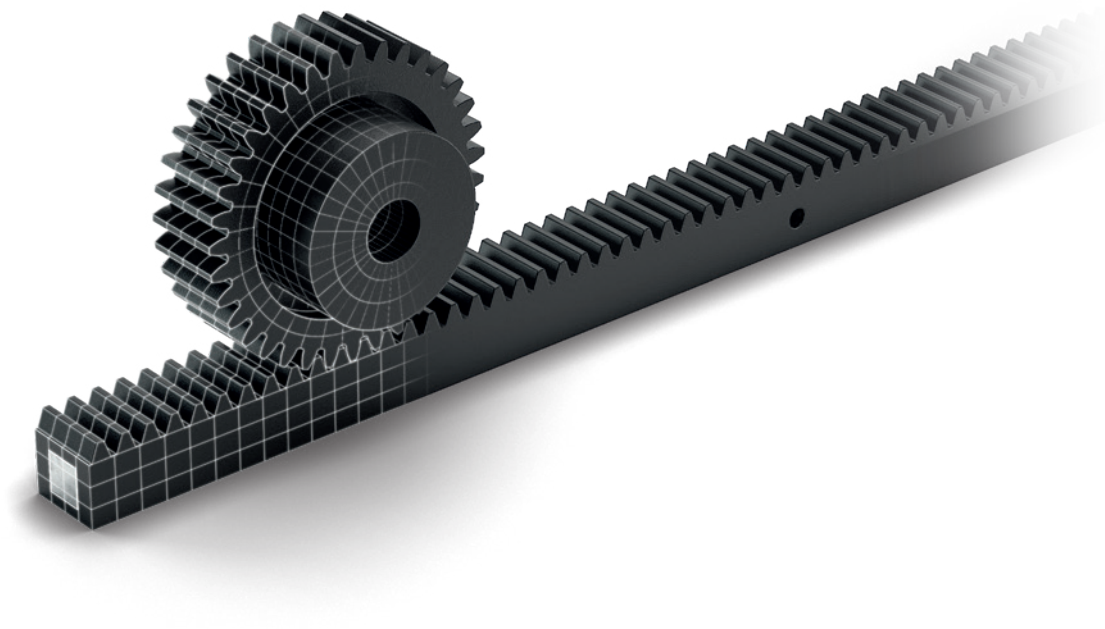
elesa+Ganter

Transmission Elements



DESIGNED
FOR ENGINEERING

TRANSMISSION ELEMENTS

The transmission elements in glass-fibre reinforced polyamide based technopolymer are an efficient alternative to metal transmission elements and can be used in all applications requiring noise reduction or the avoidance for the need of lubrication. The lightness of the technopolymer transmission elements allows their application in fields requiring a general weight reduction as well. Moreover, the technopolymer's high resistance to chemical agents limits corrosion in aggressive environments.

The steel gears are often oversized for the effective application they are used for: in this case, the technopolymer gears are an excellent solution and ensure a good mechanical resistance combined with an economical saving.

Application fields for technopolymer gears are various:

- Packaging and conveyor machines
- Industrial cleaning machines
- Glass and ceramic working machines
- Catering equipment
- Typographic industry
- Agricultural machines
- Chemical and pharmaceutical industry
- Household appliances

Coupling

The technopolymer transmission elements can be paired with both technopolymer and metal gears. In the case of coupling with metal gears, the higher thermal conductivity of the metal allows a faster dissipation of the heat accumulated during the operation. In the case of metal-technopolymer coupling, the metal pinion and the technopolymer gear are the best option, as the wear of the technopolymer toothed gear is lower.

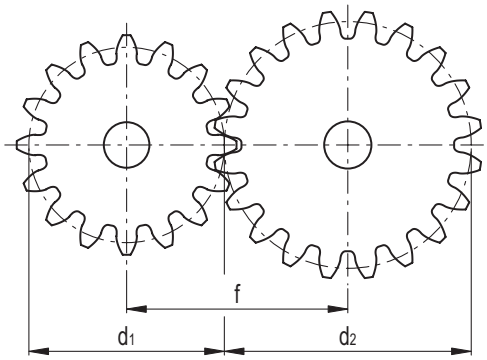
Operating distance

In order to get an optimal meshing between two gears, it is necessary to have a positive backlash between the centers of the two shafts: the effective distance "f" between the two centers of the shafts on which the gears are mounted must be slightly longer than the distance $(d_1+d_2)/2$, where d_1 and d_2 are the pitch diameters of the two gears.

$$f = \frac{d_1+d_2}{2} + t$$

The meshing without backlash or with a negative backlash would increase the friction between the teeth, thus increasing the operating temperature and diminishing the resistance to wear and stress. To avoid these problems, for ELESA gears, the following tolerances "t" are recommended:

- (+0.03 +0.1) for modules 0.5 – 1.0 – 1.5
- (+0.08 +0.3) for bigger modules



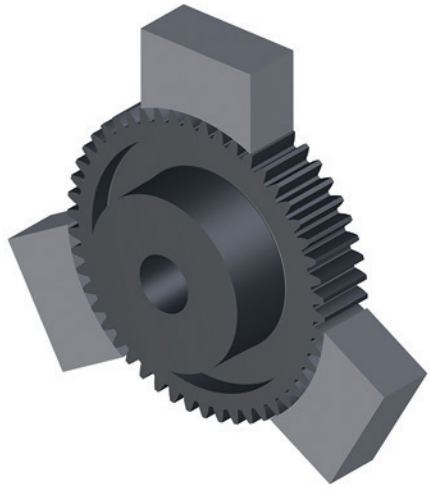
Lubrication

One of the main advantages of the reinforced technopolymer gears is the chance to use them without lubricating oil, thanks to the intrinsic nature of the polymers. Where possible, the use of lubrication is however recommended, to reduce friction and wear, thus increasing the service life of the product. For Elesa gears it is recommended to use lubricating grease based on lithium soaps and synthetic oil.

On equal use conditions, revolutions per minute and torque, the use of lubricants considerably increases the service life of the gears if compared with their operating in dry conditions.

Machining

For a correct operation on the technopolymer spur gears, the mechanical machining has to be made bypositioning the clamps on the teeth, as shown in the Fig.3. The diameter of the clamps must be turned by referring to the tip of the gear.



Materials

ELESA+GANTER spur gears and racks are made of glass-fibre reinforced polyamide based technopolymer. The main mechanical characteristics of this type of material are:

- High resistance to torsion and tensile strength (about three times higher than acetal resin)
- Good resistance to high temperatures
- Low friction coefficient, especially if compared to steel. Accordingly, the technopolymer gears can be used even when lubrication is not allowed
- Low specific weight, a greater lightness of technopolymer gears over metal gears
- High dimensional stability, high resistance to wear and chemical agents

ZCL Spur gears

The maximum torques reported in the tables of the technical datasheet are a combination of theoretical calculations and experimental data obtained in the laboratory. The tests have been made in continuous operation and at a speed of 100-150 rpm without any lubrication, to test the worst possible conditions.

The torques in the tables provide a rough indication and cannot be considered valid for every possible application. The operating conditions (rpm, working temperatures, coupling with transmission elements made of different materials, lubricated or dry conditions, continuous or intermittent operation etc.) strongly influence the performance.

ZCR Racks

Unlike the gears, the most important mechanical value for the racks is the maximum stress that can be applied on a single tooth. This is due to the fact that, on this particular transmission element, no torque is applied. The maximum stress values reported in the tables of the datasheet are the results of laboratory tests in which the force applied to the tooth increases until the tooth breaks.

The maximum stress values reported in the datasheet show the maximum stress that can be applied when a single tooth is meshed. An increase in the number of meshed teeth will not linearly increase the maximum applicable stress because only one tooth will ever work in optimal conditions.

Spur Gears

Technopolymer, pressure angle 20°

MATERIAL
Glass-fibre reinforced polyamide-based (PA) technopolymer, grey colour.

STANDARD EXECUTIONS
- **ZCL-0.5**: module 0.5 solid hub (number of teeth Z ≤ 50) or pre-drilled pass-through hole (number of teeth Z ≥ 55).
- **ZCL-1.0**: module 1.0 solid hub (number of teeth Z = 10) or pre-drilled pass-through hole.
- **ZCL-1.5**: module 1.5, pre-drilled pass-through hole
- **ZCL-2.0**: module 2.0, pre-drilled pass-through hole
- **ZCL-2.5**: module 2.5, pre-drilled pass-through hole
- **ZCL-3.0**: module 3.0, pre-drilled pass-through hole
- **ZCL-1.0-K**: module 1.0, drilled hub with keyway UNI 6604 (see page -), D10 tolerance.
- **ZCL-1.5-K**: module 1.5, drilled hub with keyway UNI 6604 (see page -), D10 tolerance.
- **ZCL-2.0-K**: module 1.0, drilled hub with keyway UNI 6604 (see page -), D10 tolerance.
- **ZCL-2.5-K**: module 2.5, drilled hub with keyway UNI 6604 (see page -), D10 tolerance.
- **ZCL-3.0-K**: module 3.0, drilled hub with keyway UNI 6604 (see page -), D10 tolerance.

For the esecutions with the pre-drilled pass-through hole, in the tables the size "d" of the hole represents the minimum diameter of the hole that can be obtained through machining.
For the -K versions, the keyway machining does not necessarily result in phasing with the gearing.

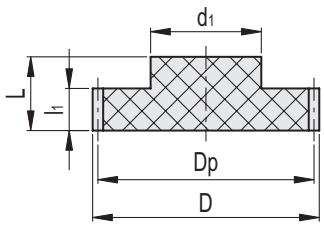
FEATURES
The torques indicated in the tables are granted with rpm included between 0 and 150. Torque values can vary depending on lubrication, temperature, pairing with different materials and continuous operating hours.
Maximum tolerance on plain pass-through hole: IT 9.

TECHNICAL DATA
See: Transmission elements (on page).

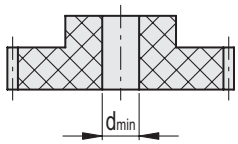
SPECIAL EXECUTIONS ON REQUEST
- Assembly by means of a transversal grub screw.
- Various non-standard gears with hub with keyway according to UNI 6604 tolerance D10.

MOUNTING
To pair two spur gears, a positive backlash must be considered. For modules 0.5 - 1.0 - 1.5 is recommended the tolerance (+0.03 +0.1). For modules 2.0 - 2.5 - 3.0 is recommended the tolerance (+0.08 +0.3).

