MANUFACTURER & EXPORTER

CARDAN SHAFTS & UNIVERSAL JOINT SHAFTS FOR INDUSTRIAL APPLICATION

transwelle®

A SYMBOL OF TECHNICAL EXCELLENCE

CARDAN INDIA

JAS-ANZ

An ISO 9001:2015 Certified Company

Mission

To cater to varied requirements of superior quality products for "Drives & Transmission Applications" for heavy & medium scale industry.

Quality Assurance

The satisfaction of all customers is fundamental principle of the ***Cardan India*** stand committed to the quality of its products and service with the assurance of complete back-up support.

Sales & Service

Our marketing engineers across India controlled by head office are technically competent to undertake selection, installations. We are responsible for the supply of various replacement spare parts for our products within the shortest period of time.

Long Term Customer Relationship

Being a service focused company, we believe that our customer's "success" is our success.

The company believes in developing & fostering partnership that are mutually beneficial.

Introduction

A leader in power transmission engineering since 1992, **Cardan India** is specialized in manufacturing and distribution of CARDAN SHAFT (UNIVERSAL JOINTS SHAFTS) and their components for industrial application. Our products are widely used on **Steel Rolling Mill, Tube Mill, Paper Mill, Rubber, Vibrating Screen, Crane, Locomotive engine, Heavy Pump, Marine, Power Plants**, etc.

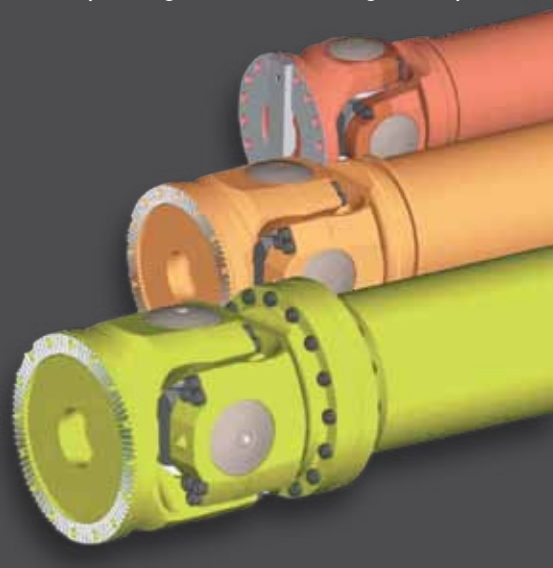
With have customers all over the country with a commanding market presence in India. Our export are also on the rise each year with a dedicated workforce.

Our company has developed the production of universal shafts, with the same high quality and accuracy. The production range covers the Light-Medium Heavy duty sector upto a torque of 9000kNm. Our technology also allows us manufacturing special universal shafts. For those application not included in the normal commercial products.

Our company offers its customers the know-how and the experience in the field of industrial design. To optimize and integrate its' products, so as to increase the efficiency of the plants. We offer our technical support during the design, the installation, the maintenance and evaluation of the performance.

Cardan India's goal is to maintain high product quality and total customer satisfaction which we strive to ensure through our relentless pursuits for quality perfection. Some highlight of our quality process.

- Application of CAD, Pro-engineer and solid works for modular and modified design.
- A high competent engineering team and a dedicated, skillful workforce
- Modern precision equipment for high quality Cardan Shaft (Universal Joints Shaft). Manufacturing and constant renovation of tooling machines towards specialization numerical controlling.
- Computer management system integrating planning, purchasing, sale, inventory, design and accounting activity.



Product At A Glance

transwelle® Cardan Shaft are commonly known as Universal Joint Shaft. One of many structural designs of universal joint shafts, **CIW-X, CIW-Y, CIW-Z, CIW-YH, CIW-T** series Cardan Shaft (universal joint shafts) is the most commonly used with the highest load capacity. Drawing on many years of universal joint engineering experience and the advanced world Technology, we have conducted in-depth research on the **CIW-X, CIW-Y, CIW-Z, CIW-YH, CIW-T** series universal joint shafts product line. Our product have far surpassed. The most strict engineering standards both in performance and product variety and are able to satisfy our customer's diverse and stringent requirements. In particular, our product range consists of the following five series **CIW-X, CIW-Y, CIW-Z, CIW-YH, CIW-T** covering a torque range of 510-90,00,000Nm the core product line.

	SERIES	Flange Diameters (mm)	Torque Range (Nm/kNm)	Description	Applications
	CIW-X Medium/ Light Duty	75-250	510Nm-27,000Nm	The light duty series CIW-X offers the Unique charactics of large operating angle, high speed , special tubing for increased torsional stiffness,low moment of inertia and low maintenance.	• Paper machines • General machines • Pumps • Test bench
	CIW-Y Heavy Duty (Close Eye Type)	180-620	28kNm-1250kNm	Our Heavy duty CIW-Y series has been proven countless of times among our customers to be most popular choice of shafts for large torque in compact design and close eye to fit a wide variety of application and with longtime.	• Rolling mills • Marine drives • Crane • Straightening machines
	CIW-Z Heavy Duty (Split Eye Type)	225-620	46kNm - 1180kNm	Our Heavy duty CIW-Z series has been proven countless of times among our customers to be most popular choice of shafts for large torque in compact design and split eye to fit a wide variety of application and with longtime.	• Rolling mills • Marine drives • Crane • Straightening machines
	CIW-YH Extra Heavy Duty	680-1200	1680kNm -9000kNm	The Extra heavy duty CIW-YH series is a specially designed cardan shaft which features special cross design along with a unique and heavy shock application with increased relaibility.	• Tube Piercer • Plate mill R1 & R2 • Crushers • Wind mill test machine
	CIW-T (Tunnel Shaft)	225-490	56kNm - 700kNm	Unique and High stroke tunnel shaft CIW-T/TH design is avery popular choice for Danieli style mills, vertical application , and other applications which involves long length compensation in limited length space.	• Bar mill • H Beam

Cardan Shafts offer excellent operational safety, high service life and low running costs for an optimally adapted range of product series CIW-X, CIW-Y, CIW-Z, CIW-YH, CIW-T. **TRANSWELLE®** Cardan Shafts are the right choice for difficult and severe requirements due to the following construction features:

■ Split/Close eye yoke design ■ Highest degree of strength and minimum distortion under load. ■ Highest load capacity of the Cardan shaft (Universal Joint Shaft) ■ Suitable material selection and treatment ■ Optimal welding connection ■ Perfect geometries by computer/micro structures analysis. The Cardan Shafts is basically a coupling used for the connection of the input of a driven device and the output of the power motor. The overall function of a cardan shaft can be subdivided in three single functions: ■ Torque and speed ■ Changing distance between power input and output ■ Changing angle between power input and output. All this is permanently elapsed by shocks resulting in vibrations and additional torsion forces. Basing on these extreme conditions of operation considerable power is arising being consumed partly by the Cardan Shaft on its own, partly by the drive elements combining it. These high pressures are difficult operating conditions are demanding high standards to the drive shaft. At the same time, lots of power transmission applications are solved easily and cost consciously by the use of cardan shafts (Universal Joint Shafts).

Manufacturing/Assembling Facility:

A state-of-art manufacturing plant equipped with high productive and precision machine like CNC Lathes, CNC Machining Centre, Horizontal Boring Machine, Broaching Machine, Milling Machine, Semi Automatic Spline Cutting Machine, Dynamic Balancing Machine etc. supported with conventional machines, EOT Crane and complete modern hi-tech tool room. Layouts of manufacturing shop and machine have been made in a fashion to minimize the movement of material.

Process:

Total quality management as per **ISO 9001:2015** has been implemented from the first day of commercial production. on a priority basis. A competent authority of international repute is already engaged in the accreditation process. Product are optimally designed on CAD/PRO-E after a thorough analysis of the applications and user requirements. Each product is manufactured through systematic process planning and quality control systems to ensure high reliability and meeting customer requirements.

Cardan Shafts are tailor-made according to the individual requests of the customers. The shafts welded by specialists will be checked with a radiographic test machine and dynamically balanced all material pass out through ultrasonic test with experts. After that, they will be lubricated depending on the request of the customer and of the field of application and finally they will be painted. Owing to the flexibility during the process of manufacture, the corresponding stock-keeping, the commitment of the employees and the permanent customer orientation, we are able to grant every customer the best service. The final result will be always best quality cardan shafts.

