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ASBESTOS TEXTILES

Superior grades of chrysotile fibres are used in the manufacture of 'Asbestos Textiles'. The particular properties of asbestos which enable its fibres to be used in textiles are: length, strength, toughness, purity and flexibility.

These fibres are subjected to exacting treatment of opening, cleaning and blending, and processed through carding, spinning and other stages. A small percentage of wet modulus organic fibres is incorporated with asbestos fibre to facilitate the processing.

Hindustan Composites Ltd. has equipped itself with the most modern Trutzschler plant for processing and blending of asbestos fibres, Belgium made HDB Cards and Ring Frames for sliver and yarn manufacture, and Dornier looms for manufacture of cloth. The Company believes in setting up high standards of quality at sustained levels. Therefore, the machineries are equipped with electronic to nucleonic control gauges.

The yarn forms the basis for a variety of asbestos textile products such as: twisted ropes, plaited packings, fibre filled rope laggings, caulking ropes, cloths, etc.

Asbestos Textiles, either used alone or in conjunction with other materials, have found their uses in many specialised applications, not only in the moderate temperature ranges upto 600^0C but also in applications where the material may be exposed to high temperatures of upto 2500°C, albeit for very short periods.

In applications involving such high temperatures, asbestos textiles, combined with resins and binders, can provide materials possessing unique properties such as low thermal conductivity, high degree of resistance to thermal shock, excellent dimensional stability and the property of uniform ablation.

The asbestos textile products service the needs of the industry in a number of general and specialised applications, such as thermal insulations, fire protections, packings and Jointings, diaphragms for electrolytic cells, base material for friction materials and industrial plastics, etc.

ASBESTOS YARN

FYSAX AML SERIES

Hindustan Composites Ltd. manufactures asbestos yarns in a wide range of constructions with a wide range of properties dependent on the various applications intended. However, they are commercially distinguished under the following groups:

A). Non-metallic. B). Metallic-incorporating metal wire. C). Union—in combination with cotton threads. The size, diameter, or “count” of a yarn can be expressed in many ways—The modern international method used is the TEX system. The “TEX NUMBER” indicates the weight of yarn in grams per Km. length.

Several strands of yarn can be twisted or braided to produce the yarn or rope of a higher diameter. The yarn can be reinforced with ductile metal wires such as brass, copper, zinc, lead, inconel, monel, stainless steel, etc. Reinforcement with filaments of metal wire offers particular properties in the end product, such as heat dissipation, high temperature resistance, strength retention or particular friction properties. It can also be spun in combination with cotton or yarns made with man-made fibres to give an added advantage of higher strength and flexibility in lower temperature applications.

Asbestos yarn can also be treated with high quality lubricants, oil resisting compounds, PTFE and coated with flake graphite or mica for specific applications.

SERVICE Asbestos yarn has a wide range of applications—in heat insulation, sealing, electrical insulations, fire protection, friction materials, etc. Asbestos yarn is also used for packing valve spindles, lagging small pipes, sealing joints in flexible metallic tubings, packing for bib-cocks at low pressure steam, sewing asbestos mattresses, in switch and fuse gear, braiding of electric cables, weaving of electrical resistance kits, cushions for glass in patent glazing bars.

In addition to this, the asbestos yarn forms a base for the manufacture of packings, tubings and cloths which service the wide ranging needs of any industry.

PRODUCT RANGE

FYSAX AMY SERIES

Quality Nomenclature	Product Description	Nominal Dia (mm)	Specification Compliance	Supplied in spools (kg)
FYSAX AMY 21	Non-metallic Commercial grade	1.5 to 6.0	DGS&D G/Misc/81-C Commercial quality	0.5 1.0 3.0
FYSAX AMYM 71	Single ply. Reinforced with Single strand brass wire	1.6	-	0.5 1.0
FYSAX AMYM ZW2	Single ply Reinforced with two strands of zinc wire	1.7	-	0.5
FYSAX AMY 81	Single ply Non-metallic Commercial grade	1.2	-	0.5 1.0
FYSAX AMY 541	Single ply Non-metallic Special grade for high temperature application	1.0	DGS&D G/Misc/81-C Spl. quality., I.N.F. 6 (a)	0.5 1.0
FYSAX AMYM 81	Single ply Reinforced with single strand of brass wire	1.3	-	0.5 1.0
FYSAX AMYG 63	No. of plies twisted together Non-metallic Lubricated and Graphited	1.5 to 6.0	-	0.5 1.0
FYSAX AMYGM 64	Two ply Each ply reinforced with a single strand of brass wire Lubricated and Graphited	1.5	-	0.5
FYSAX AMY 17/3	Three ends of asbestos yarn twisted together Non-metallic	1.6	-	0.5 1.0
FYSAX AMY 32	Single ply fine yarn Non-metallic	0.5	-	0.5 1.0
FYSAX AMY32/2	Two ends of asbestos fine yarns twisted together Non-metalllic	0.8	-	0.5 .1.0
FYSAX AMYP 13	100% Pure asbestos, single ply Non-metallic	0.8	-	0.5 1.0
FYSAX AMYP 13/2	Two ends of 100% Pure asbestos yarns twisted together Non-metallic	1.5	-	0.5 1.0

Sizes are theoretic and indicative. Applicable tolerance ± 10% if not covered by specifications.

ASBESTOS TWISTED AND CAULKING ROPES.

FYSAX AMP SERIES

TWISTED ROPES: Several ends of asbestos yarns are uniformly twisted to produce very flexible ropes.

CAULKING ROPES: A number of soft packings with various construction parameters to produce caulking ropes.

SERVICE For thermal insulation of pipelines, particularly when there is a danger of damage by abrasion in very confined spaces and additional protective cladding is not used. These ropes are widely used in coke oven doors, between the fire bricks and steel frame-work in steel plants as well as in boiler houses. These ropes satisfy the need for a resilient yet tough material to accommodate differences in thermal expansion and effect an efficient seal against leakage of gases.

PRODUCT RANGE FYSAX AMP SERIES

Quality Nomenclature	Product Description	Section Sizes(mm)	Specification Compliance	Packaging spools (kg)
FYSAX AMP 11	Soft sliver webbing containing maximum 5% organic as a core braided with asbestos yarn for high temp. applications	Round 8.0 to 30.0		5.0 7.5 20.0
FYSAM AMP 41	Several ends of asbestos yarns are twisted together to obtain a firm rope	Round 3.0 to 41.0	GOST 1779/1955 GOST 1779/1942	5.0 7.5 20.0
FYSAX AMP 71	Soft asbestos felt encased in a closely braided cover	Round 10.0 to 51.0	GOST 1779/1972	5.0 7.5 20.0
FYSAM AMP 72/3 OR FYSAX AMP 72/4	Three or four soft rope laggings twisted together and encased in a closely braided cover	Round 25.0 to 51.0	GOST 1779/1972	20.0
FYSAX AMP 72/30 OR FYSAX AMP 72/40	Three or four soft rope laggings with organic content of max.5% twisted together and encased in a closely braided cover	Round 25.0 to 51.0	GOST 1779/1972	20.0
FYSAX AMP 73/1 OR FYSAX AMP 73/2	Several ends of yarns twisted and encased in closely braided single or double covers	Round 10.0 to 51.0	GOST 1779/1972	7.5 20.0

Sizes are theoretic and indicative. Applicable tolerance ± 12.5% if not covered by specifications.

ASBESTOS FIBRE FILLED ROPE LAGGING

FYSAX AML SERIES

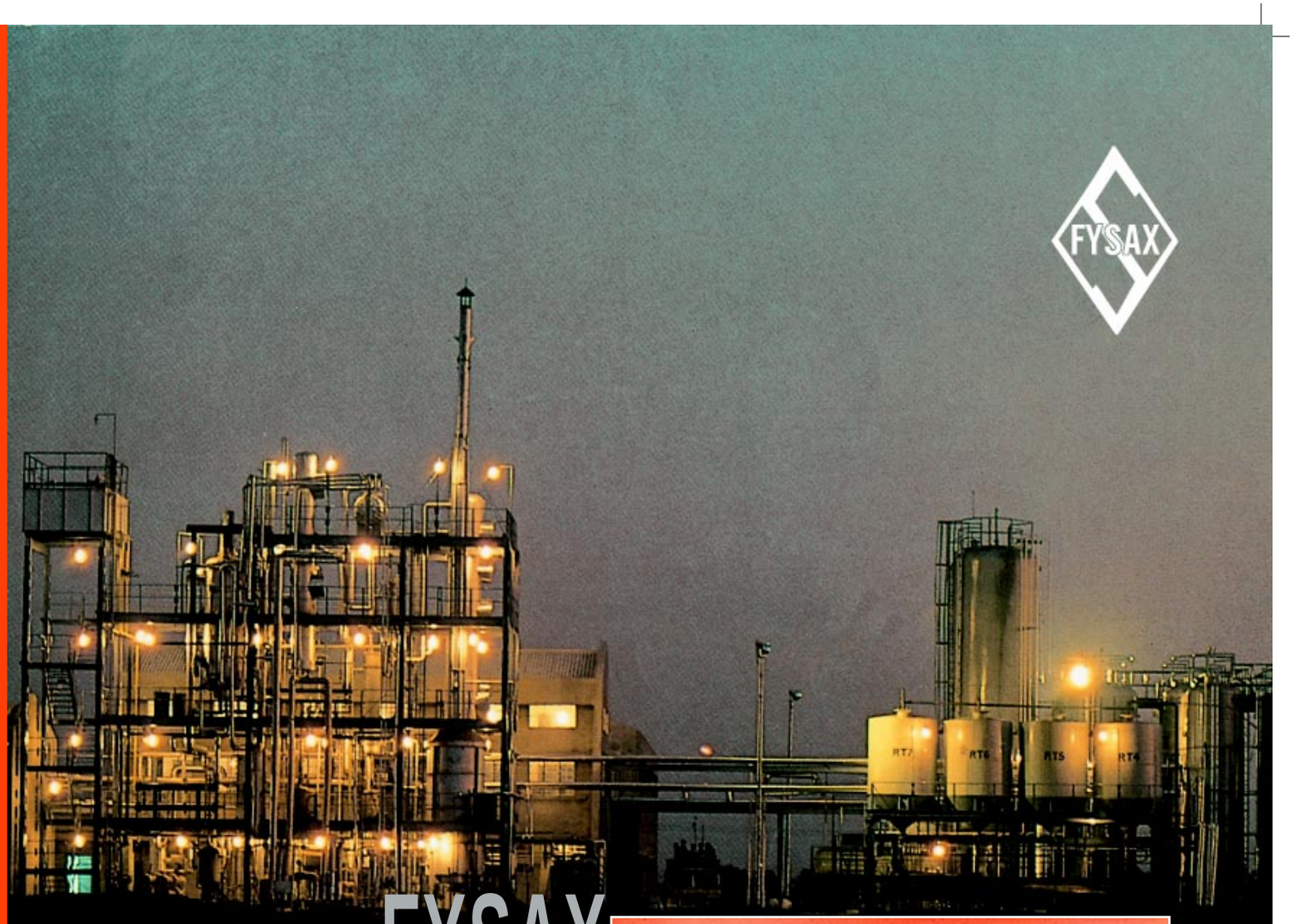
Rope lagging is one of the simplest forms of removable lagging or thermal insulating ropes.

A fine canvas is often used as a weather proofing or finishing wrap on a rope lagging covered pipe, the canvas is then coated with bituminous heat resistant paint. Alternatively a wrap of roofing felt can be used.

SERVICE Extensively used for industrial power houses, marine steam and exhaust pipelines.

