

Mechanical Packing
Industries Pvt. Ltd.

**SPITMAAN ASBESTOS FREE
COMPRESSION PACKING &
SEALING SYSTEMS**



SPITMAAN®

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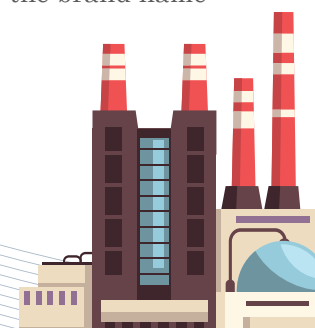
SPITMAAN®

A large industrial facility, likely a refinery or chemical plant, is shown at night. The facility is illuminated by numerous bright lights, creating a high-contrast scene against the dark sky. Several tall, cylindrical smokestacks or distillation columns are visible, some with ladders and platforms. In the foreground, a large ship, possibly a tanker, is docked at a pier. The ship's lights are also visible, and its reflection is seen in the water. The overall atmosphere is one of industrial activity and scale.

SPITMAAN®

We are a family owned and operated company with 4 decades of commitment to providing services in packing and sealing solutions through diversified products aimed at the engineering industry. We have specialized ourselves since 1960, accumulating an extensive background in the packing and sealing, Jointing, PTFE products, handling corrosive fluids / media industry. Our focus lies in solving problems with engineered cost savings.

The Group is organized into three corporate entities - Champion Jointings Pvt Ltd, Mechanical Packing Industries Pvt. Ltd and Fluoropolymer Packings and Seals Private Ltd. Each company combined by a profound understanding of the markets, wide in-depth product ranges, their own manufacturing facilities, global sourcing and an advanced distribution concept which guarantees maximum supply reliability. The products manufactured by us are marketed under the brand name of Spitmaan.

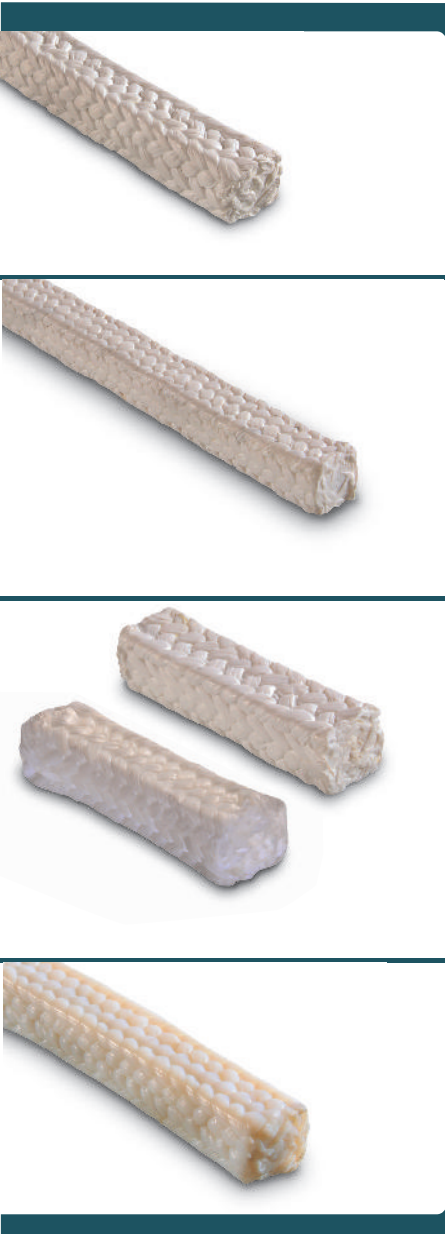







PTFE, a widely known polymer today that contributes immensely to compression packings and gaskets in its multi-filament, monofilament, extruded molded & machined profiles; to boost sealing performance on stuffing boxes, annular cavities of the equipments and flange surfaces.

PTFE does not contaminate, is inert to wide media and has similar dynamic and static coefficients of friction. It is FDA compliant and suits all applications involving aggressive chemicals, paints, pigments, dye stuffs etc except molten alkali metals, Oleum, Aquaragia and fuming Nitric acid etc.

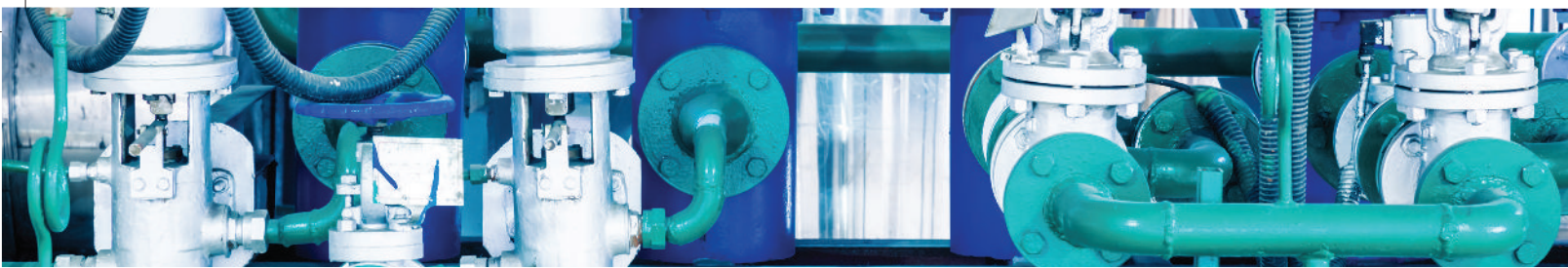
Its hybrid with Graphite and synthetic lubricants improve start up and heat dissipation.



