

BIPAS-SISTEM

2024



METAFLON KLIZNI LEŽAJEVI OSOVINSKIH VODOVA PLOVILA/ METAFLON SLIDE BEARINGS FOR MARINE SHAFTS

Katalog 2024 / Catalog 2024

Dobrodošli / Welcome

2024

“S ponosom Vam predstavljamo naš novi katalog putem kojeg ćete detaljnije ući u tematiku kliznih ležaja. Naša je ideja bila da Vas upoznamo sa cjelokupnim procesom izrade jednog takvog proizvoda, od Vašeg prvog kontakta do završne faze koja uključuje montažu i kontrolu. Vjerujemo da smo u tome uspjeli!”

“We are proud to present our new catalogue, which will help you in gaining a detailed understanding of slide bearings. Our goal was to familiarize you with the entire process of creating such a product, from your initial contact to the final phase which includes assembly and inspection of the completed procedure. We believe we have succeeded in this!”



Slika 1. Brodogradilište Nauta Lamijan/ Shipyard Nauta Lamijan

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O nama

About us



Povijest

History

Tvrtka BIPAS – SISTEM d.o.o. osnovana je u Metkoviću, na samom jugu Hrvatske, 1998. godine. Znanje stečeno u velikim grupacijama i tvrtkama grupa entuzijasta pretočila je u novo poduzeće koje je vrlo brzo steklo reputaciju pouzdanog suradnika. Zahvaljujući posjedovanju i konstantnom širenju stručnog znanja na području proizvodnje brtvenih i izolacijskih proizvoda, ulaganjem u edukaciju zaposlenika i usvajanju novih tehnologija tvrtka se je vrlo brzo pozicionirala na tržištu sa tradicijom poslovanja gotovo već 25 godina.

The company BIPAS – SISTEM d.o.o. was founded in Metković, in the south of Croatia, in 1998. The knowledge acquired in great conglomerates and companies was transferred by a group of enthusiasts into a new company which quickly gained a reputation of a reliable partner. Due to owning and constantly expanding our expertise in sealing and isolation products, and by investing into education of our employees, our company very quickly positioned itself into the market with the business tradition of almost 25 years.



Temeljne djelatnosti

Main activities



Brtvljenje

Dugogodišnjom suradnjom i stvaranjem partnerskog odnosa sa stalnim klijentima stečena su znanja za rješavanje najzahtjevnijih problema brtvljenja. Mogućnost izrade najsloženijih oblika brtvila za statičko ili dinamičko okruženje, prilagodba pojedinačnim specifičnim slučajevima su naše posebnosti.

Sealing

By long-standing collaboration and creation of partnership with our regular clients, we gained knowledge necessary for solving the most challenging sealing problems. We specialize in creating the most complex forms of seals for static or dynamic setting in addition to adaptation to individual specific situations.



Termoizolacija

Zaštita strojnih komponenti ili dijelova industrijskih postrojenja od visokih temperatura ili direktnih plamenih udara uža su specijalnost tvrtke BIPAS – SISTEM od njenog početka. U našem asortimanu nalazi se čitav niz proizvoda od staklenih i keramičkih vlakana namjenjenih za zaštitu i izolaciju do 550 °C odnosno 1100°C.

Thermal insulation

The protection of machine components or parts of industrial plants from high temperatures or direct flame are a sub-specialty of the BIPAS – SISTEM company from its beginnings. We offer a variety of products made of glass and ceramic fibres intended for protection and isolation of up to 550°C or 1100°C.



Industrijski platneni kompenzatori

Iskustvo i znanje naših stručnjaka koje se stjecalo desetljećima u problematici konstruiranja i proizvodnje industrijskih kompenzatora jedan je od glavnih razloga zašto nam se klijenti obraćaju s potpunim povjerenjem.

Industrial fabric expansion joints

The experience and knowledge of our experts which has been acquired for decades in the areas of construction and production of industrial expansion joints are only some of the reasons why clients approach us with complete confidence.

Slika 2. Prirubničke brtve/ Gaskets



Temeljne djelatnosti

Main activities

Slika 3. Brtvene pletenice/ Gland packings



Klizni ležajevi osovinskih vodova plovila – METAFILON ležajevi

Širenje proizvodnog asortimana, usvajanje novih znanja kako bismo što spremnije dočekali svakodnevne izazove na tržištu dovelo nas je i do proizvodnje kliznih ležajeva osovinskih vodova plovila. Na tržištu u Republici Hrvatskoj ti proizvodi bili su nekada poznati pod nazivom METAFILON, kao proizvodi tvrtke METAFILON d.o.o. iz Ploče. Poduzeće BIPAS – SISTEM kao sljedbenica te tvrtke djeluje na tržištu od 2010. godine.

Slide bearings of marine shafts – METAFILON bearings

Expansion of product range and knowledge acquisition for the purposes of readily facing everyday challenges of the market brought us to the production of slide bearings of marine shafts. These products were formerly known as METAFILON on the Croatian market since they were produced by METAFILON d.o.o. company from Ploče. BIPAS – SISTEM company as the successor of the formerly mentioned company has been active on the market since 2010.



Proizvodi od teflona i drugih vrsta tehničke plastike

Bogate zalihe poluproizvoda od raznih vrsta tehničke plastike, među kojima istčemo teflon dala je našoj tvrtki potrebnu širinu ponude u svijetu brtvljenja i industrije općenito. Strojevi za ekstrudiranje, prešanje, obradu odvajanjem čestica, peč za sinteriranje čini nas potpuno opremljenima i spremnima za rješavanje brojnih zahtjeva u slučaju da se od nas traži kreiranje poluproizvoda ili gotovih proizvoda uz predočavanje tehničke dokumentacije.

Products made of Teflon and other types of engineering plastics

Rich supplies of semi-manufactured goods made from different types of engineering plastics, among which we emphasize Teflon, provided our company with necessary range of products in areas of sealing and general industry. An extrusion machine, a press, a particle removal device and a sintering furnace make us fully equipped and ready to answer numerous requests in case we need to create semi-manufactured or final products with presentation of technical documentation.