PRODUCT RANGE FYSAX AML SERIES

Quality Nomenclature	Product Description	Range of Size (mm)	Specification Compliance	Temperature ^{0}C
FYSAX AML 52	Soft core of Asbestos lap enclosed in an Open mesh (fish-net) braided cover	Round 12.5 to 51.0	-	Up to 350^{0}C
FYSAX AML 43	Construction similar to AML 52, but with a lower percentge of organic matters for high temperature application	Same as above	I.N. Schedule F. 6 (a)	Up to 550^{0}C



FYSAX ASBESTOS GLAND PACKINGS

ASBESTOS GLAND PACKINGS

FYSAX AMP SERIES

To achieve zero leakage between a moving member and a relatively stationary part, a wide range of seals and rings are employed. However, the most common, least expensive and versatile in nature is the Gland Packing. Gland Packing provides a dynamic seal for a rod, shaft or stem via housing or gland which is packed with resilient or semi-resilient material, thus providing a localised contact area which offers a physical barrier to leakage.

PROPERTIES : THE GLAND PACKING MUST POSSESS

- Good anti-friction properties
- Good chemical resistance to fluid contained
- Should not get affected by the temperature of application
- Should be reasonably compressible and have a good resilience
- Should retain the lubricants
- Should not affect the shaft
- Should not contaminate the fluid being contained

Hindustan Composites Ltd. manufactures a wide range of Gland Packings to suit a variety of applications. They are of both Dry as well as Lubricated types.

Gland Packing fitment is not an exact science as its performance depends upon many variables. The fitting of a packing is an art and results depend largely on manual skills. The 'Man with Wrench' therefore, can sometimes, be a dangerous person in your plant, responsible for scored rods, excessive down time and wasted packings.

Hindustan Composites take great care at the construction stage of its gland packings which lead to a better performance even under minor imperfections in the plant condition and fitment. However, certain preparatory precautions, correct procedure of fitment and correct selection of grade and size of the gland packings would help in achieving the best results.

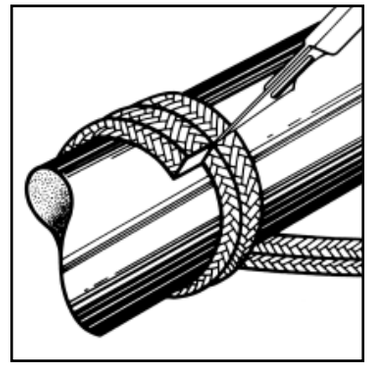
CONDITION OF PLANT

To ensure long and trouble-free sealing, check the following periodically :

- The clearance between shaft and neck-bush at the bottom end of the stuffing box. The maximum normal clearance is 0.25 mm.
- Concentricity of shaft with stuffing box bore.
- Straightness of shaft (run-out)—not to exceed 0.05 mm. Clock gauge reading.
- Condition of shaft surface in packing area—no excessive grooves, scores or pitting.
- Pump bearings—wear can induce shaft “whip” which can be harmful to packings.

PACKING THE GLAND

- Ensure that all the old packing is removed and the stuffing box is clean and free from foreign matter.
- Always re-pack with new packing.
- Choose packings recommended for the fluid to be contained.
- Select correct size of packing to fit the stuffing box dimensions.
- Wrap packing on the shaft and cut into rings of correct size.
- Fit each packing individually by tamping or with split sleeves.
- Stagger joints in consecutive packing rings.
- Fit gland follower and check that the shaft rotates freely.



- Tighten gland nuts evenly with spanner until the packing “drags” when turning the shaft by hand.
- a) Valves—pressurise the stuffing box and if necessary re-adjust the gland nuts evenly until a leak-free seal is obtained.

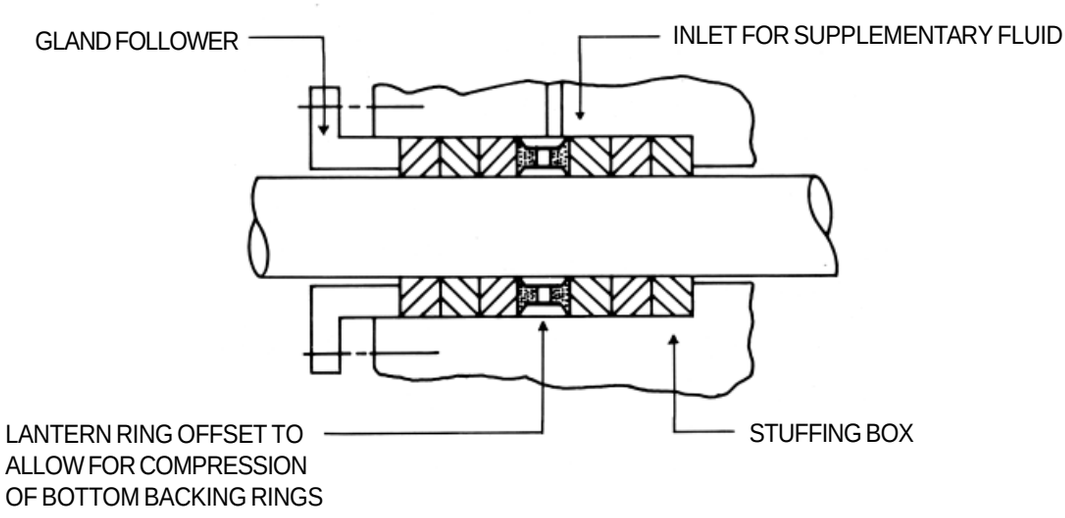
  b) Pumps—Slacken the gland nuts back and re-tighten to finger tight, to such an extent that the shaft still rotates freely.

RUNNING - IN

(This does not apply to valves) After starting the pump, allow it to run with a steady leakage for the first 15 minutes. Then begin to adjust the gland-nuts equally, one or two flats at a time, about 10 minutes between adjustment, until the leakage is reduced to an acceptable level. If during the procedure the gland begins to overheat, slacken off the gland nuts slightly to increase the leakage rate, thus reducing gland temperature. Commence re-tightening again after a further 5-10 minutes.

N.B.: Some leakage from the gland should always be maintained (approx. 10 drops/min.) to ensure adequate lubrication and cool running of the packing, unless such leakage is not permissible due to other unavoidable considerations.

When gland leakage is not permissible or when handling fluids containing abrasive substance in suspension, it is a normal practice to introduce a “fluid or liquid seal”. This is achieved by feeding a more acceptable fluid into the stuffing box by the use of a lantern ring. Regular maintenance should ensure that the lantern ring is correctly positioned and that the lubricant feed pipe is clear of obstruction.



SELECTION OF GRADE AND SIZE To facilitate the selection of suitable grade of gland packings, certain guidelines are given in this catalogue under the heading ‘Medium for Selections’. In the case of specific applications, the Technical Cell of Hindustan Composites is always available for customer guidance.

The following recommendations in general are made for the selection of suitable dimensions.

Shaft Ranges	Width of packing
16 to 28 mm dia	8 mm
30 to 46 mm dia	10 mm
50 to 75 mm dia	12.5 mm
75 to 120 mm dia	16 mm
125 to 300 mm dia	19 mm

DRY PLAITED PACKINGS FYSAX AMP SERIES

White asbestos dry packings having solid plait, braid-over-braid construction can provide dual service:

- as gland packings where external lubrication is possible
- as insulating ropes for lagging purpose

Quality Nomenclature	Product Description	Section & Range of sizes (mm)	Specification Compliance	Packaging Kg/coil	Service
FYSAX AMP 31	White dry asbestos packing plaited cover-on-cover to achieve high density without loss of flexibility.	Round or Square 6.0 to 51.0	G/Misc/81-C (Commercial quality) IS: 4687/1995, Type-1, non-acid IS: 4687/1980 Grade-1, non-acid	5.0 7.5 20.0	Steam glands. boiler lagging, sealing of oven and autoclave doors. Also caulking, thermal insulation, boiler sealing, furnace joints etc. Temp. : 350^{0}C (Normal operations) 700^{0}C (Static operations)
FYSAX AMP 51	Identical to FYSAX AMP 31 in construction, but with yarns of organic content of maximum 5% for high temperature applications.	-do-	G/Misc/81-C Special quality	5.0 7.5	Similar to FYSAX AMP 31, but with added advantage of satisfactory performance under high temperature conditions which could have detrimental effect on the carrier fibre. Temp : 520^{0}C (Normal operations) 950^{0}C (Static operations)

Sizes are theoretic and indicative. Applicable tolerance ± 10% if not covered by specifications.

LUBRICATED PLAITED PACKINGS FYSAX AMP SERIES

Quality Nomenclature	Product Description	Section & Range of sizes (mm)	Specification Compliance	Packaging Kg/coil	Service	Max. Temp. (^{0}C)	Medium for Selection						
							Water	Steam	Oils	Solvents	Alkalies	Acid(dil)	Acid(conc)
FYSAX AMP 32	Asbestos packing plaited cover-on-cover, lubricated and graphited. Non-metallic	Round or Square 6.00 to 51.00	DGS&D G/Misc/81-C,Clause 6(A), (B) & (D) IS:4687/1995, Type 2 154687/1980, Grade 2	5.00 7.50 20.00	Recommended for use in rotary and reciprocating pumps, steam engines and valves under medium pressure conditions.	350	R	R	R	N	R	N	N
FYSAX AMP 83	Asbestos packing identical to AMP 31 in construction but with a surface coating of microfine, high grade graphite. Non-metallic	Round or Square 6.00 to 51.00			It is specially suitable for valves in high pressure steam lines where the valves are operated occasionally and anti-stick is essential. It also finds extended usage in valves located in very hot surroundings where oil splutter is common, This packaging gives extended life for digesters with external lubrication in corrosive alkaline service.	450	R	R	R	N	R	N	N
FYSAX AMP 100	Asbestos packing plaited cover-on-cover and treated with a mixture of vegetable oil and high flash point lubricant Non - metallic.	Round or Square 6.00 to 51.00		5.00 7.50 20.00	Recommended against mild alkalies, gases and chemicals, ingredients of which are likely to cause hardening of the packing.	500	R	R	R	N	R	R	N
FYSAX AMP 120 SUPER	Each yarn individually treated with high flash point lubricant and fine flake graphite, and plaited cover-on-cover. Non-metallic.	Round or Square 6.00 to 38.00	DGS&D G/Msic/81-C,Clause 6(A), (B) & (C) IS:4687/1995 Type 3 IS:4687/1980 Grade 3	5.00	An all purpose superior SELF lubricating packing. Remains flexible and resilient under high pressure temp. conditions and its self bedding properties avoid scoring of shaft and offers an efficient seal on slightly worn or scored moving members	550	R	R	R	N	R	R	N
FYSAX AMP 123	Similar to FYSAX AMP 120 (SUPER) in construction but treated with a fine grade of mica instead of graphite. Non-metallic.	Round or Square 6.00 to 38.00	IS:4687/1995 Type 3 (Mica treated) IS:4687/1980 Grade 3 (Mica Lubricated)	5.00 7.50 20.00	Same as above, but best suited for stainless steel shafts.	550	R	R	R	N	R	R	N

Sizes are theoretic and indicative. Applicable tolerance ± 10% if not covered by specifications. *R= Recommenced N= Not Recommended*

PTFE IMPREGNATED PACKINGS

FYSAX AMPT SERIES

PTFE (polytetrafluoroethylene) and Asbestos individually possess unsurpased qualities. PTFE is virtually immune to chemicals and solvents of any concentration. An inert material, it possesses excellent properties such as lubrication, low co-effecient of friction, electrical insulation, non-toxicity, etc. A combination of these two superior materials ; i.e. Asbestos and PTFE offers attractive advantages for a wide range of chemical amd mechanical applications.