STYLE & DESCRIPTION	pH	TEMP °C		PRESSURE bar		
				SPEED Mtr/S		
		Min	Max			
SPITMAAN - STYLE 1						
PTFE fiber Packing with carefully selected structural inert yarn in each strand interbraided with or with out break-in lubricant. Advantages: <ul style="list-style-type: none">• Strong structural yarn suits dynamic and static equipment at high speed and pressures.• Effectively prevent fugitive’s emissions.• Special PTFE covering technique ensures low friction and resists deformation in service.	1-13	-200	290	150	50	100
				0.25	5	1
SPITMAAN - STYLE 2						
A FDA compliant premium e- PTFE Yarn Packing impregnated with food grade PTFE dispersion and heat conductive additives to aid low friction and control thermal expansion to improve sealing life. Advantages: <ul style="list-style-type: none">• Choice of food grade Break In lube optional.• Extremely soft and pliant packing.• Heat conductive additive to eliminate shaft wear.• Suits especially for food and pharma applications with no contamination.	0-14	-200	290	250	100	300
				.25	10	1.5
SPITMAAN - STYLE 3						
A premium PTFE filament yarn Packing thoroughly impregnated with aqueous PTFE dispersion and treated with or without Break-In lubricants. Advantages: <ul style="list-style-type: none">• Intimate PTFE impregnation controls leakages along the shaft and stuffing box.• Optional break in lubrication for easy Start Up suiting the application.• Universally applicable in aggressive chemicals, food & pharma, dye stuffs, pigments, powder coating, paints etc.• Non hardening unlike conventional PTFE.	0-14	-200	290	250	100	300
				0.25	10	1.5
SPITMAAN - STYLE 333						
An economical extruded PTFE yarn Packing impregnated thoroughly with PTFE dispersion available with or without Break-In lubricant to suit the application. Advantages: <ul style="list-style-type: none">• Suited for valve glands, flange grooves, duct gaps and light duty applications.• Can be coiled around valve stem like expanded PTFE cords.• Acceptable sealing at reasonable economy.	0-14	-240	260	100	50	75
				.25	5	1



STYLE & DESCRIPTION	pH	TEMP °C		PRESSURE bar		
				SPEED Mtr/S		
		Min	Max	⊥	●	↔
SPITMAAN - STYLE 36						
Manufactured from e-PTFE Graphite homogeneous fiber, where Graphite is fully entrapped in PTFE matrix. Equipped with Break In lube. Advantages: <ul style="list-style-type: none">• Heat dissipative, non hardening packing.• Kinder on shafts, plungers, stems.• Inert for universal media, suiting all equipments.• Excellent resistance to shaft, stuffing box and osmotic leakage.• Preferred in ammonia, urea, and carbamate in fertilizer industries.	0-14	-200	300	300	100	300
				0.5	25	2
SPITMAAN - STYLE 23						
Premium PTFE filament yarn packing heavily impregnated with a blend of Graphite and PTFE dispersion. Treated with abundant break in lubricant. Advantages: <ul style="list-style-type: none">• A general purpose packing for diverse applications.• High density contraction restricts emission effectively.• Excellent dimensional stability and longevity.• Unique blend of PTFE and graphite ensure lowest friction and wear.	0-14	-100	260	250	100	300
				0.25	25	2
SPITMAAN - STYLE 36 ECO						
An economical extruded PTFE/GRAPHITE yarn packing impregnated thoroughly with PTFE dispersion; available with or with out Break-In lubricants to suit the application. Advantages: <ul style="list-style-type: none">• Suited for valve glands, flange grooves, duct joints and light duty applications.• Can be coiled around valve stem like expanded PTFE cords.• Acceptable sealing at reasonable economy.• Improved heat dissipation and minimal wear and tear to contact parts.	1-13	-100	260	100	50	75
				0.25	5	1



SPITMAAN®
CARBON/GRAPHITE
FIBER PACKINGS & COMPOSITES

Carbon (95% C) and Graphite (96 to 99.9% C) are amorphous and crystalline forms of pure elementary carbon respectively; hence are inert as well as thermally stable and conductive.

They both have very high surface area; can accommodate very high quantities of lubricants with superior inherent tribology, low friction characteristics, they are best sealing options. Their high thermal conductivity; and high temperature resistance; high pressure and high speed utility make them effective for sealing any equipment. They don't burn or melt and suit dry runs too.



