



CHETRA Mechanical Seals

for the Pulp and Paper Industry

The renewable resource „wood“ is used for obtaining the basic material cellulose (pulp) for paper manufacture, in which the environmentally-friendly addition of waste-paper also plays a big part.

The processing in the individual stations, such as the processing of raw materials, stock preparation plant, digestery, bleachery and paper finishing, is carried out by chemical, thermal and mechanical procedures. A substantial number of centrifugal pumps and, to a certain extent, positive-displacement pumps, agitators, refiners and sorters are engaged in this. The basic material “cellulose” as well as the chemical auxiliary agents put high demands on the seal technology of the mechanical seal used – because the media are abrasive, viscous, in part toxic and at high temperatures.

A heightened environmental awareness and appropriate stipulations such as TA-Luft (Clean Air Act), ATEX a.o., combined with economic efficiency, are the prerequisites for the planning, designing and manufacturing of every CHETRA mechanical seal.



The results are innovative and often custom-made solutions for the specific requirements of pulp and paper factories, based on decades of experience in this area, with sound application-technological experience for the optimum appropriate mechanical seal and the corresponding accessories.

The CHETRA supply program covers many high-grade standard seals as well as products custom-made for the respective application. Notable features and benefits:

- » robust construction with extensive safety reserves.
- » protection of sensitive components.
- » solid seal rings and stationary seats in self-aligning arrangement.
- » stationary design, if applicable.
- » special seal face geometry.
- » guided circulation flow for optimal heat dissipation.
- » design allowing for the high stock consistency.
- » mechanical seal design which considerably reduces the need for flushing.
- » optimization of material: application of suitable materials which are partly subjected to patented surface finish.
- » the calculated use of mechanical seal accessories including fluid flowmeter (SCU units) reduces the amount of water required.



“Made in Germany” and International Experience

CHETRA is an international specialist for high-quality and high-performance mechanical seals. We offer quality “Made in Germany” with mechanical seals for complex and demanding applications, for renowned customers in the pulp and paper industry.

Our mechanical seals are designed acc. to the relevant DIN and ISO standards (DIN EN 12756, 28136 ff., ISO 3069 a.o.), TÜV regulations, factory standards and local regulations.

Our claim to high quality is reliably underpinned: We have been working acc. to DIN EN ISO 9001: 2008 since 1996 and are certified by DQS/IQ NET.





Example Seals



CHETRA style 208 N

With the high-grade CHETRA 208 N, paper and pulp manufacturers have at their disposal a first-class standard mechanical seal acc. to DIN EN 12756 (24960). On the basis of its technical design it also meets the paper industry's requirements, which lie well above those of the ordinary application area of a conventional standard mechanical seal.

It is a short design mechanical seal (L1k) in stationary arrangement, independent of direction of rotation and balanced (without stepped shaft). The model is equipped with protected multiple springs and exchangeable components in every necessary combination of materials.

The sole use of solid seal rings and stationary seats in "self-aligning" arrangement ensures further technical advantages. Customers profit from a solid standard mechanical seal with long service life; even with difficult media – solids-loaded, higher viscosity up to 3.5 % bone dry (without flushing).



CHETRA style 821

Another CHETRA mechanical seal specifically suitable for the technically extremely demanding requirements in the pulp and paper industry is the double-acting model style 821 (version 862). This line of products was designed by CHETRA engineers and targetted the special demands and challenges of this branch of industry.

These special demands include e.g. the processing of paper and pulp > 3.5 % bone dry and high density pulp up to 20 % bone dry. Process steps with lyes, glues and latex are accomplished. Especially the latex material has a tendency to "cake together" and thus may block the mechanical seal.

CHETRA mech. seal style 821 takes these exceptional constructive and material-specific parameters into account. This mechanical seal meets even the most complicated requirements through its special guided circulation flow, protection of sensitive components, anti-adherent coating of parts in contact with the product and the sturdy design with corresponding cross-sections. Operation: higher barrier fluid pressure and version 862 with regulated auxiliary flushing.