Opće informacije

General Information

Širenje proizvodnog asortimana i usvajanje novih znanja kako bismo što bolje odgovorili na svakodnevne izazove na tržištu dovelo nas je do proizvodnje kliznih ležajeva za osovinske vodove plovila. Na tržištu u Republici Hrvatskoj, ti proizvodi su nekada bili poznati pod nazivom METAFLOK, kao proizvodi tvrtke METAFLOK d.o.o. iz Ploče. Poduzeće BIPAS – SISTEM, kao nasljednica te tvrtke, djeluje na tržištu od 2010. godine. Još tijekom devedesetih godina prošlog stoljeća, tvrtka DYNEON HOECHST iz Njemačke koristila je teflon s dodacima kao materijal za izradu kliznih ležaja. Prvi klizni ležaji ovog tipa ugrađeni su u Republici Hrvatskoj još 1994. godine. Prosječni vijek trajanja ležaja, uz uvjet pravilne montaže, minimalno je 5 godina. Međutim, kako vrijeme pokazuje, ležaji izrađeni od ovog tipa materijala redovito traju puno duže.

Expanding our product range and acquiring new knowledge to better respond to everyday market challenges has led us to the production of slide bearings for marine shafts. These products were once known in the Croatian market under the name METAFLOK, as products of METAFLOK d.o.o. from Ploče. The company BIPAS – SISTEM, as the successor of that company, has been operating in the market since 2010. Back in the 1990s, the German company DYNEON HOECHST used Teflon with additives as the material for manufacturing sliding bearings. The first slide bearings of this type were installed in the Republic of Croatia as early as 1994. The average lifespan of these bearings, provided they are properly installed, is a minimum of 5 years. However, as time has shown, bearings made from this type of material often last much longer.



Upotreba

Usage

Slika 4. Brodogradilište Nauta Lamijan/ Shipyard Nauta Lamijan



Ribarice/ Fishing boats



Čamci/ Boats



Gliseri/ Speedboats



Katamarani/ Catamarans



Trajekti/ Ferries



Jahte/ Yachts

Različita industrijska postrojenja/ Various industrial facilities

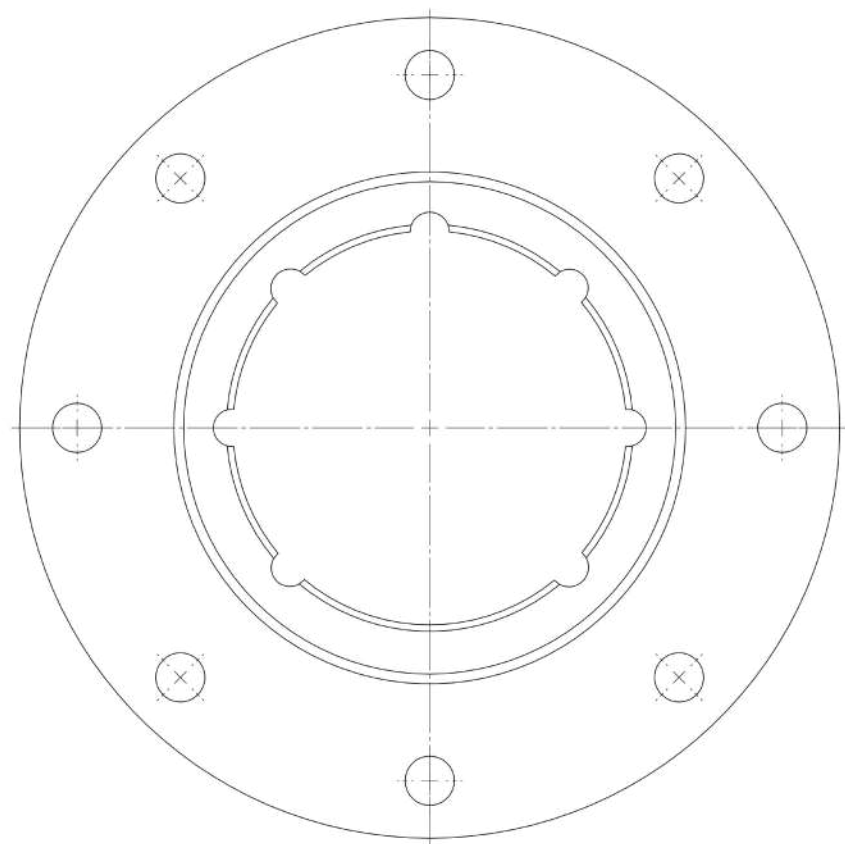


Slika 5. Materijal u obliku praha/ Material in powder form

Fizikalne i kemijske karakteristike

Physical and chemical characteristics

	Vrsta materijala/ Type of material	
	BS 20K 5G	BS 60B
Gustoća/ Density	2,14 $\frac{g}{cm^3}$	3,90 $\frac{g}{cm^3}$
Otpornost na tlak/ Pressure resistance	14 $\frac{N}{mm^2}$	16 $\frac{N}{mm^2}$
Tvrdoća/ Hardness	60 ShD	72 ShD
Termalna postojanost/ Thermal stability	60 ShD	72 ShD
Termalna postojanost/ Thermal stability	-200/+260 °C	-200/+260 °C
Točka topljenja/ Melting point	342 °C	342 °C
Koeficijent trenja u mediju/ Coefficient of friction in medium	0,02	0,03
Upijanje vode/ Water absorption	0 %	0 %
Otpornost na medije/ Media resistance	pH 0-14	pH 0-14
Neotrovan materijal/ Non-toxic material		
Negoriv materijal/ Non-flammable material		
Ležaji za velike brzine i srednja specifična opterećenja/ Bearings for high speeds and moderate specific loads		