Quality Assurance Plan:

Starting from the design and until the painting, each production step is controlled and verified in order to guarantee an excellent, top quality product. All the universal shafts produced must meet a series of strict controls, starting from the quality of the raw material upto dynamic balancing, where the application requests it. .

Our company offers its customers the know-how and the experience in the field of the industrial design, to optimise and integrate its products so as to increase the efficiency of the plants. We offer our technical support during the design, the installation the maintenance and the evaluation of the performance.

Each product is manufactured as per the quality assurance plan derived in line with stringent quality standards and customers requirement. Major steps involved in quality control systems are:

A. Through inspection of raw materials, sub-contract and bought out items

B. In-process inspection of components and process control during manufacturing

C. Inspection in sub-assembly and assembly stages

D. Finished product inspection and testing

The plant is equipped with measuring instruments of internationally reputed manufacturers and special testing instrument like **Hardness Tester, Ultrasonic Flow Detector, Tensile Tester, Micro Structure Tester, Chemical Testing, M.P.T Balancing Machine**, etc.

CIW-X SERIES

Cardan Shaft | Universal Joints Shafts | CLOSE EYE & SIDE BOLT TYPE

Light - Medium Duty Design

Technical Data and sizes

Shaft Size	Unit	CIW X 75 / 80	CIW-X 90	CIW-X 100	CIW-X 120	CIW-X 130	CIW-X 146	CIW-X 150	CIW-X 175	CIW-X 180	CIW-X 180H	CIW-X 204	CIW-X 204H	CIW-X 225	CIW-X 230	CIW-X 242	CIW-X 250
Tn	**Nm**	**510**	**810**	**1220**	**2350**	**3400**	**4600**	**5600**	**9000**	**10000**	**14000**	**15000**	**22000**	**24000**	**25200**	**27000**	**27000**
Tf	**Nm**	**250**	**400**	**600**	**1160**	**1700**	**2300**	**2800**	**4500**	**5000**	**7000**	**7500**	**11000**	**12000**	**12600**	**13500**	**13500**
β	°	30°	30°	30°	30°	25°	22°	30°	22°	20°	20°	22°	22°	25°	20°	18°	18°
Df	mm	75	90	100	120	130	146	150	175	180	180	204	204	225	230	242	250
D	mm	72	92	100	98	112	146	112	153	160	160	170	170	170	170	170	170
D1+_0.1mm	mm	62	74.5	84	101.5	110	120	130	155.5	155.5	155.5	184	184	196	205	210	218
D2 H9	mm	42	47	57	75	90	95	90	132	95	110	170	140	140	140	140	140
t	mm	2	2.5	2.5	2.5	3	3	3	2	3	3	1	3	3	3	3	3
k	mm	5.5	6	8	8	10	10	10	10	14	16	10	10	15	15	15	15
H + 0.2	mm	6	6.5	8.5	8.5	10.5	12.5	12.5	10	13	14.1	14.1	16	16	16	16	17
n	no	6	4	6	8	8	4	8	8	8	8	8	8	8	8	8	8
Lm	mm	45	52	55	63	82	63.5	82	70	85	90	76.2	92	90	90	95	95
D3	mm	50*3	50*3	68*5	68*5	95*5	95*5	95*5	100*7	100*10	106*10	106*8	115*8	120*10	125*10	125*10	125*12
SAE	SERIES	1310	1410	1480	1550	1510	1550	1510	1610	1610 Spl	1700	1700	1800	1800 Spl	STD	1810	1810Spl
DIN	SERIES	75	90	100	120	130	146	150	175	180	180	204	204	225	230	242	250
A type L	mm	390	410	440	480	500	500	500	550	560	600	580	620	625	650	680	680
Lv	mm	40	40	50	60	80	70	80	80	80	80	100	100	110	120	140	140
B Type	mm	325	375	400	425	450	450	450	500	500	540	520	560	560	600	620	650
C Type	mm	180	208	220	246	328	254	328	280	340	380	380	380	380	380	380	380

Notations:

L = Standard length or compressed length for designs with length compensation

Lv = Length compensation

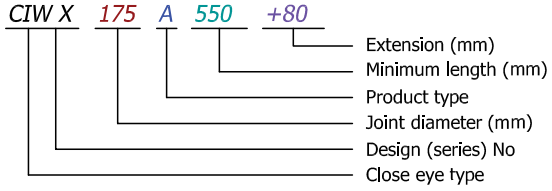
Tn = Nominal torque (Yield torque 50% over Tn)

Tf = Fatigue torque i.e permissible torque as determined according to fatigue strength under riversing loads

β = Maximum deflection angle

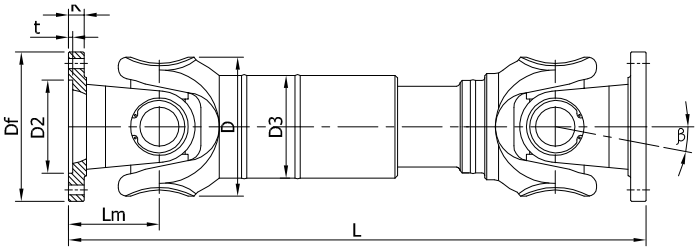
n = Number of holes

*** Note :** please consult us for customization regarding length, length compensation and flange connection [DIN or SAE etc.]



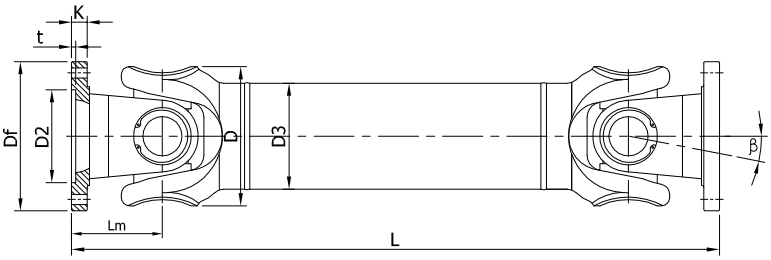
Type A:

Welded shaft with length compensation design



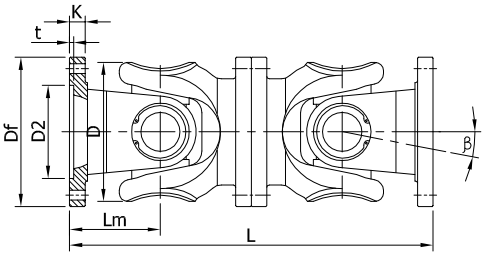
Type B:

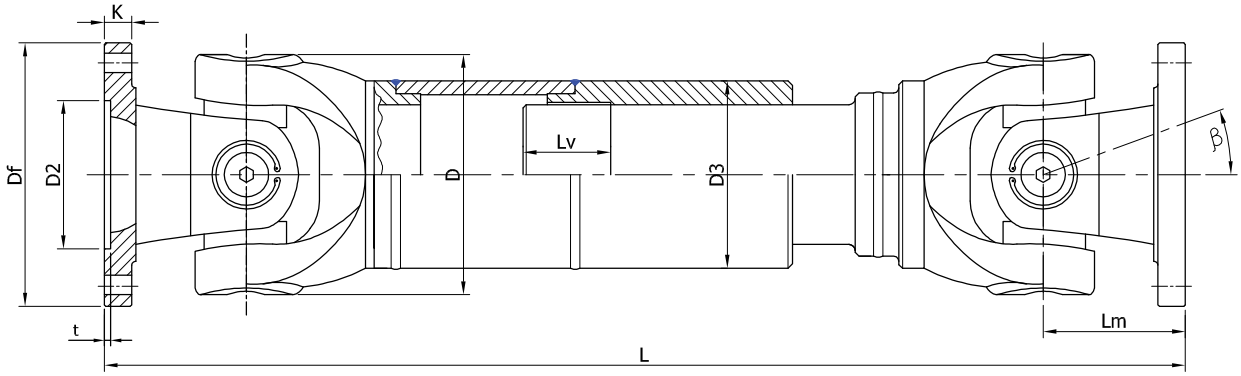
Welded shaft without length compensation design

