



ISO 9001:2008
ISO 14001:2004
OHSAS 18001:2007

ESA European
Sealing
Association e.V.

AVKOPACK®

COMPRESSION PACKING FOR VALVES AND PUMPS





The compression packings are the oldest and yet the most frequent sealing technology.

A quality packing guarantees long operational life of the equipment, it saves labor, reduces waste and decreases energy costs.

The compression packings series AVKOPACK® is with guaranteed quality. Every single product is a result of long manufacturing experience and permanent pursuit for improvement.

An indicator for the reliable performance of AVKO's products is the long-term approval.

The series of non-asbestos compression packings is awarded with gold medal and certificate from the international Plovdiv fair in 1996 and 2005.

Since 1998 our company is certified for quality control management system, according to ISO 9001 and its latest version ISO 9001:2000; ISO 14001:2004; OHSAS 18001:2007.

AVKO is a member of the European Sealing Association (ESA) - an organization influencing the requirements and standards in the sealing industry.

ECOLOGY, SAFETY, INNOCUOUSNESS

Technology processes and products, manufactured by AVKO do not pollute the environment and meet all the requirements for safety and innocuousness.



RAW MATERIALS USED FOR MANUFACTURING PACKINGS

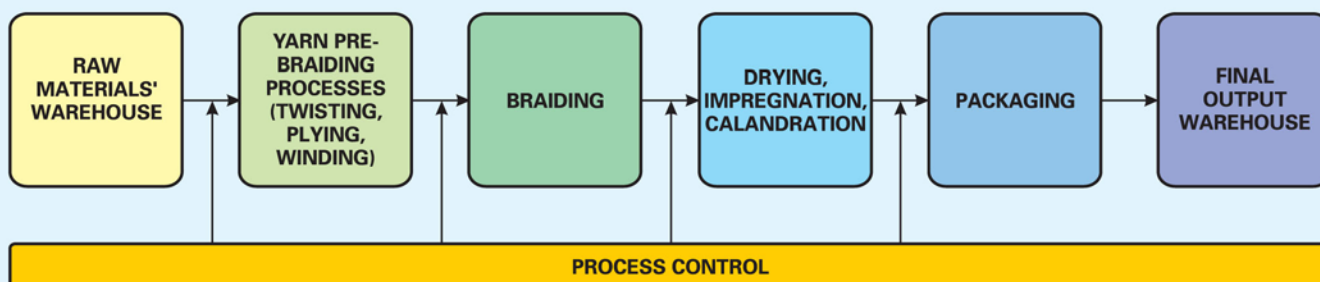
The materials used for the AVKOPACK® packings, are widely spread in the sealing sphere. The main requirements that they have to meet are good thermal resistance, strength, low friction coefficient, aggressive resistance. We use yarns made of expanded PTFE - pure and filled with graphite, aramide, carbon novoloid fibers, natural expanded graphite, natural fibers such as ramie and cotton, as well as inconel wires.

Lubricants are a key part of the packings' structure. According to the media and exploitation temperature - mineral oils, mineral product mixes, different graphite brands, PTFE dispersions, corrosion inhibitors, and additional improvements are used.

The rich options of different materials' properties, gives us the chance to satisfy high hermetic rates, thus leading to less pollution, safety, economy and cleaner environment.

COMPRESSION PACKINGS MANUFACTURING

PRINCIPLE SCHEME OF THE TECHNOLOGICAL PROCESS



BRAIDING CONSTRUCTION

Braid over braid.

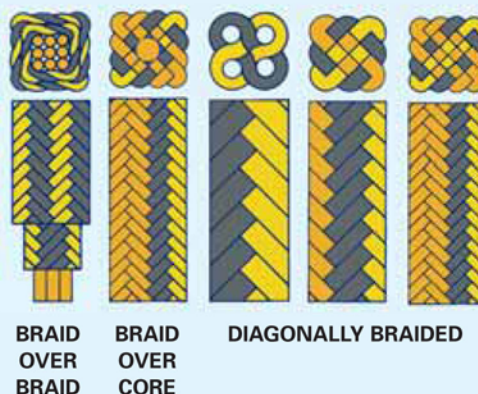
The braiding machine makes cylindrical layers of yarn. The exact size is reached with braiding layers one over the other, using 12 and 16 shuttle braiding machines.