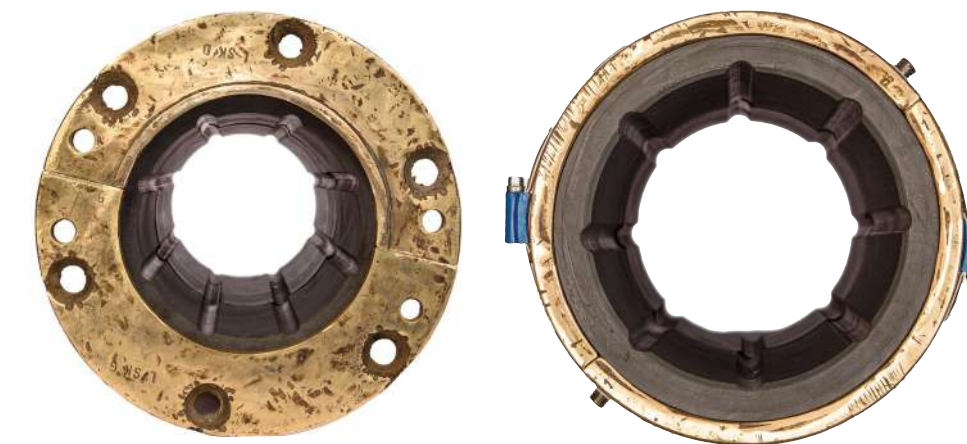


Slika 6. Nacrt sklopa ležaja i čahure/ Drawing of the bearing and sleeve assembly

Kompletna izrada ležaja

Complete bearing manufacturing

- | | |
|---|---|
| ✓ Potrebno dostaviti podatke o vratilu | It is necessary to provide shaft data |
| ✓ Potrebno dostaviti čahuru ležaja | It is necessary to provide bearing shell |
| ✓ Stručno savjetovanje pri izboru materijala | Expert advice on material selection |
| ✓ Izrada ležaja prema prethodno dogovorenom nacrtu | Manufacturing the bearing according to the previously agreed design |
| ✓ Uprešavanje ležaja u čahuru | Press-fitting the bearing into the shell |
| ✓ Izrada aksijalnog osiguranja | Manufacture of the axial securing mechanism |

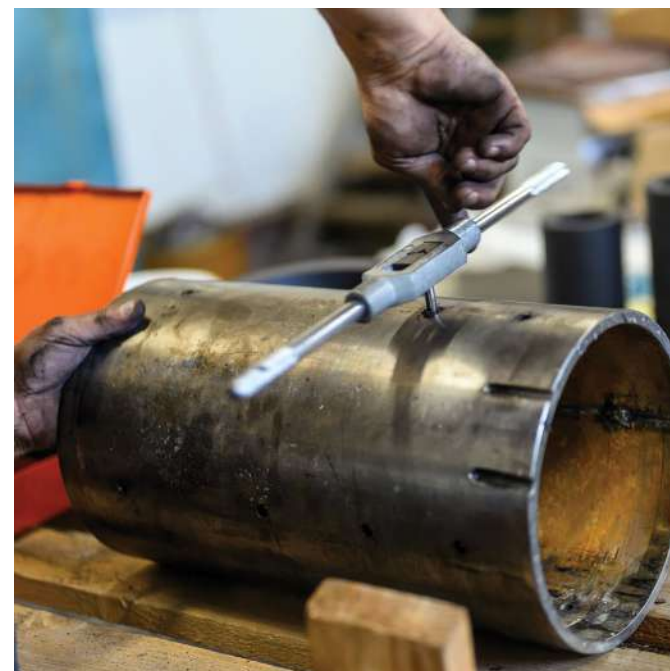




Slika 7. Demontaža starog ležaja/ Dismantling the old bearing



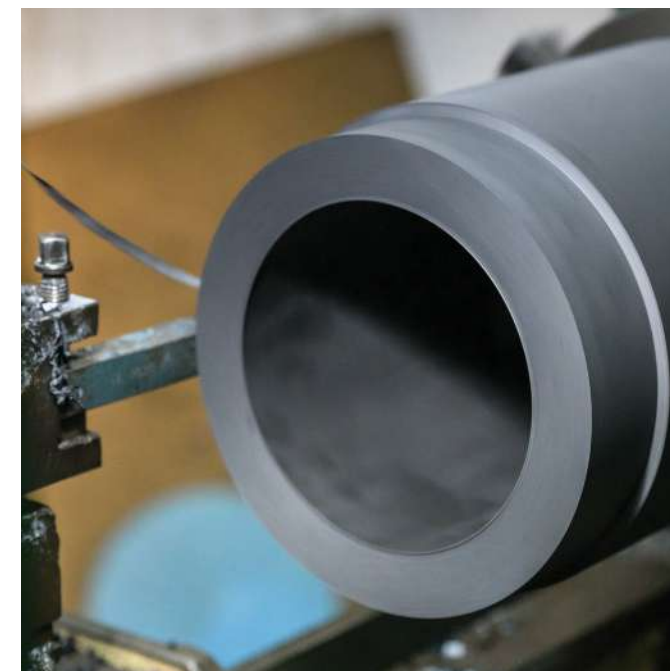
Slika 8. Čišćenje čahure/ Cleaning the sleeve



Slika 9. Priprema čahure/ Sleeve preparation



Slika 10. Provjera vanjskog promjera ležaja/
Checking the outside diameter of the bearing



Slika 11. Strojna obrada vanjskog promjera/
Outside diameter machining



Slika 12. Uprešavanje novog ležaja/ Inserting a new bearing



Izrada poluproizvoda

Semi-manufactured products

- ✓ **Potrebno dostaviti podatke o vratilu** The information about the shaft is required
- ✓ **Stručno savjetovanje pri izboru materijala** Expert advice on material selection
- ✓ **Izrada tuljka uvećanih dimenzija za strojnu obradu** Manufacturing oversized bushings for machining

Slika 13. Poluproizvodi u peći/ Semiproducts in the oven



Slika 14. Peč za sinteriranje/ Sintering oven

Slika 15. Alati za briketiranje/ Tools for briquetting





Slika 16. Tokarenje ležaja/ Bearing turning

Režimi rada

Working regimes

Broj okretaja vretena/ Spindle speed	350 – 5300 /min
Dubina ulaza noža/ Knife entry depth	2 – 4 mm
Uzdužni posmak/ Longitudinal feed	0,01 – 0,05 mm
Materijal noža/ Knife material	Vidija (sinter pločice) / Cemented carbide (sintered brake pads)
Zadnji prolaz ponoviti istom mjerom/ Repeat the last pass with the same intensity	
Oštricu noža brusiti nakon svakih 200 – 300 mm uzdužnog prolaza/ Sharpen the knife blade after every 200 - 300 mm of longitudinal pass	
Kontrolu dimenzija treba obavljati na istoj ili približnoj temperaturi obrade/ Dimensional checks should be performed at the same or approximately the same processing temperature	
Ležaj raditi u plusu od +0,03 mm do +0,10 mm/ The bearing should have a tolerance of +0,03 mm to +0,10 mm	



26.

