nova TKL

Nova TVORNICA KLIZNIH LEŽAJEVA d.o.o.

QUALITY SYSTEM CERTIFICATION ISO 9001 DNV

http://www.tkl.hr

About us

More then a five decades of experience is a period of time on which today's production of sliding bearings is based on. It's founded as a technical indipendent factory from ex 'Jugoturbina", the biggest energetic factory in ex Yugoslavia.

SLIDING BEARING FACTORY is from 1996. complete privat company, and from 2004. it's called Nova TVORNICA KLIZNIH LEŽAJEVA. We are certified according to ISO 9001:2008 by DNV, and we are also recognized by BUREAU VERITAS for sliding bearing production.

We have around 50 employers, which has according to their long period experience and constant developing achieved great results in producing and repairing sliding bearings. More then 10.000 of various types of sliding bearings were produced in our company, along with complete technical documentation, adequate tools and special measuring equipment.

Sliding bearings are produced out of best quality materials, and we use modern technologies for control in production.

Product Range

Up to now, more then 10.000 different types of sliding bearings are produced in our company, along with complete technical documentation, adequate tools and special measuring equipment.
We can produce and repair all types of sliding bearings.
Our techicians can do all the calculations and complete technological documentation for production.

Together with sliding bearing production we can do different machining, heat treatment and NDT examinations.

Bearings from our production program are built in the following plants:

- all types of diesel engines (ranging from smaller tractor and transport vehicle engines to big ship and stationary plant engines)
- all types of turbine plants (Hydroelectric power plants, thermoelectric power plants and nuclear power plants)
- cement plants
- electric motors
- pumps
- compressors
- roll stands in iron works
- mining plants
- chemical plants
- various kinds of industrial plants

Guide bearing for water turbine

Excenter shell for cement factories

Materials

Sliding bearings are produced from different combination of materials. We use these combinations:

- bronze – white metal
- steel (casted steel, casted iron) – white metal

Various technological procedures are used in production of sliding bearings, but their application depends on the bearing form and size:

- static (gravitational) casting of white metal – not limited in size
- welding and soldering technique – not limited in size
- centrifugal casting – max Ø1500 x 1600mm

In production of sliding bearings only the primary raw material from best European producers is used.
Table 1. shows the types of lead based white metal and tin based white metal mostly used. Other white metal types are used if required by the buyer.

ECKA TEGOSTAR is an ecological type containing no lead, cadmium, nickel or arsenic, but having high mechanical properties as well.

NTKL has a suficient quantity of mentioned types of white metal.The main supplier of white metal is ECKA Germany GmbH.

Table 2. shows mechanical properties of mostly used white metals.

Sleeve and shell for diesel motors

Generator bearing

Bearings for diesel motors

Table 1: Chemical composition of white metal (%)

	LM THERMIT	SnSb12 Cu6Pb (WM 80)	TEGO V738	TEGOTENAX V840	TEGOTENAX S V841	ECKA Tegostar
Sn	6	80	81	89	88	81,13
Pb	75,8	2	max 0,06	max 0,06	max 0,06	
Sb	15	12	12	7,5	7,5	12
Cu	1,2	6	5	3,5	3,5	6
Ni	0,5		0,3		0,2	
As	0,5		0,5		max 0,1	
Cd	1		1,2		0,8	
Zn						0,6
Ag						0,1

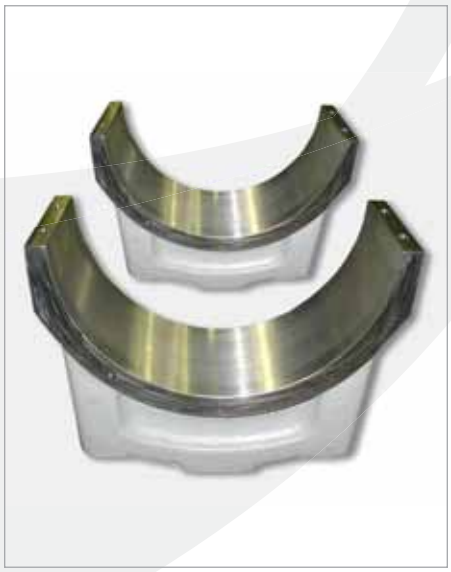
Table2: Mechanical properties of white metal

