ES
ELASTIČNE SPOJNICE
ELASTIC COUPLINGS

BEOPUMPE
BEOGRAD

ES

PRIMENA
Elastične spojnice tip ES konstruisane su na bazi velikog iskustva u primeni te se odlikuju visokim stepenom sigurnosti u pogonu uz optimalne dimenzije i težinu. Ove spojnice nalaze široku primenu i kod najtežih pogonskih uslova.

IZBOR MATERIJALA
Za "normalne" brojeve obrtaja diskovi se izrađuju od livenog gvožđa, a za "povišene" brojeve obrtaja od čelika. Elastični prstenovi izrađeni su od specijalne gume i smešteni su na čeličnim svornim vijcima. Elastični prstenovi su lako zamenjivi.

BALANSIRANJE
Spojnice iznad veličine ES6 balansirane su statički, a prema zahtevu i dinamički. Spojnice koje rade kod "povišenih" brojeva obrtaja balansirane su dinamički.

IZRADA OTVORA VRATILA
Otvori vratila izrađuju se u toleranciji ISA H7. Ukoliko nije drugačije zahtevano, spojnice se isporučuju sa najmanjim otvorom za vratila (prema tabeli 1) bez žleba za klin. Na osnovu zahteva isporučuje se spojnica sa traženim prečnikom otvora i odgovarajućim žlebom za klin.

IZBOR VELIČINE SPOJNICE
Veličinu spojnice određuju: snaga pogonske mašine, vrsta pogonske mašine, broj obrtaja i prečnici vratila.
Primer:
Centrifugalna pumpa pogonjena je el. motorom snage 100 kW a radni broj obrtaja je 2925 min-1. Vratilo el. motora ima prečnik d2= 80 mm, a vratilo pumpe d1=60 mm. Iz tabele 3 korekcioni koeficijent K iznosi 1,25. Prema tome
ŠN(KS)/n(min-1)Ć • K=(136/2925) • 1.25=0.058
Po ovome bi odgovarala spojnica ES6 čiji je
(N/n) • K=0.075
maksimalni otvor spojnice ES6 je d2=75 mm, a budući da vratilo el. motora ima prečnik d2=80 mm treba odabrati spojnicu veličine ES7. Radi lakšeg pronalaženja veličine N/n dat je dijagram za izbor spojnica, a u tabeli 2 pregled najvećih mogućih otvora za vratilo.
Dobijeni rezultati iz dijagrama moraju se uvek korigovati za koeficijenat K, a pre konačnog izbora spojnice proveriti da li otvori odgovaraju za data vratila.

USES
Elastic couplings type ES have been constructed on the basis of the extensive experience in use, and are characterized by a high degree of operational safety and with optimal dimensions of the weight. These couplings are widely used in the toughest operating conditions.

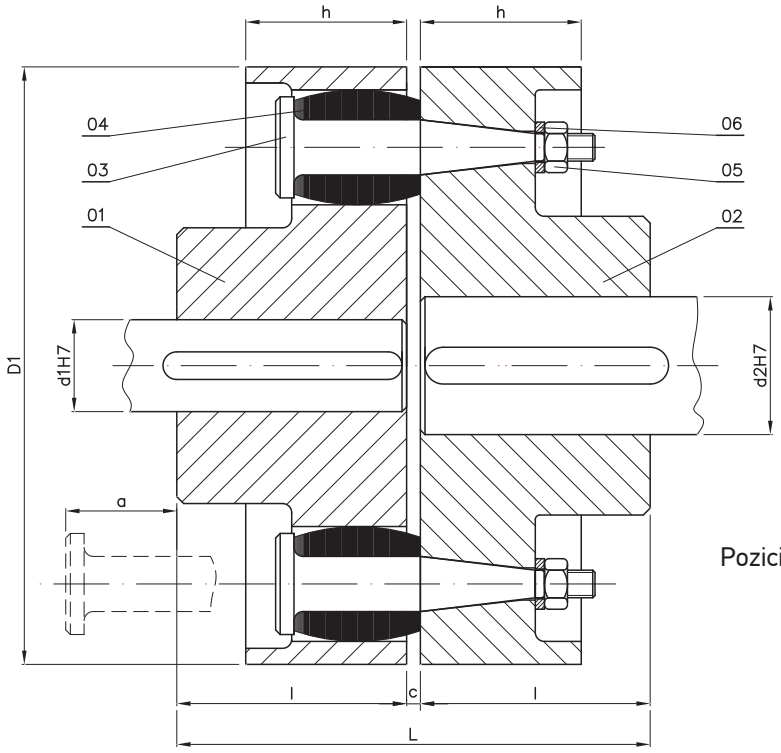
MATERIALS
For the standard speeds discs are made from cast iron, and for increased speeds of steel. The elastic rings are made of special rubber and are placed on steel bolts. The elastic rings are easily replaced.

