

1985
KN-9007

1987
TN-9014
TN-9015
TS-9013
TS-9016

- Controlled Swell
- Latent Cure
- Fully Cured
- Graphite

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FIBER PRODUCTS
LANCASTER, PA 17604

Sales Offices

DETROIT, MICHIGAN
Suite 305
30600 Northwestern Highway
Farmington Hills, MI 48018
313 851-0335

UXBRIDGE, ENGLAND
Armstrong World Industries Ltd.
Armstrong House
3 Chequers Square
Uxbridge, Middlesex UB8 1NG
Tel: (0895) 51122
TeleFax: (0895) 811693
Telex: 935894/935895

DÜSSELDORF, WEST GERMANY
Armstrong World Industries, G.m.b.H.
Jan-Wellem-Platz 1
Postfach 14 33
D 4000 Düsseldorf 1
Tel: (0211) 82.230
TeleFax: (0211) 82.23.211
Teletex: (17) 2114157

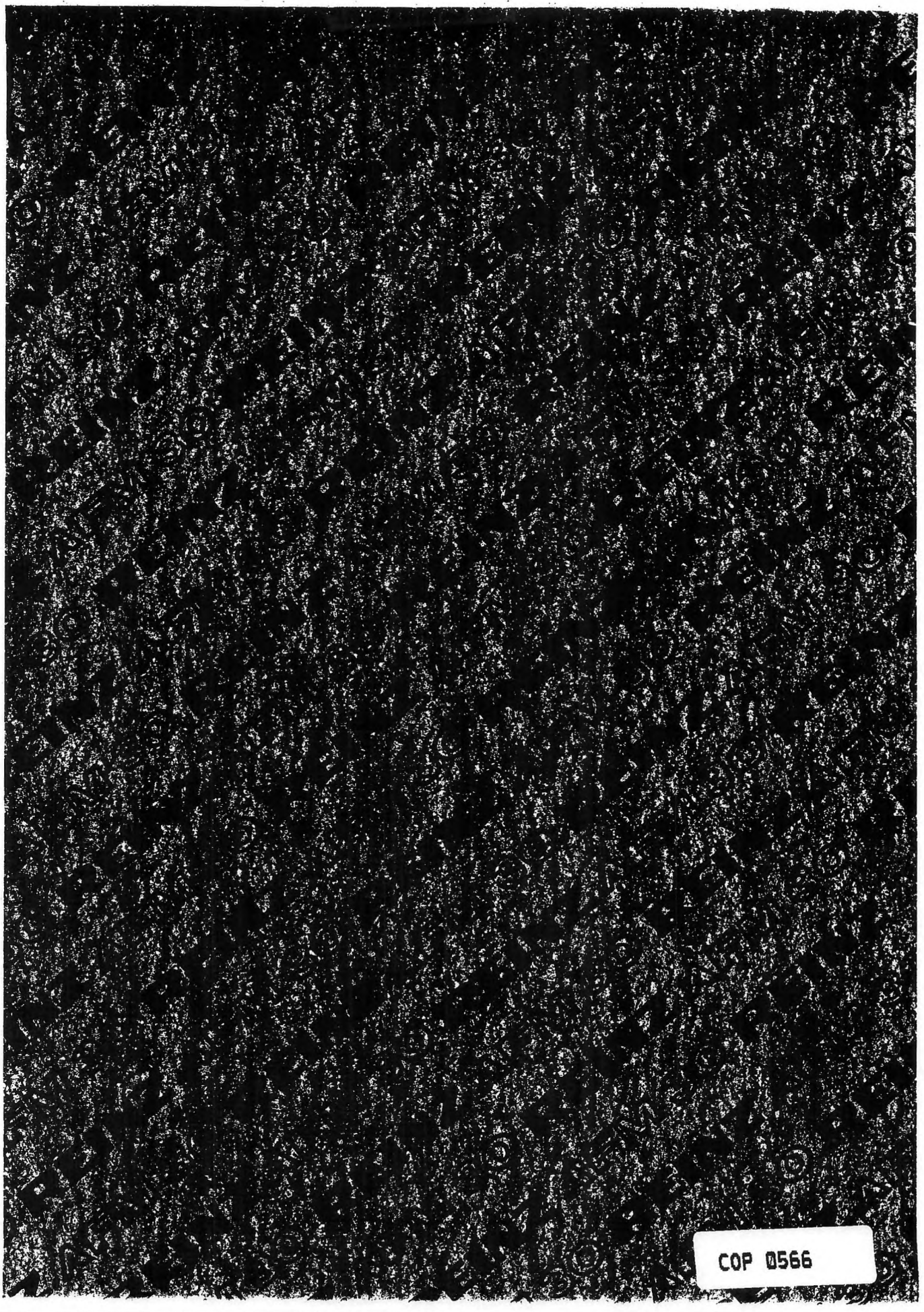
PARIS, FRANCE
Armstrong World Industries France S.A.
5, rue Louis Lejeune
92128 Montrouge
Tel: (1) 47.46.73.00
Telecopie: (1) 47.35.82.11
Telex: 200974

TOKYO, JAPAN
Armstrong (Japan) K.K.
Onarimon Yusen Building
3-23-5 Nishi-Shinbashi
Minato-ku, Tokyo, 105
Tel: (81-3) 434-4473/4
Telex: 0242-3788

Armstrong

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