STYLE & DESCRIPTION	pH	TEMP °C		PRESSURE bar		
		Min	Max	SPEED Mtr/S		
				⊥	•	↔
SPITMAAN - STYLE 66 Packing braided from Ultra pure Nuclear Grade Graphite Filament Yarn that meets MIL/GE/NEDC specs. Impregnated with purest Graphite and corrosion inhibitor that resists radiation. Advantages: <ul style="list-style-type: none">• Nuclear compliance as bull rings for valves.• Preferred packing in nuclear reactor area.• Soft on contact parts. ** Back up Rings needed for Reciprocating services.	0-14	-200	650- Steam, 450-02/ Air, 2400+- Inert	250 2	100 30	150** 3
SPITMAAN - STYLE 180 A Fire safe and Emission Proof packing, braided from Expanded Natural Graphite Yarns that are reinforced and jacketed with multiple INCONNEL Wires. Intimately treated with micro Graphite and a corrosion inhibitor. Suited for Valves and Flanges handling inflammable and hazardous media. Advantages: <ul style="list-style-type: none">• API 589 and 607 Fire Safety compliant.• Thermal stability in all high temp., media.• Emission proof in VOCs & VIOCs.• Preferred packing in Petrochemicals.• High temp. and high pressure packing, will not blow off.	0-14	-200	650- steam, 450- 02/air, 3000+- Inert	1000 0.5	- -	- -
SPITMAAN - STYLE 78 CC Unique packing braided from a Composite blend of Carbon filament yarns on all corners & Expanded Graphite fibers in the core, and faces in a proprietary blend of GRAPHITE dispersion, thermo stable inert lubes and corrosion inhibitor. Advantages: <ul style="list-style-type: none">• Carbon corners ensure blow off resistance.• Universal packing for all applications.• Dry running capability.• Excellent for very strong alkalis and acids.	0-14	-200	600 - Steam, 450-02/ Air, 1000+ Inert	250 0.5	75 30	100 1.5-
SPITMAAN - STYLE 78 An Expanded Graphite Fiber Packing with each yarn reinforced with e-Glass fiber, Impregnated with Graphite inert lubes and corrosion inhibitor. Advantages: <ul style="list-style-type: none">• Unique all purpose packing for static and dynamic equipments.• Economical replacement of asbestos packing.• Use of bull rings enhances performance on all equipments.• Cost effective emission proof packing.	0-14	-200	650 Steam, 440-02/ Air, 600+ - Inert EGP- 300	250 0.5	75 30	100 1.5



STYLE & DESCRIPTION	pH	TEMP °C		PRESSURE bar		
		Min	Max	SPEED Mtr/S		
				⊥	•	↔
SPITMAAN - STYLE 80 I / SS An Expanded Graphite Fiber Packing with each yarn reinforced with a thermo stable Steel INCONEL wires. Impregnated with inert lube with a corrosion inhibitor. Suited for static and very slow speed equipments. Advantages: <ul style="list-style-type: none">• Excellent valves and flanges group packing.• Metallic reinforcement render high temp. and high pressure capability.• Emission proof packing, saves leakage and down time costs.• Option of PTFE dispersion available.	0-14	-200	650 Steam, 440-02/ Air, 850+- Inert	300 0.5	- -	- -
SPITMAAN - STYLE 38 A premium Carbon filament yarn packing impregnated with Graphite or PTFE dispersion. Available with or without Break In lubricant. Treated with corrosion inhibitor. Advantages: <ul style="list-style-type: none">• High temp packing for all purposes, High yield.• Unique impregnation options enable wide applicability on variety of media.• Excellent heat dissipation and emission control.• First choice for aggressive chemicals.	0-14	-200	600- Steam, 450-02/ Air, 700+ Inert	350 0.5	100 16	300 2
SPITMAAN - STYLE 83 A Carbonized filament yarn packing impregnated with a blend of PTFE, Graphite and inert lubricants in high density construction Advantages: <ul style="list-style-type: none">• Effective replacement of Asbestos.• General purpose packing, with good longevity.• Effective heat control of moving parts.• Suits dynamic and static operations.	3-11	-200	+300	00 0.5	75 10	150 2



SPITMAAN®

ARAMID
FIBER BRAIDED PACKINGS
& COMPOSITES

Aramid Fibers have unmatched tenacity and mechanical properties exceeding those of many metals. They have soft lobular profile, excellent penetration and tear resistance and do not melt. The lubricity and heat dissipation properties can be greatly enhanced with various dispersions.

They are well suited as bull rings, slurry / dry powder / molten polymer packings. Aramid hybrids with other fibers significantly enhance mechanical strength, dimensional stability and sealing performance. They are the most sought after packings.

SPITMAAN®

SYNTHETIC KYNOL
& ACRYLIC
PACKINGS

Novoloid or Kynol Fiber packings are an effective replacement of many expensive types of packings due to excellent chemical resistance, non melting nature. They have low friction characteristics and excellent strength. They best suit many corrosive chemicals including acids, alkalis, organic chemicals, gases, hot and cold water, and sea water etc.

Acrylic yarn packings are general service packings to replace asbestos packings.