BALANCING
Couplings above type ES6 are balanced statically and dynamically according to the request. Couplings that work with increased speeds are dynamically balanced.

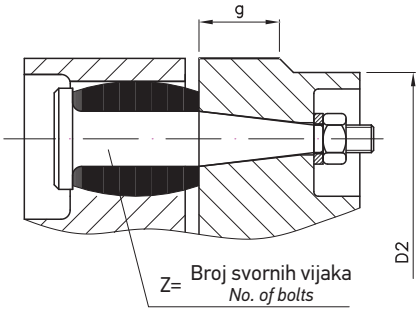
MAKING SHAFT OPENING
Shafts opening are made in ISA H7 tolerance. Unless otherwise required, the couplings are provided with the smallest opening for the shaft (according to table 1) without the groove for the insert spring. Based on the request coupling is delivered with the required diameter holes and the corresponding groove for the insert spring.

SELECTION OF TYPE OF COUPLING
The type of coupling determined: power of drive engine, type of drive engine, speed and shaft diameters.
Example:
Centrifugal pump driven by the electric motor power of 100 kW and operating speed is 2925 min-1. Shaft of electric motor has the diameter d2 = 80 mm, and the pump shaft d1 = 60 mm. From table 3, the correction coefficient K is 1.25. Accordingly
ŠN (KS) / n (min-1)Ć • K = (136/2925) • 1.25 = 0,058
by this to match the coupling ES6 which
(N / n) • K = 0.075
maximum opening of the coupling ES6 is d2 = 75 mm, and since the shaft of electric motor has a diameter d2 = 80 mm should be selected coupling type ES7. For ease finding the type N / n chart of a coupling selection is given below, and in Table 2 overview of the largest possible opening for the shaft.
The results obtained from the chart must always be corrected for the coefficient K, and before final selection of coupling check whether holes correspond to the shaft.

PRESEK ELASTIČNE SPOJNICE TIP ES



CROSS-SECTION OF COUPLING TYPE ES



Pozicija	Naziv	Item	Part name
1	Gonjeni disk	1	*Driven disk*
2	Pogonski disk	2	*Disk drive*
3	Svorni vijak	3	*Bolt*
4	Gumeni uložak	4	*Lining*
5	Navrtka	5	*Nut*
6	Podloška	6	*Washer*