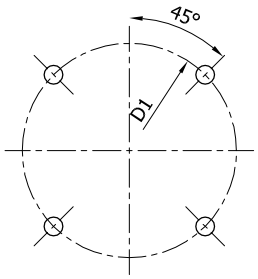


Type C:

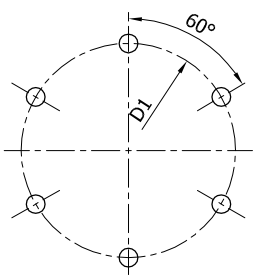
Shaft flanged without length compensation design



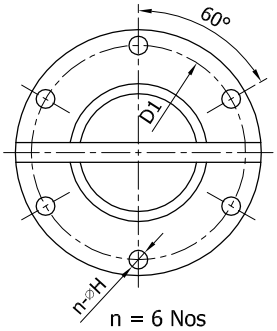




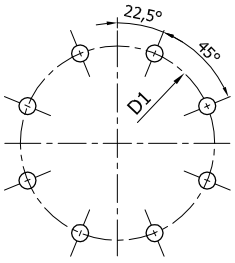
n = 4 Nos



n = 6 Nos



n = 6 Nos



n = 8 Nos

CIW-Y SERIES

Cardan Shaft | Universal Joints Shafts | CLOSE EYE TYPE

Heavy Duty Design

Technical Data and sizes

Shaft Size	Unit	CIW-Y 180	CIW-Y 204	CIW-Y 225	CIW-Y 250	CIW-Y 285	CIW-Y 315	CIW-Y 350	CIW-Y 390	CIW-Y 440	CIW-Y 490	CIW-Y 550	CIW-Y 620
Tn	**kNm**	**28**	**40**	**56**	**80**	**120**	**160**	**225**	**320**	**500**	**700**	**1000**	**1250**
Tf	**kNm**	**14**	**20**	**28**	**40**	**58**	**80**	**110**	**160**	**250**	**350**	**500**	**625**
β	°	15°	15°	15°	15°	15°	15°	15°	15°	15°	15°	15°	15°
Df	mm	180	200	225	250	285	315	350	390	440	490	550	620
D	mm	180	200	225	250	285	315	350	390	440	490	550	620
D1+_0.1mm	mm	155.5	184	196	218	245	280	310	345	390	435	492	555
D2 H9	mm	105	120	135	150	170	185	210	235	255	275	320	380
t	mm	5	5	5	6	7	8	8	8	10	12	12	15
k	mm	17	18	20	25	27	32	35	40	42	47	50	55
H+0.2mm	mm	17	17	17	19	21	23	23	25	28	31	31	38
n	No.	8	8	8	8	8	10	10	10	16	16	16	16
Lm	mm	105	110	125	140	160	180	195	215	260	290	305	340
D3	mm	117*10.5	130*11.5	159*10.5	180*12.5	203*14.5	219*16.7	245*19	273*21	325*24	351*31	402*30	426*40
b e9	mm	24	28	32	40	40	40	50	70	80	90	100	100
g	mm	7	8	9	12.5	15	15	16	18	20	22.5	22.5	25
A type L	mm	800	900	1000	1060	1270	1390	1520	1530	1690	1850	2060	2280
Lv	mm	100	120	140	140	140	140	150	170	190	190	240	250
B Type L	mm	530	590	640	730	840	930	1000	1010	1130	1240	1400	1520
C Type L	mm	420	440	500	560	640	720	780	860	1040	1080	1220	1360
D Type L	mm	580	620	690	760	860	970	1030	1120	1230	1360	1550	1720
E Type L	mm	850	940	1050	1120	1320	1440	1550	1710	1880	2050	2310	2540
Lv	mm	100	120	140	140	140	140	150	170	190	190	240	250

Notations:

L = Standard length or compressed length for designs with length compensation

Lv = Length compensation

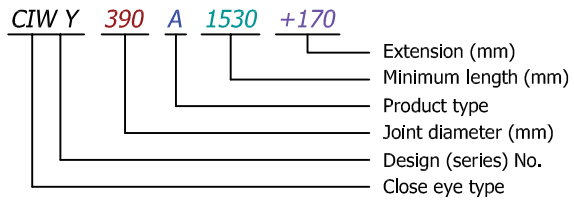
Tn = Nominal torque (Yield torque 50% over Tn)

Tf = Fatigue torque i.e permissible torque as determined according to fatigue strength under riversing loads

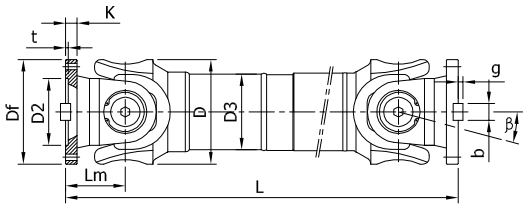
β = Maximum deflection angle

n = Number of holes

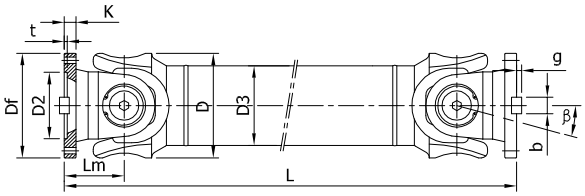
* **Note :** please consult us for customization regarding length, length compensation and flange connection [DIN or SAE etc.]