ZCL-0.5 (Z ≤ 50)



ZCL-0.5 (Z ≥ 55)

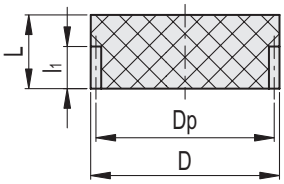


ZCL-0.5

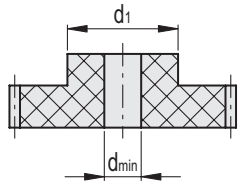
Code	Description	Module M	No. of teeth Z	Dp*	D	L	d min	d1	l1	Max. torque [Nm]	⚖
550011	ZCL-0.5-24	0.5	24	12	13	16	-	10	8	0.8	2
550013	ZCL-0.5-25	0.5	25	12.5	13.5	16	-	10	8	0.8	2
550015	ZCL-0.5-30	0.5	30	15	16	16	-	10	8	1.0	3
550017	ZCL-0.5-32	0.5	32	16	17	16	-	10	8	1.0	3
550019	ZCL-0.5-36	0.5	36	18	19	16	-	10	8	1.2	4
550021	ZCL-0.5-40	0.5	40	20	21	16	-	10	8	1.3	4
550023	ZCL-0.5-45	0.5	45	22.5	23.5	16	-	10	8	1.5	5
550025	ZCL-0.5-48	0.5	48	24	25	16	-	10	8	1.6	6
550027	ZCL-0.5-50	0.5	50	25	26	16	-	10	8	1.6	6
550029	ZCL-0.5-55	0.5	55	27.5	28.5	16	4	20	8	1.8	8
550031	ZCL-0.5-60	0.5	60	30	31	16	4	20	8	2.0	11
550033	ZCL-0.5-70	0.5	70	35	36	16	4	20	8	2.3	13
550035	ZCL-0.5-80	0.5	80	40	41	16	4	20	8	2.6	17

***** Pitch diameter.

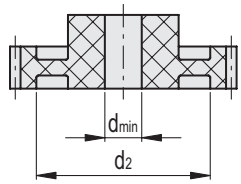
ZCL-1.0 (Z = 10)



ZCL-1.0 (12 ≤ Z ≤ 50)



ZCL-1.0 (Z ≥ 55)

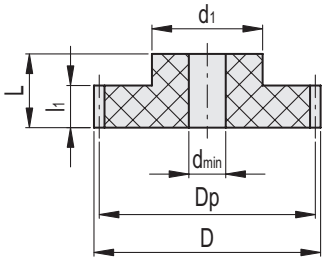


ZCL-1.0

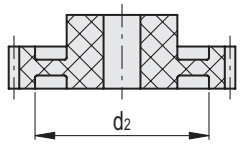
Code	Description	Module M	No. of teeth Z	Dp*	D	L	d min	d1	d2	l1	Max. torque [Nm]	⚖
550101	ZCL-1.0-10	1.0	10	10	12	25	-	-	-	15	2.5	2
550103	ZCL-1.0-12	1.0	12	12	14	25	4	9	-	15	2.9	3
550107	ZCL-1.0-14	1.0	14	14	16	25	4	10	-	15	3.4	4
550109	ZCL-1.0-15	1.0	15	15	17	25	4	10	-	15	3.7	4
550111	ZCL-1.0-16	1.0	16	16	18	25	5	13	-	15	3.9	5
550115	ZCL-1.0-18	1.0	18	18	20	25	5	14	-	15	4.4	6
550119	ZCL-1.0-20	1.0	20	20	22	25	5	16	-	15	4.9	8
550121	ZCL-1.0-21	1.0	21	21	23	25	5	16	-	15	5.2	9
550123	ZCL-1.0-22	1.0	22	22	24	25	5	18	-	15	5.4	9
550127	ZCL-1.0-24	1.0	24	24	26	25	6	20	-	15	5.9	12
550129	ZCL-1.0-25	1.0	25	25	27	25	6	20	-	15	6.1	12
550131	ZCL-1.0-26	1.0	26	26	28	25	6	22	-	15	6.4	13
550133	ZCL-1.0-27	1.0	27	27	29	25	6	22	-	15	6.6	15
550135	ZCL-1.0-28	1.0	28	28	30	25	6	22	-	15	6.9	15
550139	ZCL-1.0-30	1.0	30	30	32	25	6	25	-	15	7.4	18
550143	ZCL-1.0-32	1.0	32	32	34	25	6	25	-	15	7.9	19
550145	ZCL-1.0-33	1.0	33	33	35	25	6	25	-	15	8.1	20
550147	ZCL-1.0-34	1.0	34	34	36	25	8	30	-	15	8.4	24
550149	ZCL-1.0-35	1.0	35	35	37	25	8	30	-	15	8.6	24
550151	ZCL-1.0-36	1.0	36	36	38	25	8	30	-	15	8.8	28
550155	ZCL-1.0-38	1.0	38	38	40	25	8	30	-	15	9.3	28
550157	ZCL-1.0-39	1.0	39	39	41	25	8	30	-	15	9.6	28
550159	ZCL-1.0-40	1.0	40	40	42	25	8	30	-	15	9.8	29
550163	ZCL-1.0-42	1.0	42	42	44	25	10	35	-	15	10.3	35
550167	ZCL-1.0-44	1.0	44	44	46	25	10	35	-	15	10.8	36
550169	ZCL-1.0-45	1.0	45	45	47	25	10	35	-	15	11.1	37
550173	ZCL-1.0-48	1.0	48	48	50	25	10	35	-	15	11.8	42
550177	ZCL-1.0-50	1.0	50	50	52	25	10	35	-	15	12.3	45
550183	ZCL-1.0-55	1.0	55	55	57	25	14	35	44	15	13.5	45
550187	ZCL-1.0-58	1.0	58	58	60	25	14	35	44	15	14.3	49
550189	ZCL-1.0-60	1.0	60	60	62	25	14	40	51	15	14.7	58
550195	ZCL-1.0-65	1.0	65	65	67	25	20	40	51	15	16.0	60
550197	ZCL-1.0-70	1.0	70	70	72	25	20	40	61	15	17.2	71
550201	ZCL-1.0-72	1.0	72	72	74	25	20	40	61	15	17.7	78
550205	ZCL-1.0-74	1.0	74	74	76	25	20	40	61	15	18.2	72
550207	ZCL-1.0-75	1.0	75	75	77	25	20	50	66	15	18.4	74
550209	ZCL-1.0-77	1.0	77	77	79	25	20	50	66	15	18.9	90
550211	ZCL-1.0-80	1.0	80	80	82	25	20	50	66	15	19.7	97

***** Pitch diameter.

ZCL-1.5 (Z ≤ 36)



ZCL-1.5 (Z ≥ 38)

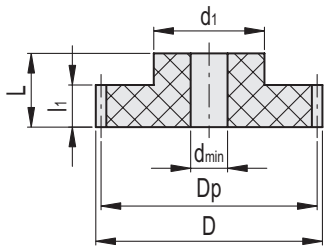


ZCL-1.5

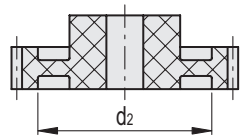
Code	Description	Module M	No. of teeth Z	Dp*	D	L	d min	d1	d2	l1	Max. torque [Nm]	⚖
550301	ZCL-1.5-12	1.5	12	18	21	30	5	14	-	17	8.2	7
550305	ZCL-1.5-14	1.5	14	21	24	30	5	16	-	17	9.6	10
550307	ZCL-1.5-15	1.5	15	22.5	25.5	30	5	18	-	17	10.3	13
550309	ZCL-1.5-16	1.5	16	24	27	30	5	18	-	17	10.9	13
550313	ZCL-1.5-18	1.5	18	27	30	30	6	20	-	17	12.3	16
550317	ZCL-1.5-20	1.5	20	30	33	30	8	25	-	17	13.7	23
550319	ZCL-1.5-21	1.5	21	31.5	34.5	30	8	25	-	17	14.4	25
550321	ZCL-1.5-22	1.5	22	33	36	30	8	28	-	17	15.0	25
550325	ZCL-1.5-24	1.5	24	36	39	30	8	28	-	17	16.4	28
550327	ZCL-1.5-25	1.5	25	37.5	40.5	30	8	30	-	17	17.1	34
550329	ZCL-1.5-26	1.5	26	39	42	30	8	30	-	17	17.8	35
550333	ZCL-1.5-28	1.5	28	42	45	30	8	30	-	17	19.1	39
550337	ZCL-1.5-30	1.5	30	45	48	30	12	35	-	17	20.5	45
550341	ZCL-1.5-32	1.5	32	48	51	30	12	35	-	17	21.9	49
550343	ZCL-1.5-33	1.5	33	49.5	52.5	30	12	35	-	17	22.6	55
550345	ZCL-1.5-34	1.5	34	51	54	30	12	35	-	17	23.2	54
550347	ZCL-1.5-35	1.5	35	52.5	55.5	30	12	35	-	17	23.9	61
550349	ZCL-1.5-36	1.5	36	54	57	30	12	35	-	17	24.6	48
550353	ZCL-1.5-38	1.5	38	57	60	30	16	35	42	17	26.0	53
550355	ZCL-1.5-39	1.5	39	58.5	61.5	30	16	35	42	17	26.7	61
550357	ZCL-1.5-40	1.5	40	60	63	30	16	40	48	17	27.4	64
550359	ZCL-1.5-42	1.5	42	63	66	30	16	45	53	17	28.7	72
550363	ZCL-1.5-44	1.5	44	66	69	30	16	45	53	17	30.1	84
550365	ZCL-1.5-45	1.5	45	67.5	70.5	30	16	45	53	17	30.8	85
550367	ZCL-1.5-46	1.5	46	69	72	30	16	45	53	17	31.5	86
550371	ZCL-1.5-48	1.5	48	75	75	30	16	45	53	17	32.8	99
550373	ZCL-1.5-50	1.5	50	75	78	30	16	45	53	17	34.2	111
550375	ZCL-1.5-51	1.5	51	76.5	79.5	30	20	50	63	17	34.9	110
550377	ZCL-1.5-52	1.5	52	78	81	30	20	50	63	17	35.6	113
550381	ZCL-1.5-54	1.5	54	81	84	30	20	50	63	17	36.9	122
550383	ZCL-1.5-55	1.5	55	82.5	85.5	30	20	50	63	17	37.6	126
550385	ZCL-1.5-60	1.5	60	90	93	30	20	55	73	17	41.0	147
550389	ZCL-1.5-65	1.5	65	97.5	100.5	30	20	60	81	17	44.4	175
550391	ZCL-1.5-70	1.5	70	105	108	30	20	60	93	17	47.9	137
550393	ZCL-1.5-75	1.5	75	112.5	115.5	30	20	60	93	17	51.3	155
550395	ZCL-1.5-80	1.5	80	120	123	30	20	60	109	17	54.7	170

***** Pitch diameter.

ZCL-2.0 (Z ≤ 30)



ZCL-2.0 (Z ≥ 31)