GLAVNE KARAKTERISTIKE I DIMENZIJE SPOJNICA

Tabela 1

MAIN FEATURES AND DIMENSIONS OF COUPLINGS

Table 1

Veličina spojnice *Type of coupling*	N/n •K	Maksimalni dozvoljeni br. obrtaja *Max. r.p.m.*		Prečnici *Diameters* d1 i d2					Prečnici *Diameters*		Dužine *Lenght*			Venac *Wreath*		Demontažne mere *Dismounting dimensions*	Težina kg *Weight kgs*	Zamajni momenat *Flywheel moment*		
		Normalni br. obrtaja *Normal r.p.m*	Povišeni br. obrtaja *Elevated r.p.m.*	Najmanji *Minimum* d1 mm	d2 mm	Normalni *Standard* d1 i d2 mm	Maksimalni *Maximum* d1 mm	d2 mm	D1 mm	D2 mm	l mm	L mm	c mm	h mm	g mm	a mm		Poz 1. *Pos 1.* kgm²	Poz 2. *Pos 2.* kgm²	Ukupna *Total* kgm²
ES1	0,004	5600	6000	10	10	10,14,16, 18,20	20	25	90		30	62	2	30		30	2	0,005	0,0037	0,0087
ES2	0,008	5000	6000	12	12	12,16,20, 25	25	30	100		35	72	2	30		30	2,5	0,007	0,0072	0,0142
ES3	0,012	4500	6000	16	16	16,20,25, 28,30	30	40	115		40	82	2	35		30	3,7	0,008	0,0158	0,0236
ES4	0,024	4000	6000	20	20	20,25,30, 35,38,40	40	50	130		50	102	2	35		30	5	0,022	0,026	0,0486
ES5	0,045	3600	5600	20	25	25,30,35, 40,45,50	50	60	160		60	122	2	40		25	9	0,045	0,068	0,113
ES6	0,075	3000	5000	25	30	30,35,40, 45,50,55, 60	65	75	190		75	152	2	40		25	15	0,096	0,150	0,246
ES7	0,14	2650	4500	30	35	35,40,45, 50,55,60, 70	75	90	225	210	90	183	3	50	25	30	25	0,264	0,309	0,573
ES8	0,22	2250	4000	35	40	40,50,60, 70,80,90	90	100	270	255	100	203	3	60	25	35	40	0,565	0,70	1,165
ES9	0,30	2000	3600	40	45	50,60,70, 80,90, 100	100	110	300	280	120	244	4	60	35	35	58	0,90	1,30	2,20
ES10	0,42	1800	3300	45	50	50,60,70, 80,90, 100,110	110	125	340	320	140	284	4	70	35	35	83	1,75	2,10	3,85
ES11	0,60	1650	3000	55	60	60,70,80, 90,100, 110,125	125	140	380	345	160	324	4	70	35	35	102	3,00	3,20	6,20
ES12	1,0	1500	2800	65	70	70,80,90, 100,110, 125,140	140	160	440	400	180	364	4	85	45	40	163	5,6	8,10	13,70
ES13	1,4	1250	2500	75	80	80,90, 100,110, 125,140, 160	160	180	500	460	200	404	4	85	45	40	221	10,9	14,0	24,90
ES14	2,3	1120	2250	85	90	90,100, 110,125, 140,160 180	180	200	560	505	220	444	4	100	50	40	326	19,0	26,0	45,0
ES15	3,7	1000	2000	95	100	100,110, 125,140, 160,180, 200	200	220	640	585	250	504	4	100	50	40	469	33,2	44,0	77,2
ES16	6,8	850	1750	110	110	110,125, 140,160, 180,200, 220	220	250	750	685	280	565	5	120	60	40	658	73	92	165,0

GLAVNE KARAKTERISTIKE I DIMENZIJE SPOJNICA

Tabela 2

MAIN FEATURES AND DIMENSIONS OF COUPLINGS

Table 2

	ES1	ES2	ES3	ES4	ES5	ES6	ES7	ES8	ES9	ES10	ES11	ES12	ES13	ES14	ES15	ES16
Dmax Pumpe *Pumps.*	20	25	30	40	50	65	75	90	100	110	125	140	160	180	200	220
Dmax Motora *El. Motors*	25	30	40	50	60	75	90	100	110	125	145	160	180	200	220	250

SMERNICE ZA IZBOR KOEFICIJENTA “K“

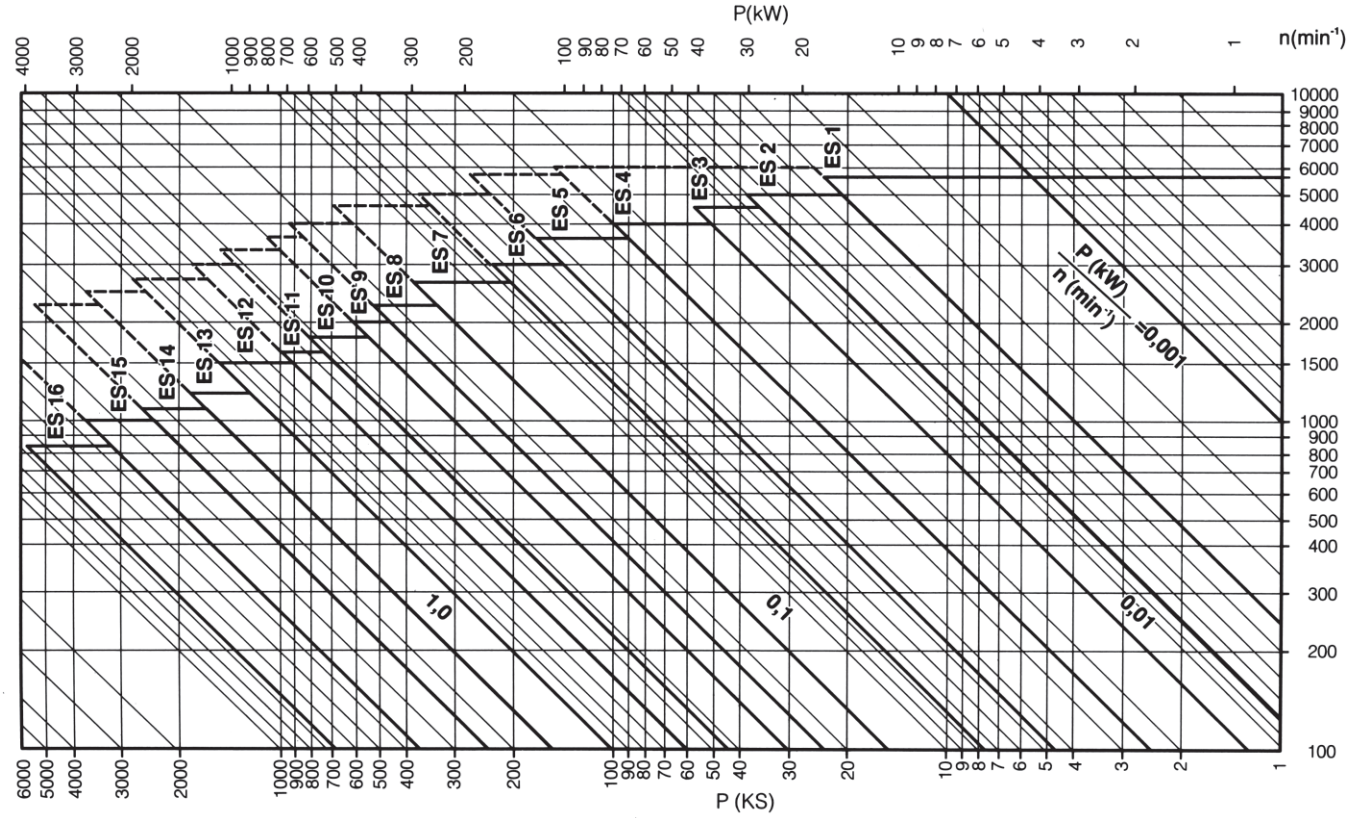
GUIDELINES FOR SELECTION OF COEFFICIENT K