CHETRA style 807

The double-acting mechanical seal style 807 (808 S) is a mechanical seal specifically designed for the requirements of the paper industry. Double pressure-balanced, for operation with higher barrier fluid pressure or pressureless quench, this mechanical seal is applied in media with a high solids content.

Typical application areas:

paper and pulp > 3.5 % bone dry (without flushing), medium and high-density pulp > 15 % bone dry, calcium carbonate with 20 % solid matter, kaolin, glueing media, lyes etc.





Experience

Innovative Supply Systems and Accessories

- » **CHETRA individual supply systems and central installations:** An innovative and complete program for the supply of mechanical seals, consisting of **barrier fluid** and **quench fluid vessels**, acc. to EU guidelines and Regulation for Pressure Vessels (PED) incl. API vessels (acc. to ASME standard) and in connection with TA-Luft (= Clean Air Act).
- » **CHETRA vessel accessories:** p/t measuring systems, level switch, manual refill pump, cooling coil, pressure gauge and pressure switch.
- » **CHETRA heat exchanger,** water-cooled or air-cooled.
- » **CHETRA cyclone separator.**
- » **CHETRA pressure transmitter.**
- » **CHETRA loop systems.**
- » **CHETRA central refill systems.**
- » **CHETRA SCU units for control and measurement of flushing water.**

CHETRA International Services

- » **CHETRA Service Centers** in Europe, in the Middle East and in Asia, as well as on-call service supervisors from the parent company ensure swift implementation of CHETRA mechanical seals, whether new or second-hand.
- » **CHETRA repair and maintenance service:** Analysis of damage, advice for improvement potential, expert and quick overhauling and optimizing of CHETRA seals and competitors' seals, worldwide logistics.
- » **CHETRA maintenance contracts:** Optimized fixed costs contracts and maintenance contracts.
- » **CHETRA spare parts service:** Large volume of spare parts on stock and perfected logistics for the supply of mechanical seals spare parts. Spare parts kits available for all cartridge mechanical seals (all dynamically used parts) as well as individual spare parts acc. to parts' unit.
- » **CHETRA CAS® Computer Aided Seal Selection:** A CHETRA-developed design recommendation for 1000 media, as to the type and materials of the mechanical seal with reference to pressure, temperature and speed, incl. appropriate operation and determination of friction power.



Solutions

Technology

Thorough and “leakage-free” sealing of latex mixes

One of the largest Finnish paper manufacturers had problems with sealing of latex mixes in the kitchen coatings. This specific application in the paper production is one of the most technically demanding, difficult tasks in the seal industry.

Because of excessive leakage with the seals used so far, the most important latex pumps were refitted with CHETRA mechanical seals style 821 with barrier fluid system.

Service Lives of Seals in Pulpers at a New Level

CHETRA was asked for a solution, because some paper factories, domestic and abroad, had trouble with the service life of seals in pulpers.

Special requirements ensue from heavy shaft deflections, effected by the lateral arrangement and the design-related, rather far distant position of the bearing to the seal. Very often the propeller runs above the level of the material and hits it. The stock consistency is also difficult to cope with, which is often 5 % bone dry and higher.

A stationary seal of CHETRA mechanical seals series 201, designed for these special requirements, met all seal-technically demanding requirements and solved the problems. Service lives of 10 years (!) are achieved.

Standardization and Continuous Improvement

Sealing technology was put on a new, standardized basis in Austria's largest corrugated board factory. Essentially, all relevant areas of application in the factory use only three CHETRA mechanical seals:

- > Style 700 mechanical seal with single metal bellows, up to 2 (2.5) % bone dry.
- > Style 208 N single mechanical seal in stationary design up to 3.5 % bone dry without flushing.
- > Style 807 double mechanical seal, double-balanced, for higher barrier pressure or pressureless quench for operation; bone dry > 3.5 %.