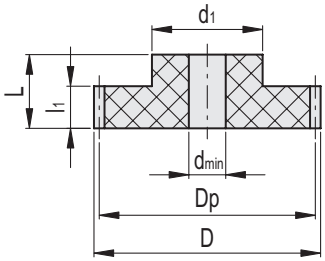


ZCL-2.0

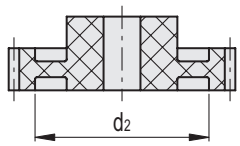
Code	Description	Module M	No. of teeth Z	Dp*	D	L	d min	d1	d2	l1	Max. torque [Nm]	⚖
550501	ZCL-2.0-12	2.0	12	24	28	35	8	18	-	20	18.6	15
550503	ZCL-2.0-13	2.0	13	26	30	35	8	18	-	20	20.1	17
550505	ZCL-2.0-14	2.0	14	28	32	35	8	20	-	20	21.7	20
550507	ZCL-2.0-15	2.0	15	30	34	35	8	22	-	20	23.2	23
550509	ZCL-2.0-16	2.0	16	32	36	35	8	25	-	20	24.8	29
550511	ZCL-2.0-17	2.0	17	34	38	35	8	25	-	20	26.3	31
550513	ZCL-2.0-18	2.0	18	36	40	35	10	30	-	20	27.9	34
550515	ZCL-2.0-19	2.0	19	38	42	35	10	30	-	20	29.4	40
550517	ZCL-2.0-20	2.0	20	40	44	35	10	30	-	20	31.0	42
550519	ZCL-2.0-21	2.0	21	42	46	35	10	30	-	20	32.5	46
550521	ZCL-2.0-22	2.0	22	44	48	35	10	30	-	20	34.1	49
550523	ZCL-2.0-23	2.0	23	46	50	35	10	35	-	20	35.6	60
550525	ZCL-2.0-24	2.0	24	48	52	35	10	35	-	20	37.2	56
550527	ZCL-2.0-25	2.0	25	50	54	35	10	35	-	20	38.7	66
550529	ZCL-2.0-26	2.0	26	52	56	35	14	40	-	20	40.3	71
550531	ZCL-2.0-27	2.0	27	54	58	35	14	40	-	20	41.8	71
550533	ZCL-2.0-28	2.0	28	56	60	35	14	40	-	20	43.4	74
550535	ZCL-2.0-29	2.0	29	58	62	35	14	40	-	20	44.9	86
550537	ZCL-2.0-30	2.0	30	60	64	35	14	40	-	20	46.5	83
550539	ZCL-2.0-31	2.0	31	62	66	35	14	40	48	20	48.0	87
550541	ZCL-2.0-32	2.0	32	64	68	35	16	45	51	20	49.6	95
550543	ZCL-2.0-33	2.0	33	66	70	35	16	45	51	20	51.1	98
550545	ZCL-2.0-34	2.0	34	68	72	35	16	45	51	20	52.7	105
550547	ZCL-2.0-35	2.0	35	70	74	35	16	45	51	20	54.2	113
550549	ZCL-2.0-36	2.0	36	72	76	35	16	50	59	20	55.8	115
550551	ZCL-2.0-37	2.0	37	74	78	35	16	50	59	20	57.3	118
550553	ZCL-2.0-38	2.0	38	76	80	35	16	50	59	20	58.9	125
550555	ZCL-2.0-39	2.0	39	78	82	35	16	50	59	20	60.4	127
550557	ZCL-2.0-40	2.0	40	80	84	35	16	55	66	20	62.0	138
550561	ZCL-2.0-42	2.0	42	84	88	35	16	55	66	20	65.1	156
550565	ZCL-2.0-44	2.0	44	88	92	35	16	60	68	20	68.2	175
550567	ZCL-2.0-45	2.0	45	90	94	35	16	60	68	20	69.7	177
550569	ZCL-2.0-46	2.0	46	92	96	35	16	60	75	20	71.3	181
550573	ZCL-2.0-48	2.0	48	96	100	35	16	60	75	20	74.4	193
550577	ZCL-2.0-50	2.0	50	100	104	35	20	60	84	20	77.5	209
550581	ZCL-2.0-52	2.0	52	104	108	35	20	60	90	20	80.6	203
550585	ZCL-2.0-54	2.0	54	108	112	35	20	60	90	20	83.7	211
550591	ZCL-2.0-57	2.0	57	114	118	35	20	60	90	20	88.3	208
550597	ZCL-2.0-60	2.0	60	120	124	35	20	60	101	20	93.0	238
550601	ZCL-2.0-62	2.0	62	124	128	35	20	60	101	20	96.1	257
550605	ZCL-2.0-64	2.0	64	128	132	35	20	60	101	20	99.2	276
550607	ZCL-2.0-65	2.0	65	130	134	35	20	60	101	20	100.7	226
550609	ZCL-2.0-66	2.0	66	132	136	35	20	60	101	20	102.3	295
550613	ZCL-2.0-68	2.0	68	136	140	35	20	60	101	20	105.3	265
550617	ZCL-2.0-70	2.0	70	140	144	35	20	60	117	20	108.4	274
550621	ZCL-2.0-72	2.0	72	144	148	35	20	60	117	20	111.5	324
550625	ZCL-2.0-74	2.0	74	148	152	35	20	60	117	20	114.6	340
550627	ZCL-2.0-75	2.0	75	150	154	35	20	60	117	20	116.2	349
550629	ZCL-2.0-76	2.0	76	152	156	35	20	60	117	20	117.7	376
550633	ZCL-2.0-78	2.0	78	156	160	35	20	60	117	20	120.8	381
550637	ZCL-2.0-80	2.0	80	160	164	35	20	60	117	20	123.9	292
550657	ZCL-2.0-90	2.0	90	180	184	35	20	60	147	20	139.4	451
550677	ZCL-2.0-100	2.0	100	200	204	35	25	60	183	20	154.9	384

***** Pitch diameter.

ZCL-2.5 (Z ≤ 26)
ZCL-3.0 (Z ≤ 27)



ZCL-2.5 (Z ≥ 27)
ZCL-3.0 (Z ≥ 28)



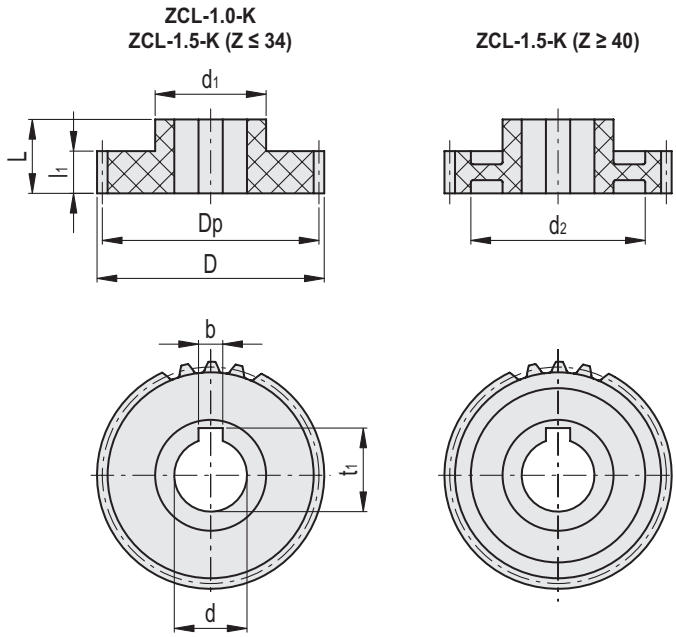
ZCL-2.5

Code	Description	Module M	No. of teeth Z	Dp*	D	L	d min	d1	d2	l1	Max. torque [Nm]	⚖
550701	ZCL-2.5-12	2.5	12	30	35	40	8	22	-	25	36.3	26
550703	ZCL-2.5-14	2.5	14	35	40	40	8	22	-	25	42.4	38
550705	ZCL-2.5-15	2.5	15	37.5	42.5	40	10	30	-	25	45.4	45
550707	ZCL-2.5-16	2.5	16	40	45	40	10	30	-	25	48.4	46
550711	ZCL-2.5-18	2.5	18	45	50	40	10	35	-	25	54.5	61
550715	ZCL-2.5-20	2.5	20	50	55	40	10	35	-	25	60.5	73
550719	ZCL-2.5-22	2.5	22	55	60	40	16	40	-	25	66.6	90
550721	ZCL-2.5-23	2.5	23	57.5	62.5	40	16	40	-	25	69.6	90
550723	ZCL-2.5-24	2.5	24	60	65	40	16	40	-	25	72.6	96
550725	ZCL-2.5-25	2.5	25	62.5	67.5	40	16	40	-	25	75.6	109
550727	ZCL-2.5-26	2.5	26	65	70	40	16	40	-	25	78.7	75
550729	ZCL-2.5-27	2.5	27	67.5	72.5	40	16	40	50	25	81.7	121
550731	ZCL-2.5-28	2.5	28	70	75	40	16	40	50	25	84.7	131
550733	ZCL-2.5-29	2.5	29	72.5	77.5	40	16	45	56	25	87.8	141
550735	ZCL-2.5-30	2.5	30	75	80	40	16	45	56	25	90.8	147
550739	ZCL-2.5-32	2.5	32	80	85	40	16	50	61	25	96.8	171
550745	ZCL-2.5-35	2.5	35	87.5	92.5	40	16	50	61	25	105.9	172
550755	ZCL-2.5-40	2.5	40	100	105	40	18	50	73	25	121.0	233
550761	ZCL-2.5-45	2.5	45	112.5	117.5	40	18	60	85	25	136.2	298
550763	ZCL-2.5-50	2.5	50	125	130	40	20	60	105	25	151.3	299