Braid over a core.

The final product is made through braiding one or more layers of yarn over the core. The core may be extruded, twisted, or braided. The construction may be attained both on circuit and diagonally braiding machines.

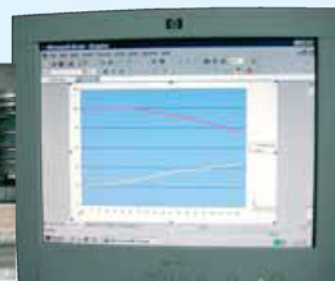
Diagonally braided.

Every fiber is fixed by the others, forming thick, united structure, which cannot unbraided or break down while working. There are not separate layers, which wear out one by one, nor the braid is loosened. The diagonally braided packings have more regular density, which is an opportunity for better lubricants' retention. Thus the produced packing is solid and flexible. Such packings are suitable for centrifugal and piston pumps, mixers, valves, compensators, etc.






TESTS AND CONTROL

The tests for reliability are conducted through control of the heat released at the contact surface with the shaft. Also, packings are judged according to the wear out they undergo at different shaft speeds and stiffness. Other parameters give information for the optimal and reliable decisions when making a choice or selection of high-quality yarns, lubricants, inhibitors and packings construction.





AVKOPACK® - STUFFING BOX PACKINGS FOR VALVES AND PUMPS - TECHNICAL PARAMETERS AND APPLICATIONS

Type of packing AVKOPACK®	Composition							V (m/s)	pH	Density (g/cm³)	Media																		
	Material	Impregnation/ Reinforcement	P (bar)			T (°C)					Industrial and refuse waters	Sea water	Water ; pharmaceutical and nutritious products	Steam	Superheated steam	Concentrated acids	Diluted acids	Concentrated lyes	Diluted lyes	Solvents	Air, dry industrial	Acid gas	Inert gases	Oxygen	Oils and grease	Synthetic oils	Paints and varnish	Adhesive viscose media and bituminous	Abrasive media
						-	+																						
1101	PTFE	lubricant	30	30	250	200	280	18	0-14	1.4	●	●	-	●	-	●	●	●	●	●	●	●	●	-	●	●	●	○	○
1101S	PTFE		30	30	250	200	280	18	0-14	1.2	●	●	●	●	-	●	●	●	●	●	●	●	●	●	●	●	●	○	○
1120	PTFE / graphite	lubricant	30	80	200	100	280	20	0-14	1.3	●	●	-	●	-	●	●	●	●	●	●	●	●	-	●	●	○	○	○
1201	aramid	PTFE / lubricant	35	200	250	100	280	15	2-12	1.35	●	●	-	●	-	○	○	○	●	○	●	●	●	-	●	●	○	●	●