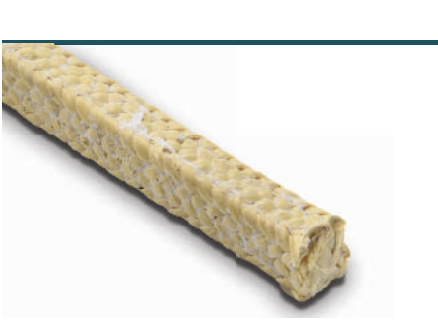
SPITMAAN - STYLE 174 / 174 G
A premium Aramid fiber packing, thoroughly impregnated with a blend of PTFE/GRAPHITE dispersion, complemented with synthetic Break-In agent for protection at start up.
Advantages:
• Improved heat dissipation and lower friction.
• High density tenacious packing to combat slurries and solids and application involving fire safety.
• Improved chemical resistance.
• Performs on all common Paper & Pulp equipments.



SPITMAAN - STYLE 172 / 172 Z
A Premium packing made from Aramid fibers in the corners and core; PTFE filament yarns on the faces thoroughly impregnated with PTFE and complemented with Break-In agent.
172 Z is Zebra braid
Advantages:
• Reciprocating pump packing.
• Good for pulp, paper, food stuffs, viscous media.
• Seals Ammonia, water, Urea, Carbamate in Fertilizer sector.
• Suits Dosing pumps, Jet pumps, rams, rod sealing .



SPITMAAN - STYLE 176 / 176 Z
A Premium Reciprocating and fine slurry packing made from Aramid fibers in the corners and core and Graphited PTFE filament on the faces thoroughly impregnated with inert lube, and complemented with BREAK-IN agent.
176 Z is Zebra Braid.
Advantages:
• Improved heat dissipation, lower friction than AP 172 with Graphited PTFE faces.
• High tenacity and stability in service.
• Unmatched Reciprocating Pump packing.



SPITMAAN STYLE 170
The packing manufactured from special grade aramid fibres. The fiber does not suffer from thermal expansion. This packaging is impregnated with inert polymers and high temperature resisting lubricants has a low co-efficient of friction and considerably disperses the heat generated by the peripheral speed.
Advantage:
• Most suited for wide range of chemicals, hydrocarbons, paper mills, steam, solvents, abrasive fluids, acids, alkali and oils (except for molten alkalies, metal and fluorine) ash handling systems of power plants.



SPITMAAN STYLE 127
A Premium Kynol/NOVOLOID fiber packing thoroughly impregnated with PTFE and treated with BREAK-IN agent.
Advantages:
• Superior chemical resistance, non melting.
• Heavy lubrication to ensure low friction.
• Suits all dynamic and static sealing applications.
• Suited for clear and viscous/molten media.
Spitmaan Style 127 is ZEBRA PKG OF ARAMID KYNOL



SPITMAAN STYLE 127 GR
A Premium Kynol/NOVOLOID fiber packing thoroughly impregnated with a blend of PTFE & GRAPHITE DISPERSION, complemented with BREAK-IN lubricant.
Advantages:
• Excellent leak control due to unique lube blend.
• Improved heat dissipation, minimum friction.
• Non stick and doesn't contaminate media.
• No deformation in service, no wear and tear.
Spitmaan Style 127 GR is a ZEBRA PKG OF GRAPHITED ARAMID & GRAPHITED KYNOL



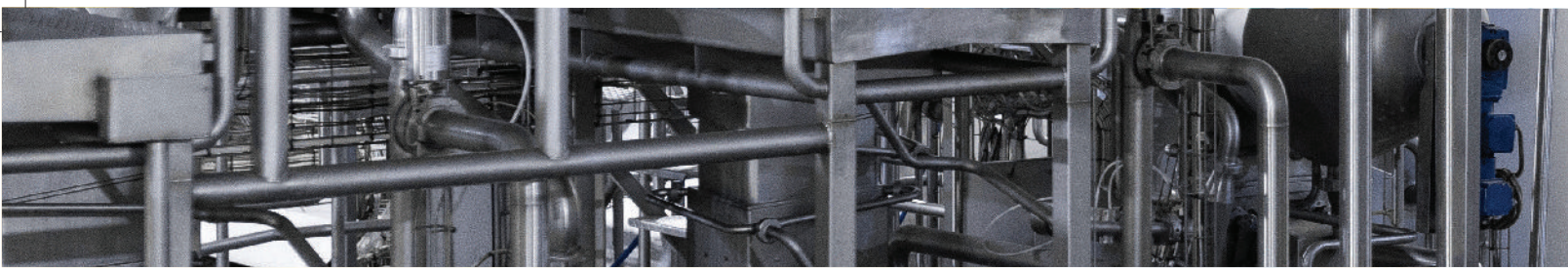
SPITMAAN STYLE 134
A special ACRYLIC fiber Packing heavily impregnated with PTFE . Available with/ without BREAK-IN lubricant to suit applications.
Advantages:
• Cost effective, immune to many mild chemicals.
• Heavy lube ensures effective sealing.
• Replaces asbestos in many general services.



SPITMAAN STYLE 134 G
A special ACRYLIC fiber Packing blend of PTFE /Graphite dispersion. Available with or without Break In lubricant.
Advantages:
• Improved heat conduction and wear control.
• Unique dispersion blend minimizes risk of leaks.
• Economical asbestos replacement.



SPITMAAN STYLE 135
The ACRYLIC packing is also supplied impregnated throughout with special lubricant and graphite.
Advantage:
• Excelent packing for use in low and medium pressure pumps and valves.