ZCL-3.0

Code	Description	Module M	No. of teeth Z	Dp*	D	L	d min	d1	d2	l1	Max. torque [Nm]	⚖
550801	ZCL-3.0-12	3.0	12	36	42	45	12	25	-	30	62.7	43
550805	ZCL-3.0-14	3.0	14	42	48	45	12	30	-	30	73.2	61
550807	ZCL-3.0-15	3.0	15	45	51	45	12	30	-	30	78.4	70
550809	ZCL-3.0-16	3.0	16	48	54	45	12	35	-	30	83.7	82
550813	ZCL-3.0-18	3.0	18	54	60	45	12	40	-	30	94.1	109
550817	ZCL-3.0-20	3.0	20	60	66	45	12	45	-	30	104.6	135
550821	ZCL-3.0-22	3.0	22	66	72	45	16	45	-	30	115.0	156
550823	ZCL-3.0-23	3.0	23	69	75	45	16	45	-	30	120.3	169
550825	ZCL-3.0-24	3.0	24	72	78	45	16	45	-	30	125.5	180
550827	ZCL-3.0-25	3.0	25	75	81	45	16	45	-	30	130.7	175
550829	ZCL-3.0-26	3.0	26	78	84	45	16	45	-	30	135.9	205
550831	ZCL-3.0-27	3.0	27	81	87	45	16	45	-	30	141.2	224
550833	ZCL-3.0-28	3.0	28	84	90	45	16	50	65	30	146.4	207
550835	ZCL-3.0-29	3.0	29	87	93	45	16	50	65	30	151.6	220
550837	ZCL-3.0-30	3.0	30	90	96	45	16	50	65	30	156.9	236
550841	ZCL-3.0-32	3.0	32	96	102	45	16	50	73	30	167.3	243
550845	ZCL-3.0-35	3.0	35	105	111	45	20	60	80	30	183.0	315
550855	ZCL-3.0-40	3.0	40	120	126	45	20	60	85	30	209.1	322
550865	ZCL-3.0-45	3.0	45	135	141	45	20	60	101	30	235.3	434
550875	ZCL-3.0-50	3.0	50	150	156	45	20	60	127	30	261.4	400

***** Pitch diameter.



ZCL-1.0-K

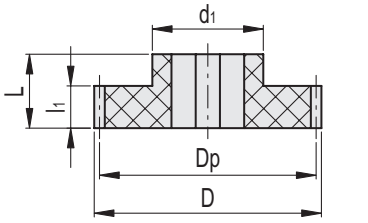
Code	Description	Module M	No. of teeth Z	Dp*	D	L	dH9	bD10	t1	d1	l1	Max. torque [Nm]	⚖
550119-K	ZCL-1.0-20-A8-K	1.0	20	20	22	25	8	2	9 +0.1	16	15	4.9	8
550123-K	ZCL-1.0-22-A10-K	1.0	22	22	24	25	10	3	11.4 +0.1	18	15	5.4	9
550127-K	ZCL-1.0-24-A10-K	1.0	24	24	26	25	10	3	11.4 +0.1	20	15	5.9	12
550129-K	ZCL-1.0-25-A10-K	1.0	25	25	27	25	10	3	11.4 +0.1	20	15	6.1	12
550139-K	ZCL-1.0-30-A12-K	1.0	30	30	32	25	12	4	13.8 +0.1	25	15	7.4	18
550143-K	ZCL-1.0-32-A12-K	1.0	32	32	34	25	12	4	13.8 +0.1	25	15	7.9	19
550147-K	ZCL-1.0-34-A12-K	1.0	34	34	36	25	12	4	13.8 +0.1	30	15	8.4	24
550149-K	ZCL-1.0-35-A12-K	1.0	35	35	37	25	12	4	13.8 +0.1	30	15	8.6	24
550159-K	ZCL-1.0-40-A12-K	1.0	40	40	42	25	12	4	13.8 +0.1	30	15	9.8	29
550169-K	ZCL-1.0-45-A15-K	1.0	45	45	47	25	15	5	17.3 +0.1	35	15	11.1	37

ZCL-1.5-K

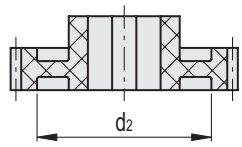
Code	Description	Module M	No. of teeth Z	Dp*	D	L	dH9	bD10	t1	d1	d2	l1	Max. torque [Nm]	⚖
550317-K	ZCL-1.5-20-A12-K	1.5	20	30	33	30	12	4	13.8 +0.1	25	-	17	13.7	23
550321-K	ZCL-1.5-22-A12-K	1.5	22	33	36	30	12	4	13.8 +0.1	28	-	17	15.0	25
550325-K	ZCL-1.5-24-A12-K	1.5	24	36	39	30	12	4	13.8 +0.1	28	-	17	16.4	28
550327-K	ZCL-1.5-25-A12-K	1.5	25	37.5	40.5	30	12	4	13.8 +0.1	30	-	17	17.1	34
550337-K	ZCL-1.5-30-A15-K	1.5	30	45	48	30	15	5	17.3 +0.1	35	-	17	20.5	45
550341-K	ZCL-1.5-32-A15-K	1.5	32	48	51	30	15	5	17.3 +0.1	35	-	17	21.9	49
550345-K	ZCL-1.5-34-A15-K	1.5	34	51	54	30	15	5	17.3 +0.1	35	-	17	23.2	54
550357-K	ZCL-1.5-40-A20-K	1.5	40	60	63	30	20	6	22.8 +0.1	40	48	17	27.4	64
550373-K	ZCL-1.5-50-A20-K	1.5	50	75	78	30	20	6	22.8 +0.1	45	53	17	34.2	111

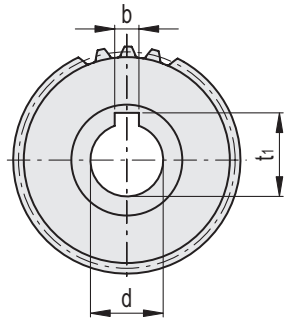
***** Pitch diameter.

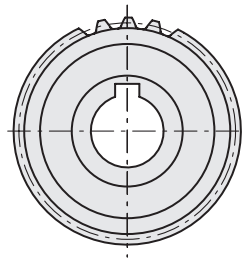
ZCL-2.0-K (Z ≤ 30)
ZCL-2.5-K (Z ≤ 25)
ZCL-3.0-K (Z ≤ 25)



ZCL-2.0-K (Z ≥ 35)
ZCL-2.5-K (Z ≥ 30)
ZCL-3.0-K (Z ≥ 30)







ZCL-2.0-K

Code	Description	Module M	No. of teeth Z	Dp*	D	L	dH9	bD10	t1	d1	d2	l1	Max. torque [Nm]	⚖
550507-K	ZCL-2.0-15-A10-K	2.0	15	30	34	35	10	3	11.4 +0.1	22	-	20	23.2	23
550509-K	ZCL-2.0-16-A12-K	2.0	16	32	36	35	12	4	13.8 +0.1	25	-	20	24.8	29
550513-K	ZCL-2.0-18-A12-K	2.0	18	36	40	35	12	4	13.8 +0.1	30	-	20	27.9	34
550517-K	ZCL-2.0-20-A12-K	2.0	20	40	44	35	12	4	13.8 +0.1	30	-	20	31.0	42
550521-K	ZCL-2.0-22-A12-K	2.0	22	44	48	35	12	4	13.8 +0.1	30	-	20	34.1	49
550525-K	ZCL-2.0-24-A15-K	2.0	24	48	52	35	15	5	17.3 +0.1	35	-	20	37.2	56
550527-K	ZCL-2.0-25-A15-K	2.0	25	50	54	35	15	5	17.3 +0.1	35	-	20	38.7	66
550537-K	ZCL-2.0-30-A15-K	2.0	30	60	64	35	15	5	17.3 +0.1	40	-	20	46.5	83
550547-K	ZCL-2.0-35-A20-K	2.0	35	70	74	35	20	6	22.8 +0.1	45	51	20	54.2	113
550557-K	ZCL-2.0-40-A20-K	2.0	40	80	84	35	20	6	22.8 +0.1	55	66	20	62.0	138
550577-K	ZCL-2.0-50-A25-K	2.0	50	100	104	35	25	8	28.3 +0.2	60	84	20	77.5	209
550597-K	ZCL-2.0-60-A25-K	2.0	60	120	124	35	25	8	28.3 +0.2	60	101	20	93.0	238

ZCL-2.5-K

Code	Description	Module M	No. of teeth Z	Dp*	D	L	dH9	bD10	t1	d1	d2	l1	Max. torque [Nm]	⚖
550701-K	ZCL-2.5-12-A10-K	2.5	12	30	35	40	10	3	11.4 +0.1	22	-	25	36.3	26
550707-K	ZCL-2.5-16-A12-K	2.5	16	40	45	40	12	4	13.8 +0.1	30	-	25	48.4	46
550715-K	ZCL-2.5-20-A15-K	2.5	20	50	55	40	15	5	17.3 +0.1	35	-	25	60.5	73
550719-K	ZCL-2.5-22-A20-K	2.5	22	55	60	40	20	6	22.8 +0.1	40	-	25	66.6	90
550723-K	ZCL-2.5-24-A20-K	2.5	24	60	65	40	20	6	22.8 +0.1	40	-	25	72.6	96
550725-K	ZCL-2.5-25-A20-K	2.5	25	62.5	67.5	40	20	6	22.8 +0.1	40	-	25	75.6	109
550735-K	ZCL-2.5-30-A20-K	2.5	30	75	80	40	20	6	22.8 +0.1	45	56	25	90.8	147
550755-K	ZCL-2.5-40-A20-K	2.5	40	100	105	40	20	6	22.8 +0.1	50	73	25	121.0	233

ZCL-3.0-K

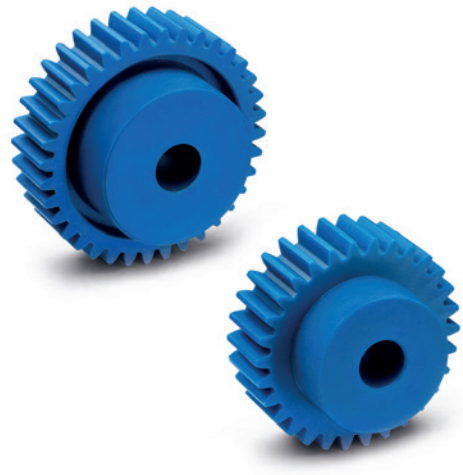
Code	Description	Module M	No. of teeth Z	Dp*	D	L	dH9	bD10	t1	d1	d2	l1	Max. torque [Nm]	⚖
550801-K	ZCL-3.0-12-A12-K	3.0	12	36	42	45	12	4	13.8 +0.1	25	-	30	62.7	43
550807-K	ZCL-3.0-15-A12-K	3.0	15	45	51	45	12	4	13.8 +0.1	30	-	30	78.4	70
550809-K	ZCL-3.0-16-A15-K	3.0	16	48	54	45	15	5	17.3 +0.1	35	-	30	83.7	82
550817-K	ZCL-3.0-20-A20-K	3.0	20	60	66	45	20	6	22.8 +0.1	45	-	30	104.6	135
550827-K	ZCL-3.0-25-A20-K	3.0	25	75	81	45	20	6	22.8 +0.1	45	-	30	130.7	175
550837-K	ZCL-3.0-30-A20-K	3.0	30	90	96	45	20	6	22.8 +0.1	50	65	30	156.9	236
550855-K	ZCL-3.0-40-A25-K	3.0	40	120	126	45	25	8	28.3 +0.2	60	85	30	209.1	322
550875-K	ZCL-3.0-50-A25-K	3.0	50	150	156	45	25	8	28.3 +0.2	60	127	30	261.4	400

***** Pitch diameter.

ZCL-VD

Spur Gears

Visually Detectable technopolymer, pressure angle 20°



MATERIAL

Glass-fibre reinforced polyamide based (PA) technopolymer, RAL 5005 blue colour, matte finish.
Produced from FDA compliant raw material (FDA CFR.21 and EU 10/2011).

