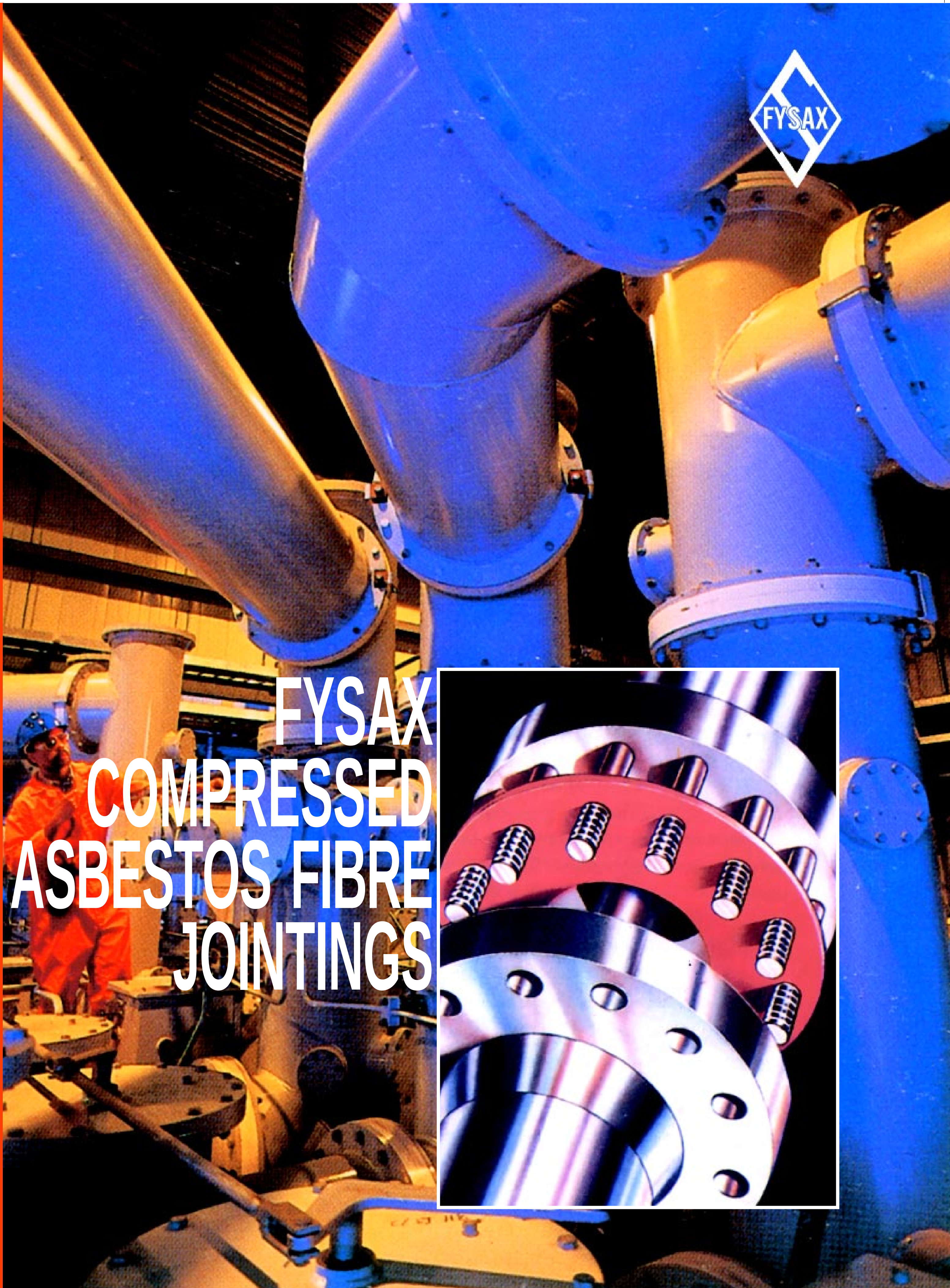
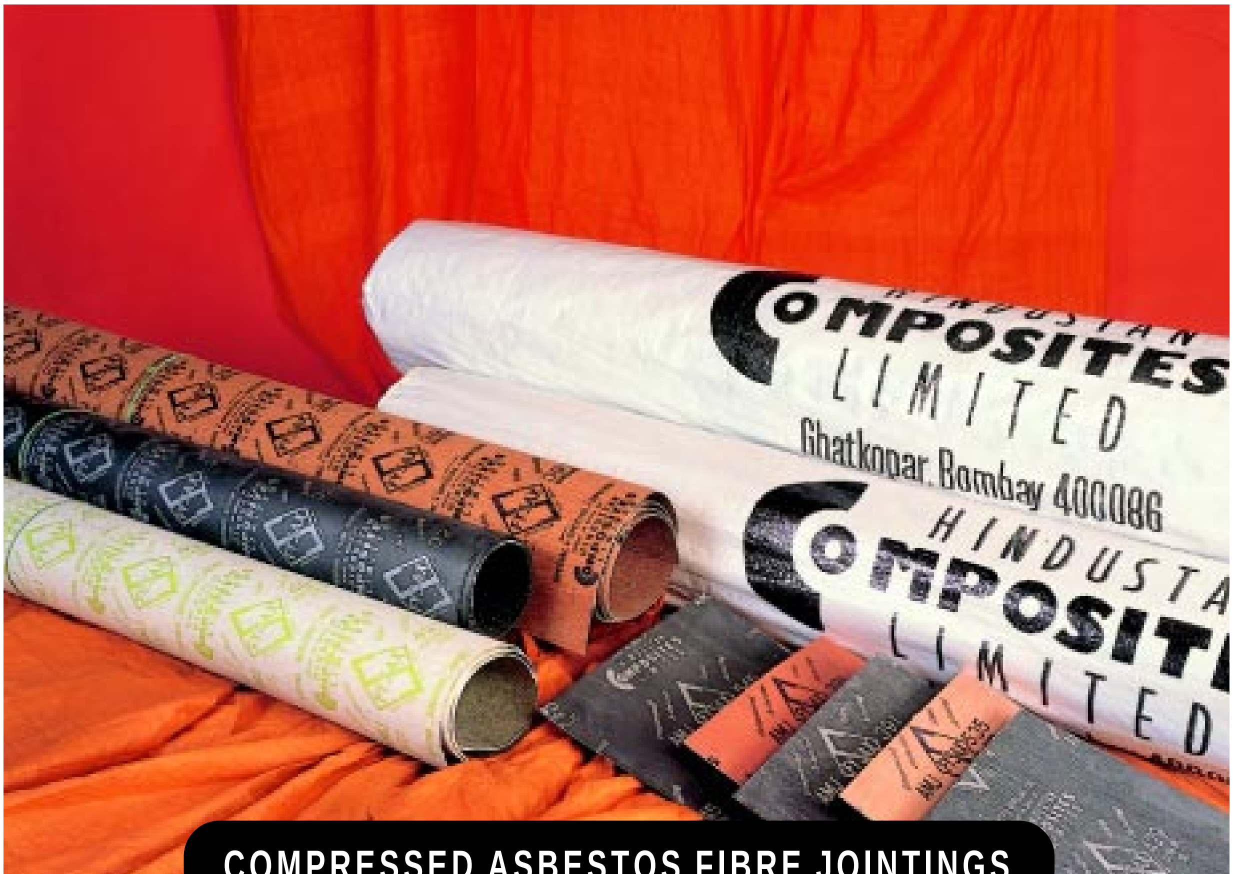
FYSAX COMPRESSED ASBESTOS FIBRE JOINTINGS