Quality Nomenclature	Product Description	Section & Range of sizes (mm)	Specification Compliance	Packaging coil	Service	Temp. (^{0}C)	Water	Steam	Oils	Solvents	Alkalies	Acid(dil)	Acid(conc)
FYSAX AMPT 700	A high grade plaited white asbestos packing impregnated with PTFE. The exacting concentration of PTFE particularly at the rubbing surface offers excellent lubricating properties.	Square or Round 6.00 to 25.00		7.5 m	Recommended for valves in rotating or reciprocating pumps and other revolving shafts in a system containing highly inflammable fluids, hot and cold oils, water and gases. Recommended for oxygen, solvents and strong alkaline services.	Sub-Zero to 315	R	R	R	R	R	R	R
FYSAX AMPT 702	Construction similar to FYASX AMPT 700, impregnated with PTFE, but treated additionally with special mineral oil lubricant.	Square or Round 6.00 to 25.00		7.5 m	Same as above, but with an added advantage for high speed conditions where additional lubrication is required.	Sub-Zero to 315	R	R	R	R	R	R	#
FYSAX AMPT 732	Packing similar to AMP 31 in construction, but impregnated with PTFE.	Square or Round 6.00 to 25.00		1.0 kg 2.5 kg 6.0 kg	Same as AMPT 700 but for medium pressure applications.	Sub-Zero to 315	R	R	R	R	R	R	#

Sizes are theoretic and indicative. Applicable tolerance ± 10% if not covered by specifications. R = Recommended N= Not Recommended # Check with R&D Service of HCL before selection.

LUBRICATED PACKINGS REINFORCED WITH METAL WIRE

FYSAX AMP SERIES

Quality Nomenclature	Product Description	Section & Range of sizes (mm)	Specification Compliance	Packaging Kg/coil	Service	Max. Temp. (^{0}C)	Medium for Selection						
							Water	Steam	Oils	Solvents	Alkalies	Acid(dil)	Acid(conc)
FYSAX AMPT 121 SUPER	A superior all purpose SELF lubricating asbestos packing reinforced with soft brass wire. Each strand of yarn is treated individually with high flash point lubricant and fine flake graphite evenly dispersed. A solid plait construction.	Square or Round 6.00 to 38.0	IS: 4687/1995 Type 3*(with brass wire) IS: 4687/1980 Grade3* (with brass wire)	5.00	Recommended for super heated steam at temperatures and pressures. Can also be used for many applications against oils, gases, water, weak alkalies and many chemicals. Specially recommended for high pressure super heated steam, valves, turbines, glands, etc., where abrasive and viscous liquids are not likely to adversely affect the brass metal.	550	R	R	R	N	R	N	N
FYSAX AMP 131	A cover-on-cover plaited packing made from asbestos yarn reinforced with soft brass wire. Each cover is specially treated with a compound which offers resistance to oils in hot and cold conditions and is coated with fine flake mica.	Square or Round 6.00 to 25.00	IN/F-16 IS:4687/1995 TYPE 3* (With brass wire) (Mica Treated) IS:4687/1980 Grade3* (with brass wire) (Mica treated)	1.00 5.00	Recommended for valves in super heated steam, hot oils, tar and other viscous or abrasive fluids. Most suitable for stainless steel shafts.	550	R	R	R	N	R	N	N
FYSAX AMP 360	Plaited cover-on-cover from high quality asbestos yarn doubled with soft anti friction white metal wire, lubricated and graphited.	Square or Round 6.00 to 51.00	IS:4687/1995 type 2* (with white metal wire) IS:4687/1980 Grade 2* (with white metal wire)	5.00	For rotary shafts and reciprocating rods involved in heavy duty application. Especially suitable for viscous and abrasive liquids. Incorporation of white metal, a low friction bearing surface, eliminates the servicing of moving parts.	350	R	R	R	N	R	N	N
FYSAX AMP 122	A packing similar to FYSAX AMP 360 in construction, but with reinforcement of soft brass wire.	Square or Round 6.00 to 51.00	IS:4687/1995 type 2* (with brass wire) IS:4687/1980 Grade 2* (with brass wire)	1.00 5.00	Recommended for high pressure conditions for temperatures upto 515^{0}C against abrasive and viscous liquids which do not have an adverse effect on brass metal.	515	R	R	R	N	R	N	N
FYSAX AMP 205	A plaited asbesots packing reinforced with inconel wire, lubricated and graphited.	Square or Round 6.00 to 51.00		1.00 5.00	A high-grade packing for super sealing jobs.	900	R	R	R	N	R	N	N

* Being Metallic the Clauses 3.1.2.6 and 3.1.3.6 shall be modified as mutually agreed between the purchaser and manufacturer.

Sizes are theoretic and indicative, Applicable tolerance ± 10% if not covered by specifications. R=Recommended N = Not Recommended

GLAND PACKING RINGS

FYSAX AMP SERIES

When packing a stuffing box in a valve, whether during manufacture or routine maintenance, ease and speed of fitting the packing is of important consideration.

To facilitate this, Hindustan Composites Ltd. offers **preformed rings** intended for use to contain various media at different temperatures and pressure ranges.

The packings are available in scarf joined or angular slit open blocked rings forms, made to finely controlled densities and dimensional tolerances. The rings are available in square as well as rectangular cross sections. Selection of appropriate metal in the wire form, binder and lubricant are important criteria depending upon the application.

Use of packing in ring form facilitates easier and quicker fitting — an all important consideration in today's escalating labour and overhead costs.
Since the rings are pre-compressed, they fit and seal the shaft and the entire gland chamber uniformly along the complete length, thus eliminating localised shaft wear and producing a longer lasting seal.

SERVICE Recommended for use in the stuffing box of valves and pumps to seal the fluids under different temperature and pressure conditions, around a rotating and/or linear movement of stem under fluctuating conditions.

PRODUCT RANGE FYSAX AMP SERIES SPECIALTY PACKINGS

Quality Nomenclature	Product Description	Temperature ^0C	Pressure Kg/cm^2
FYSAX AMP 200	High grade asbestos braided packing impregnated with PTFE	315	200
FYSAX AMP201	Stainless steel wire reinforced asbestos braided packing lubricated with mica	550	150
FYSAX AMP202	Stainless steel wire reinforced asbestos braided packing lubricated with molybdenum disulphide	550	250
FYSAX AMP205	Inconel wire reinforced asbestos braided packing lubricated with atomised graphite	900	300
FYSAX AMP206	Stainless steel wire reinforced asbestos braided packing lubricated with high purity graphite	550	250
FYSAX AMP207	Inconel wire reinforced asbestos braided packing lubricated with atomised graphite	900	300
FYSAX AMP208	Stainless steel wire reinforced asbestos braided packing with soft core and lubricated with pure graphite	450	250
FYSAX AMP209	Inconel wire reinforced asbestos braided packing with soft core and lubricated with pure graphite	700	300
FYSAX AMP210	Non metallic asbestos braided packing lubricated with mica	550	130
FYSAX AMP215	Monel wire reinforced asbestos braided packing lubricated with graphite of high purity	1000	350
FYSAX AMP217	Monel wire reinforced asbestos braided packing lubricated with molybdenum disulphide	1000	300
FYSAX AMP219	Inconel wire reinforced asbestos braided packing lubricated with molybdenum disulphide	700	250

RANGE in sizes (IN MM)

Outer Dia		Inner Dia		Thickness	
Min.	**Max.**	**Min.**	**Max.**	**Min.**	**Max.**
16.0	200	8.0	175	6.00	21.0

ASBESTOS CLOTH

FYSAX AMC SERIES

Asbestos cloth woven from Asbestos yarns possesses excellent fire resistant, rot and vermin proof qualities. Therefore it is used in a number of diversified applications. Asbestos cloths are available in a variety of styles, textures, thicknesses and weights to suit these applications.

SERVICE

- THERMAL INSULATION — For use on boilers, pipelines and ancillary equipment, in power plants, factories, buildings and Marine Vessels.
- PROTECTIVE CLOTHING AND FIRE PROTECTION — For the manufacture of fire-resistant gloves, suits and other clothing for fire fighting; also for heat-resistant gloves, aprons, etc. for use in glass works, foundries, chemical works, welding shops, plastic moulding shops, etc. For use as safety-curtains in theatres, ships and aircraft and wherever a fire barrier is required. For the manufacture of fire blankets for use in ships, schools, institutions, cinema projection rooms, kitchens, garages etc., and wherever there may be a need for clean and effective means of smothering during small outbreaks of fire.

- PACKINGS AND JOINTINGS — Asbestos cloth, when proofed with rubber, is an excellent jointing medium. It can be folded into tapes and rings, and cut into gaskets for the sealing of pipe flange joints and boiler joints. It is also lubricated and shaped into proofed asbestos cloth packings.

- ELECTROLYSIS — For the diaphragms of electrolytic cells, in Vanaspati units etc.

- PLASTICS — As a filler in high-strength, heat-resistant laminates for electrical applications.

- FILTRATION — As a filtration medium for various liquids.

PRODUCT RANGE FYSAX AMC SERIES

Quality Nomenclature	Product Description	Appox thickness (mm)	Approx Width (mm)	Approx Weight (kg/sqm)	Specification Compliance	Packaging Wt/Roll (Kg)
FYSAX AMC 40	Plain weave Non-metallic	1.8	1000	1.20	DGS&D G/MISC/81C Commercial quality	36-60
FYSAX AMC 41	Plain weave Non- metallic	2.0	1000	1.30	-	36-60
FYSAX AMC 41(G)	Plain weave Non- metallic	2.0 (max)	1000	1.15	-	36-60
FYSAX AMC 42	Plain weave Heavy construction Non-metallic	3.2	1000	2.5	-	50-70
FYSAX AMC 44	Plain weave Heavy construction Non-metallic	6.0	1000	3.37		50-70
FYSAX AMC 45	Plain weave Fine finish Non-metallic	1.2	1000	1.15	-	35-45
FYSAX AMC 46 DS	Twill weave Heavy Construction Non-metallic Dust suppressed	3.2	1000	2.69	IN/TC/23 Pattern No. 0414/924-5542	35-65
FYSAX AMC 47 DS	Twill weave Medium construction Non-metallic Dust suppressed	1.6	1000	1.29	IN/TC/23 Pattern No. 0414/924-5543	35-65
FYSAX AMCM 51	Plain weave Each strand reinforced with brass wire	1.6	1000	1.40		36-60
FYSAX AMCP 507	100% chemically pure asbestos cloth, plain and close weave, Medium construction	2.0	1000	2.4		45-80
FYSAX AMCP 508	100% chemically pure asbestos cloth, plain and close weave, Heavy construction	3.2	1000	2.8		45-80

The sizes are theoretic and indicative. Applicable tolerance ± 10% if not covered by specifications.

RUBBER PROOFED ASBESTOS SHEETING AND TAPES

FYSAX AMS AND AMT SERIES

Asbestos cloth coated with good quality resilient rubber proofing is available in the continuous sheet form as well as folded tape form. Proofed sheeting and tapes due to good flow characteristics are excellent sealing materials, particularly where the flange surfaces are not machined and uniform. Proofed goods are expected to yield under minor pressures to conform to uneven and rough surfaces to offer a perfect seal. Further the proofed goods used under high temperature conditions allow the rubber compound to vulcanise and provide a hard joint for efficient sealing.

SERVICE An all purpose jointing material for sealing manholes, hand-holes and inspection covers on boilers, tanks and pressure vessels, retort doors and other applications against air, water, steam and mild alkalies.

AMT 77 is specially recommended for sealing doors of hot ovens and fireproof safes, hot air ducts, panels and cowlings, etc.

PRODUCT RANGE

SHEETINGS-FYSAX AMS SERIES

Quality Nomenclature	Product Description	Noinal Thickness (mm)	Nominal Width (mm)	Approx Weight (Kg/m²)	Approx. Weight (kg/Roll)	Specification Compliance
FYSAX AMS 80	Proofed sheeting supplied in rolls of continuous length Non-metallic	✲1.6 and above	1000	✲✲3.00	50	DGS&D G/Misc/81-C Commercial quality
FYSAX AMSM81	Proofed sheeting reinforced with brass wire supplied in rolls of continuous length	✲1.6 and above	1000	✲✲3.25	50	-

Maximum Temperature: 180°C

Size are theoretic and indicative. Applicable tolerance ± 10% if not covered by specifications.