STANDARD EXECUTIONS

- **ZCL-1.0-VD**: module 1.0, pre-drilled pass-through hole
- **ZCL-1.5-VD**: module 1.5, pre-drilled pass-through hole
- **ZCL-2.0-VD**: module 2.0, pre-drilled pass-through hole

In the table the size "d" of the hole represents the minimum diameter of the hole that can be obtained through machining.

FEATURES

The RAL 5005 blue colour is easily visible in case of accidental food contamination.
Particularly suitable for applications in the food and pharmaceutical industries.
The torques indicated in the tables are granted with rpm included between 0 and 150. Torque values can vary depending on lubrication, temperature, pairing with different materials and continuous operating hours.
Maximum tolerance on plain pass-through hole: IT 9.

TECHNICAL DATA

See: Transmission elements (on page -).

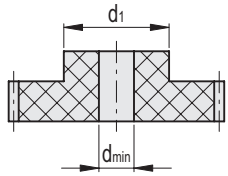
SPECIAL EXECUTIONS ON REQUEST

- Gears of various dimensions.
- Assembly by means of a transversal grub screw.
- Hub with hole and keyway in compliance with UNI 6604 tolerance D10.

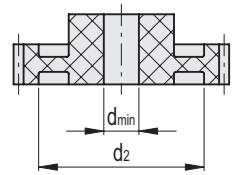
MOUNTING

To pair two spur gears, a positive backlash must be considered. For modules 1.0 - 1.5 is recommended the tolerance (+0.03 +0.1). For module 2.0 is recommended the tolerance (+0.08 +0.3).

ZCL-1.0 (Z ≤ 48)



ZCL-1.0 (Z = 60)

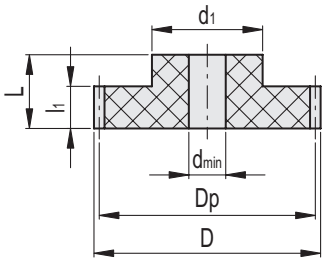


ZCL-1.0-VD

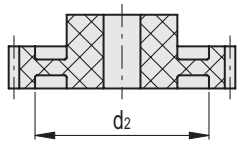
Code	Description	Module M	No. of teeth Z	Dp*	D	L	d min	d1	d2	l1	Max. torque [Nm]	⚖
553103	ZCL-1.0-12-VD	1.0	12	12	14	25	4	9	-	15	2.6	3
553109	ZCL-1.0-15-VD	1.0	15	15	17	25	4	10	-	15	3.2	4
553111	ZCL-1.0-16-VD	1.0	16	16	18	25	5	13	-	15	3.4	5
553119	ZCL-1.0-20-VD	1.0	20	20	22	25	5	16	-	15	4.3	8
553127	ZCL-1.0-24-VD	1.0	24	24	26	25	6	20	-	15	5.1	12
553139	ZCL-1.0-30-VD	1.0	30	30	32	25	6	25	-	15	6.4	18
553143	ZCL-1.0-32-VD	1.0	32	32	34	25	6	25	-	15	6.8	19
553151	ZCL-1.0-36-VD	1.0	36	36	38	25	8	30	-	15	7.7	28
553159	ZCL-1.0-40-VD	1.0	40	40	42	25	8	30	-	15	8.5	29
553169	ZCL-1.0-45-VD	1.0	45	45	47	25	10	35	-	15	9.6	37
553173	ZCL-1.0-48-VD	1.0	48	48	50	25	10	35	-	15	10.3	42
553189	ZCL-1.0-60-VD	1.0	60	60	62	25	14	40	51	15	12.8	58

* Pitch diameter.

ZCL-1.5 (Z ≤ 36)
ZCL-2.0 (Z ≤ 30)



ZCL-1.5 (Z ≥ 40)
ZCL-2.0 (Z ≥ 36)



ZCL-1.5-VD

Code	Description	Module M	No. of teeth Z	Dp*	D	L	d min	d1	d2	l1	Max. torque [Nm]	⚖
553301	ZCL-1.5-12-VD	1.5	12	18	21	30	5	14	-	17	6.3	7
553307	ZCL-1.5-15-VD	1.5	15	22.5	25.5	30	5	18	-	17	7.9	13
553313	ZCL-1.5-18-VD	1.5	18	27	30	30	6	20	-	17	9.5	16
553317	ZCL-1.5-20-VD	1.5	20	30	33	30	8	25	-	17	10.5	23
553325	ZCL-1.5-24-VD	1.5	24	36	39	30	8	28	-	17	12.7	28
553337	ZCL-1.5-30-VD	1.5	30	45	48	30	12	35	-	17	15.8	45
553349	ZCL-1.5-36-VD	1.5	36	54	57	30	12	35	-	17	19	48
553357	ZCL-1.5-40-VD	1.5	40	60	63	30	16	40	48	17	21.1	64
553371	ZCL-1.5-48-VD	1.5	48	72	75	30	16	45	53	17	25.3	99

ZCL-2.0-VD

Code	Description	Module M	No. of teeth Z	Dp*	D	L	d min	d1	d2	l1	Max. torque [Nm]	⚖
553501	ZCL-2.0-12-VD	2.0	12	24	28	35	8	18	-	20	15.8	15
553507	ZCL-2.0-15-VD	2.0	15	30	34	35	8	22	-	20	19.8	23
553517	ZCL-2.0-20-VD	2.0	20	40	44	35	10	30	-	20	26.4	42
553525	ZCL-2.0-24-VD	2.0	24	48	52	35	10	35	-	20	31.7	56
553537	ZCL-2.0-30-VD	2.0	30	60	64	35	14	40	-	20	39.6	83
553549	ZCL-2.0-36-VD	2.0	36	72	76	35	16	50	59	20	47.5	115
553557	ZCL-2.0-40-VD	2.0	40	80	84	35	16	55	66	20	52.8	138
553573	ZCL-2.0-48-VD	2.0	48	96	100	35	16	60	75	20	63.3	193

* Pitch diameter.

Spur Gears

Acetal resin based technopolymer, pressure angle 20°.

MATERIAL
Acetal resin based (POM-C) technopolymer, white colour.

STANDARD EXECUTIONS
- H10 reamed pass-through hole.
- **ZCP-0.5**: module 0.5.
- **ZCP-0.7**: module 0.7.
- **ZCP-1.0**: module 1.0.
- **ZCP-1.25**: module 1.25.
- **ZCP-1.5**: module 1.5.
- **ZCP-2.0**: module 2.0.
- **ZCP-3.0**: module 3.0.

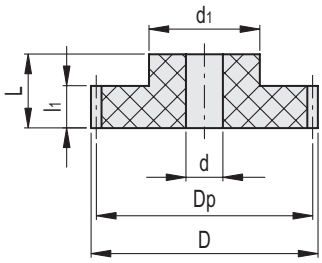
FEATURES
The torques indicated in the tables are granted with rpm included between 0 and 150. Torque values can vary depending on lubrication, temperature, pairing with different materials and continuous operating hours.
Excellent sliding properties, reduced coefficient of friction, and high resistance to wear and tear make this product suitable for high rotation speeds (above 1,000rpm) even in the absence of lubrication. The acetal resin based technopolymer makes the product suitable for use in food sectors, in humid environments, and guarantees high resistance to chemical agents, including many solvents.

TECHNICAL DATA
See: Transmission elements.

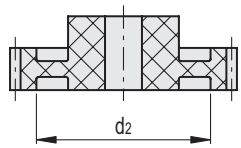
SPECIAL EXECUTIONS ON REQUEST
- Hub with threaded grub screw
- Hub with hole and keyway in compliance with UNI 6604

MOUNTING
To pair two spur gears, a positive backlash must be considered.
For modules 0.5 – 0.7 – 1.0 – 1.25 – 1.5 is recommended the tolerance (+0.03 +0.1). For modules 2.0 - 3.0 is recommended the tolerance (+0.08 +0.3).
The H10 reamed hole allows the gear to be mounted on the shaft. In the case of application with low torques, a hole and keyway for coupling is not necessary as a threaded screw is sufficient. It is not recommended to enlarge the hole by more than 2mm with respect to the diameter shown in the tables, to avoid the occurrence of cracks in the material.

ZCP-0.5 (Z ≤ 38)



ZCP-0.5 (Z ≥ 40)