Određivanje broja kanala

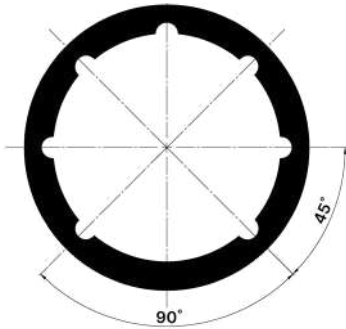
Determining the number of grooves

Promjer osovine [mm]/ Shaft diameter [mm]	Ispod/ Under 25 mm	Ispod/ Under 100 mm	Ispod/ Under 200 mm	Ispod/ Under 300 mm	Iznad/ Over 300 mm
Broj kanala/ Number of grooves	4	5	7	9	HRB – Split

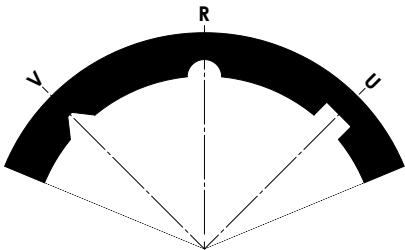
X NA DONJEM DIJELU, GDJE LEŽI OSOVINA, NE IZRAĐIVATI KANALE!/
DO NOT CREATE GROOVES AT THE BOTTOM PART WHERE THE SHAFT LIES!