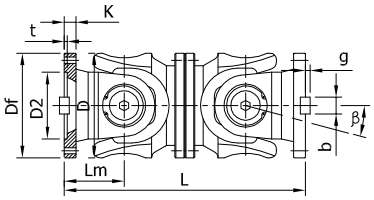
Type A:
Long flexible type



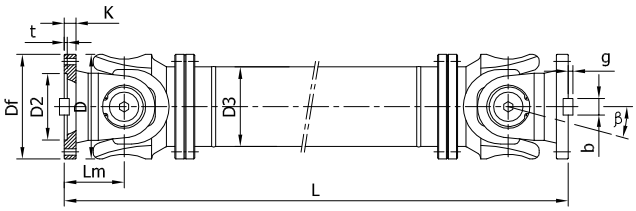
Type B:
Short flexible type



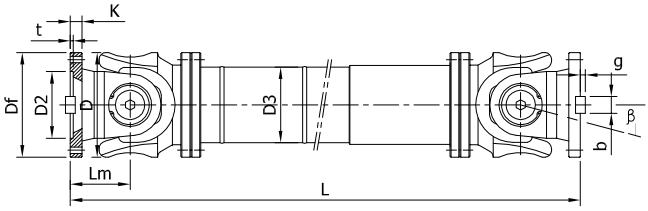
Type C:
Long non-flexible

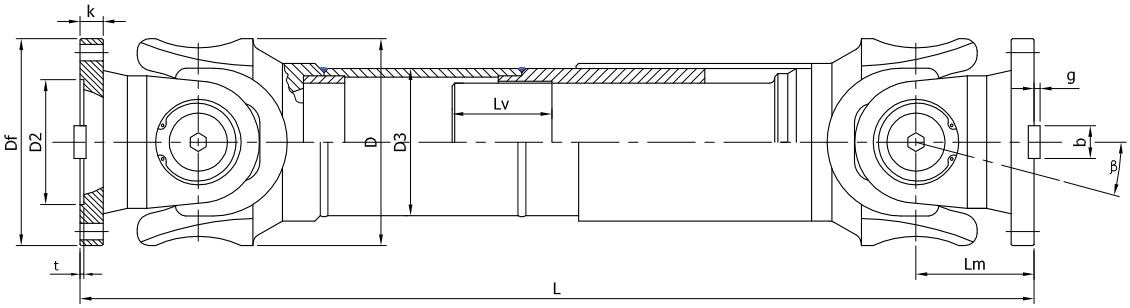


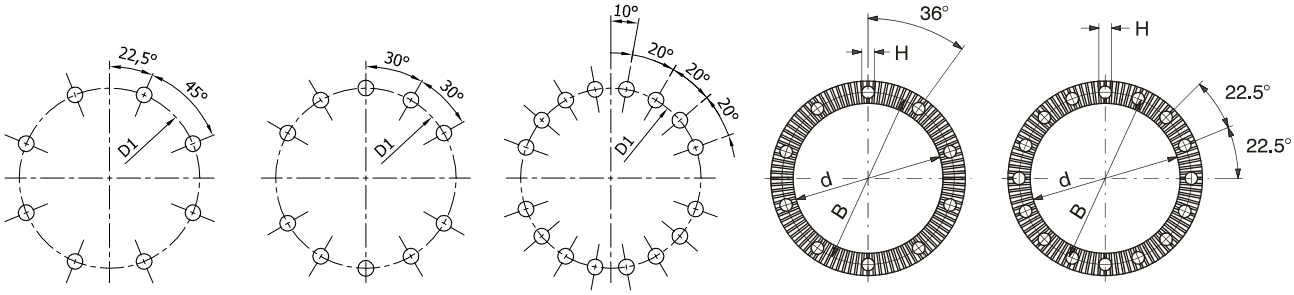
Type D:
Short non-flexible



Type E:
Long flexible
double flange







n = 8 Nos

n = 10 Nos

n = 16 Nos

Hirth Serrations

CIW-Z SERIES

Cardan Shaft | Universal Joints Shafts | SPLIT EYE TYPE

Heavy Duty Design

Technical Data and sizes

Shaft Size	Unit	CIW Z-225	CIW-Z 250	CIW-Z 285	CIW-Z 315	CIW-Z 350	CIW-Z 390	CIW-Z 435	CIW-Z 480	CIW-Z 550	CIW-Z 620
Tn	**kNm**	**46**	**70**	**96**	**132**	**220**	**310**	**460**	**540**	**730**	**1180**
Tf	**kNm**	**23**	**35**	**47**	**66**	**110**	**155**	**230**	**270**	**360**	**565**
β	°	15°	15°	15°	15°	15°	15°	10°	10°	10°	10°
A	mm	225	250	285	315	350	390	440	490	550	620
K	mm	225	250	285	315	350	390	440	490	550	620
B+_ 0. Tmm	mm	196	218	245	280	310	345	385	425	492	555
CH7	mm	140	140	175	175	220	235	255	275	320	380
F	mm	5	6	7	8	8	9	10	12	12	12
G	mm	20	24	27	32	35	40	42	47	50	55
H + 0.2mm	mm	17	19	21	23	23	25	28	31	31	38
n	No	8	8	8	10	10	10	16	16	16	16
M	mm	110	130	140	155	170	190	210	230	250	270
S	mm	130*12	160*14	185*16	202*17	220*22	245*25	270*25	295*30	320*32	355*40
X e9	mm	32	36	40	40	50	70	80	90	100	100
Y	mm	9	12.5	15*	15*	16	18	20	22.5	22.5	25
A type Lz	mm	800	950	1080	1260	1350	1550	1690	1850	2120	2340
Lz2	mm	140	140	140	170	170	170	190	190	210	250
B Type Lz	mm	540	680	780	900	960	1090	1210	1310	1500	1660
C Type Lz	mm	500	560	600	640	680	760	840	920	1000	1080
D Type Lz	mm	680	760	810	870	920	1040	1130	1240	1350	1460
E Type Lz	mm	840	890	1130	1320	1400	1610	1740	1910	2170	2400
Lz2	mm	140	140	140	170	170	170	190	190	210	250

Notations:

Lz = Standard length or compressed length for designs with length compensation

Lz2 = Length compensation

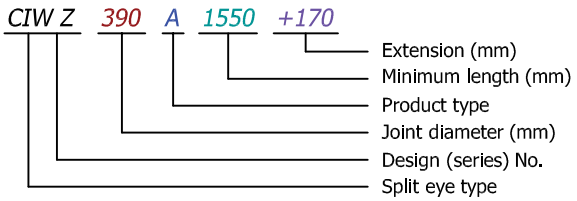
Tn = Nominal torque (Yield torque 50% over Tn)

Tf = Fatigue torque i.e permissible torque as determined according to fatigue strength under riversing loads

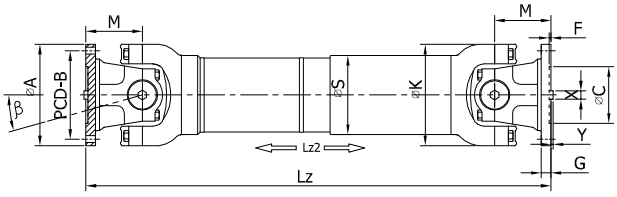
β = Maximum deflection angle

n = Number of holes

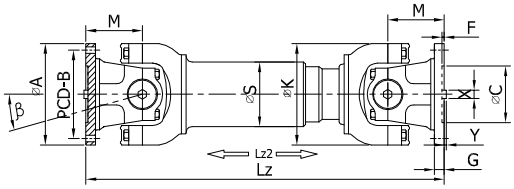
*** Note :** please consult us for customization regarding length, length compensation and flange connection [DIN or SAE etc.]



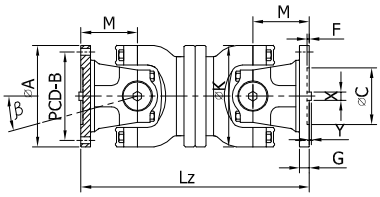
Type A:
Long flexible type



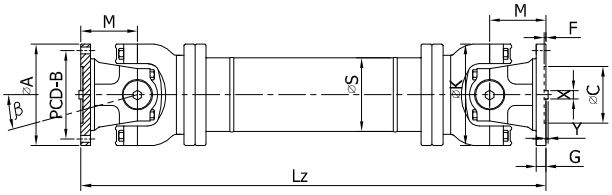
Type B:
Short flexible type



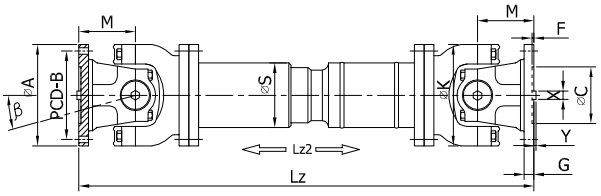
Type C:
Short non-flexible

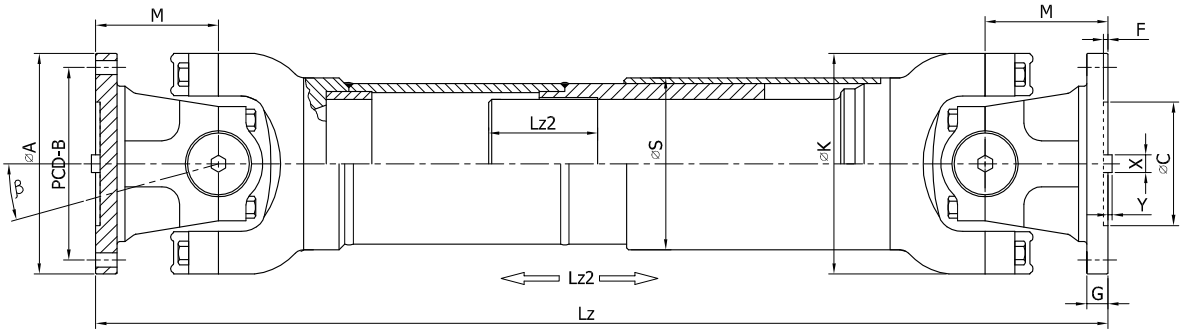


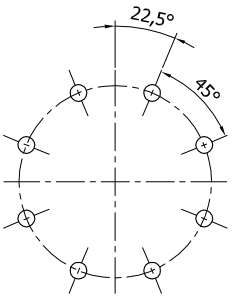
Type D:
Long non-flexible



Type E:
Long flexible double flange







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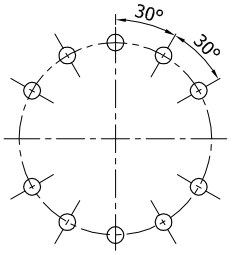

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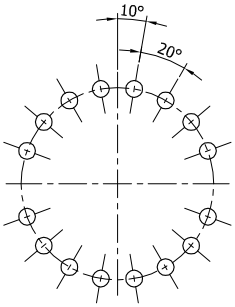