SPITMAAN®

VEGETABLE

FIBER PACKINGS
& COMPOSITES

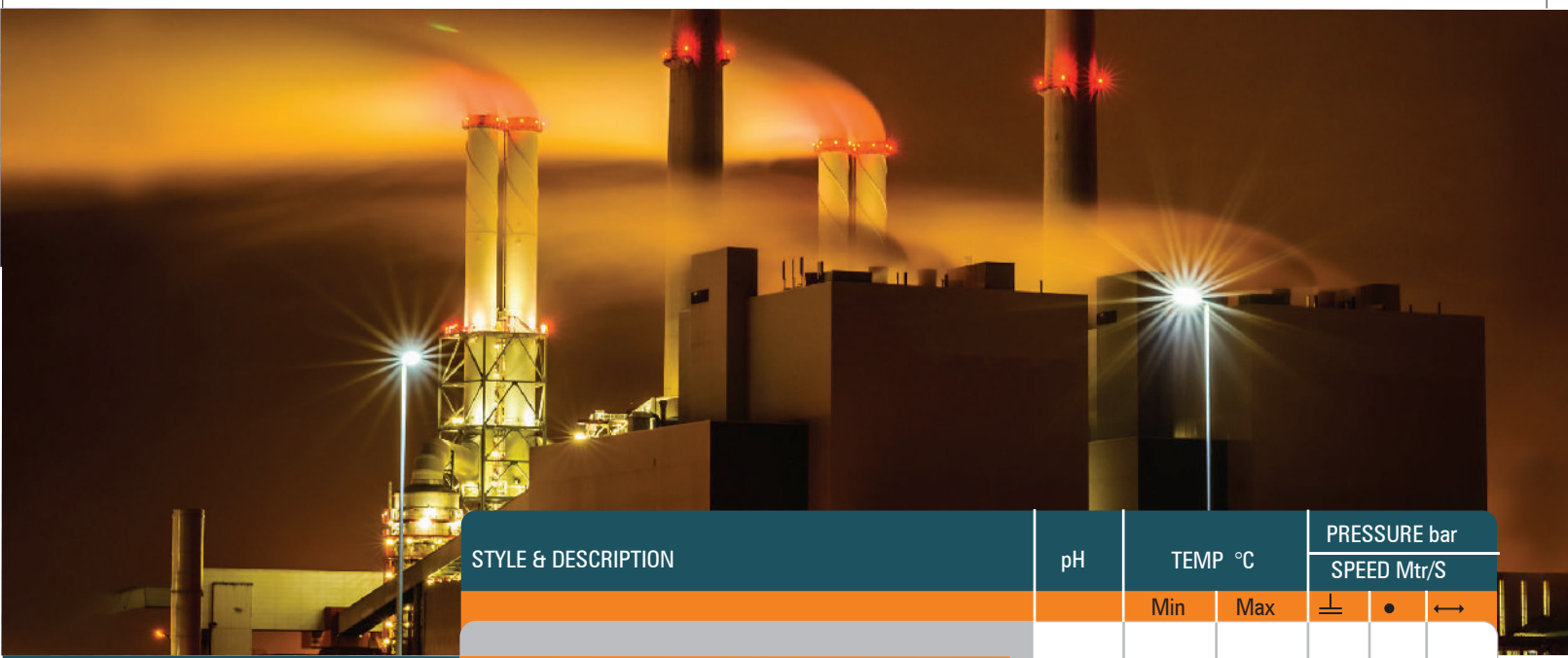
The natural cellulosic/vegetable fiber packings are commonly used for agricultural, marine, and general purpose applications. They are soft and absorbent to retain media in the packing matrix, ensuring cool running and wear control of contact parts.

SPITMAAN offers premium Ramie and Flex Fiber Packing in pure and hybrid forms with proprietary lubricants to serve large application segment at fair economy.

They suit all applications like pumps, valves, stern tubes, rudders, steering gears in marine / shipping industry. They suit all dynamic and static equipments in process and water supply.



STYLE & DESCRIPTION	pH	TEMP °C		PRESSURE bar		
				SPEED Mtr/S		
		Min	Max	⊥	●	↔
SPITMAAN STYLE 2224						
A Blend of Premium cellulosic and synthetic filaments impregnated with a special marine friendly lubricant to suit stern tubes, rudder shafts, steering gears and other marine applications in shipping, naval, dockyard applications on ships, tugboats, trawlers and cruise ships. Advantages: <ul style="list-style-type: none">• Unique blend of yarns for long lasting service.• Impregnation to block silt and resist salt water.• Good water retention for cool runs, no wear.	6-10	-100	150	35	20	40
				0.25	8	1
SPITMAAN STYLE 169						
Premium Ramie Fiber Packing thoroughly impregnated with PTFE dispersion and additives, complemented with synthetic BREAK-IN lubricant. Advantages: <ul style="list-style-type: none">• Universally applicable on marine applications• Durability of Ramie enhanced by lubricants.• Immune to salt water, good water retention.	4-10	-50	110	20	15	30
				0.25	8	1
SPITMAAN STYLE 169 G						
A Premium Ramie Fiber Packing thoroughly impregnated with PTFE/Graphite dispersion and additives, complemented with synthetic BREAK-IN lubricant for improved performance. Advantages: <ul style="list-style-type: none">• Improved heat conduction. Soft on worn parts.• Impregnation blend facilitates emission control• Suits mild industrial and all marine applications.	4-10	-50	110	20	15	30
				0.25	8	1
SPITMAAN STYLE 374 HYDROLFLON						
A multi service hydraulic packing duplex braided manufactured from pre impregnated soft vegetable fiber yarn. During the process it is further treated with special additives. Having lowest co-efficient of friction alongwith break-in lubricants. This special additive avoids discolouration of product pumped. Advantages: <ul style="list-style-type: none">• This packing is best suited to seal the glands of pumps, valves handling condensate, demineralised water, cold and hot water application in thermal power plants and hydraulic installations.	4 - 10		150		80 BAR	