			LM THERMIT	SnSb 12 Cu6Pb (WM 80)	TEGO V738	TEGOTENAX (V840)	TEGOTENAX S (V841)	TEGOSTAR 738
Hardness		20°C	26	27	35	23	28	24
HB 10/250/80		50°C	21	23	28	17	23	20
DIN ISO 4383 part 2		100°C	14	13	17	10	16	12
		150°C	8	7	10	8	9	10
TENSILE TEST								
0,2% ultim. str.	$R_{p0,2}$	N/mm²	28	62	84	46	66	76
Tensile strenght	R_m	N/mm²	57	89	102	77	100	78
Tensile-strain	A_5	%	1.2	3.0	1.5	11.2	8.4	1.0
Young's modul.	$R_{p\ 0,01}$	N/mm²	29900	55700	52500	56500	49500	57000

COMPRESSIVE TEST													
			20°C	100°C	20°C	100°C	20°C	100°C	20°C	100°C	20°C	100°C	20°C	100°C
0,2% compr. str.	$\sigma_{d0,2}$	N/mm²	46	27	62	37	80	48	47	27	63	30	90	50
2% compr. str	σ_{d2}	N/mm²	85	59	87	69	122	80	76	45	103	60	107	54
Compr. -strenght	σ_{dB}	N/mm²	134	83	189	121	195	126	157	100	235	136	190	91
Compr. -strain	ε_{dB}	%	34	37	46	53	34	34	47	50	39	44	50	50

BOND STRENGHT							
(Steel C10; bearing metal thickness > 6 mm) (DIN ISO 4386 part 2)	R_{ch}	N/mm²	57	39	98	75	86	62
DYNAMIC TEST								
Rotating bending strenght	σ_{bW}	N/mm²	±28	±28	±39	±29	±33	±35
IMPACT BENDING TEST								
Average number of impacts			285	490	910	3741	2689	2856
Average impact energy		J	77	134	250	1028	739	785

Bronze bearings for locomotives



Main bearing cap for diesel motor

Turbine bearing

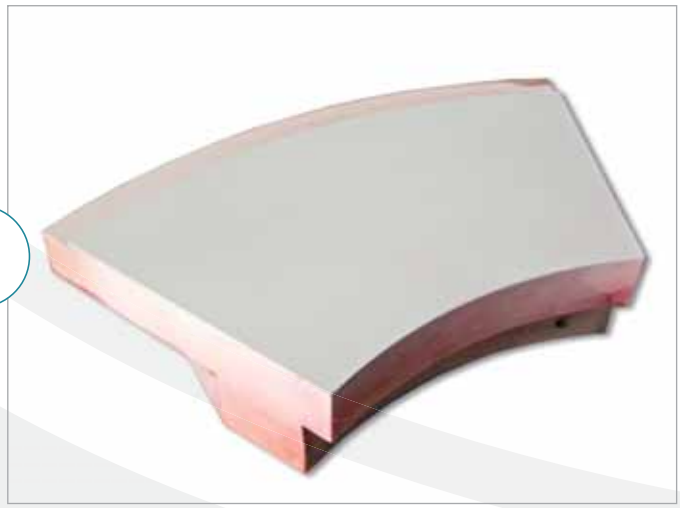
Repair

We can repair all types of sliding bearings not limited in size. After receiving the bearing complete input control is done containing visual and dimensional control, and if needed penetrant liquid, ultrasonic and magnetic particle test. Condition of the bearing is written in protocol of measurents and given to the customer.