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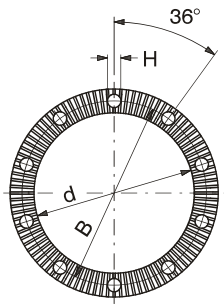
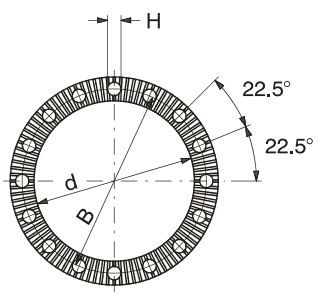




Hirth Serrations

CIW-T SERIES

Cardan Shaft | Universal Joints Shafts | TUNNEL TYPE | LONG SPLINE

Heavy Duty Design

Technical Data and sizes

Model	Dfx/Dfy	Tn kN.m	Tf kN.m	β (°)	Lv(mm)	Lmin	Dfx	Dtx	D2x	bx	tx	gx	Kx	Lm(x)	Dfy	Ly
CIW-T 225	225/315	56	28	5° /15°	650	920	225	196	105	32	5	9	20	125	315	190
CIW-T 250	250/330	80	40		700	1020	250	218	115	40	5	12.5	25	140	330	200
CIW-T 285	285/390	120	58		750	1140	285	245	135	40	7	15	27	160	390	230
CIW-T 315	315/435	160	80		750	1300	315	280	150	40	7	15	32	180	435	250
CIW-T 350	350/480	225	110		800	1445	350	310	165	50	8	16	35	195	480	290
CIW-T 390	390/520	320	160		800	1605	390	345	185	70	8	18	40	215	520	320
CIW-T 440	440/600	500	250		900	1760	435	385	200	80	10	20	42	260	600	390
CIW-T 490	490/650	700	350		900	1955	480	425	225	90	12	22.5	47	290	650	410

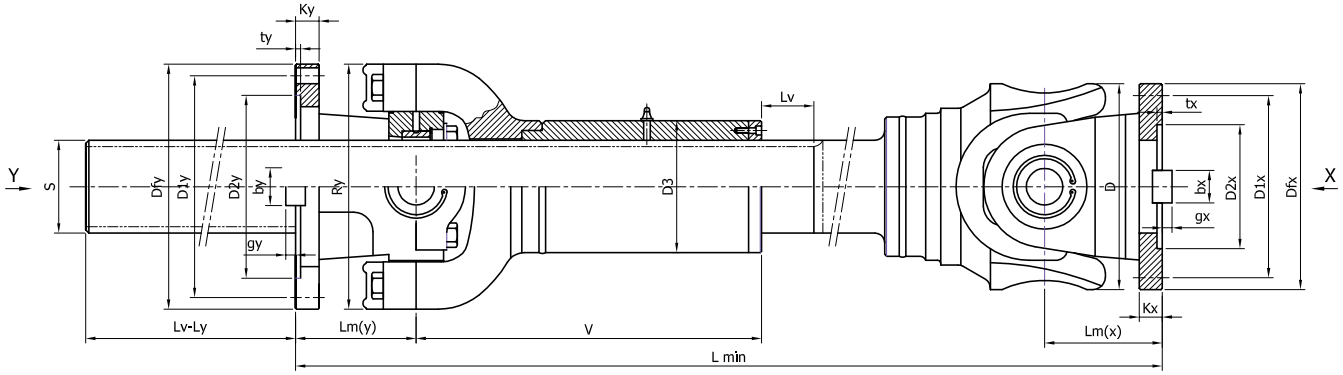
Model	(mm)													(kg)	
	Dty	D2y	by	ty	gy	ky	Lm(y)	n1-d1	n2-d2	S	D3	V	Ry	Lmin	100mm
CIW-T 225	285	220	32	5	9	28	140	8-ϕ17	8-ϕ17	102.18	146	395	315	215	6.4
CIW-T 250	315	240	40	7	12.5	30	150	8-ϕ19	8-ϕ19	117.72	159	435	330	283	8.5
CIW-T 285	355	270	40	8	15	40	170	8-ϕ21	8-ϕ21	127.7	180	480	390	400	10
CIW-T 315	390	300	40	8	15	42	190	10-ϕ23	10-ϕ23	137.5	203	565	435	533	11.6
CIW-T 350	435	335	50	10	16	47	210	10-ϕ23	10-ϕ23	165.2	219	630	480	721	16.8
CIW-T 390	480	385	70	10	18	50	230	10-ϕ25	10-ϕ25	177.24	245	695	520	1013	19.4
CIW-T 440	550	420	80	12	20	60	280	16-ϕ28	10-ϕ28	201.25	273	735	600	1410	25
CIW-T 490	595	450	90	15	22.5	60	290	16-ϕ31	14-ϕ31	225.25	325	810	650	2040	31.3

CIW-TS SERIES

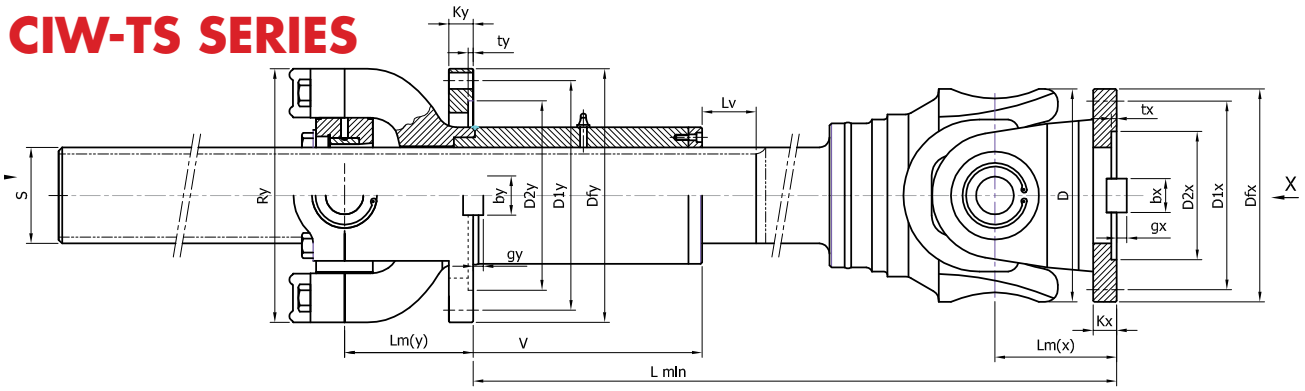
Model	Dfx/Dfy	Tn kN.m	Tf kN.m	β (°)	Lv(mm)	Lmin	Dfx	Dtx	D2x	bx	tx	gx	Kx	Lm(x)	Dfy	Lz
CIW-TS 225	225/315	50	28	5° /15°	650	260	225	196	105	32	5	9	20	125	315	90
CIW-TS 250	250/330	71	40		700	285	250	218	115	40	5	12.5	25	140	330	100
CIW-TS 285	285/390	100	58		750	325	285	245	135	40	7	15	27	160	390	110
CIW-TS 315	315/435	150	80		750	360	315	280	150	40	7	15	32	180	435	130
CIW-TS 350	350/480	212	110		800	400	350	310	165	50	8	16	35	195	480	130
CIW-TS 390	390/520	300	160		800	445	390	345	185	70	8	18	40	215	520	140
CIW-TS 440	440/600	425	250		900	500	435	385	200	80	10	20	42	260	600	170
CIW-TS 490	490/650	560	350		900	570	480	425	225	90	12	22.5	47	290	650	170