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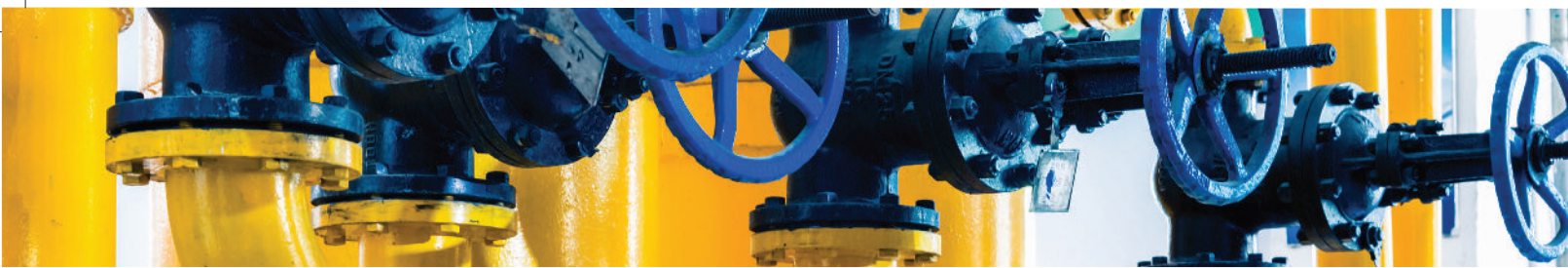
CUSTOM MADE

PACKING SETS



STYLE & DESCRIPTION	pH	TEMP °C		PRESSURE bar		
				SPEED Mtr/S		
		Min	Max	⊥	●	↔
SPITMAAN STYLE 3116 HYDROGRAF						
A fine soft natural fiber braided packing impregnated with lubricants and graphite. The packing presents a smooth surface that will not score shaft or sleeves because the soft fiber constantly absorbs the liquid being pumped and maintains a soft and pliable running face on the shaft. Advantages: <ul style="list-style-type: none">• Recommended for use on reciprocating and rotary pumps, valve spindles, refrigeration machinery and compressors, cooling water and condensate services.	6 - 8		130		upto 80 BAR	
SPITMAAN STYLE 376 HYDRAULIC SHIPPING						
A specially developed soft natural fibre yarn packing non graphited impregnated with top quality lubricants and specially processed to give high cross sectional density and structural strength . Advantages: <ul style="list-style-type: none">• Recommended for high speed centrifugal demineralised water pumps, compressors and refrigerations, cooling water and condensate pump.	6 - 8		130		200 BAR	
SPITMAAN STYLE 2222 AQUA SPECIAL						
The packing is manufactured from vegetable fiber yarn impregnated with non-graphite lubricant to enhance the antifriction property. Advantages: <ul style="list-style-type: none">• Withstand high pressure and temperature for all hydraulic uses in pumps, water wheel, shafts, sea water, river water and stern glands.	6 - 8		130		upto 80 BAR	

STYLE & DESCRIPTION	pH	TEMP °C		PRESSURE bar		
				SPEED Mtr/S		
		Min	Max	⊥	●	↔
SPITMAAN PACKING SETS						
<p>The SPITMAAN packing sets are custom engineered combination sealing materials consisting of sealing devices arranged to suit new and old equipment stuffing boxes.</p> <p>These are designed on the basis of media operational parameters and equipment conditions.</p> <p>Advantages:</p> <ul style="list-style-type: none">• We can design SPITMAAN custom made sets for valves, pumps, reactors dryers, and soot blowers and variety of other equipments.• Custom engineered and SPITMAAN constuction ensures guaranted sealing life.• Combination of carefully selected sealing and lubricator rings protect shafts, valve stems and plungers/pistons.	0- 14	-240	650	FULL VAC-U ME TO 500		30






SPITMAAN

HIGH TEMPERATURE
SEALING/INSULATION PACKINGS

Glass, Ceramic, Silica, Quartz, Alumina and Zirconia are some of the modern high temperature sealing and refractory insulation materials; available in various forms. They bear excellent thermal stability, oxidation and melting resistance and very low heat conductivity. They are versatile choice for use on industrial sealing applications in addition to thermal insulation.

SPITMAAN can offer all these packings / fabrics, to meet the application demand. Our standard range, how ever, includes glass, ceramic and silica fiber packings, fabrics and gaskets either single or in the hybrid variants, suitably coated / dispersed to enhance operating performance.