✲ Over 1.6 mm thikness are made of two or more plies.
✲✲ Weight indicated are for appx. 1.6 mm thickness sheeting.

TAPES - FYSAX AMT SERIES

Quality Nomenclature	Product Description	Nominal Thickness (mm)	Nominal Width (mm)	Approx Length mtrs/Coil	Max. Temp °C	Specification Compliance
FYSAX AMT 86	Proofed tape single ply or multi-plies folded and com-pressed together. Supplied in coils of continuous length. Non-metallic	3.2 & above	12.5& above	✲30	180	DGS&D G/Misc/81-C Commercial quality
FYSAX AMTM 87	Same as AMT 86 but reinforced with brass wire	3.2 & above	12.5 & above	*30	180	
FYSAX AMT 77	Construction similar to AMTM 87 but for high temperature application	3.2	10 to 75	■10	400	

✲ Weight per coil 25 mm wide x 3.2 mm thick - 4.5 kg appx
* Weight per coil 25 mm wide x 3.2 mm thick - 4.75 kg appx
■ Weight per coil 25 mm wide x 3.2 mm thick - 1.5 kg appx

Sizes are theoretic and indicative. Applicable tolerance ± 10% if not covered by specifications.

ASBESTOS MILLBOARD

This is a versatile, thermal insulation and heat-resistant material produced in sheet form using good quality asbestos fibres, incombustible fillers and vegetable binders. It does not suffer loss of strength upto 485°C. When suitably supported the board can be used satisfactorily at extreme temperatures upto approx. 1400°C.

SERVICE For all kinds of thermal insulations ranging from domestic cookers and ironing boards to industrial applications such as glass moulding, ovens and furnaces and domestic stoves. As the sheets can be bent to any diameter with a little moisture, they are most suitable for large diameter pipe cladding.

PRODUCT RANGE FYSAX AMM SERIES

Quality Nomenclature	Product Description	Thickness (mm)	Size	Packaging	Specification Compliance
FYSAX AMM 1000	General purpose insulating material	1.5 to 25.0	1Meter Square	50 kgs or 100kgs.	DGS&D G/Misc/81-C, DG ships 6853, GOST 2850/1958
FYSAX AMM 1100	Special quality for automotive gaskets and electrical industry	0.8 to 3.0	1Meter Square	50 kgs or 100 kgs	

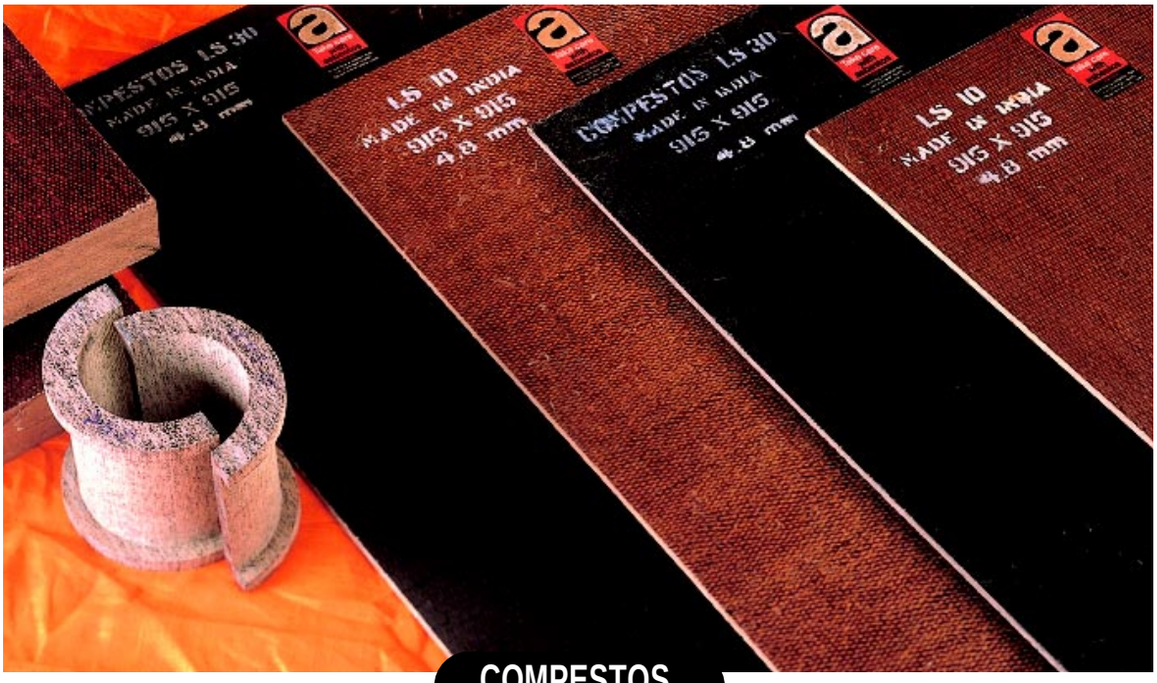
ASBESTOS DISCS

The heat resistant discs are made from materials containing a higher percentage of asbestos and a small quantity of organic binder, to withstand the application temperatures exceeding 1000°C.

SERVICE Recommended for making up a solid block of supporting internal and external rollers in glass plants. The discs possess adequate physical strength to withstand the machining operations to achieve a mirror finish.

PRODUCT RANGE FYSAX AMM SERIES

Quality Nomenclature	Product Description	Outer Dia. Max.	Inner Dia. Min.	Thickness Max.	Specification Compliance
AMM 909	Asbestos discs	350mm	100mm	8mm	AP97 (DIN3752)



COMPESTOS
GRADE LS SERIES

Asbestos laminated sheets are moulded from Asbestos Cloth with thermosetting resins and are specially developed for engineering applications. The high content of Asbestos, superior grade of binder and special press-curing technique impart high degree of mechanical strength. These materials are hard wearing, heat resistant and unaffected by a wide range of chemicals and solvents.

SPECIAL CHARACTERISTICS

COMPESTOS materials do not require special lubricants. They are compatible with water, water emulsions, many chemicals and normal lubricating oils, grease, compounds, molybdenum di-sulphide paste, etc. COMPESTOS materials are characterised by the following outstanding properties:

- Excellent dimensional stability
- Good wear and chemical resistance
- Low moisture absorption
- Very high strength to weight ratio
- High temperature resistance
- High impact resistance
- Excellent irradiation characteristics
- Impervious to effects of moisture of marine exposure
- Resistant to vermin attack

The outstanding properties make compestos superior to many conventional materials for applications involving Bearings, Wearing pads, Gears and other Rotating or Reciprocating parts.

PRODUCT RANGE FYSAX LS SERIES

GRADE LS 30

This is a general purpose Laminated Sheet having a dry lubricating additive incorporated evenly throughout the structure which lowers the co-efficient of friction and imparts self lubricating properties. LS 30 can be effectivily used under widely differing conditions, involving:

High surface speeds with lighter loads or low speeds with heavy loads,
Parts subjected to high stresses,
Situations where lubrication by normal methods is difficult, intermittent or indeed impossible,
Situations where corrosive conditions, electrical conductivity etc. rule out the use of metals.

GRADE LS 10

This is a special application Laminated Sheet, having relatively high co-efficient of friction. Grade LS 10 is an effective replacement for Grade LS 30 where frictional forces are minimum and external lubrication is possible Due to its good electrical resistance and antistatic nature, it is used as a flooring material in railways.

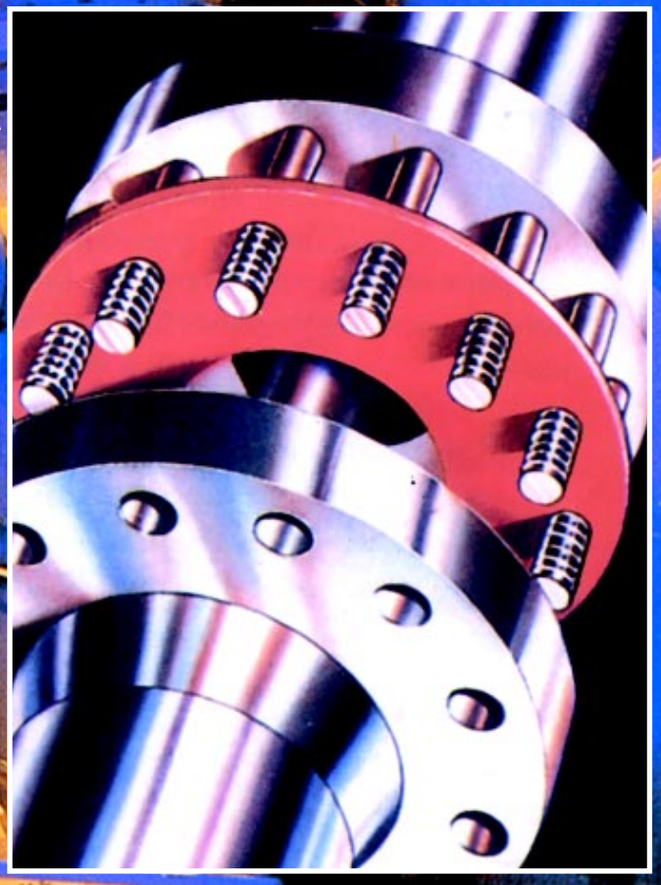
APPLICATIONS

Bushes, Bearings, Wear Strips, Centre Pivots, Rubbing Pads, Thrust Washers, Doctor Blades, Compressor Blades and Rotor Blades, Seatings, Guides, Facings, Slides, Valve Discs, Tread Plates, Pump Rings, Impellers and Gears.

RANGE OF SIZES

LS30 and LS10 are both available in sheet size of 1000mm x 1000 mm. and in the thickness range of 3.0 mm to 51.0 mm. Sheet sizes other than 1000mm x 1000mm. can also be supplied if production volume and constraints permit.

FYSAX COMPRESSED ASBESTOS FIBRE JOINTINGS



COMPRESSED ASBESTOS FIBRE JOINTINGS

Hindustan Composites Ltd. has been in the field of manufacture of Insulating and Sealing materials for nearly 45 years. Compressed Asbestos Fibre Jointings developed and manufactured with overseas technical backup by Hindustan Composites Ltd., has been more than satisfying the needs of the industry domestically as well as overseas.

Compressed asbestos fibre jointings are manufactured from carefully selected chrysotile fibres, intimately blended with suitable heat resisting binders and fillers and vulcanised into sheets of homogenous compositions and uniform thickness.

To avoid the necessity of producing perfect finish on the contact faces of a mechanical assembly, which is not only costly but quite often impracticable, a gasket of compressed asbestos fibre jointings enables a tight seal to be created and maintained between separable members. The seal is effected by the yielding, or the flow of the jointing material into the imperfections of the joint contact faces. In this way the gasket provides an unbroken barrier of homogenous structure through which no pathways exist for escape of the confined media.

Highly specialised knowledge and technical skill is necessary to manufacture adequate grades of compressed asbestos fiber jointings to satisfy various service parameters, such as resistance to contained fluid and pulsating loads if necessary.

The engineers and technicians involved in design, production, service and maintenance are quite familiar with the wide range of Compressed Asbestos Fibre jointings manufactured by Hindustan Composites and earlier marketed under the brand names of 'Permanite' and ' Firefly ' CAF.

These jointings after upgradation, wherever necessary are now being offered under our export brand name FYSAX.

Our R&D Centre with its highly specialised and experienced staff continues to provide all the backup services for upgradation of technology and products to meet the highest quality and performance standards while keeping pace with the accelerated rate of technological advancement and demand for excellence from the Industry. This catalogue contains the comprehensive data in the form of guidelines for engineers and technicians to enable them to select the appropriate grade of jointing materials for specific applications from the wide range available. However, the numerous parameters under which the jointing is expected to meet manyfold demands, may make the selection difficult. Our Technical Cell would be most delighted to help solve your problems promptly.