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

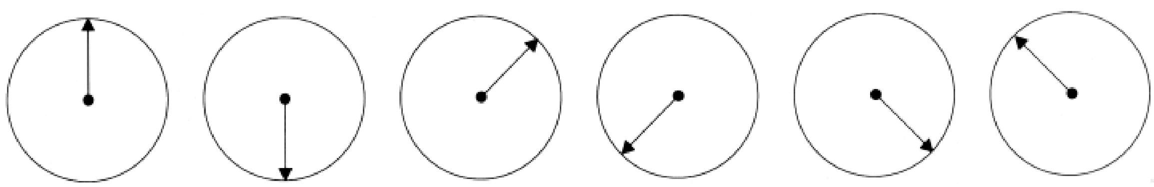
- RECOVERY - As the jointing material should get compressed under pressure, it should also offer resilience to recover and maintain its sealing effect by not allowing any 'Permanent Set' due to changes in pressure of the confined fluid and effects of its temperature, or due to flange deflection or bolt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

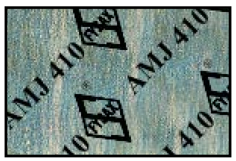
Quality	Thickness (mm)	Sheet Size (mm)
• All (Except AMJ 545 ultra Metallic)	1.5 & above	1550 (±50) X 1550 (±50)
• All (except AMJ 493 ACID and AMJ 545 Ultra-Metallic)	All	1850 (±50) X 1250 (±50)
• All	All	1500 (±50) X 1500 (±50)
• AMJ 493 ACID and AMJ 545 Ultra-Metallic	0.6 MM & above	1850 (±50) X 1250 (±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. ^{0}C	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.

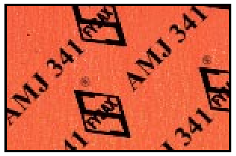
The temperature and pressure recommended above are for design purpose only, and are not part of Quality Assurance Tests.

FYSAX

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.

FYSAX

Quality Nomenclature	Product Description	Recomm. Max. Temp. ^{0}C	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

COMPOSITES

FYSAX

	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)	⊕	⊕	★	⊕	⊕	⊕	✗	✗	✗	✗

✓ = 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
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.

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COMPOSITES

FYSAX