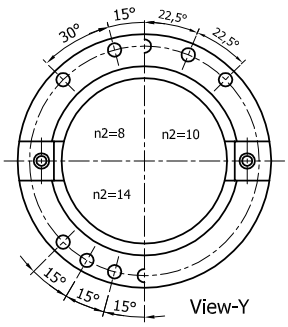
Model	(mm)													(kg)	
	D1y	D2y	by	ty	gy	ky	Lm(y)	n1-d1	n2-d2	S	D3	V	Ry	Lmin	100mm
CIW-TS 225	285	220	32	5	9	28	140	8-ϕ17	8-ϕ17	102.18	146	395	315	215	6.4
CIW-TS 250	315	240	40	7	12.5	30	150	8-ϕ19	8-ϕ19	117.72	159	435	330	283	8.5
CIW-TS 285	355	270	40	8	15	40	190	8-ϕ21	8-ϕ21	127.7	180	480	390	400	10
CIW-TS 315	390	300	40	8	15	42	190	10-ϕ23	10-ϕ23	137.5	203	565	435	533	11.6
CIW-TS 350	435	335	50	10	16	47	210	10-ϕ23	10-ϕ23	165.2	219	630	480	721	16.8
CIW-TS 390	480	385	70	10	18	50	230	10-ϕ25	10-ϕ25	177.24	245	695	520	1013	19.4
CIW-TS 440	550	420	80	12	20	60	280	16-ϕ28	10-ϕ28	201.25	273	735	600	1410	25
CIW-TS 490	595	450	90	15	22.5	60	290	16-ϕ31	14-ϕ31	225.25	325	810	650	2040	31.3

CIW-T SERIES

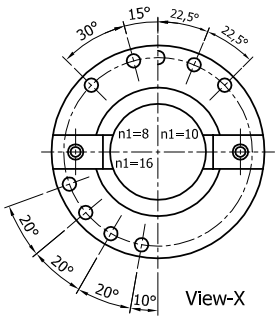


CIW-TS SERIES





View-Y



View-X

Notations:

L = Standard length or compressed length for designs with length compensation

Lv = Length compensation

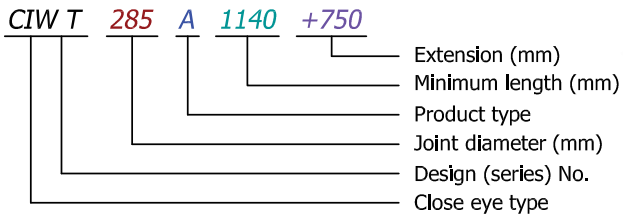
Tn = Nominal torque (Yield torque 50% over Tn)

Tf = Fatigue torque i.e permissible torque as determined according to fatigue strength under riversing loads

β = Maximum deflection angle

n = Number of holes

* **Note :** please consult us for customization regarding length, length compensation and flange connection [DIN or SAE etc.]



CIW-YH SERIES

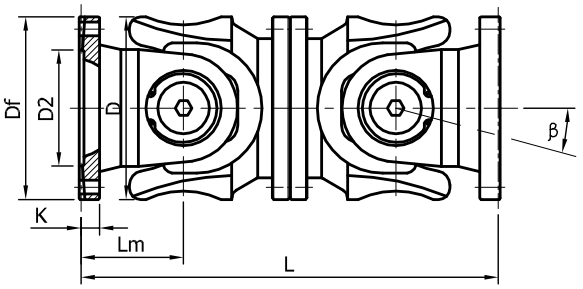
Cardan Shaft | Universal Joints Shafts | CLOSE EYE TYPE

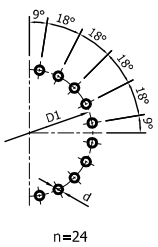
Extra Heavy Duty Design

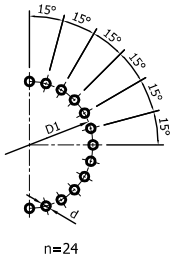
Technical Data and sizes

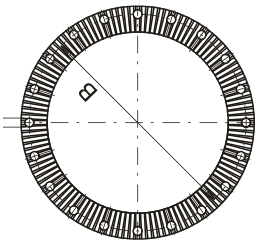
Shaft Size	Unit	CIW-YH 680	CIW-YH 700	CIW-YH 750	CIW-YH 780	CIW-YH 800	CIW-YH 840	CIW-YH 900	CIW-YH 920	CIW-YH 1000	CIW-YH 1060	CIW-YH 1100	CIW-YH 1200
C	L	1540	1600	1840	1920	1920	2120	2280	2280	2380	2480	2500	2720
D	L	1940	2100	2400	2500	2500	2680	2950	2950	3130	3200	3300	3570
E	L	3230	3460	3620	4000	4000	4250	4580	4850	4770	4950	5100	5660
	Lv	250	250	250	250	250	250	300	300	300	300	300	300
Tn (kN.m)		**1650**	**1750**	**2250**	**2500**	**2670**	**3100**	**3800**	**4050**	**5200**	**6500**	**6900**	**9000**
Tf (kN.M)		**985**	**1050**	**1350**	**1500**	**1600**	**1860**	**2280**	**2430**	**3120**	**3900**	**4140**	**5400**
β (°)		15	15	15	15	15	15	15	15	15	15	15	15
D		680	700	750	780	800	840	900	920	1000	1060	1100	1200
Df		680	700	750	780	800	840	900	920	1000	1060	1100	1200
D1		635	635	695	725	745	775	835	855	915	980	1015	1100
D2 (H9)		550	570	610	640	660	710	740	760	840	840	920	1000
D3		560	560	620	660	660	660	750	750	790	800	850	900
Lm		385	400	480	480	480	530	570	570	595	620	625	680
K		70	70	95	95	95	110	120	120	130	130	130	130
n		24	24	24	24	24	24	24	24	20	20	20	20
d		26	26	31	31	36	38	38	38	50	45	50	58
Flange Bolt		M24	M24	M30	M30	M30	M36	M36	M36	M48	M42	M48	M56

C -TYPE









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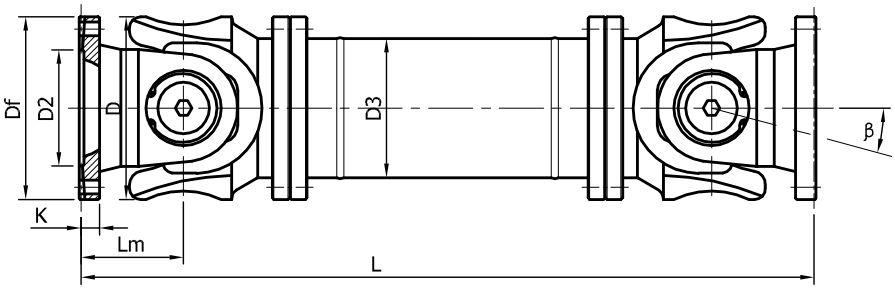

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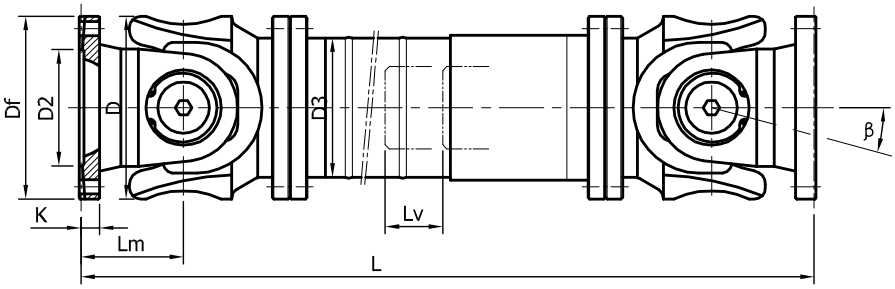


transwelle® A SYMBOL OF TECHNICAL EXCELLENCE

ISO 9001: 2015 Certified Company

Cardan India

Selection Information and Speed Limits

Speed Limit based on limits of Mass Acceleration

When **Cardan Shaft** (Universal Joint Shaft) are operated at any angle greater than zero, the center section of the universal joint shaft always runs irregularly, being accelerated and decelerated twice in every revolution. The maximum values of mass acceleration torque arising here are dependent on the operating speed and angle of deviation ß and upon the moment of inertia of the cardan shaft section (RPM x ß)

To ensure smooth running of the universal joint, especially at idling speed, the mass acceleration torque must not be allowed to exceed the limits.

Speed Limit based on Lateral Critical Speed

In applications where long lengths of shafts are required, the speed is restricted by the lateral critical speed of the center section. This speed is a function of the center tube diameter wall thickness, and the effective length. The maximum operating speed must be less than the lateral critical speed Nc.