CHOICE OF JOINTING GRADE The choice of the grade of jointing material for any given condition is of paramount importance.

A number of factors need to be taken into consideration, while the choice of the correct grade and thickness is finally made for a particular application.

TYPE OF CONFINED MEDIA Resistance to attack by the confined media on the jointing material forms the sole basis of selection. Please refer to the 'Fibre jointings Recommendation Chart' given at the end. Though other factors also play an important role in the selection procedure, these guidelines serve the purpose adequately.

FLANGE SURFACE FINISH Too smooth a surface would be detrimental. The gasket and flange surface must provide suitable friction to reduce the chances of the gasket bursting under pressure.

Concentric grooves, particularly the standard gramophone record or spiral type are most ideal, though commercial machine finish would do in most cases. However, the jointing material itself should have a high surface co-efficient of friction, so that the gasket may be firmly gripped between the flange faces. This characteristic of the jointing, though appears to be insignificant for consideration, plays an important role in reducing the possibilities of 'Gasket Burst'. Hindustan Composites pays special attention to process technology of surface compounds to meet this requirement.

GASKET AND BOLT CONFIGURATION

For a given gasket stress, the possibilities of leakage will increase as the width of the gasket decreases. Placement of bolts, to even out the stress is also an important consideration while designing the flange.

CLAMPING PRESSURE

Actual initial compressive stress needed on a gasket to reduce leakage to zero or to an acceptable level, also known as 'Minimum Gasket Sealing Stress' depends upon the following:

- Design of the flange and bolt configuration
- Internal pressure of the fluid
- Viscosity of the contained fluid and its temperature which has an effect on the viscosity

Generally the actual clamping pressure is increased over the minimum gasket sealing stress by multiplying internal pressure by a factor known as the 'Gasket Factor'. As a thumb rule, the gasket factor for liquids is 1 and that for gases is 2.5.

CHOICE OF THICKNESS

Though there are no hard and fast rules governing the choice of gasket thickness, the gasket should be as thin as possible to minimise the stress relaxation. The considerations are, dimensions and conditions of the flange.

As a guideline the following choices can be made, depending upon the condition of the flange surface:

FLANGE SURFACE	Finely ground	Finely machine finished	Normally machined	Rough machined	Well forged or die-cast
THICKNESS	0.25 to 0.4 mm	0.5 to 1.00 mm	1.2 to 1.5 mm	1.5 to 3.0 mm	3.0 mm and above

IMPORTANT CHARACTERISTICS OF JOINTING MATERIALS

Specifications covering the physical properties basically help in classifying the grades of jointing materials. For example, in recent years there has been an increasing tendency to take tensile strength as being the total measure of the quality and likely performance, but in reality it is by any means, not the sole criterion to judge its possible behaviour in service. The following characteristics also play important role in determining how efficiently the jointing material performs under varying operating parameters.

- COMPRESSIBILITY - A jointing material should possess compressive characteristics so that it allows the material to flow and conform to the flange surface with an ability to 'bed-in' and provide necessary friction

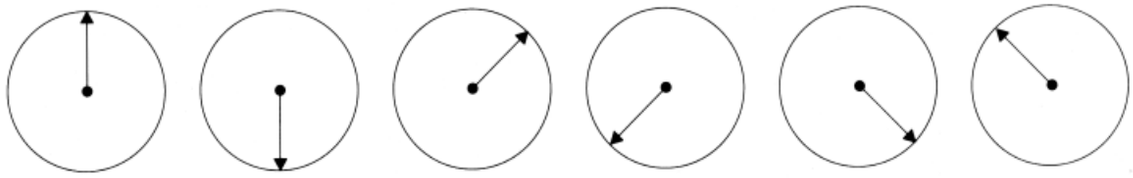
- RECOVERY - As the jointing material should get compressed under pressure, it should also offer resilience to recover and maintain its sealing effect by not allowing any 'Permanent Set' due to changes in pressure of the confined fluid and effects of its temperature, or due to flange deflection or bolt expansion.

STRESS RELAXATION - This determines the dimensional stability of the jointing material under combined effects of pressure and temperature. There should be a minimum tendency of the gasket to relax its stresses under high pressure/temperature conditions to reduce the torque loss and maintain an effective seal. Hindustan Composites Limited strive to maintain these important characteristics in its jointings material, through well formulated furnished, controlled manufacturing process, stringent checks and balances at every stage.

GUIDELINES ON THE USE OF FYSAX AMJ JOINTINGS

The FYSAX AMJ series of jointings are carefully designed to provide excellent performance under normal fitment. However, certain preparatory precautions would help in achieving the best results:

- The flange faces must be clean and devoid of any projections, dents, burrs, pittings, distortion, etc.
- The OD, ID and the bolt clearances should be cut with a sharp cutter to avoid folds and burrs.
- Ensure that the flange surfaces are fully covered by the gasket to avoid possible corrosion, with adequate clearance around bolt holes to avoid folds, bulge or shear during bolt tightening.
- Avoid contamination of the gasket with oil, grease, adhesives, etc.
- Insert the gasket in-between the flanges, slip one bolt and position the gasket and place other bolts.
- Lightly tighten in the following order and repeat the order with full spanner pressure



DIMENSIONS

- **Range of Nominal Thicknesses (mm)**

0.25	0.4	0.5	0.75	1.0	1.2	1.5	2.0	3.0	4.0	5.0	6.0

- Sheet Sizes

Quality	Thickness (mm)	Sheet Size (mm)
• All (Except AMJ 545 ultra Metallic)	1.5 & above	1550 (±50) X 1550 (±50)
• All (except AMJ 493 ACID and AMJ 545 Ultra-Metallic)	All	1850 (±50) X 1250 (±50)
• All	All	1500 (±50) X 1500 (±50)
• AMJ 493 ACID and AMJ 545 Ultra-Metallic	0.6 MM & above	1850 (±50) X 1250 (±50)

Note : Sheet sizes of 3200 (±50) X 3200 (±50), 4500 (±50) X 1500 (±50) and 3200 (±50) X 1600 (±50) can be supplied in specific thicknesses on mutual consent.

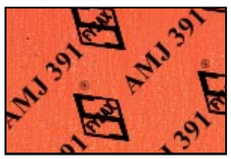
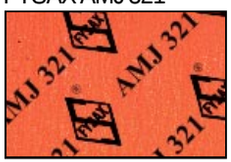
PRODUCT RANGE FYSAX AMJ SERIES

Quality Nomenclature	Product Description	Recomm. Max. Temp. ^0C	Recomm. Max. Pressure Kg/cm^2	Specification Compliance	Service
FYSAX AMJ 545 ULTRA METALLIC 	A superior grade of jointing, reinforced with FINE MESH STEEL GAUZE. The special construction provides excellent seal under pulsating or rapidly fluctuating pressure conditions, eliminates physical breakdown and contributes towards bolt torque retention. Available in Graphited finish only.	600	180	BS.1832/1991, Grade A (for base material without steel mesh) IS: 2712/1979, GradeW/1 reinforced IS: 2712/1998, GradeW/1 reinforced	Recommended against most gases and fluids except acids, under high pressure and vibrating conditions. Specially recommended for sealing high pressure steam pipelines where the design provides narrow flanged joints, Is extensively used for gasketing in internal combustion engines and air compressors.
FYSAX AMJ 535 ULTRA 	A superior grade of jointing made from carefully selected chrysotile asbestos fibres and heat resisting compounds. Provides excellent service against extreme temperature and pressure conditions. Although, primarily a steam jointing, it satisfies a variety of service parameters. Non-metallic Available in Red, Graphited, Green or Yellow finish	550	150	BS.1832/1991, Grade A IS : 2712/1979, Grade W/1 IS : 2712/1998, Grade W/1	Recommended against high pressure super-heated and saturated steam, gases, alkalies, weak acids, oils, solvents, alcohols and most chemicals.
	Also available with metallic reinforcement as FYSAX AMJ 540 Ultra Meallic.	550	160	IS: 2712/1998, GradeW/1 reinforced	Same as above but for high pressure conditions.
FYSAX AMJ 493 ACID EXTRA SPL. 	Made from good quality chrysotile asbestos fibres, intimately bonded with a special compound having acid resisting properties. The special compound used in this jointing is the practical result of research and field experience over many years. It imparts to the jointing the ability to withstand the destructive action of hot concentrated acids under conditions of temperature and pressure commonly encountered in the chemical and allied industries - Non-metallic - Light Ash Grey finish	220	150	U.K. Dept. of Atomic Energy D.At.En 70142 c IS:2712/1979, Grade A/1 IS:2712/1998, Grade A/1	Recommended against organic, inorganic and mineral acids, under hot and cold conditions and in a concentrated form. Also suitable against oleum.

The temperature and pressure recommended above are for design purpose only, and are not part of Quality Assurance Tests.

Quality Nomenclature	Product Description	Recomm. Max. Temp. ^0C	Recomm. Max. Pressure Kg/cm^2	Specification Compliance	Service
FYSAX AMJ429 OIL EXTRA SPL. 	Manufactured from high-grade chrysotile asbestos fibres with rubber compound having a high resistance to oils and solvents. Most suitable for oil conditions calling for a high resistance to hydrocarbons. -Non -metallic - Grey finish * Also available with metallic reinforcement as FYSAX AMJ 439 OIL Extra Spl. Metallic	550 550	150 160	BS.1832/1991, Grade O&A IS:2712/1979, Grade0/1& W/1 IS:2712/1998, Grade0/1,& W/1	Recommended for sealing against hot oils, petroleum distillates, solvents, refrigerants, etc. Gives equally satisfactory service against water, steam, alkalies and general chemicals, Coal distillation solvents and refrigeration plants. Finds application in high pressure stills, internal combustion engines, compressors, etc.
FYSAX AMJ 411 AVION EXTRA SPL. 	Manufactured from good quality chrysotile asbestos and special rubber compounds and chemicals which are not affected by aviation fuels and lubricating oils -Non-metallic -Dull Red finish	550	150	U.K.Air Ministry DTD 378A	Recommended for sealing against aviation fuels and lubricating oils in joints of aero engines including flanges of magnesium alloy. Also suitable for machined pipes, flanges against steam, gases, alkalies and mild acids.
FYSAX AMJ 410 REFRIG EXTRA SPL. 	High grade jointing with a special binding compound -Blue finish -Non -metallic	550	150	BS.1832/1991, Grade O&A IS:2712/1979, Grade 0/1 & W/1 IS:2712/1998, Grade 0/1 & W/1	Recommended for use against hot oils, fuels and solvents, Specially suitable for compressor duties including refrigeration.

The temperature and pressure recommended above are for design purpose only, and are not part of Quality Assurance Tests.

Quality Nomenclature	Product Description	Recomm. Max. Temp. ^0C	Recomm. Max. Pressure Kg/cm^2	Specification Compliance	Service
FYSAX AMJ 391 SPECIAL 	A versatile jointing, catering to the needs of the industry and covering a range of applications due to incorporation of a superior grade of bonding compound. -Red or Graphited finish -Metallic and Non-metallic in both finishes	450 Non-Met 500 Met	85Non-Met 105Met	U.K. Dept of Atomic Energy. D.AT. En 70143 BS.1832/1991, Grade B IS:2712/1979, Grade W/2 & 0/2 IS:2712/1998, Grade W/2 & 0/2	Recommended for use against wet steam, water, gases, alkaline chemicals, etc, also suitable against oils and fuels under moderate temperature conditions.
FYSAX AMJ 341 	A medium grade jointing, finding extensive application in the maintenance of all services throughout a wide range of the industry. -Red or Graphited finish -Metallic and Non-matallic in both the finishes	440 Non-Met 480 Met	80Non-Met 100 Met	IS:2712/1979, Grade W/3 IS : 2712/1998, Grade W/3 BS.1832/1991, Grade B DGS&D Spec G/Misc/81-C Comm. quality	Recommended for use against steam, water, gases, alkalies and many chemicals.
FYSAX AMJ 321 	Moderately priced, general purpose steam jointing, most suitable for the commonly faced requirements in any industry for jointing or gasketing purposes. -Red or Graphited finish -Metallic and Non-metallic in both finishes	380 Non -met 420 Met	40 Non-met 45 Met	IS:2712/1979, Grade W/3 IS:2712/1998, Grade W/3	Recommended for use against steam, water, gases and alkalies.
COMPOLITE 200 	Economically priced general purpose jointing, suitable for normal temperature and pressure conditions. -Red or Graphited finish -Metallic and Non-metallic in both finishes	350 Non-met 375 Met	30 Non-Met 35 Met	IS:2712/1979, Grade W/3 IS:2712/1998, Grade W/3	Recommended for use against steam, water, gases and mild alkalies under moderate pressure.