Above and beyond the aforementioned improvements, CHETRA provides the Austrian factory with a continuous improvement process. This means that the seals meant for overhauling or repair are in a continuous process of survey and analysis to consistently guarantee improvements and optimizations for product, operation and background conditions.

Pulp and Paper Industry

The mechanical seals listed here comprise high-quality **standard seals (DIN EN standard)** as well as **cartridge mechanical seals** acc. to factory standard and **customer-specific** requirements.

Further mechanical seal designs are available.

Mechanical seal, style / Series:	Typical applications:	Technical Data (physical parameters):		
Single mechanical seals “non-cartridge”				
208 N	For universal applications: single mech. seal in stationary design acc. to DIN EN 12756 (24960) – L1k/BU; solids-loaded and higher viscous media up to 3.5 % bone dry. Available also in imperial design. - without flushing -	pmax:	50 bar	
		t:	-80° C up to +220° C	
		vmax:	35 m/s	
700	Single-acting mech. seal with metal bellows acc. to DIN EN 12756 (24960) L1k; e.g. in paper and pulp up to 3 % bone dry. - without flushing -	p:	vacuum up to 25 bar	
		t:	-80° C up to +220° C	
		vmax:	15 m/s	
Single mechanical seals cartridge				
201	“Customized” stationary cartridge single mech. seal for demanding applications such as sorters, pulpers, deflakers, flow box pumps, mechanical wood pulp, dye; up to 3.5 resp. 5 % bone dry, depending on application - without flushing -	pmax:	70 bar	
		tmax:	220° C	
		vmax:	35 m/s	
207	Universal cartridge single mech. seal		207	209 D
209 D	Typical applications s. style 208 N, e.g. condensate, splash water, pulp preparation a.o.	pmax:	50 bar	25 bar
		tmax:	220° C	200° C
		vmax:	35 m/s	25 m/s
Double mechanical seals cartridge				
541	Mech. seal for agitators (with or without integrated bearing; bottom drive); specifically for abrasive media, e.g. kaolin.	pmax:	35 bar	
		tmax:	220° C	
		vmax:	10 m/s	
806	Double mechanical seal, spec. designed for Ahlström/Scan pump series APP (AHLSTAR), semicartridge; applications: vaporizers, paper additives, pulp causticization, digester pumps etc.	pmax:	15 bar	
		tmax:	180° C	
		vmax:	20 m/s	
807 (808 S)	Double cartridge, independent of direction of rotation, for pumps (double pressure-balanced). Operation: higher barrier fluid pressure or pressureless. Paper & pulp > 3.5 % without flushing; medium and high-density pulp > 15 % bone dry; digester circulating pumps, high-solids media, e.g. calcium carbonate with 20 % solid matters; kaolin, sticky media, div. lyes in chemicals recovery etc.	p:	vacuum up to 35 bar	
		tmax:	250° C	
		vmax:	25 m/s	
821	“Customized” double mech. seal for pumps for most difficult applications such as kitchen coatings, latex, synthetical binding agents, glues and other solids-loaded and “adhering” media. Stock consistencies > 5 % bone dry without flushing.	pmax:	12 bar	
		tmax:	220° C	
		vmax:	25 m/s	

All mechanical seals are available in compliance with **ATEX**. Dimensions: Dia: 15 mm to 450 mm, sizes in inches possible.

Safety instructions for application areas and technical data:

The statements in this leaflet are based on the current state-of-the-art technology, including extensive testing and practical experience. Please note: The physical parameters (technical data) given here will interact with each other and cannot be fully utilized all at the same time. The listed temperature ranges are, among others, dependent on the type of secondary seal used, the accessories for the seal and the other technical parameters. Due to the variety of uses and the individual technical arrangements only general pointers, which may not be applicable in every case, can be given for a successful application. No responsibilities can be accepted for statements made in this leaflet and therefore it is recommended to always undertake tests prior to application.

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