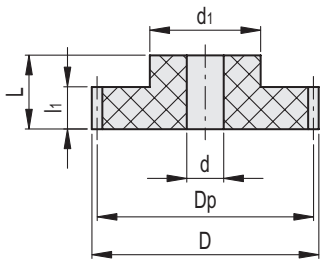


ZCP-0.5

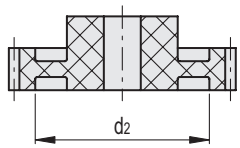
Code	Description	Module M	No. of teeth Z	Dp*	D	L	d	d_1	d_2	l_1	Max. torque [Ncm]	⚖
555012	ZCP-0.5-12	0.5	12	6	7	7	2	4	-	3	2	1
555013	ZCP-0.5-13	0.5	13	6.5	7.5	7	2	4	-	3	2.2	1
555014	ZCP-0.5-14	0.5	14	7	8	7	2	5	-	3	2.4	1
555015	ZCP-0.5-15	0.5	15	7.5	8.5	10	3	5.8	-	3	2.5	1
555016	ZCP-0.5-16	0.5	16	8	9	10	3	5.8	-	3	2.7	1
555017	ZCP-0.5-17	0.5	17	8.5	9.5	10	3	5.8	-	3	2.9	1
555018	ZCP-0.5-18	0.5	18	9	10	10	4	7.4	-	3	3.1	1
555019	ZCP-0.5-19	0.5	19	9.5	10.5	10	4	7.4	-	3	3.2	1
555020	ZCP-0.5-20	0.5	20	10	11	10	4	7.4	-	3	3.4	1
555021	ZCP-0.5-21	0.5	21	10.5	11.5	10	4	8	-	3	3.5	1
555022	ZCP-0.5-22	0.5	22	11	12	10	4	9	-	3	3.8	1
555023	ZCP-0.5-23	0.5	23	11.5	12.5	10	4	9	-	3	3.9	1
555024	ZCP-0.5-24	0.5	24	12	13	10	4	9	-	3	4.1	1
555025	ZCP-0.5-25	0.5	25	12.5	13.5	10	4	9	-	3	4.3	1
555026	ZCP-0.5-26	0.5	26	13	14	10	4	9	-	3	4.5	1
555027	ZCP-0.5-27	0.5	27	13.5	14.5	10	4	9	-	3	4.6	1
555028	ZCP-0.5-28	0.5	28	14	15	10	4	9	-	3	4.8	1
555030	ZCP-0.5-30	0.5	30	15	16	10	4	12	-	3	5.2	2
555032	ZCP-0.5-32	0.5	32	16	17	10	4	12	-	3	5.5	2
555035	ZCP-0.5-35	0.5	35	17.5	18.5	10	4	12	-	3	6	2
555036	ZCP-0.5-36	0.5	36	18	19	10	4	12	-	3	6.2	2
555038	ZCP-0.5-38	0.5	38	19	20	10	4	12	-	3	6.6	2
555040	ZCP-0.5-40	0.5	40	20	21	10	4	12	16.5	3	6.9	2
555042	ZCP-0.5-42	0.5	42	21	22	10	4	12	16.5	3	7.3	2
555045	ZCP-0.5-45	0.5	45	22.5	23.5	10	4	12	16.5	3	7.7	2
555048	ZCP-0.5-48	0.5	48	24	25	10	6	15	20	3	8.3	3
555050	ZCP-0.5-50	0.5	50	25	26	10	6	15	20	3	8.6	3
555052	ZCP-0.5-52	0.5	52	26	27	10	6	15	20	3	9	3
555054	ZCP-0.5-54	0.5	54	27	28	10	6	15	20	3	9.3	3
555055	ZCP-0.5-55	0.5	55	27.5	28.5	10	6	15	23	3	9.5	3
555056	ZCP-0.5-56	0.5	56	28	29	10	6	15	23	3	9.7	4
555060	ZCP-0.5-60	0.5	60	30	31	10	6	15	23	3	10.4	4
555064	ZCP-0.5-64	0.5	64	32	33	10	6	15	23	3	11.1	4
555065	ZCP-0.5-65	0.5	65	32.5	33.5	10	6	15	23	3	11.2	4
555070	ZCP-0.5-70	0.5	70	35	36	10	6	15	30	3	12.1	5
555072	ZCP-0.5-72	0.5	72	36	37	10	6	15	30	3	12.5	5
555075	ZCP-0.5-75	0.5	75	37.5	38.5	10	6	15	33	3	13	5
555080	ZCP-0.5-80	0.5	80	40	41	10	6	15	33	3	13.7	6
555090	ZCP-0.5-90	0.5	90	45	46	10	6	15	39	3	15.6	7
555096	ZCP-0.5-96	0.5	96	48	49	10	6	15	42	3	16.5	8
555100	ZCP-0.5-100	0.5	100	50	51	10	6	15	44	3	17.3	8
555120	ZCP-0.5-120	0.5	120	60	61	10	6	15	54	3	20.8	10

* Pitch diameter.

ZCP-0.7 (Z ≤ 20)



ZCP-0.7 (Z ≥ 24)

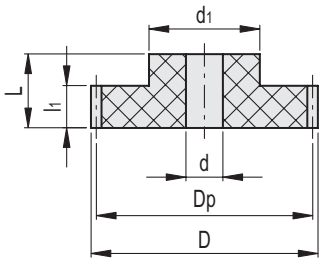


ZCP-0.7

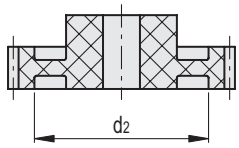
Code	Description	Module M	No. of teeth Z	Dp*	D	L	d	d1	d2	l1	Max. torque [Ncm]	⚖
555212	ZCP-0.7-12	0.7	12	8.4	9.8	15	3	6	-	6	8.1	1
555214	ZCP-0.7-14	0.7	14	9.8	11.2	15	3	6	-	6	9.4	1
555216	ZCP-0.7-16	0.7	16	11.2	12.6	15	4	9	-	6	10.8	1
555218	ZCP-0.7-18	0.7	18	12.6	14	15	4	9	-	6	12.2	2
555220	ZCP-0.7-20	0.7	20	14	15.4	15	4	9	-	6	13.6	2
555224	ZCP-0.7-24	0.7	24	16.8	18.2	15	4	9	13	6	16.3	2
555225	ZCP-0.7-25	0.7	25	17.5	18.9	15	6	9	13	6	17	2
555228	ZCP-0.7-28	0.7	28	19.6	21	15	6	9	13	6	19	3
555230	ZCP-0.7-30	0.7	30	21	22.4	15	6	12	16	6	20.3	3
555232	ZCP-0.7-32	0.7	32	22.4	23.8	15	6	12	16	6	21.7	4
555236	ZCP-0.7-36	0.7	36	25.2	26.6	15	6	15	21	6	24.4	5
555240	ZCP-0.7-40	0.7	40	28	29.4	15	6	15	21	6	28	6
555248	ZCP-0.7-48	0.7	48	33.6	35	15	8	18	24	6	33.6	7
555250	ZCP-0.7-50	0.7	50	35	36.4	15	8	18	28	6	35	8
555256	ZCP-0.7-56	0.7	56	39.2	40.6	15	8	18	30	6	39.2	9
555260	ZCP-0.7-60	0.7	60	42	43.4	15	8	18	30	6	42	10
555268	ZCP-0.7-68	0.7	68	47.6	49	15	8	18	37	6	47.6	11
555270	ZCP-0.7-70	0.7	70	49	50.4	15	8	18	37	6	49	12
555280	ZCP-0.7-80	0.7	80	56	57.4	15	10	21	47	6	56	16
555290	ZCP-0.7-90	0.7	90	63	64.4	15	10	21	57	6	63	17
555300	ZCP-0.7-100	0.7	100	70	71.4	15	10	21	57	6	70	23
555320	ZCP-0.7-120	0.7	120	84	85.4	15	10	21	77	6	84	25

* Pitch diameter.

ZCP-1.0 (Z ≤ 16)



ZCP-1.0 (Z ≥ 17)

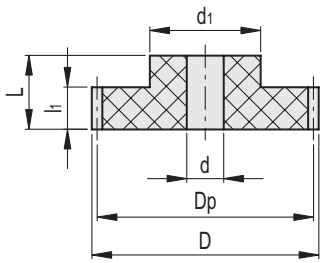


ZCP-1.0

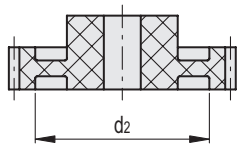
Code	Description	Module M	No. of teeth Z	Dp*	D	L	d	d1	d2	l1	Max. torque [Ncm]	⚖
555412	ZCP-1.0-12	1.0	12	12	14	17	4	9	-	9	25	2
555413	ZCP-1.0-13	1.0	13	13	15	17	4	9	-	9	27.1	2
555414	ZCP-1.0-14	1.0	14	14	16	17	4	9	-	9	29	2
555415	ZCP-1.0-15	1.0	15	15	17	17	4	9	-	9	31.1	3
555416	ZCP-1.0-16	1.0	16	16	18	17	4	9	-	9	33.2	3
555417	ZCP-1.0-17	1.0	17	17	19	17	4	9	12	9	35.3	3
555418	ZCP-1.0-18	1.0	18	18	20	17	4	9	12	9	37.4	3
555419	ZCP-1.0-19	1.0	19	19	21	17	4	9	12	9	39.6	4
555420	ZCP-1.0-20	1.0	20	20	22	17	4	9	12	9	41.5	4
555421	ZCP-1.0-21	1.0	21	21	23	17	5	12	16	9	43.6	4
555422	ZCP-1.0-22	1.0	22	22	24	17	5	12	16	9	45.7	5
555423	ZCP-1.0-23	1.0	23	23	25	17	5	12	16	9	47.8	5
555424	ZCP-1.0-24	1.0	24	24	26	18	6	15	18	9	50	7
555425	ZCP-1.0-25	1.0	25	25	27	18	6	15	18	9	52	7
555426	ZCP-1.0-26	1.0	26	26	28	18	6	15	18	9	54.1	8
555427	ZCP-1.0-27	1.0	27	27	29	18	6	15	18	9	56.1	8
555428	ZCP-1.0-28	1.0	28	28	30	18	6	15	21	9	58.2	8
555430	ZCP-1.0-30	1.0	30	30	32	18	6	15	21	9	62.4	9
555432	ZCP-1.0-32	1.0	32	32	34	18	6	18	24	9	66.6	11
555435	ZCP-1.0-35	1.0	35	35	37	18	8	18	24	9	72.8	13
555436	ZCP-1.0-36	1.0	36	36	38	18	8	18	27	9	75	13
555438	ZCP-1.0-38	1.0	38	38	40	18	8	18	27	9	79.1	14
555440	ZCP-1.0-40	1.0	40	40	42	18	8	18	27	9	83.2	16
555442	ZCP-1.0-42	1.0	42	42	44	18	8	18	27	9	87.4	18
555445	ZCP-1.0-45	1.0	45	45	47	18	8	18	37	9	93.7	17
555448	ZCP-1.0-48	1.0	48	48	50	18	8	18	37	9	100	20
555450	ZCP-1.0-50	1.0	50	50	52	18	8	21	40	9	104.1	22
555452	ZCP-1.0-52	1.0	52	52	54	18	8	21	40	9	108.1	24
555454	ZCP-1.0-54	1.0	54	54	56	18	8	21	46	9	112.3	24
555455	ZCP-1.0-55	1.0	55	55	57	18	8	21	46	9	114.4	25
555456	ZCP-1.0-56	1.0	56	56	58	18	8	21	46	9	116.5	26
555458	ZCP-1.0-58	1.0	58	58	60	18	8	21	46	9	120.8	28
555460	ZCP-1.0-60	1.0	60	60	62	18	8	21	46	9	124.8	31
555464	ZCP-1.0-64	1.0	64	64	66	18	10	21	57	9	133.2	30
555465	ZCP-1.0-65	1.0	65	65	67	18	10	21	57	9	135.2	31
555470	ZCP-1.0-70	1.0	70	70	72	18	10	21	62	9	145.7	35
555472	ZCP-1.0-72	1.0	72	72	74	18	10	21	62	9	149.8	38
555475	ZCP-1.0-75	1.0	75	75	77	18	10	21	62	9	156.1	42
555480	ZCP-1.0-80	1.0	80	80	82	18	10	21	70	9	166.5	45
555485	ZCP-1.0-85	1.0	85	85	87	18	10	21	70	9	177	53
555490	ZCP-1.0-90	1.0	90	90	92	18	10	22	80	9	187.2	55
555500	ZCP-1.0-100	1.0	100	100	102	18	12	24	90	9	208.1	66
555510	ZCP-1.0-110	1.0	110	110	112	18	12	24	100	9	229	78
555520	ZCP-1.0-120	1.0	120	120	122	18	12	24	105	9	249.8	96
555530	ZCP-1.0-130	1.0	130	130	132	18	12	24	119	9	270.5	105
555540	ZCP-1.0-140	1.0	140	140	142	18	12	24	125	9	291.4	125

* Pitch diameter.