**The temperature and pressure recommended above are for design purpose only and are not part of the Quality Assurance Tests.*

COMPRESSED ASBESTOS FIBRE JOINTINGS RECOMMENDATION CHART

FYSAX AMJ SERIES

	545 ULTRA MET	535 ULTRA	493 ACID E.SPL.	429 OIL E.SPL.	411 AVION E.SPL	410 REFRIG E.SPL.	391 SPL	341	321	COMPOLITE 200
WATER:										
Boiler feed	✓	✓	✗	✓	★	★	★	⊕	⊕	⊕
Cold	✓	✓	✗	✓	★	★	✓	✓	✓	✓
Condensate	★	✓	✗	★	★	★	✓	★	★	★
Distilled	★	✓	✗	★	★	★	★	★	✗	✗
Hot	★	✓	✗	★	★	★	✓	★	✗	✗
Sea	★	✓	★	★	★	★	★	★	★	★
Soapy	✗	✓	✗	✓	★	★	★	★	★	★
STEAM:										
Saturated	✓	✓	✗	★	★	★	✓	✓	✓	✓
Superheated										
Upto 375 PSI	✓	✓	✗	★	★	★	✓	✓	★	★
Upto 600 PSI	✓	✓	✗	★	★	★	✓	★	✗	✗
Upto 1200 PS	✓	✓	✗	★	★	★	★	✗	✗	✗
Upto 1500 PS	★	✓	✗	★	★	★	✗	✗	✗	✗
Upto 2000 PS	★	✓	✗	★	★	★	✗	✗	✗	✗
Over 2000 PSI	⊕	⊕	✗	⊕	⊕	⊕	✗	✗	✗	✗
ACIDS:										
Acetic, glacial	✗	★	✓	★	★	★	★	★	⊕	⊕
Benzoic	⊕	★	✓	★	★	★	★	★	⊕	⊕
Carbolic (Phenol)	⊕	★	✗	★	★	⊕	⊕	✗	✗	✗
Chromic	✗	⊕	✓	⊕	⊕	✗	✗	✗	✗	✗
Cresylic	⊕	★	✗	★	★	⊕	⊕	⊕	⊕	⊕
Formic	✗	★	✓	★	★	⊕	⊕	⊕	⊕	⊕
Hydrochloric (conc)	✗	★	✓	★	★	⊕	⊕	⊕	✗	✗
Hydrochloric (dilute)	✗	★	✓	★	★	⊕	⊕	⊕	✗	✗
Hydrofluoric	✗	✗	★	✗	✗	✗	✗	✗	✗	✗
Nitric (conc)	✗	✗	★	✗	✗	✗	✗	✗	✗	✗
Nitric (dilute)	✗	✗	★	✗	✗	✗	✗	✗	✗	✗
Oleum (fuming Sulphuric)	✗	✗	⊕	✗	✗	✗	✗	✗	✗	✗
Phosphoric	✗	★	✓	★	✗	★	★	⊕	✗	✗
Sulphuric (conc)	✗	⊕	✓	⊕	✗	⊕	✗	✗	✗	✗
Sulphuric (dilute)	✗	⊕	★	⊕	✗	⊕	✗	✗	✗	✗
Sulphurous	✗	★	✓	★	✗	★	★	⊕	✗	✗
Tar	✗	★	✓	✓	✗	★	★	⊕	⊕	⊕
ALKALIES:										
Ammonia, Anhydrous/Aqua	★	✓	★	✓	★	★	★	★	⊕	⊕
Caustic Liquor	✗	✓	★	✓	★	★	★	⊕	✗	✗
Oil/Soda Solution	★	✓	★	✓	★	★	★	★	★	★
Potassium Hydroxide Solution	★	✓	★	✓	★	★	★	★	⊕	⊕
Sodium Hydroxide Solution	★	✓	★	★	★	★	★	★	★	★
Sodium Silicate	★	✓	★	★	★	★	★	★	★	★

✓ = Recommended ★ = Suitable ⊕ = Resistant but Conditional ✗ = Not Recommended

	545 ULTRA MET	535 ULTRA	493 ACID E.SPL.	429 OIL E.SPL.	411 AVION E.SPL	410 REFRIG E.SPL.	391 SPL	341	321	COMPOLITE 200
REFRIGERANTS:										
Ammonia, Anhydrous/Aqua	★	✓	★	★	★	★	★	★	⊕	⊕
Freons	✗	✓	★	★	★	★	★	★	⊕	⊕
Ethylene Glycol	⊕	⊕	✗	★	★	✓	✗	✗	✗	✗
Oil and Ammonia	✗	⊕	✗	★	★	✓	⊕	⊕	✗	✗
Oil and Freon 11, 12 or 22	✗	⊕	✗	★	★	✓	✗	✗	✗	✗
Oil and Methylene Chloride	✗	⊕	✗	★	★	✓	✗	✗	✗	✗
Oil and Sulphur Dioxide	✗	⊕	✗	★	★	✓	✗	✗	✗	✗
ORGANIC SOLVENTS:										
Acetone	★	★	✗	✓	★	★	★	★	⊕	⊕
Alcohol	★	★	⊕	✓	★	★	★	★	⊕	⊕
Benzene	⊕	★	✗	★	★	✓	⊕	✗	✗	✗
Carbon Disulphide	✗	✗	★	✗	✗	⊕	✗	✗	✗	✗
Carbon Tetrachloride	⊕	⊕	⊕	⊕	★	⊕	⊕	✗	✗	✗
Cellosolve	⊕	★	✗	★	★	✓	⊕	✗	✗	✗
Chloroform	⊕	⊕	⊕	⊕	★	⊕	⊕	✗	✗	✗
Cyclohexane	★	★	✗	★	★	✓	★	✗	✗	✗
Cyclohexenol	★	★	✗	★	★	✓	★	✗	✗	✗
Heptane	★	★	✗	★	★	✓	★	✗	✗	✗
Iso-propyl Alcohol	★	★	⊕	✓	★	★	★	★	⊕	⊕
Ketones	★	★	✗	✓	★	★	★	★	★	★
Naphta	⊕	★	✗	★	★	✓	⊕	✗	✗	✗
Nitrobenzene	✗	⊕	✗	⊕	⊕	⊕	✗	✗	✗	✗
Perchlorethylene	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Propyl Acetate	⊕	⊕	⊕	⊕	⊕	⊕	⊕	✗	✗	✗
Tetrachlorethylene	⊕	⊕	⊕	⊕	⊕	⊕	⊕	✗	✗	✗
Toluene	⊕	★	⊕	★	★	⊕	⊕	✗	✗	✗
Trichlorethylene	⊕	⊕	⊕	⊕	⊕	⊕	⊕	✗	✗	✗
Triethylamine	✗	⊕	✗	⊕	⊕	★	⊕	⊕	⊕	⊕
Turpentine	⊕	★	★	✓	★	★	⊕	✗	✗	✗
White Spirit	⊕	★	★	✓	★	★	⊕	✗	✗	✗
Amyl Acetate	⊕	⊕	⊕	⊕	⊕	⊕	⊕	✗	✗	✗
OILS & DISTILLATES;										
Aromatic Fuels	⊕	★	✗	★	★	✓	★	✗	⊕	⊕
Aviation Fuel	⊕	★	✗	★	★	✓	★	✗	✗	✗
Benzine	⊕	★	✗	★	★	✓	⊕	★	★	★
Diesel Fuel	⊕	★	✗	★	★	✓	⊕	✗	✗	✗
Creosote	⊕	★	✗	★	★	✓	⊕	✗	✗	✗
Gasoline	⊕	★	✗	★	★	✗	⊕	✗	✗	✗
Hydrocarbons	⊕	★	✗	★	★	✓	⊕	✗	✗	✗
Kerosene	★	★	✗	★	★	✓	⊕	✗	✗	✗
Methylated Spirit	★	★	⊕	✓	★	★	★	✗	✗	✗
Paraffin	⊕	★	✗	★	★	✓	⊕	✗	✗	✗
Petrol	⊕	★	✗	★	★	✓	⊕	✗	✗	✗
Petroleum Ether/Spirit	⊕	★	✗	★	★	✓	⊕	✗	✗	✗

✓ = Recommended ★ = Suitable ⊕ = Resistant but Conditional ✗ = Not Recommended

	545 ULTRA MET	535 ULTRA	493 ACID E.SPL.	429 OIL E.SPL.	411 AVION E.SPL	410 REFRIG E.SPL.	391 SPL	341	321	COMPOLITE 200
Reffinate	⊕	★	✗	✓	★	✓	★	✗	✗	✗
Bunker c. Fuel	★	★	✗	✓	★	✓	★	✗	✗	✗
Coconut	★	★	✗	✓	★	✓	★	✗	✗	✗
Cottonseed	★	★	✗	✓	★	✓	★	✗	✗	✗
Crude	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
Diesel	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
Engine	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
Fuel	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
Gas	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
Heavy	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
Hydraulic	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
Hydrogenated	★	★	✗	✓	★	✓	★	✗	✗	✗
Light	⊕	★	✗	✓	★	✓	★	✗	✗	✗
Linseed	★	★	✗	✓	★	✓	★	✗	✗	✗
Lubricating	⊕	★	✗	✓	★	✓	★	✗	✗	✗
Mineral	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
Napththanic	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
Neutral	⊕	★	✗	✓	★	✓	★	✗	✗	✗
Paraffin Base	⊕	★	✗	✓	★	✓	★	✗	✗	✗
Quenching	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
Rape-seed	⊕	★	✗	✓	★	✓	★	✗	✗	✗
Refrigeration	⊕	⊕	✗	✓	⊕	✓	★	✗	✗	✗
Residue	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
Rich	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
Silicone	⊕	★	✗	✓	★	✓	⊕	⊕	⊕	⊕
Slop	⊕	★	✗	✓	★	✓	★	⊕	⊕	⊕
Soda Solution	⊕	★	✗	✓	★	✓	★	⊕	⊕	⊕
Spindle	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
Transformer	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
Vacuum Distillate	⊕	★	✗	✓	★	✓	⊕	✗	✗	✗
AIR AND GASES:										
Air	★	✓	★	★	✓	★	★	★	★	★
Argon	★	✓	★	★	✓	★	★	★	★	★
Butane	⊕	★	⊕	✓	★	✓	⊕	⊕	⊕	⊕
Carbon Dioxide	★	✓	★	★	✓	★	★	★	★	★
Coal Gas	★	✓	★	★	✓	★	★	★	★	★
Ethane	⊕	★	⊕	✓	★	✓	⊕	⊕	⊕	⊕
Hydrogen	★	✓	★	★	✓	★	★	★	★	★
Methane	⊕	★	⊕	✓	★	✓	⊕	⊕	⊕	⊕
Natural Gas	★	✓	★	★	✓	★	★	★	★	★
Nitrogen	★	✓	★	★	✓	★	★	★	★	★
Oxygen	★	✓	★	★	✓	★	★	★	★	★
Propane	⊕	★	⊕	✓	★	✓	⊕	⊕	⊕	⊕
Propylene	⊕	⊕	★	⊕	✓	★	✓	⊕	⊕	⊕
Sulphur Dioxide (dry)	⊕	⊕	★	⊕	⊕	⊕	✗	✗	✗	✗