STYLE & DESCRIPTION	pH	TEMP °C		PRESSURE bar		
		Min	Max	SPEED Mtr/S		
						
SPITMAAN STYLE 162 G / 164 P						
164 P is texturised E glass PTFE dispersed with or without break in lubricant. 162 G is texturised E glass PTFE dispersed with graphite / PTFE blend with or without break in lube.	1-12	-100	DRY +540 P+260 G+540	DRY	---	---
Advantages: <ul style="list-style-type: none">• High thermal resistance replaces asbestos.• Economical tenacious & durable packing.• Seals & insulates with equal efficiency.• Covers wide range of static & dynamic applications.				0.15	50	200
				P 100	50	200
				0.15	10	2
				G 100		
				0.25		
SPITMAAN STYLE 161 I						
Texturised E Glass packings with each strand reinforced with Inconel wires. Suited only for static sealing and insulation.	1-12	-100	DRY +540 P+260 G+540	0.15	---	---
Advantages: <ul style="list-style-type: none">• Improved strength and durability.• Economical static sealing and insulation packing.				P-200		
				0.25		
				G200		
				0.25		
SPITMAAN STYLE 165 / 165 G						
A premium CERAMC Fiber packing with Structural E-Glass fibers. 165 is a plain Ceramic Packing. 165 G is with Graphite dispersion.	1-14	-	1000	Plain	---	---
Advantages: <ul style="list-style-type: none">• High insulation capability, fire resistance.• Graphite dispersions improve sealing, abrasion / impact / thermal resistance.• Economical but superior replacement of asbestos as heat shield.				V- 20		
				G-20		
SPITMAAN STYLE 165 M						
A premium Ceramic fiber Packing reinforced with INCONNEL or SS Structural Wires. All variants as 165/165G except metallic core in each strand.	1-14	-	1200	Plain	---	---
Advantages: <ul style="list-style-type: none">• Improved strength and durability.• High impact and deformation resistance.				G-25		
SPITMAAN STYLE 160						
Dry packing manufactured from special glass fiber having excellent thermal insulation property. Packing is flexible dimensionally stable having high tensile strength. Unaffected by chemicals or solvents for industrial and marine application	3 -10		600			
Advantages: <ul style="list-style-type: none">• An ideal packing for caulking thermal insulation, boiler seating, furnace joints, oven and autoclave doors, resists oil, mild acids & alkalies for use in thermal power stations, heat insulation of exhausts in ships and ship building industries, flue gas ducts and other general insulations.						



SPITMAAN



SPITMAAN

EXPANDED GRAPHITE
SEALING PRODUCTS

Grafseal is an excellent expanded graphite sealing material (carbon content 99% +) with multi purpose sealing utility for flanges, stuffing boxes, valve bonnets and CRH/HRH NRVs.

Excellent conformability, high stress relaxation resistance, low creep and capability to seal at low torque makes it best rated dynamic and static sealing material.

Excellent inertness and resistance to cryogenic as well as high temperatures, high pressures and cyclic loads, makes it a popular maintenance choice on variety of fluid sealing applications.



STYLE & DESCRIPTION	pH	TEMP °C		PRESSURE bar			
		Min	Max	SPEED Mtr/S			
				⊥	●	↔	
SPITMAAN SF / FF Tapes							
Pure natural expanded calendered foils to form in – situ packings, confirming to all stuffing boxes, contour gap filling and thread sealing applications	0-14	-200	650— Steam 400-02/ Air 3000+ Inert	SF- 100	50	----	
Advantages:				----- 0.5	----	----	
• Excellent for corroded / eroded flanges as a lay on materials.				FF- 100	2.5	----	----
• Excellent preseat for spiral wound gasket. Easy to install on overhead flanges.							
• Can be laid to seal complex flanges with small gap.							
SPITMAAN Rings							
SPITMAAN GRAFSEAL die molded ring in desired densities and in square, rectangular, wedge or chevron profiles to suit sealing valves, pumps and other equipments.	0-14	-200	650 – Steam 400 -02/ Air 3000+ Inert	300	50		
Advantages:				----- 0.5	30		
• Universal Valve sealing material that seal at low torque.				300	----		
• Very good for cyclic load with suitable Bull Rings.							
• Long sealing performance with suitable densities and molded profiles.							
SPITMAAN GRAFSEAL are high pressure SEAL rings in plain and complex / angular profiles for pressure and bonnet sealing on various valve types. Available with various reinforcements.				----- 0.25			
Advantages:							
• Available in any profile as per various Gate, Globe, Check and other valve designs.							
• Various reinforcements render strength and life.							
• Excellent sealing Performance at low torque.							



The finer points of pump packing installation and adjustment.

Proper installation and adjustment can make the difference between the success and failure of a packed pump. By keeping in mind the fine points of a few key principles, the chances of success are greatly increased.

Remove

Remove all old packing. This can be the most difficult step in the process of packing a pump. Repacking equipment during a system outage is often performed under time constraints. Resist the temptation to simply remove a few rings of packing that are near the top of the stuffing box. Instead, get to the bottom of it! If the pump uses a flush injection and lantern ring be sure to remove the lantern ring and the packing below it. Packing removal tools such as picks and corkscrew- type packing hooks typically have sharp ends. Take care to ensure they do not damage the shaft and bore surfaces as they are used.