ZCP-1.25 (Z ≤ 15)



ZCP-1.25 (Z ≥ 20)

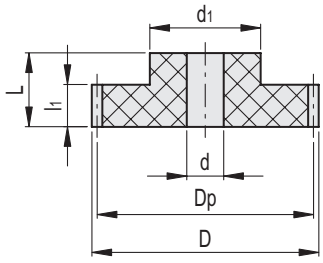


ZCP-1.25

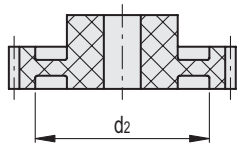
Code	Description	Module M	No. of teeth Z	Dp*	D	L	d	d1	d2	l1	Max. torque [Ncm]	⚖
555612	ZCP-1.25-12	1.25	12	15	17.5	19	5	10	-	10	43.3	3
555615	ZCP-1.25-15	1.25	15	18.75	21.25	19	5	10	-	10	54.1	4
555620	ZCP-1.25-20	1.25	20	25	27.5	19	5	12	16	10	72.2	7
555625	ZCP-1.25-25	1.25	25	31.25	33.75	19	6	15	21	10	90.3	12
555630	ZCP-1.25-30	1.25	30	37.5	40	19	8	18	29	10	108.4	14
555635	ZCP-1.25-35	1.25	35	43.75	46.25	19	8	18	29	10	126.5	20
555640	ZCP-1.25-40	1.25	40	50	52.5	19	8	18	40	10	144.5	23
555650	ZCP-1.25-50	1.25	50	62.5	65	19	8	21	46	10	180.6	38
555660	ZCP-1.25-60	1.25	60	75	77.5	19	10	21	66	10	216.8	44.95
555670	ZCP-1.25-70	1.25	70	87.5	90	19	10	21	76	10	253	61
555680	ZCP-1.25-80	1.25	80	100	102.5	19	12	24	86	10	289.1	80
555700	ZCP-1.25-100	1.25	100	125	127.5	19	12	24	108	10	361.4	121

* Pitch diameter.

ZCP-1.5 (Z ≤ 20)



ZCP-1.5 (Z ≥ 21)



ZCP-1.5

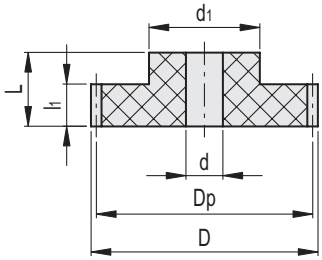
Code	Description	Module M	No. of teeth Z	Dp*	D	L	d	d1	d2	l1	Max. torque [Ncm]	⚖
555812	ZCP-1.5-12	1.5	12	18	21	23	6	12	-	12	75	5
555813	ZCP-1.5-13	1.5	13	19.5	22.5	23	6	14	-	12	81.1	7
555814	ZCP-1.5-14	1.5	14	21	24	23	6	14	-	12	87.4	7
555815	ZCP-1.5-15	1.5	15	22.5	25.5	23	6	14	-	12	93.7	8
555816	ZCP-1.5-16	1.5	16	24	27	23	6	14	-	12	100	9
555817	ZCP-1.5-17	1.5	17	25.5	28.5	23	6	14	-	12	106.2	10
555818	ZCP-1.5-18	1.5	18	27	30	23	8	17	-	12	112.3	12
555819	ZCP-1.5-19	1.5	19	28.5	31.5	23	8	17	-	12	118.7	13
555820	ZCP-1.5-20	1.5	20	30	33	23	8	17	-	12	124.8	14
555821	ZCP-1.5-21	1.5	21	31.5	34.5	23	8	17	23	12	131.1	13
555822	ZCP-1.5-22	1.5	22	33	36	23	8	17	23	12	137.3	14
555823	ZCP-1.5-23	1.5	23	34.5	37.5	23	8	17	23	12	143.6	16
555824	ZCP-1.5-24	1.5	24	36	39	23	8	19	27	12	149.8	17
555825	ZCP-1.5-25	1.5	25	37.5	40.5	23	8	19	27	12	156.1	18

ZCP-1.5

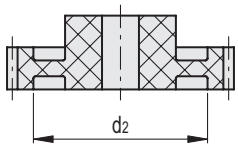
Code	Description	Module M	No. of teeth Z	Dp*	D	L	d	d_1	d_2	l_1	Max. torque [Ncm]	⚖
555826	ZCP-1.5-26	1.5	26	39	42	23	8	19	27	12	162.3	20
555827	ZCP-1.5-27	1.5	27	40.5	43.5	23	8	19	27	12	168.6	22
555828	ZCP-1.5-28	1.5	28	42	45	23	8	19	27	12	174.8	23
555830	ZCP-1.5-30	1.5	30	45	48	23	10	24	34	12	187.2	27
555832	ZCP-1.5-32	1.5	32	48	51	23	10	24	34	12	200	31
555835	ZCP-1.5-35	1.5	35	52.5	55.5	23	10	24	42	12	218.5	32
555836	ZCP-1.5-36	1.5	36	54	57	23	10	24	42	12	224.8	34
555838	ZCP-1.5-38	1.5	38	57	60	23	10	24	42	12	237.3	38
555840	ZCP-1.5-40	1.5	40	60	63	23	10	24	48	12	249.8	39
555842	ZCP-1.5-42	1.5	42	63	66	23	10	24	48	12	262.3	44
555843	ZCP-1.5-43	1.5	43	64.5	67.5	23	10	24	48	12	266.8	46
555845	ZCP-1.5-45	1.5	45	67.5	70.5	23	10	24	48	12	281	52
555848	ZCP-1.5-48	1.5	48	72	75	23	10	24	48	12	299.7	60
555850	ZCP-1.5-50	1.5	50	75	78	23	12	27	63	12	312.2	55
555852	ZCP-1.5-52	1.5	52	78	81	23	12	27	63	12	324.7	61
555854	ZCP-1.5-54	1.5	54	81	84	23	12	27	63	12	337.2	67
555855	ZCP-1.5-55	1.5	55	82.5	85.5	23	12	27	63	12	343.5	70
555860	ZCP-1.5-60	1.5	60	90	93	23	12	27	70	12	374.6	80
555870	ZCP-1.5-70	1.5	70	105	108	23	14	30	90	12	437.2	96
555880	ZCP-1.5-80	1.5	80	120	123	23	14	30	105	12	499.6	118
555890	ZCP-1.5-90	1.5	90	135	138	23	14	30	119	12	562	144
555900	ZCP-1.5-100	1.5	100	150	153	34	20	40	132	19	989	272
555910	ZCP-1.5-110	1.5	110	165	168	34	20	40	150	19	1087.8	256
555920	ZCP-1.5-120	1.5	120	180	183	34	20	40	163	19	1186.7	301
555930	ZCP-1.5-130	1.5	130	195	198	34	20	40	180	19	1285.5	329
555940	ZCP-1.5-140	1.5	140	210	213	34	20	40	193	19	1384.4	381
555950	ZCP-1.5-150	1.5	150	225	228	34	20	40	208	19	1483.3	425

* Pitch diameter.

ZCP-2.0 (Z ≤ 16)



ZCP-2.0 (Z ≥ 17)



ZCP-2.0

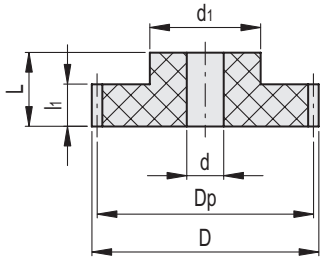
Code	Description	Module M	No. of teeth Z	Dp*	D	L	d	d_1	d_2	l_1	Max. torque [Ncm]	⚖
556012	ZCP-2.0-12	2.0	12	24	28	27	8	18	-	15	166.5	12
556013	ZCP-2.0-13	2.0	13	26	30	27	8	18	-	15	180.4	13
556014	ZCP-2.0-14	2.0	14	28	32	27	8	18	-	15	194.2	15
556015	ZCP-2.0-15	2.0	15	30	34	27	8	18	-	15	208.1	17
556016	ZCP-2.0-16	2.0	16	32	36	27	8	18	-	15	222	19
556017	ZCP-2.0-17	2.0	17	34	38	27	8	18	23	15	236	19
556018	ZCP-2.0-18	2.0	18	36	40	27	8	18	23	15	249.8	21
556019	ZCP-2.0-19	2.0	19	38	42	27	8	18	23	15	263.7	24
556020	ZCP-2.0-20	2.0	20	40	44	27	10	20	26	15	277.6	26

ZCP-2.0

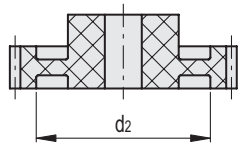
Code	Description	Module M	No. of teeth Z	Dp*	D	L	d	d_1	d_2	l_1	Max. torque [Ncm]	⚖
556021	ZCP-2.0-21	2.0	21	42	46	27	10	20	26	15	291.4	28
556022	ZCP-2.0-22	2.0	22	44	48	27	10	20	26	15	305.3	32
556023	ZCP-2.0-23	2.0	23	46	50	27	10	24	35	15	319.2	33
556024	ZCP-2.0-24	2.0	24	48	52	27	10	24	35	15	333.1	36
556025	ZCP-2.0-25	2.0	25	50	54	27	10	24	35	15	347	39
556026	ZCP-2.0-26	2.0	26	52	56	27	10	24	38	15	360.7	40
556027	ZCP-2.0-27	2.0	27	54	58	27	10	24	38	15	374.6	44
556028	ZCP-2.0-28	2.0	28	56	60	27	10	24	38	15	388.5	47
556030	ZCP-2.0-30	2.0	30	60	64	27	10	24	44	15	416.3	50
556032	ZCP-2.0-32	2.0	32	64	68	27	10	24	44	15	444	59
556035	ZCP-2.0-35	2.0	35	70	74	27	12	26	54	15	485.7	63
556036	ZCP-2.0-36	2.0	36	72	76	27	12	26	54	15	499.6	68
556038	ZCP-2.0-38	2.0	38	76	80	27	12	26	61	15	527.3	70
556040	ZCP-2.0-40	2.0	40	80	84	27	12	26	61	15	555.1	81
556042	ZCP-2.0-42	2.0	42	84	88	27	12	26	61	15	583	91
556045	ZCP-2.0-45	2.0	45	90	94	27	14	30	70	15	624.5	100
556048	ZCP-2.0-48	2.0	48	96	100	27	14	30	76	15	666.2	109
556050	ZCP-2.0-50	2.0	50	100	104	27	14	30	80	15	694	116
556055	ZCP-2.0-55	2.0	55	110	114	27	14	30	90	15	763.2	134
556060	ZCP-2.0-60	2.0	60	120	124	27	14	30	100	15	832.7	153
556070	ZCP-2.0-70	2.0	70	140	144	27	14	30	120	15	971.5	195
556075	ZCP-2.0-75	2.0	75	150	154	34	20	40	132	19	1318.5	272
556080	ZCP-2.0-80	2.0	80	160	164	34	20	40	139	19	1406.3	270
556085	ZCP-2.0-85	2.0	85	170	174	34	20	40	150	19	1494.2	291
556090	ZCP-2.0-90	2.0	90	180	184	34	20	40	163	19	1582.2	301
556095	ZCP-2.0-95	2.0	95	190	194	34	20	40	163	19	1670.1	379
556100	ZCP-2.0-100	2.0	100	200	204	34	20	40	180	19	1758	370
556110	ZCP-2.0-110	2.0	110	220	224	34	20	40	193	19	1933.8	472

* Pitch diameter.