Slika 17. Izrada kanala/ Manufacturing the channel

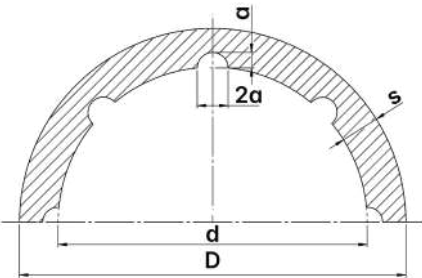
Presjek/ Section



Oblici kanala/
Shapes of the grooves

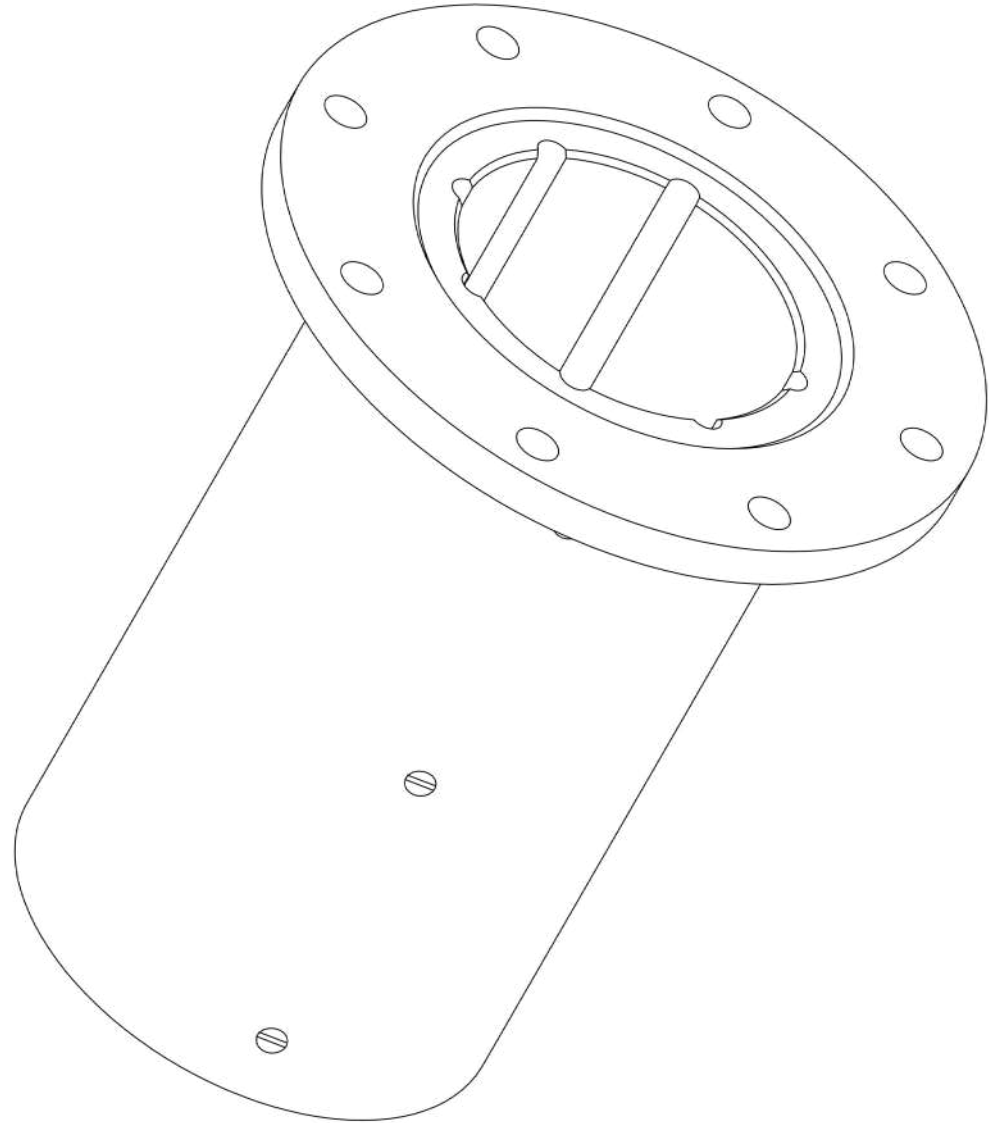


Dubina i širina kanala/
Depth and width of the grooves



$a=(0,40 \text{ ili } 0,45)s \text{ [mm]}$
 $s=D-d \text{ [mm]}$

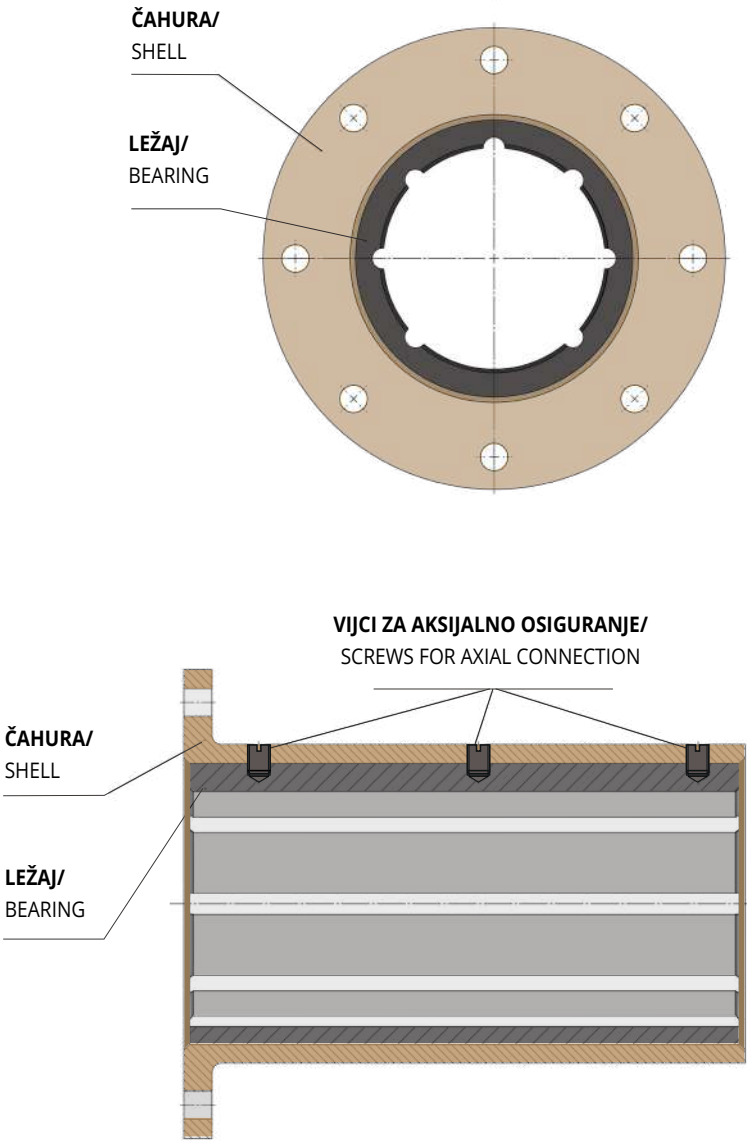
27.



Slika 18. 3D model sklopa ležaja i čahure/ 3D model of the bearing and sleeve assembly

Upute za montažu

Assembly instructions



- Unutrašnji promjer brončane košuljice (čahure) mora biti potpuno cilindričan jer ležaj poprima oblik košuljice./**
The inner diameter of the bronze shell must be perfectly cylindrical as the bearing takes on the shape of the shell.
- Za aksijalno osiguranje spoja ugraditi vijke./**
For axial connection securing, install screws.
- Za čvršći spoj između košuljice (čahure) i ležaja preporučuje se sljedeće:**
a) Ležaj raditi u "plusu" $\varnothing L+0,03+0,05$ i hladiti u vodi 2-3 sata,
b) Ležaj raditi u "plusu" $\varnothing L+0,07+0,10$ i hladiti u hladnjaku 2-3 sata./
For a stronger connection between the shell and the bearing he following is advised:
a) Manufacture the bearing with a tolerance of $\varnothing L+0,03+0,05$ and cool it in water for 2-3 hours,
b) Manufacture the bearing with a tolerance of $\varnothing L+0,07+0,10$ and cool it in a refrigerator for 2-3 hours.
- Obradu unutrašnjeg promjera raditi 4 sata nakon ubacivanja ležaja u čahuru./**
After the bearing has been press-fitted, leave the material to stabilize for 2-3 hours.
- Prije ugradnje osovine, tanko nauljiti ležaj./** Machining the inner diameter should be done 4 hours after inserting the bearing into the shell.
- Prije ugradnje osovine, tanko nauljiti ležaj./** Before installing the shaft, apply a thin layer of oil to the bearing.



Slika 20. Zadnja provjera/ Last check



Slika 21. Montirani ležaj/ Mounted bearing



Slika 22. Proces montiranja/ Mounting process

Slika 19. Početak montaže/

Start of assembly



Kontrola

Inspection

X | Uz gotovi sklop isporučuje se **PROIZVOĐAČKI ATEST**
I ATEST HRVATSKOG REGISTRA BRODOVA