Tabela 3 / **Table 3**

GONJENJE MAŠINA *WORKING MACHINE*	POGONSKA MAŠINA / *DRIVING MACHINE*								
	Elektromotori *Electric motors*	Parna turbina *Steam turbine*	Vodena turbina *Water turbine*	Klipna parna mašina *Piston steam machine*	Motori sa unutrašnjim sagorevanjem *Internal combustion motors*				
					6 cil. *cyl.*	4 cil. *cyl.*	3 cil. *cyl.*	2 cil. *cyl.*	1 cil. *cyl.*
Generatori za osvetljenje, mali ventilatori, centrifugalne pumpe, rotacione duvaljke, transmisije... *Generators for lighting, small fans, centrifugal pumps, rotary blowers, transmission ...*	1,25	1,3	1,5	1,75	1,4	1,5	1,6	1,8	2,2
Elevatori, veći ventilatori, turbokompresorl, kllpne pumpe sa stepenom neujednačenosti 1:100 do 1:200, lakše mašine za obradu drveta, lakše mašine, lakše tekstilne mašine, mašine za savijanje lima, transportne trake... *Elevators, bigger fans, turbochargers , piston pumps with a degree of unevenness of 1: 100 to 1: 200, the lighter woodworking machines, lighter machines, lighter textile machines, metal bending, conveyor belts ...*	1,45	1,5	1,7	1,95	1,6	1,7	1,8	2	2,4
Kranovi, teške dizalice, mešalice, pomoćni brodski motori, mašine za presovanje, kompresori sa stepenom neujednačenosti 1:100 do 1:200, brusilice, makaze *Cranes, heavy cranes, mixers, auxiliary engines, machines for pressing, compressors with a degree of unevenness of 1: 100 to 1: 200, grinders, shears,*	1,65	1,7	1,9	2,15	1,8	1,9	2	2,2	2,6
Betonske mešalice, klipne pumpe sa zamajcem, klipni kompresori sa jednim zamajcem, jamski ventilatori, pluger pumpe, brodski propeleri.. *Concrete mixers, piston pumps with flywheel, piston compressors with one flywheel, cave fans, pluger pumps, ship propellers ....*	2,25	2,3	2,5	2,75	2,4	2,5	2,6	2,8	3,2
Teške mašine za valjanje metala, kompresori bez zamajca, teške prese... *Heavy metal rolling machines, compressors without a flywheel, heavy presses ...*	3,05	3,1	3,3	3,55	3,2	3,3	3,4	3,6	4

DIJAGRAM ZA IZBOR SPOJNICE

CHART OF COUPLING SELECTION



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