Note:

Allowable Operating Speed= NC x .75.

In many applications, operation at ½ critical speed will also create unacceptable vibration. For these applications the operating speed should be 8% above or below 50% of the maximum indicated.

For flange-to-flange lengths greater than shown, if allowable speed exceeds, contact **CARDAN INDIA.**

Balancing

All standard universal joints under 300 RPM are supplied unbalanced. Between 300-850 RPM they are balanced if required. Consult factory for further information. Over 850 RPM all universal joints are normally supplied balanced. Please consult the factory for special balancing requirements.

The Selection of Cardan Shaft / Universal Joint Shafts

According to standard, use the following methods to select CIW-X, CIW-Y, CIW-Z, CIW-YH, CIW-T series Cardan Shaft (universal joint shaft).
Please consult us for selecting other product series.

1. Universal joint shafts are selected according to the load features, calculated torques, bearing life, and operating speed.
2. The calculated torque is acquired from Formulas (1), (2) or (1), (3).

$$T_c = KT \quad \text{.....(1)}$$
$$T = 9550\, P_w / n \quad \text{.....(2)}$$
Or $$T = 7020\, P_H / n \quad \text{.....(3)}$$

Where, T_c = Calculated torque, Nm;
T = Nominal tarque, Nm;
P_w = Driving power, kW;
P_H = Driving power, hp;
N = Operating speed, rpm;
K = Service factors

Table 10: **Service Factors K**

Service factor type	Driven Equipment	K
Light shock load	Generators, Centrifugal pump, Wood handling, machines Belt conveyors, Ventilators Paper machines,	1.1 to 1.3
Medium shock load	Compressors (multi-cyl.) Pumps (multi-cyl.) Small section mills, Continuous wire mills, Conveyor primary drives,	1.3 to 1.8
Heavy shock load	Marine transmissions, Transport roller tables, Continuous tube mills, Continuous working roller tables, Medium section mills, Compressors (single-cyl.) Pumps (single-cyl) Mixers Presses, Straightening machines, Crane drives, Ball mills.	2 to 3
Extra heavy shock load	Crane accessory drives, Crushers, Reversing working roller tables, Reeling drives, Scale breakers, Blooming stands.	3 to 5
Extreme shock load	Feed roller drives, Plate shears.	6 to 15

3. Generally, universal joint shafts are selected according to the torque to be transmitted on required bearing life. They can also be selected checking their torque strengths or bearing life relation to the requirements of the applied equipment.

3.1 Checking the tortional strength using Formula

$T_c < T_n$ or $T_c < T_f$ or $T_c < T_p$..... (4)

Where,
T_c = Calculate torque, Nm
T_n = Nominal torque, Nm (i.e a theoretic calculated value under these pre-determined conditions)
speed of shaft n= 30rpm, deflected angle B = 3°, and a bearing life
LN = 5000 hours under even load,
T_f = Permissible torque according to the fat strength under alternating loads. Nm
T_P = Permissible torque according to the fat strength under pulsating loads, Nm
T_P = 1.45 T_f

3.2 Checking the bearing life

Where,
LN = Service life, hrs;
n= Operating speed, rpm;
ß= Joint operating angle in operation, (°);
K1 = Prime motor factor
Electric motor: K_1 = 1
Diesel generator : K_1 = 1.2
KL + Bearing capacity factor
Lmin = Min. bearing life, hrs;
T = Theoretic torque, kN • m

Using Formula (5)

$$L_N = \frac{K_L}{K_1 n_\beta T^{10/3}} \times 10^{10} \geq L_{min} \quad \text{....(5)}$$

4. When there are simultaneous horizontal and vertical angular misalignments on the universal joint shaft, the composite deflection angle is calculated using Formula (6);

$$tg\beta = \sqrt{tg^2\beta 1 + tg^2\beta 2} \quad \text{.....(5)}$$

Where, ß = Composite deflection angle, (°);
ß1 = Horizontal deflection angle, (°);
ß2 = Vertical deflection angle, (°)

5. If the joint diameter of the shaft is 390 mm or less, Formulas (7) and (8) should be used to check the maximum speed in addition to the considerations of torque bearing life.

n_{max} (n_β) .....(7)
n_{max} (n_L) .....(8)
Where,
n_{max} = Maximum operating speed, rpm;
(n_β) = Maximum permissible speed in relation to operating angle, rpm. (See Figure 1)
(n_L)= Maximum permissible speed in relation to operating length, rpm. (See Figure 2)

6. If the line speed of the shaft is over 7m/s, dynamic balancing test is requested, normally to a balancing accuracy between G6.3 ~ G16. There are complex variables which effects the balancing grade.

The Installation and Maintenance of Universal Joint Shafts

For installation and maintenance of universal joint shaft, please refer to the (Manual for CIW – X, Y, Z, YH, T Series), which is provided in the package boxes with the products.

Advantages and Features

- Domestic manufacturer & exporter
- High torque capacity
- Long bearing life
- High operating angle capability
- One piece yoke/split yoke and bearing housing construction
- Eliminates unnecessary bolted connections and serrations in yokes
- Heat treated alloy steel components
- Ideal loading across entire bearing length due to balanced deflection between yokes and cross
- Replaceable inner bearing race on size and large significantly reducing cross-maintenance expenses
- Available in five basic types
- Technical support and engineering services available
- Extensive repair facility
- Special sizes and designs available upon request
- Large sizes available

Below a partial list of applications for the

Transwelle® Cardan Shaft

- Conveyors
- Cooling Tower Fans
- Cranes and Hoists
- Crushers
- Glass Manufacturing
- Paper Mills- Calender Drives- Sizing and Press Rolls- Couch Rolls- Process Pumps, Jumbo press, Pope reel
- Vibrating Screen
- Coal Washery
- Sinter Screen
- SMS
- Marine Propulsion
- Mining Equipment
- Oil and Gas Drilling Pumps
- Packaging
- Plastic Manufacturing - Melt Pumps
- Printing Presses
- Pumps- Irrigation - Lift - Sewage
- Railway Drives
- Rubber Processing - Mixers - Calenders
- Shredders
- Textile Equipment

Metal Industries
(Steel, Aluminium, Copper and Brass)

- Continuous Stands (TMT)
- Roughing Stands (TMT)
- Intermediate Stands (TMT)
- H/V Stand (Housing Less)
- Bar and Rod Mills
- Cold Reduction
- Continuous Casters
- Hot Strip Mills
- Levelers
- Payoff Reels- Pinch Rolls- Coilers- Brush Rolls- Bricles- Flatteners- Slitters
- Seamless Pipe Mills
- Scale Breakers
- Stacker Reclaimer
- Side Trimmers
- Straighteners
- Temper Mills
- Tension Reels
- Tube Mills
- Vertical Edgers
- Wire Mills
- Shears
- Runout Tables- Piercers - Transfer













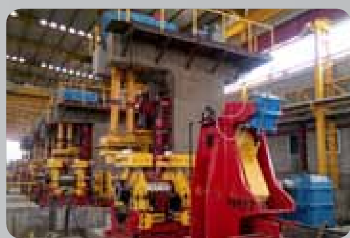


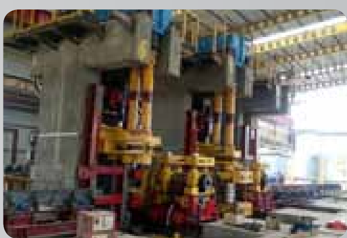






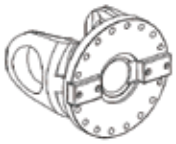







FLANGE DESIGN



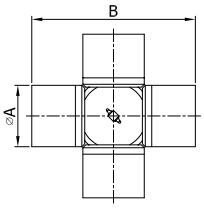
Face key

Hirth Serration

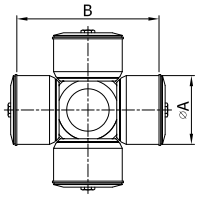
Integral Face Pad

Welded

U. J CROSS DESIGN



CIW-X SERIES



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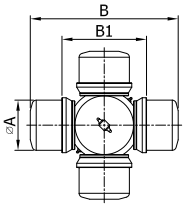