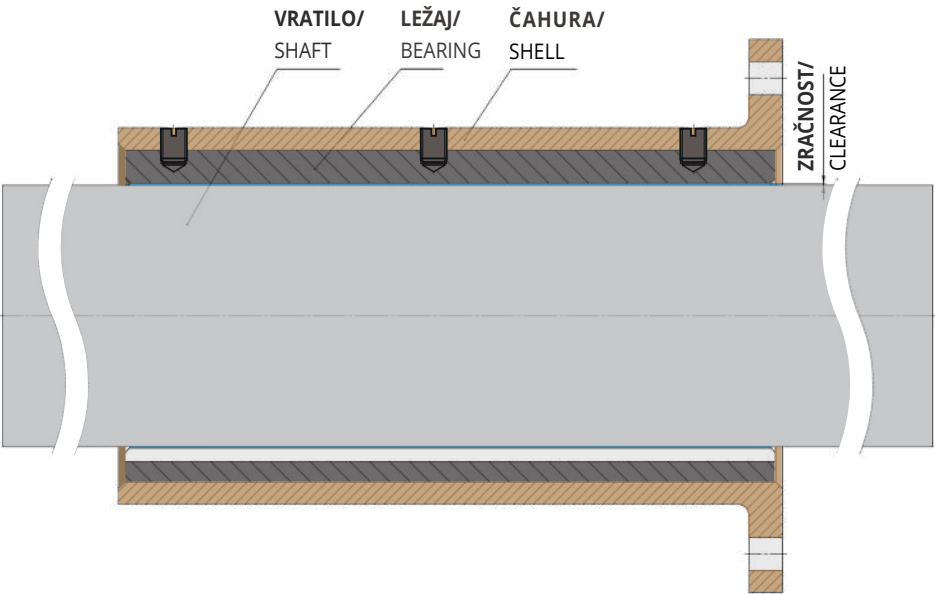
Along with the finished assembly, **THE MANUFACTURER'S TEST CERTIFICATE** and **THE CROATIAN REGISTER OF SHIPS CERTIFICATE** are provided



Slika 23. Kontrola montaže/ Mounting control

Završna kontrola ležaja izvršava se 24 sata nakon obrade i to provlačenjem kalibra. Ukoliko je potrebno, korekciju izvršiti finim brusnim papirom.

The final inspection of the bearing is carried out 24 hours after the processing by passing a gauge through it. If necessary, corrections should be made using fine sandpaper.



Dozvoljena zračnost ležaja/ Acceptable bearing clearance					
PROMJER OSOVINE/ SHAFT DIAMETER[mm]	25 – 50	50 – 100	100 – 150	150 – 200	Veće/ Higher dim.
ZRAČNOST/ CLEARANCE [mm]	0,25 – 0,30	0,30 – 0,40	0,40 – 0,60	0,60 – 0,80	HRB Split



Trajnost

Durability

Slika 24. Brodograđilište Nauta Lamljan/ Shipyard Nauta Lamljan

Dugotrajnost ležaja ovisi o sljedećim parametrima:	The durability of the bearing depends on the following:
✓ Korektna izrada ležaja	✓ Correct manufacture of the bearing
✓ Fina obrada vratila	✓ Fine shaft finishing
✓ Stručna montaža	✓ Professional assembly

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Dodatna oprema za plovila

Additional
equipment

marine



Slika 25. Brtvene pletenice/ Gland packings

Brtvene pletenice

Gland packings

BS 9080



P [bar]	-	-	20
T [°C]	+80		
Ph	6-8		
V [m/s]	-	-	6

Pletenica izrađena od pamučnih vlakana impregnirana industrijskim lojem. Veoma ekonomična. Koristi se za brtvljenje na pumpama do 80 °C.

Braided cotton fibers impregnated with industrial varnish. Very economical. Used for sealing in pumps up to 80 °C.