1201P	staple aramid	PTFE / lubricant	20	80	150	100	280	15	2-12	1.4	●	●	-	●	-	○	●	○	●	○	●	○	●	-	●	●	●	●	●
8470	PTFE		20		150	100	280	12	0-14	1.7	●	●	●	●	-	●	●	●	●	●	●	●	●	●	●	●	●	●	-
8471	PTFE / graphite		25		150	100	280	15	0-14	1.7	●	●	●	●	-	●	●	●	●	●	●	●	●	●	●	●	●	●	
1202	PTFE / graphite / aramid	lubricant	30	250	250	150	280	25	2-12	1.3	●	●	-	●	-	○	●	○	●	●	●	●	●	-	●	●	○	●	●
1203	PTFE / aramid	lubricant	30	100	200	100	280	25	2-12	1.3	●	●	-	●	-	○	●	○	●	●	●	●	●	-	●	●	○	●	●
1301	carbon fibres	lubricant	30	50	200	60	400	20	2-14	1.4	●	●	●	●		○	●	●	●	●	●	●	●	●	●	●	○	○	
1302	carbonised fibres	PTFE	30	50	200	60	300	20	2-14	1.2	●	●	-	○	-	-	●	●	●	●	●	●	●	-	●	●	●	○	○
8009	carbon fibres				300	240	550	-	0-14	1.3	●	●	●	●		○	●	●	●	●	●	●	●	●	●	●	●	○	○
1320G	exp. graphite		30	200	300	240	650	30	1-14	1÷1.1	●	●	-	●	●	○	●	●	●	●	●	●	●	-	●	●	●	○	○
1320GI	exp. graphite	Inconel	-	-	400	240	650	-	1-14	1.1÷1.3	●	●	-	●	●	○	●	●	●	●	●	●	●	-	●	●	●	○	○
1331	exp. graphite / carbon		35	250	400	240	650	20	1-14	1.0	●	●	-	●	●		●	●	●	●	●	●	●	-	●	●	●	-	○
77	exp. graphite / carbon	Inconel	-	-	400	240	650	-	1-14	1.0	●	●	-	●	●	○	●	●	●	●	●	●	●	-	●	●	●	○	○
8099H	exp. graphite				550	240	650		1-14	1.25	●	●	○	●	●	○	●	●	●	●	●	●	●	●	●	●	●	●	○
1400	cotton	PTFE / lubricant	25	25	40	50	140	12	5-11	1.4	●	●	●	-	-	-	○	-	○	○	●	●	●	-	●	●	-	-	○
1401	ramie	PTFE / lubricant	20	100	100	50	140	12	5-11	1.4	●	●	●	-	-	-	○	○	○	○	●	●	●	-	●	●	-	-	○
1502	glass						500		6-11	1.0	-	-	-	-	-	-	-	-	-	-	●	-	●	-	-	-	-	-	-
1513	glass	PTFE / graphite	20	40	60	50	280	15	2-12	1.8	●	●	-	○	-	-	●	-	○	○	●	-	●	-	●	-	-	-	-
1520	glass	PTFE	20	40	60	50	280	12	2-12	1.8	●	●	-	○	-	-	●	-	○	○	●	-	●	-	●	-	-	-	-
1530	glass	graphite			200		550	1,5	6-11	1.0	-	-	-	-	-	-	-	-	-	-	●	-	●	-	-	-	-	-	-
1602	ceramic						980		5-11	0.65	-	-	-	-	-	-	-	-	-	-	●	-	●	-	-	-	-		-
1602AR	ceramic						1200		5-11	0.65	-	-	-	-	-	-	-	-	-	-	●	-	●	-	-	-	-		-
1720	Acrylic	PTFE	20	20	50	50	200	10	2-12	1.3	●	●	-	●	-	-	●	○	○	●	●	○	●	-	●	●	-	○	○
1720G	Acrylic	PTFE/graphite	20	20	50	50	200	13	2-12	1.3	●	●	-	●	-	-	●	○	○	●	●	○	●	-	●	●	-	○	○
1730	Novoloid	PTFE / lubricant	25	25	80	50	250	10	1-13	1.3	●	●	-	●	-	●	●	●	●	●	●	●	●	-	●	●	●	●	●
1740	Synthetic	PTFE	35	35	150	150	330	20	4-14	1.3	●	●	-	●	-	○	●	○	●	○	●	○	●	-	●	●	●	●	●