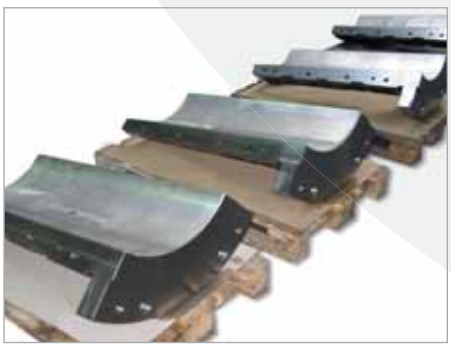
Condition before repair

Condition after repair

Condition before repair



Condition after repair



4-piece guide bearing

Slide bearing for electromotors

Turbine guide bearing

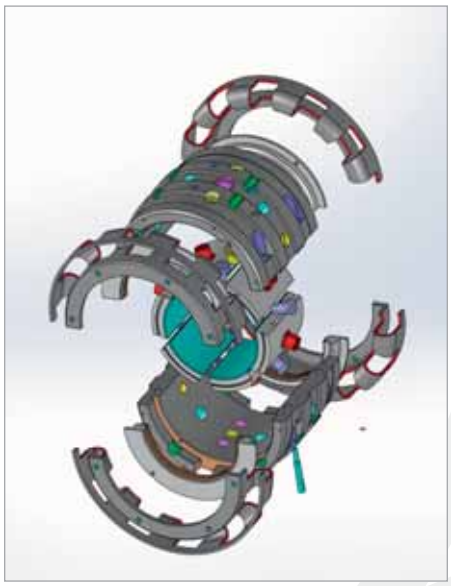
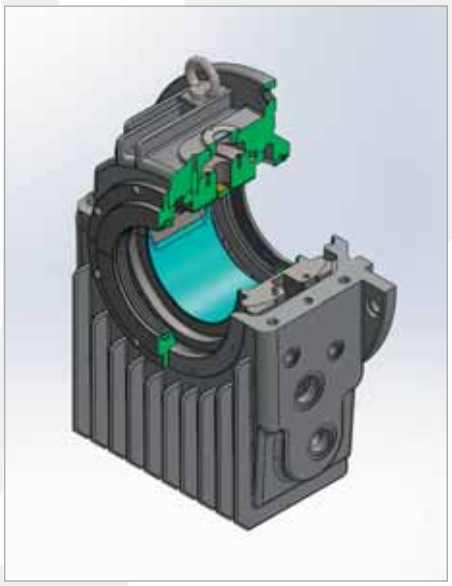
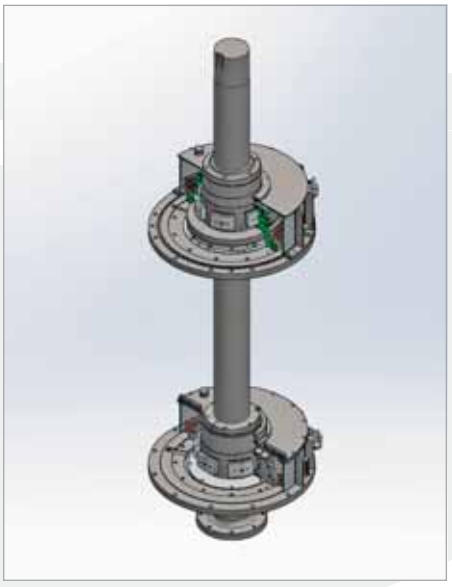
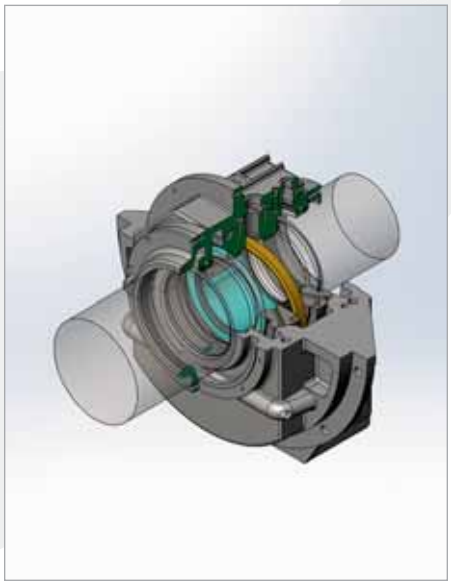
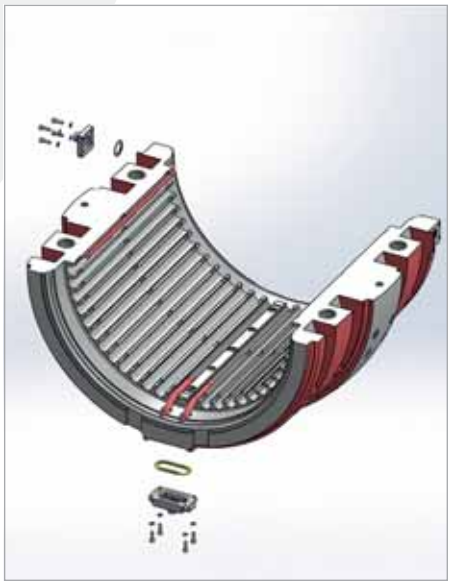
Quality

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV = ISO 9001 =

Quality is assured by rigurous input, inter-stage and output control. The bearings are produced under 100% quality control.
The control of white metal bonding is performed by ultrasonic and liquid penetrant examinations carried out by qualified personel. Since 2003 we have ISO 9001:2008 Certificate issued by DNV. The criterion of quality is equall with international standard ISO 4386, and also other criterion can be used if requested by buyer. In addition to the technical documentation we supply the buyer with attest documentation for built-in materials, ultrasonic and penetrant liquid examination as well as protocol of measurements.

Development

Last few years we have started with development of our own complete bearing solutions for different types of turbines, generators and electromotors, so we can produce bearings according to the turbine or generator producers request. We have developed solutions for vertical and horizontal machines.

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