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	545 ULTRA MET	535 ULTRA	493 ACID E.SPL.	429 OIL E.SPL.	411 AVION E.SPL	410 REFRIG E.SPL.	391 SPL	341	321	COMPOLITE 200
FOOD AND DRINK:										
Cane Sug	☆	✓	⊕	✓	☆	☆	☆	☆	☆	☆
Castor Oil	☆	✓	✗	✓	☆	✓	☆	✗	✗	✗
Food Proc	☆	✓	⊕	☆	☆	☆	☆	☆	☆	☆
Milk	☆	✓	☆	☆	☆	☆	☆	☆	☆	☆
Vegetable	☆	✓	✗	✓	☆	✓	☆	✗	✗	✗
Fruit Juice	☆	✓	☆	☆	☆	☆	☆	☆	☆	☆
Syrups	☆	✓	☆	☆	☆	☆	✓	☆	☆	☆
Vinegar	☆	✓	☆	☆	☆	☆	☆	☆	⊕	⊕
Wine/Whisky	☆	✓	☆	✓	☆	☆	☆	☆	⊕	⊕
GENERAL CHEMICALS:										
Alum	☆	✓	☆	☆	✓	☆	☆	☆	☆	☆
Bleach Liquor	☆	✓	☆	☆	✓	☆	☆	☆	☆	☆
Borax	☆	✓	☆	☆	✓	☆	☆	☆	☆	☆
Bromine	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Calcium Carbonate	☆	✓	☆	☆	✓	☆	☆	☆	☆	☆
Calcium Chloride	☆	✓	☆	☆	✓	☆	☆	☆	☆	☆
Chlorine	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Chlorobenzene	⊕	⊕	⊕	⊕	⊕	✗	⊕	⊕	⊕	⊕
Chloromethane	⊕	⊕	⊕	⊕	⊕	⊕	⊕	✗	✗	✗
Copper Sulphate	☆	✓	☆	☆	✓	☆	☆	☆	☆	☆
Dowtherm	✗	☆	✗	☆	☆	✓	✗	✗	✗	✗
Ether	☆	☆	☆	✓	☆	✓	☆	☆	☆	☆
Ethyl Acetate	⊕	⊕	⊕	⊕	⊕	⊕	⊕	✗	✗	✗
Ethyl Alcohol	☆	☆	✗	✓	☆	☆	☆	☆	☆	☆
Ferric Chloride	⊕	☆	☆	☆	☆	☆	☆	☆	☆	☆
Glycerine	☆	✓	☆	☆	✓	☆	☆	☆	☆	☆
Hydrogen Peroxide (20 vols)	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Lye	☆	✓	☆	☆	✓	☆	☆	☆	☆	☆
Methyl Acetate	⊕	⊕	⊕	⊕	⊕	⊕	⊕	✗	✗	✗
Methyl Alcohol	☆	✓	⊕	☆	✓	✓	☆	☆	☆	☆
Methyl Chloride	⊕	⊕	⊕	⊕	⊕	⊕	⊕	✗	✗	✗
Methylene Chloride	⊕	⊕	⊕	⊕	⊕	✗	⊕	✗	✗	✗
Pentane	⊕	✓	✗	✓	☆	✓	⊕	✗	✗	✗
Sewage	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
Sodium Salts	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
Sodium	☆	☆	☆	☆	☆	☆	☆	☆	☆	
Sodium Sulphite	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
Sodium Thiosulphate	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
Tin Sodium Phosphate	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆
Zinc Sulphate	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆

The Recommendation Chart, does not take into consideration, the parameters such as concentrations, temperatures and pressures (except in few cases). It should, therefore be used as a General Guide for the selection process. For specific applications the services of the Iechnical Cell of Hindustan composites Ltd. are always available for consultation.

✓ = Recommended ☆ = Suitable ⊕ = Resistant but Conditional ✗ = Not Recommended

ASBESTOS

'Asbestos' is the term applied collectively to various classes of fibrous minerals used in the industry and characterised by their resistance to heat, and the strength and flexibility of their fibres.

Chrysotile (white) asbestos is by far the most important variety and comprises 80-90 percent of the asbestos consumed in the industry. It is a hydrated silicate of magnesium corresponding approximately to the formula $3MgO.\ 2SiO_2\ .\ 2H_2O$. It may also contain small traces of aluminium and iron, and dependent on the quantities of these traces the colour of chrysotile asbestos in the crude rock form varies from pure white to greyish-green, although it appears white in the textile form.

Individual chrysotile asbestos fibres are silky and very flexible with a diameter smaller than that of any synthetic fibre. An electron microscope photograph shows that asbestos fibres can be successfully split into finer fibres with a diameter of less than 1/5,00,000 inch or 0.00005 mm.

Asbestos is incombustible and is a poor conductor of heat. It is unaffected by temperatures upto approximately 450^0C, when it begins to lose its chemically combined 'water of crystallisation'; this process is completed at about 700^0C, but the residue which remains fibrous, does not fuse until temperatures of 1450-1500^0C are reached.

Asbestos is known as the "wonder mineral" because it possesses many remarkable qualities which are not known to be possessed by any material, singly or collectively available today.

These qualities are : ● Resistance to heat ● Resistance to abrasion ● Resistance to flame ● Adaptable for resin absorption ● Resistance to moisture ● Resistance to alkalies and weak acids ● Resistance to ageing ●Resistance to vermin attack

Though small deposits of asbestos fibres are located in India, most of the asbestos required for manufacture of Asbestos Textiles are imported into India from Canada, Zimbabwe, CIS and South Africa.

ASBESTOS AND HEALTH

Not very long ago there was a storm in the United States regarding the use of asbestos. Fortunately, it turned out to be just another storm in tea cup.

As the leader in our industry, we at Hindustan Composites feel it necessary to dispel any lingering doubts about the use of this extremely versatile material.

- Asbestos is a naturally occurring mineral which is inert and is not toxic to touch, smell or ingestion.
- Asbestos fibre is not a health hazard unless its dust becomes airborne and when such dust is continuously inhaled in large amounts over a prolonged period.

- Health risks related to asbestos dust are primarily occupational (workplace) rather than environmental.
- Safe use of asbestos is possible by exercising adequate engineering controls and work practices. Most responsible manufactures have ensured that this is taken care of and that the dust levels are maintained within the prescribed limit by the competent authority.

- A careful evaluation of alternate materials to asbestos has established that they pose a greater health hazard and the long term effects of such substitutes are yet to be determined.

- The products manufactured by Composites are either dust suppressed or fibre encapsulated. This results in the fibres being “locked in” thereby preventing dust emission in handling and its end use.

All asbestos products manufactured by Hindustan Composites Limited contain only chrysotile fibres, which due to their curvi-linear nature are the least harmful of all varieties of asbestos. As recommended by the ILO Convention the use of Crocidolite (blue asbestos) variety of asbestos fibres, which is the most harmful due to its needle like structure, was discontinued by us many years ago.

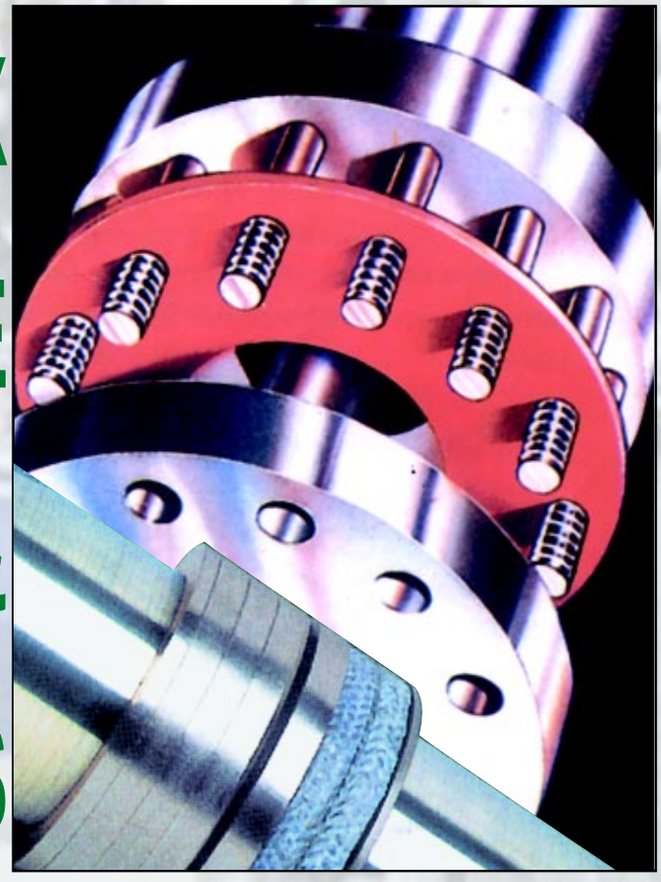
It is noteworthy that past problems associated with the use of asbestos were confined to the workplace alone. There is no evidence of any associated health problem connected with the end use of asbestos containing products. In fact, extensive scientific and medical studies carried out over the years have established that such products do not present any environmental risk and pose no threat to the general public.

Taking all these factors into consideration, the proposed ban on the use and manufacture of asbestos containing products sought to be imposed by the US based Environmental Protection Agency was struck down by the US Court of Appeals in 1991. As a consequence E.P.A. lifted its ban on asbestos products in November 1993.

For more information/details on Asbestos-related products, do write in to our head office in Mumbai.

FYSAX

FYSAX ASBESTOS-FREE JOINTINGS & PACKINGS



HINDUSTAN COMPOSITES LIMITED

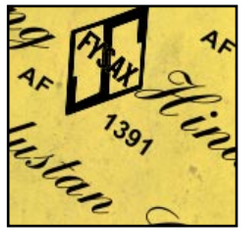
WHERE SAFETY IS AN ONGOING CONCERN

"FYSAX" GRADES OF ASBESTOS FREE COMPRESSED FIBRE JOINTINGS

FYSAX AF 1321

FYSAX AF 1341

FYSAX AF 1391

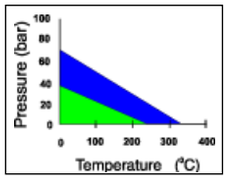


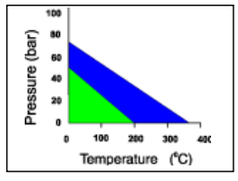
General composition	Synthetic Fibres	Aramid/Mineral/Synth	Aramid/Mineral/Glass
	SBR/NBR	SBR/NBR	NBR/EPDM
Colour/Finish	Green	Black	Yellow
General Properties	Versatile, Economical	Specific oil resistant General purpose	Withstands High Pressure/Temp

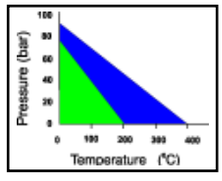
General Applications	Low to medium loading, good resistance to oils, water, steam, fuels & chemicals at moderate temperatures & pressures.	Medium loading, excellent resistance to oils, hot water, gases, hydrocarbons and many chemicals.	Medium to high loading, excellent resistance to gases, fuels, oils, mild acids & alkalies and wide range of chemicals.