● Suitable work media ○ Suitable work media, but requiring heightened techical attention - Not suitable work media

FINISEAL® 8099H PACKING FOR EXTREME MEDIA CONDITIONS

FINISEAL® 8099H is a diagonally braided packing, manufactured after a special technology in order to guarantee high exploitation parameters.

FINISEAL® 8099H is designed for working in high temperatures and under pressure, while no loss of mass or shrinkage occurs. The packing is made out of graphite with more than 99% carbon contents (tape type), reinforced with continuous inconel wire and the outer surface braided with inconel.



The graphite tapes are manipulated by adding corrosion blocking system. The graphite and the additional elements are an excellent protection against electrochemical corrosion, especially in high temperatures.

This is a packing for excessive parameters and extreme working conditions with high exploitation reliability, which spares the equipment. It is designed for valves, slides and other types of armature mainly in power, oil industry, chemistry, metallurgy etc.

Technical parameters:

Working temperature: -240°C / +650°C

Inert gasses: +1250°C

Working pressure: 550 bar for armature

pH 1-14

TREGRAPH® RINGS, MADE OUT OF EXPANDED GRAPHITE

The TREGRAPH® rings are suitable for the sealing of stuffing boxes of pumps and valves.

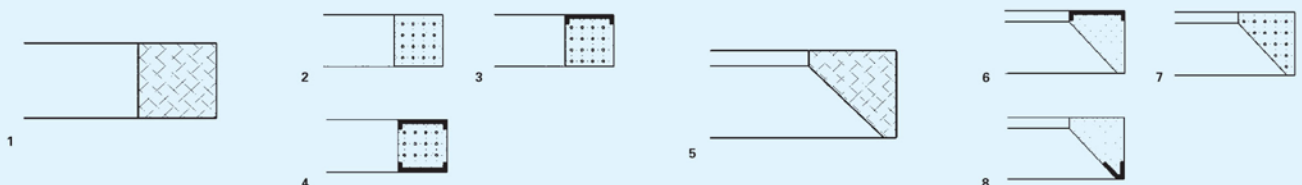
The rings are able to work in fluid temperature of up to 550°C, in vacuum - up to 2200°C and in inert media - up to 3000°C. They are resistant in aggressive media - concentrated acids, solutions, hot oils and other, with chemical resistance pH 0-14.

The density is 1,4-0.3 g/cm³.

The TREGRAPH® rings are produced with dimensions and technical characteristics in accordance to AVKO-S 1301-1-02 standard.



TYPE OF TREGRAPH® RINGS



1. TREGRAPH® ring
2. TREGRAPH® AR ring, reinforced with steel wire SS 304.
3. TREGRAPH® AR ring, reinforced with steel wire and one-side sheet of AISI 316
4. TREGRAPH® AR ring, reinforced with steel wire and both sides sheets of AISI 316
5. TREGRAPH® ring
6. TREGRAPH® AR ring, one-side sheet of AISI 316
7. Conic TREGRAPH® AR ring with steel wire SS 304
8. Conic TREGRAPH® AR ring, corner reinforced with sheet of AISI 316

COMPRESSION PACKINGS MOUNTING INSTRUCTIONS FOR PUMPS AND VALVES

It is necessarily to execute p.1 to p.3.2 from the „Installation Instructions for Montage of Stuffing sets made out of TREGAPH® AR rings“ in pumps and valves.

3.3. Choice of packing.

- make sure, that the compression packing recommended by AVKO, responds to the conditions in which it would be exploited;
- decide on the packings' cross-section and dimensions of the appropriate ring, according to the gathered data in p.3.2;
- ask the manufacturer for every special instruments for packings;
- make sure, that the packing and the equipment are properly cleaned.

3.4. Preparation of the packing rings.

3.4.1. Length determination.

- determine the exact size of the packing and the appropriate ring;
- cut the packing for one ring in a clean and careful manner - for this purpose use AVKOTOOL 11, device for cutting exact sizes at 45° angle.

3.4.2. Ring forming.

- make sure, that the ring is precisely measured in relation to the shaft;
- cut the packing in the determined length directly before the montage into the pump or valve.

3.5. Montage of the packing rings.

- put the first ring carefully around the shaft and move it forward, until it lies on the bottom of the stuffing box - for this purpose use the „split plug“ device;
- make sure, that the ring lies down tightly to the surface of the shaft and at the bottom of the stuffing box before mounting the other ring;

- arrange the ends of the next ring on 90 degrees as to the ends of the previous and move it forward;
- repeat this operation to completely fill in the stuffing box;
- put the stuffing lid and tighten the bolts and nuts by hand;
- make sure that the shaft is turning freely.

3.6. Adjustment.

3.6.1. Pump adjustment.

- tighten the bolts and nuts by hand as much as you can;
- start the pump and uniformly tighten the nuts with a spanner until attaining a steady and admissible leakage for the given pump;
- do not allow the leakage to stop - in this way you will save the pump from overheating.

3.6.2. Valve adjustment.

- consult with AVKO JSC for the necessary pressure, exercised by the stuffing lid on the set, the necessary strength for the tightening of the stuffing lid and the necessary rotating of the bolts and nuts when tightening them;
- tighten the bolts and nuts, following the next steps:

Step1 - tighten the nuts with dynamometric spanner up to 30% of their complete tightening.

Step 2 - open and close the valve repeatedly and make a complete tightening of the bolts and nuts while the valve is in a closed position.

Step 3 - tighten after 4 hours working.

3.7. Over-tightening and consequent operations

- do not allow over-tightening which may stop the shaft's movement;
- change the packing if you can't tighten it.

**AVKOTOOL 11
DEVICE FOR CUTTING PACKINGS**



**AVKOTOOL 12
EXTRACTORS**



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