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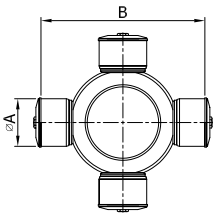
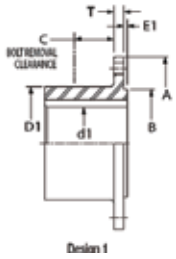
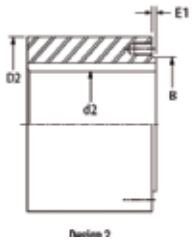
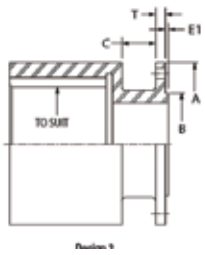


CIW-T SERIES

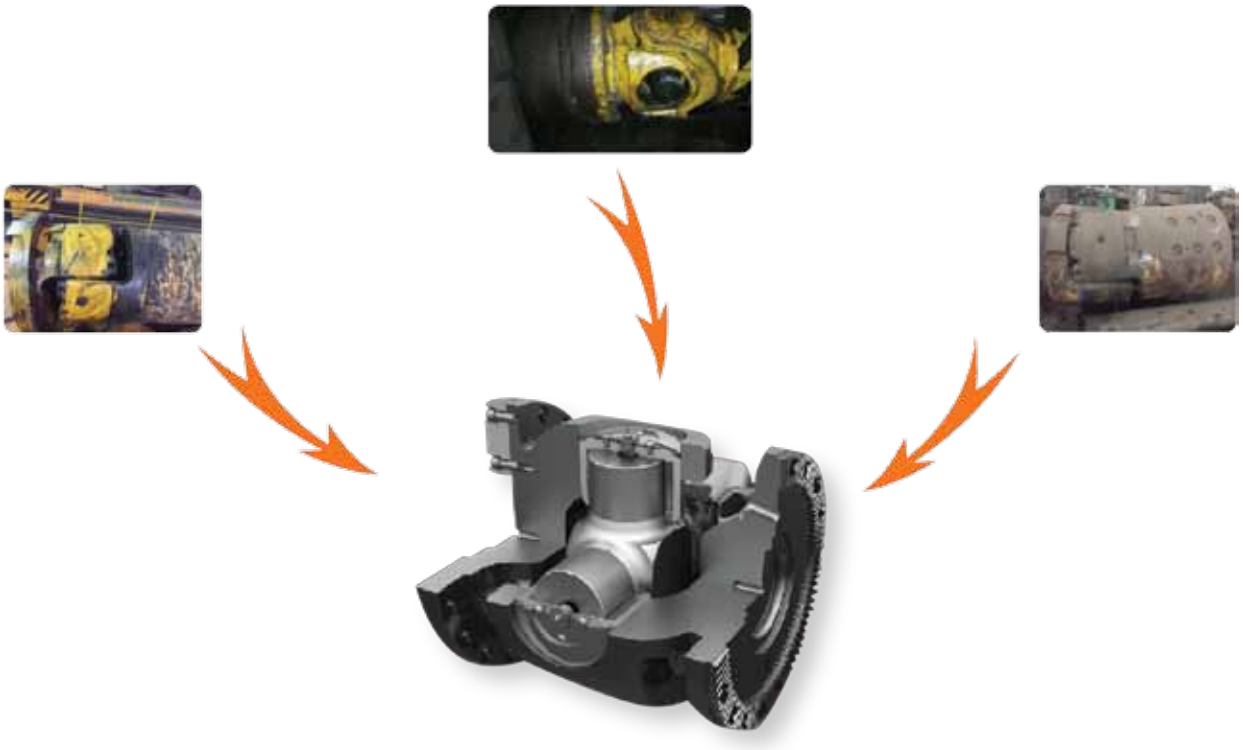
COMPANION HUB DESIGN







Product Recycling Process / Repair



- **Create onsite confirmations pre repairing report. After confirmation estimate shall be offered.**
- **Contact logistics for shipment of the repairing material.**
- **Visual checking, dismantling, cleaning, and to issue inspection report with quotation.**
- **Receive final work order, replacement of damage parts as per international product standard.**
- **Assembling, dynamic balancing, issue internal inspection report, painting, final packaging and dispatch.**
- **Customer feedback.**

Our Clients

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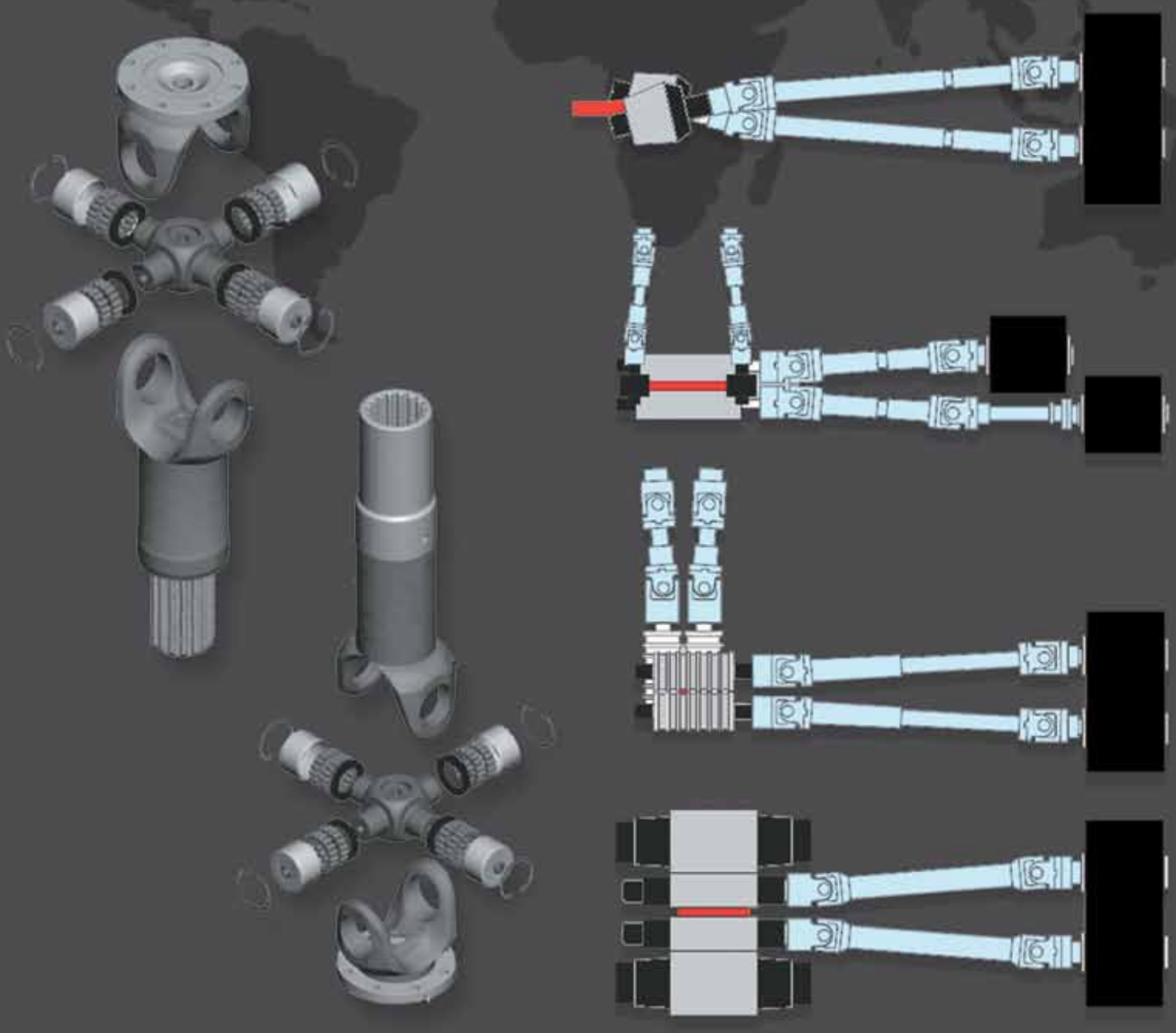

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