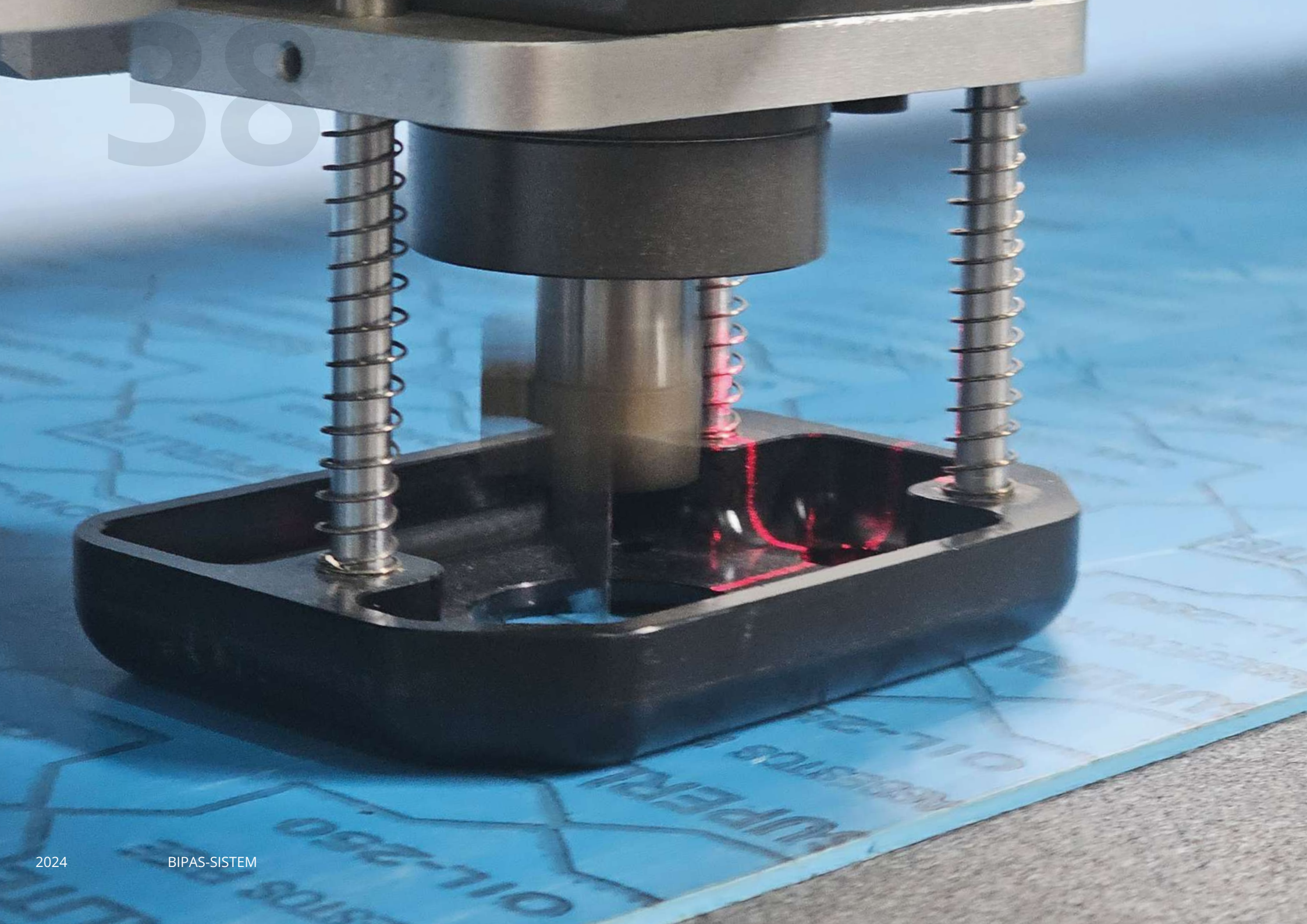
BS 9140



P [bar]	40	30	20
T [°C]	-20/+40		
Ph	4-11		
V [m/s]	1	6	15

Pletenica izrađena od RAMIE prediva. Impregnirana PTFE disprezijom. Odlikuje se izvrsnom kemijskom postojanošću. Prilagodljiva. Ne oštećuje osovinu.

Braided RAMIE yarn. Impregnated with PTFE dispersion. Known for excellent chemical resistance. Flexible. Does not damage the shaft.



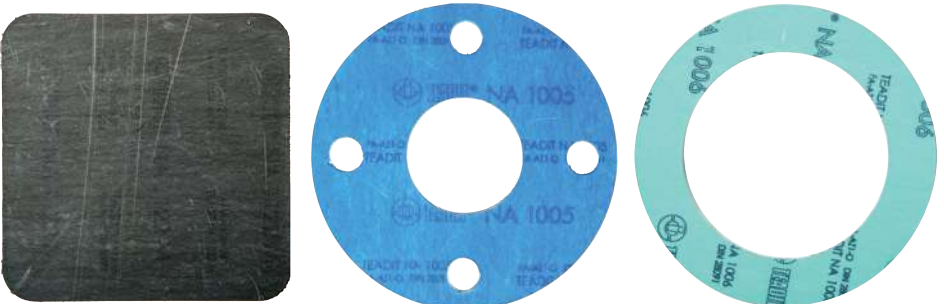
Statičke brtve

Gaskets

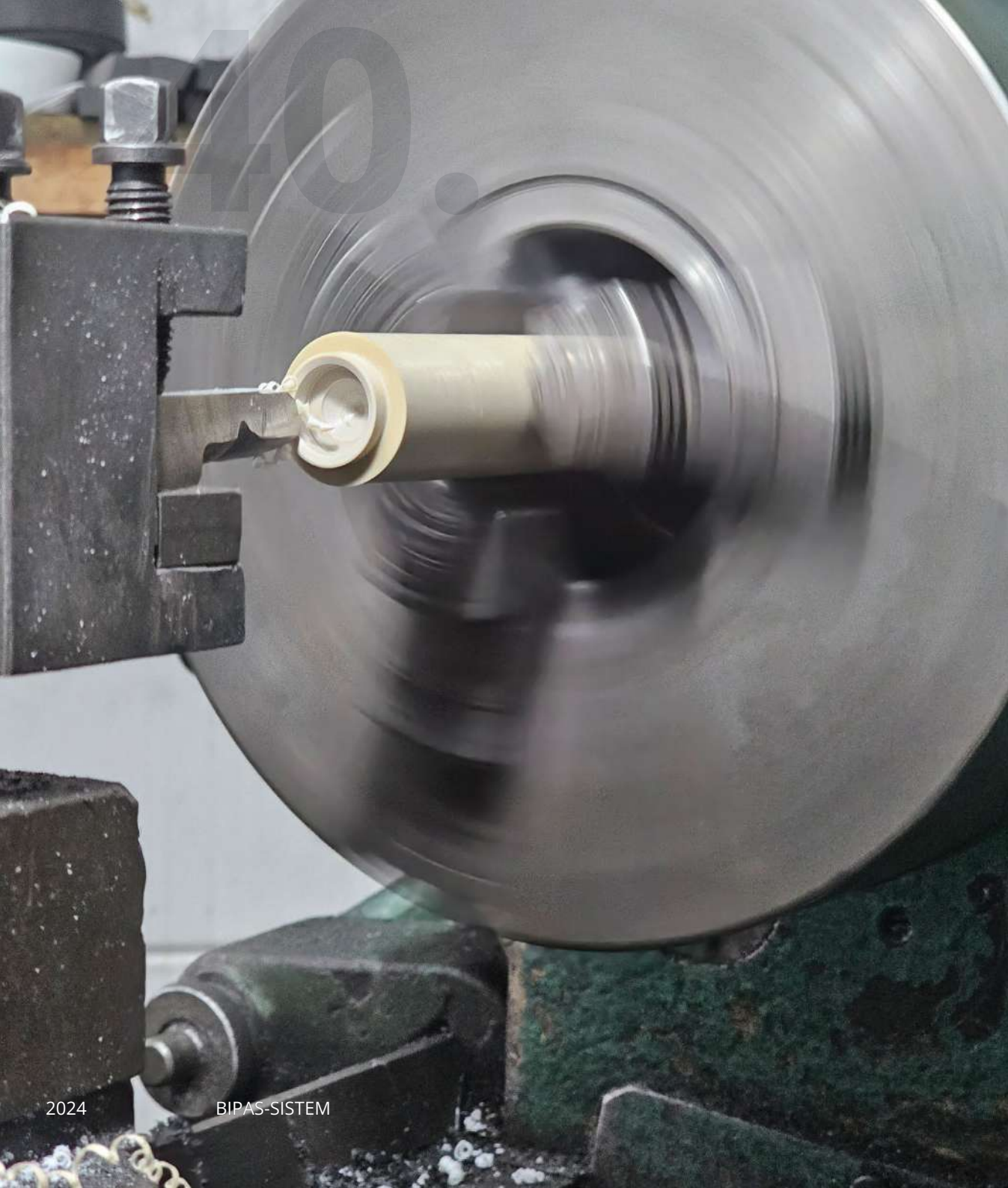
Korištenjem najmodernijih CNC rezalica režemo sve oblike standardnih i nestandardnih statičkih brtvi od materijala poput tesnita, grafita, teflona, gume, pluta i slično. Svi navedeni materijali mogu se naručiti i kao repro materijal u obliku ploča ili rola.