Inspect

The opportunity to see inside the stuffing box does not happen often. Take this opportunity to check the equipment condition and do some record keeping to make the job easier the next time the equipment needs to be serviced. The surface condition of the shaft or sleeve is critical since it is the moving surface that needs to be sealed. Axial scratches and pitting on the shaft or sleeve can quickly damage the sealing surface. The surface finish of the shaft should be in the range of 16 to 32 µin Ra. The shaft should be resurfaced or the sleeve should be replaced if significant wear is seen. Braided packings can usually tolerate slight wear in the form of smooth shallow waviness that is uniform around the circumference of the shaft or sleeve surface. The bore diameter surface is not a moving surface, but it still needs to be sealed. Axial scratches can create direct paths for leakage to the environment. Split case pumps typically have two seams that run axially along the length of the stuffing box. There is usually a gasket in these seams. Check to ensure the gasket is cut to create a smooth surface to the inside of the stuffing box. If the gasket has receded into the seam, it can result in a direct leak path. This will appear as a concentrated jet of leakage on the outside of the gland follower in the area of the seam.

Measure and Record

Measure and record key dimensions such as shaft diameter, bore diameter and box depth. If a flush injection is used, measure the length of the lantern ring and the location of the flush port. These last two measurements can be used to ensure proper alignment of the lantern ring with the flush port. They are especially important to measure if the pump has a history of problems maintaining proper flush operation. A short length of wire can be used to measure the flush port location. Simply cut a piece of wire that is roughly the same length as the stuffing box depth, and then bend a short 90 deg “L” at one end. Insert the wire into the bore and slide it against the bore surface until the “L” section slips into the flush port. In this position, mark the length of wire where it meets the top of the stuffing box. This will give a rough measurement of depth at which the flush port enters the stuffing box (see Figure 1).

Cut

Packing should be cut into individual rings so that the cut ends come together without a gap when they are inserted in the stuffing box.

Install

As each ring is inserted, it should be seated firmly into the bottom of the stuffing box before the next ring is installed. This will help maintain a more even compressive load throughout the depth of the packing set. Various types of materials such as metallic bushings, short lengths of split tubing and even cut lengths of corrugated cardboard can be used as tamping tools. Remember to remove these tools before the next ring is installed! The seam of each successive ring should be offset by 90 deg.

Adjust

For most braided pump packing, liquid leakage is absolutely necessary to provide lubrication and cooling of the sealing surface and ensure the seal’s long life. When adjusting pump packing, the goal is to arrive at the lowest acceptable leak rate while maintaining thermal equilibrium. Over tightening is the most common cause of packing failure. When making adjustments to a packed pump, remember the following principle: Make adjustments that are proportional to the leakage rate. If the pump is spraying large amounts of leakage, then large adjustments can be made until the leakage is controlled in the form of a small, steady stream. After leakage is reduced, further adjustments should be small. One-sixth of a turn on the gland nuts (one flat) can have a significant effect. Several minutes should pass before the next adjustment is made.

Leakage

There are two principle paths that leakage can take out of the stuffing box:

- Inside diameter (ID) leakage occurs along the interface between the packing and the rotating shaft. This leakage serves to cool and lubricate the dynamic surface and is necessary for most braided pump packing applications.
- Outside diameter (OD) leakage exists when the liquid runs along the interface between the packing and the stuffing box bore. While it will have some cooling effect on the packing, it is unnecessary.

Key Packing Properties

Various packing materials respond differently to adjustment. Two key material properties determine how a packing will respond to compressive adjustment: thermal conductivity and thermal expansion. Thermal conductivity determines how fast heat will travel through the material. Materials such as carbon fiber and flexible graphite are effective heat conductors. When frictional heat is generated between the packing and the high speed shaft, these materials will effectively conduct the heat out to the body of the pump. Some synthetic polymer materials, such as PTFE, are thermal insulators. When frictional heat is generated, these materials tend to retain the heat and concentrate it near the shaft surface. They typically require higher leakage rates so the frictional heat does not build up and result in burning of the packing. Thermal expansion determines how much the packing material will grow when it is heated. PTFE fibers or coatings exhibit relatively high thermal expansion. Packing that has a high PTFE content should be monitored more closely at startup. After adjustment, the leakage rate will usually be reduced. Frictional heat will then increase, and the temperature will rise during the next several minutes. As the temperature rises, the material will expand and result in a tightening and further reduction of the leakage rate. If adjustments are made carefully, with time allowed in between adjustments, the packing can reach an acceptable leakage rate without overheating. If adjustments are made too quickly, frictional heat may build to a point where it spirals out of control and causes the packing to fail. The gland follower should always be adjusted evenly so that a uniform load is applied to the packing surface and the gland follower will not become “cocked” and cause metal-to metal contact with the spinning shaft.

Conclusion

The concept of compression packing is fairly simple: squeeze a compressible material into a gap to create a seal. By choosing the appropriate material and following the fine points of sound installation and adjustment principles, a long lasting, robust, reliable seal can be achieved in some of the most demanding services.