Specific Properties(Typical values)					
Tensile strength	MPa	DIN 52910	7	8.5	11
Compressibility	%	ASTM F36	11	10	9
Recovery	%	ASTM F 37	50	55	55
Thickness increase		ASTM F 146			
ASTM Oil no.3	%		15	12	8
ASTM Fuel B	%		15	10	9
Stress Relaxation		DIN52913			
50Mpa /300^{0}C /16h	MPa		20	23	25
50 Mpa /175^0 C /16h	Mpa		22	28	30

Operating Conditions					
Temperature	^{0}C	Max.	325	375	400
		Normal	250	250	275
		with Steam	200	200	200
Pressure	Bar		50	70	90



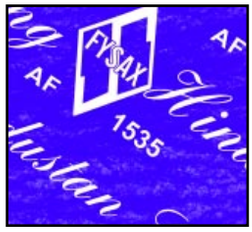
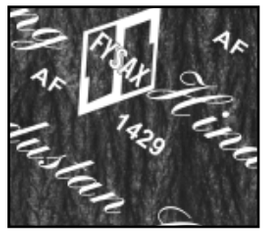
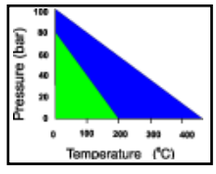
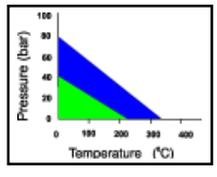
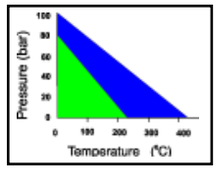
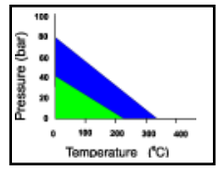




If the temperature/pressure parameters fall in the Green area, material selection can, generally be made without technical evaluation. If they fall in the Blue area, the performance will also depend upon other factors, such as, type and concentration of the medium, flange condition, thickness selection etc, hence a technical evaluation is recommended. If the parameters are in the open area, an evaluation by Technical Services Dept. of HCL will be necessary.
The data provided here is based on research efforts, field and laboratory applications, ideal or prototype conditions and long years of manufacturing experience of the sealing products. Since the actual application or installation depends upon number of variables, the data should not be used to support any waranty claim if used without consultation of HCL in extreme conditions.

COMPOSITES

FYSAX

FYSAX AF 1535	FYSAX AF 1493	FYSAX AF 1429	FYSAX AF 1666CS
			
Aramid/Mineral	Aramid./Glass	Aramid/Mineral	Aramid./Mineral/Synth.
NBR/SBR	Butyl	NBR	SBR/NBR
Violet	White	Black-Grey	Yellow
Superior chemical and hydrocarbon resistance	High performance resistant to acids	High performance, oil resistant	Controlled Swell
High loading with excellent mechanical strength & resistance to oils/alkalies & wide range of chemicals.	Offers resistance to acids, alkalies and other aggressive media	In addition to superior resistance to gases,water & steam, offers resistance to oils and hydrocarbons under severe operating conditions.	Offers controlled swell properties in oils & fuels. Excellent self sealing with low surface stress.
10 9 50 8 8 25 28	9 8 45 10 * 12 ** 25 25	12 8 60 5 7 25 30	8 11 55 25-40 15-30 25 28
450 275 225 100	200 160 – 70	425 275 225 100	330 220 180 80
			

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The data provided here is based on research efforts, field and laboratory applications, ideal or prototype conditions and long years of manufacturing experience of the sealing products. Since the actual application or installation depends upon number of variables, the data should not be used to support any waranty claim if used without consultation of HCL in extreme conditions.

* 50% HNO_3/1h/65^{0}C, ** 65% H_2SO_4/48h/Ambient

CHEMICAL RESISTANCE CHART

Medium	AF-1321	AF-1341	AF-1391	AF-1535	AF-1429	AF-1493	AF-1666CS
Air	R	R	R	R	R	C	R
Water	R	R	R	R	R	C	R
Steam	R	R	R	R	R	N	R
Saturated steam	C	R	R	R	R	N	R
Mild Inorganic acids	R	R	R	R	R	R	C
Mild Organic acids	C	R	R	R	R	R	C
Strong acids	N	N	C	N	N	R	N
Mild Alkalies	R	R	R	R	R	R	R
Strong Alkalies	N	C	C	R	R	C	R
Industrial Gases	R	R	R	R	R	C	R
Synthetic Oils	N	C	R	R	R	N	R
Vegetable Oils	N	C	C	R	R	N	R
Animal Oils	N	C	C	R	R	N	R
Aliphatic Solvents	C	R	R	R	R	N	R
Aromatic Solvents	N	C	R	R	R	N	R
Chlorinated Solvents	N	N	C	C	R	N	C
General Chemicals	R	R	R	R	R	C	R
Refrigerants	N	N	C	R	C	C	C
Food & Beverages	R	R	R	R	R	C	C

Note : **R = Recommended**
C = Conditional
N = Not recommended

STANDARD DIMENSIONS

Sheet Size (mm)	: 1500(±50) x 1500	(±50)
Thickness	: 0.5 mm, 0.75 mm	(±0.15 mm)
	: 1.0 mm, 1.5 mm	(±10%)
	: 2.0 mm, 3.0 mm	(±10%)

Sheets with other dimensions may be made available, on mutual consent.

Sheets with special surface treatment of graphite or other compounds which impart anti-stick properties and with metal gauze insertion can also be made available, on mutual consent.

ASBESTOS FREE PACKINGS

Style — **FYSAX TP**

PURE TEFLON PACKING

Features : The Packing is cross plaited from tough thermally stable PTFE filament yarn, giving it a consistent density with the compression & recovery inherent in high performance pump packings.

Recommended Applications : Valves, plunger pumps, agitators, vacuum dryers, mixers, centrifugal & rotary shafts.

Recommended Serivce Media : Ammonia charge pumps, most caustic media pumps invloving high pressure applications, with control system for steam, gases, air, oils, solvents, acids & hydrocarbons, suitable for foodstuffs & pharmaceutical industries.

Recommended Service Conditions :
Temperature:(–) 200^{0}C to 260^{0}C
(300^0 C in short operation)
Pressure:Upto 5000psi (350 kg/cm^2)
pH:0-14
Surface Speed : 10m/s

Precautions : Not suitable for use in molten alkali metals, Fluorine etc.

Style — **FYSAX GP**

PURE GRAPHITE PACKING

Features : A 100% Pure Graphite fibre packing treated with high temperature lubricant to prevent seepage through the packing. The inherent self lubrication, low coefficient of expansion, high thermal conductivity, good chemical compatibility, high temperature resistance are the characteristics of the packing.

Recommended Applications : All centrifugal & stationary services, valves, mixers & agitators, refinery services.

Recommended Service Media : Most destructive acids, corrosives & caustics at very high temperature, superheated steam, hot tar, SO_2 & SO_3 .

Recommended Service conditions :
Temperature: (–) 250^{0}C to 600^{0}C
(550^{0}C in Steam)
Pressure: Upto 5000psi (350 kg/cm^2)
pH:0-14
Surface Speed: 20 m/s

Precautions. : Not recommended for use in Oxygen, fuming Nitric acid, Aqua Regia, Oleum & Fluorine

Sizes : in square sections of 6, 8, 10, 12.5, 14, 16, 18, 20, 22 & 25 mm.
Unit packaging : supplied in spools of 1, 2.5, 5, 10 & 20 kg

ASBESTOS FREE PACKINGS

Style **FYSAX GTO**

TEFLON/GRAPGITE PACKING

Features : The packing made from 100% PTFE/ Graphite yarn. It is universally applicable & offers problem free installation & removal. It offers low coefficient of friction & thermal expansion, good thermal conductivity, speed capability & minimum shaft wear in a very large range of applications.

Recommended Applications : Pumps, valves, mixers & agitators

Recommended Serivce Media : Acids, oils, corrosive gases & alkali solutions.

Recommended Service Conditions :

Temperature: (–) 200^{0}C to 300^{0}C
Pressure:upto 5000psi (350 kg/cm^2)
pH:O-14
Surface Speed: 25m/s

Style **FYSAX AP**

PURE ARAMID PACKING

Features Braided from pure Aramid fibre. It is flexible & is an excellent abrasive resisting material even under high pressure conditions. Rings of these are recommended for use as backup rings.(anti-extrusion rings)

Recommended Applications Ideal for paper mill applications,high pressure water injection systems, high pressure reciprocating pumps.

Recommended Service Media Suitable for abrasive slurries, fuels, oils, mild acids & alkalies, high pressure dozing pumps, hydrocarbons, greases & brines.

Recommended Service conditions

Temperature: (–) 200^{0}C to 300^{0}C
Pressure:upto 3000psi (210 kg/cm^2)
pH:3-12
Surface Speed: 15 m/s

Sizes : in square sections of 6, 8, 10, 12.5, 14, 16, 18, 20, 22 & 25 mm.
Unit packaging : supplied in spools of 1, 2.5, 5, 10 & 20 kg

ASBESTOS FREE PACKINGS

FYSAX TAP

(Teflon/Aramid Packing)

The strength & low friction of Aramid fibre combined with negligible friction of PTFE gives the packing the capacity to handle high pressure applications-both rotating & reciprocating. Ideal for dairies, food stuff, beverage, pharmaceutical industries, refineries, fertilizer plants & feed water pumps.

Temperature: (–) 110^{0}C to 260^{0}C
Pressure:upto 7000psi (490 kg/cm^2)
pH : 2-12

FYSAX GCP

(Teflon braided Packing coated with Graphite)

PTFE packng with a high content of graphite coating having self lubrication, very low co-efficient of thermal expansion limits, better extrusion & compression resistance. Widely used in refineries, petrochemicals & fertillizer plants.

Temperature: (–) 240^{0}C to 300^{0}C
Pressure: Upto 5000 psi (350 kg/cm^2)
pH : 0-14

FYSAX CIP

(Carbon Inconel Packing)

Braided from super tough inconel wire throughout jacketed with soft Carbon fibres. Ideal for super heated high pressure control valves & highly abrasive spreader stoker services.

Temperature: (–) 200^{0}C to 900^{0}C
Pressure: Upto 10000psi (700 kg/cm^2)
pH: 1-11

FYSAX GLASS-G

(Graphite Impregnated Glass packing)

Ideal for small valve stems & rotary shafts. Suitable for mild acids, steam, oils & brines in general service

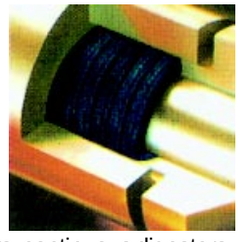
Temperature:Upto 230^{0}C
pH:4-10

FYSAX TGAP

(Aramid Packing with PTFE and Graphite)

Braided from Aramid fibres with a high content of PTFE/ Graphite. Most suited in centrifugal & reciprocating pumps with high pressure & sliding velocity for abrasive media.

Temperature : (–) 200^{0}C to 300^{0}C
Pressure : Upto 8000 psi
pH : 2 - 12



FYSAX CP

(Pure Carbon Packing)

Made from carbon filament Yarn, having excellent thermal dissipation & self lubricating properties. Ideally suitable for boiler feed pumps, condensate dryers, continuous digesters, high temp high pressure valves.

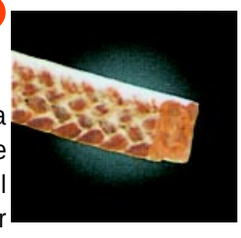
Temperature : (–) 200^{0}C to 600^{0}C
Pressure : Upto 5000 psi (350 kg/cm^2)
pH : 0 - 14

FYSAX GLASS

(Texturized Glass Packing)

High density texturized glass packing, designed for maximum flexilbility & strength. Suited for expansion joint packing in boilers, furnaces

Temperature: Upto 540^{0}C
pH: 2 - 12



FYSAX NOVOLOID

(Novoloid fibre Teflon treated)

This is treated with PTFE and a non-silicone lubricant suitable for rotary & centrifugal equipments, pulp & paper equipments

Temperature : Upto 260^{0}C
Pressure: Upto 8000 psi (560 kg/cm^2)
pH : 1 - 14

Sizes : in square sections of 6, 8, 10, 12.5, 14, 16, 18, 20, 22 & 25 mm.
Unit packaging : supplied in spools of 1, 2.5, 5, 10 & 20 kg

COMPOSITES

COMPOSITES
NATIONAL NETWORK