Using the latest CNC cutters, we cut all shapes of standard and custom static gaskets from materials such as gasket sheets, graphite, Teflon, rubber, cork etc. All these materials can also be ordered as raw material in the form of sheets or rolls.

- BRTVENE PLOČE/
GASKET SHEETS**
- PRIRUBNIČKE BRTVE RAZNIH OBLIKA/
GASKETS OF VARIOUS SHAPES**



Slika26. CNC rezalica/ CNC cutter



CNC glodanje i tokarenje tehničke plastike

CNC milling and turning of technical plastics

Slika 27. Tokarenje i CNC glodanje/Turning and CNC milling

CNC glodanje

U našem svakodnevnom radu koristimo modernu 2.5-osnu CNC glodalicu radne površine 1500x1600 mm. Omogućuje obradu velikih plastičnih ploča debljine do 70mm, izradu zupčanika velikih promjera s ravnim zubima te plastičnih vodiča duljine do 3m.

CNC Milling

In our daily operations, we use a modern 2.5-axis CNC milling machine with a working surface of 1500x1600 mm. It allows us to process large plastic panels up to 70mm of thickness, to manufacture gears with large diameters and straight cogs, and to produce plastic railings up to 3m in length.

CNC rezanje

Potpuno nova CNC rezalica koja ujedno ima i integrirani modul za glodanje tanjih plastičnih ploča ili rupa na brtvenim pločama. Radna ploha dimenzija 1600x2600 mm. Stroj je iznimno precizan i brz.

CNC Cutting

A brand new CNC cutter with an integrated module for milling thinner plastic panels or holes in gasket sheets. The working surface measures 1600x2600 mm. The machine is exceptionally precise and fast.

Tokarenje

Dugi niz godina nudimo mogućnost potpune izrade kliznog ležaja, što zahtijeva bogato znanje i iskustvo u području tokarenja. Osim strojne obrade ležaja, izrađujemo i druge dijelove od tehničke plastike poput kolotura, užnica, brtvi sjedišta ventila i slično. U svom radu koristimo dvije manualne i jednu poluautomatsku tokarilicu.

Turning

For many years, we have offered the complete manufacturing of slide bearings, which requires extensive knowledge and experience in turning. In addition to machining bearings, we also produce other parts from engineering plastics, such as pulleys, sleeves, valve seat seals etc. In our operations, we use two manual lathes and one semi-automatic lathe.



Gumeni kompenzatori

Rubber compensators

Svoj asortiman proizvoda odlučili smo upotpuniti i gumenim kompenzatorima. U svojoj ponudi imamo kompenzatore renomiranih europskih proizvođača koji posjeduju sve potrebne ateste.

We have decided to expand our product range to include rubber compensators. Our offer includes compensators from renowned European manufacturers with all the necessary certifications.



44.

Priznanja

Recognition



Reference

Reference

Od svoga osnutka tvrtka BIPAS – SISTEM, uzevši u obzir sve mjerljive poslovne parametre, najveći trag ostavlja na području Republike Hrvatske. Budući da su se sve zemlje u okruženju u zadnjih 20 godina industrijski razvijale, javila se potreba za pronalaženjem poslovnih partnera izvan matične države. Godine 2005. u Sarajevu se osniva partnerska tvrtka BIPAS – SISTEM, koja za cilj ima pokrivanje tržišta susjedne zemlje Bosne i Hercegovine, dok se u 2022. godini osniva predstavništvo u gradu Zagrebu sa jasnom namjerom širenja poslovanja na sjeverozapadnom dijelu Hrvatske. Stjecanjem novih zadovoljnih klijenata i sa apsolutnim povjerenjem u kvalitetu i pouzdanost naših proizvoda želja nam je u budućnosti iskoračiti na zapadnoeuropska tržišta i što vjernije predstavljati našu zemlju u ovom području industrije.

Considering all the measurable business parameters, BIPAS – SISTEM company has since its beginning left the greatest mark within the Republic of Croatia. Since all the surrounding countries have been developing their industries in the last 20 years, there was a call for finding business partners outside the home country. In 2005, a partner company BIPAS – SISTEM is founded in Sarajevo which serves a purpose of meeting the needs of the neighbouring market of Bosnia and Herzegovina. In 2022, a branch office is opened in Zagreb with the clear purpose of business expansion in the north-western part of Croatia. By gaining new and satisfied clients and with the absolute confidence in the quality and reliability of our products, it is our great wish to step into the markets of Western Europe in the future to represent our country as faithfully as possible in this area of industry.

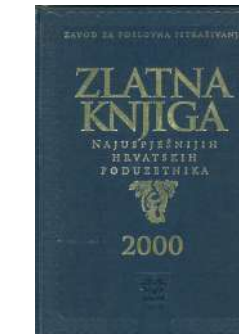
Certifikati i priznanja

Certificates and recognition

Tvrtka BIPAS – SISTEM je na osnovi prosudbe nadležnih tijela zadovoljila normu ISO 9001:2015 te kao takva ima sve potrebne osnove za proizvodnju i prodaju brtveno izolacijskih materijala. Također, Hrvatski registar brodova potvrdio nas je kao proizvođača komponenti koje se ugrađuju na brodove i na postrojenja pod njihovim nadzorom. Ovi certifikati, osim što nam daju zakonske okvire i dozvole za rad, daju nam i odgovornost da sve što proizvodimo i radimo, bude na takvoj razini da ničija sigurnost nije ugrožena.

Based on the evaluation of authorities, BIPAS – SISTEM company meets the standard ISO 9001:2015 and as such has all the necessary basis for manufacturing and sale of sealing and insulation materials. In addition, Croatian Register of Shipping acknowledged us as the manufacturer of components built into ships and facilities under their supervision. Besides providing us with legal framework and work permits, these certificates also give us the responsibility of maintaining the level of all our production and work in such a way that nobody's safety is endangered.

Slika 28. METAFILON klizni ležajevi/ METAFILON slide bearings



Sjedište uprave/

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