ZCP-3.0 (Z = 12)



ZCP-3.0 (Z ≥ 15)



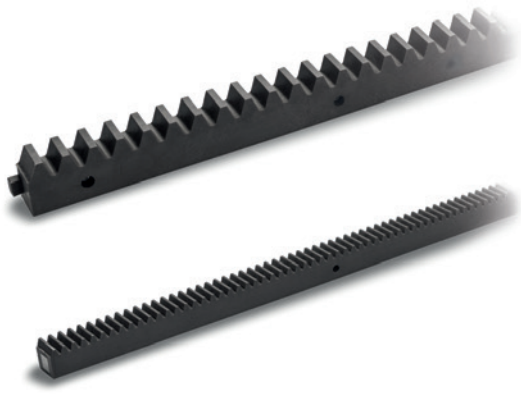
ZCP-3.0

Code	Description	Module M	No. of teeth Z	Dp*	D	L	d	d_1	d_2	l_1	Max. torque [Ncm]	⚖
556212	ZCP-3.0-12	3.0	12	36	42	34	12	24	-	19	474.6	31
556215	ZCP-3.0-15	3.0	15	45	51	34	12	24	30	19	593.3	42
556220	ZCP-3.0-20	3.0	20	60	66	34	12	24	38	19	791	68
556225	ZCP-3.0-25	3.0	25	75	81	34	14	28	58	19	989	97
556230	ZCP-3.0-30	3.0	30	90	96	34	14	28	68	19	1186.7	128
556235	ZCP-3.0-35	3.0	35	105	111	34	16	32	79	19	1384.4	167
556240	ZCP-3.0-40	3.0	40	120	126	34	16	32	94	19	1582.2	204
556250	ZCP-3.0-50	3.0	50	150	156	34	20	40	132	19	1977.7	270
556260	ZCP-3.0-60	3.0	60	180	186	34	20	40	163	19	2373.3	300
556270	ZCP-3.0-70	3.0	70	210	216	34	20	40	193	19	2768.8	380
556275	ZCP-3.0-75	3.0	75	225	231	34	20	40	208	19	2966.6	423

* Pitch diameter.

Racks

Technopolymer, pressure angle 20°



MATERIAL
Glass-fibre reinforced polyamide-based (PA) technopolymer, grey colour.

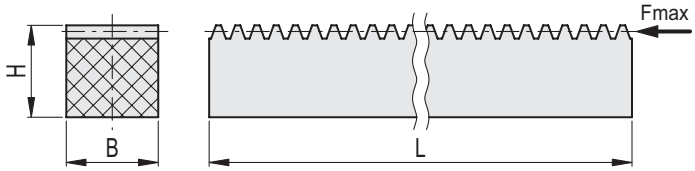
STANDARD EXECUTIONS
- **ZCR**: square section racks.
- **ZCR-A**: square section racks with steel core.
- **ZCR-PL**: racks with mounting bracket for mounting on a plane parallel to teeth.
- **ZCR-PD**: racks with mounting bracket for mounting on a plane perpendicular to teeth.
- **ZCR-T**: "T" shape racks.

FEATURES
The loads reported in the tables indicate the maximum load that can be applied on a single tooth.
The alignment between two or more racks is granted only for the execution ZCR-A with module 1.0 – 1.5 – 2.0 – 4.0.

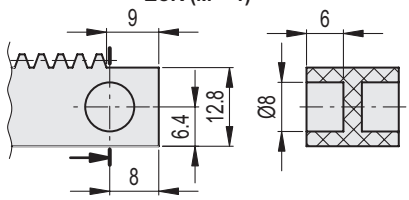
TECHNICAL DATA
See: Transmission elements (on page).

SPECIAL EXECUTIONS ON REQUEST
Special lengths on request. On special lengths the meshing is not granted in case of alignment.

ZCR (M = 0.5)



ZCR (M = 1)

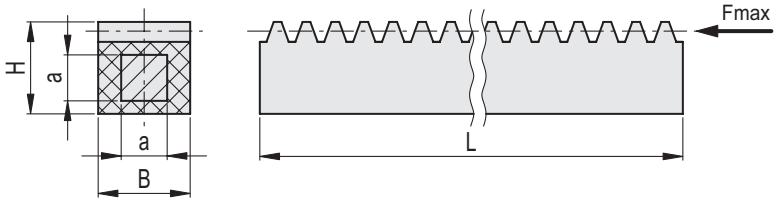


ZCR

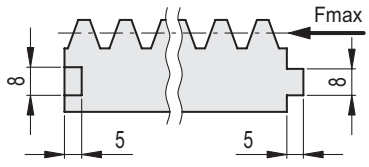
Code	Description	Module M	L	L#	B	H	Fmax [N]	⚖
552001	ZCR-0.5-250	0.5	251	251	8	8	99	19
552011	ZCR-1.0-150	1.0	166	156	15	15	372	49
552021	ZCR-1.0-250	1.0	265	256	15	15	372	80

Toothing length

ZCR-A (M ≤ 3)

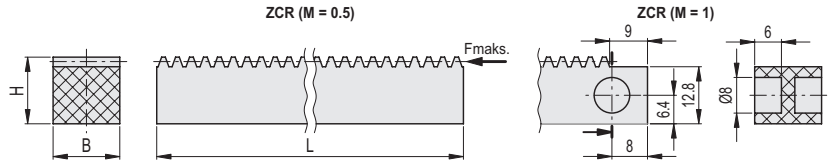


ZCR-A (M = 4)



ZCR-A

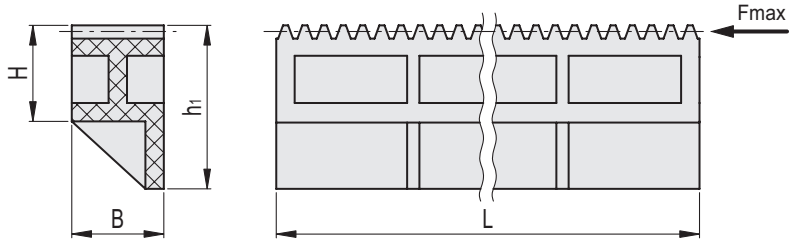
Code	Description	Module M	L	B	H	a	Fmax [N]	⚖
552201	ZCR-A-1.0-350	1.0	352	15	15	8 x 8	372	261
552211	ZCR-A-1.5-250	1.5	254	17	17	8 x 8	633	190
552221	ZCR-A-1.5-500	1.5	565	17	17	8 x 8	633	422
552231	ZCR-A-2.0-250	2.0	251	20	20	10 x 10	993	275
552241	ZCR-A-2.0-500	2.0	565	20	20	10 x 10	993	620
552251	ZCR-A-3.0-250	3.0	254	30	30	15 x 15	2234	630
552261	ZCR-A-3.0-500	3.0	500	30	30	15 x 15	2234	1260
552281	ZCR-A-4.0-1000	4.0	1018	20	28	10 x 10	1986	1250



ZCR-PL

Code	Description	Module M	L	B	H	b1	Fmax [N]	⚖
552101	ZCR-1.0-150-PL	1.0	151	15	15.5	25.5	372	36
552111	ZCR-1.0-250-PL	1.0	248	15	15.5	25.5	372	58

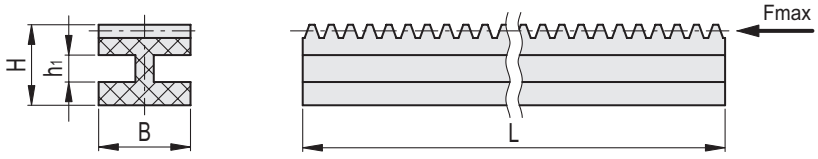
ZCR-PD



ZCR-PD

Code	Description	Module M	L	B	H	h1	Fmax [N]	⚖
552121	ZCR-1.0-150-PD	1.0	151	15	15.5	26.5	372	34
552131	ZCR-1.0-250-PD	1.0	248	15	15.5	26.5	372	55

ZCR-T



ZCR-T

Code	Description	Module M	L	B	H	h1	Fmax [N]	⚖
552141	ZCR-1.0-150-T	1.0	151	15	13	4	372	26
552151	ZCR-1.0-250-T	1.0	248	15	13	4	372	42

Toothed joints

Technopolymer

MATERIAL

Polyamide based (PA) technopolymer with molybdenum disulfide additive.

STANDARD EXECUTIONS

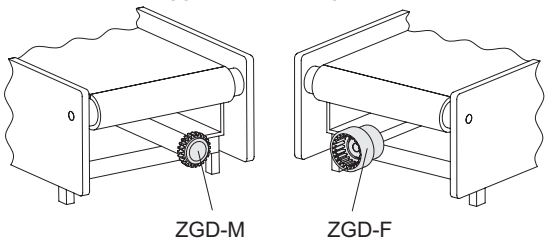
Aluminium bushing.

- **ZGD-M**: male half-coupling, external teeth.
- **ZGD-F**: female half-coupling, internal teeth.

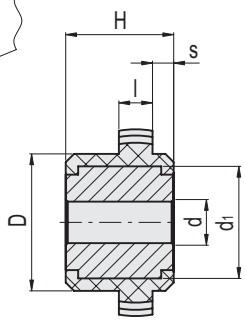
FEATURES AND APPLICATIONS

Toothed joints are used to couple rotating shafts.
Their use allows for interference fits between shafts and also to compensate for radial, axial and angular misalignments, while ensuring low weight and low inertia. The misalignment and torque values shown in the table are guaranteed in a range between 0 and 150 rpm. Values may vary depending on temperature, coupling, and hours of continuous operation.
The male and female joints must be used combined and can only be coupled when both their module and the number of teeth are the same.
For any keyway machining it is recommended to take the joints from the hub side.

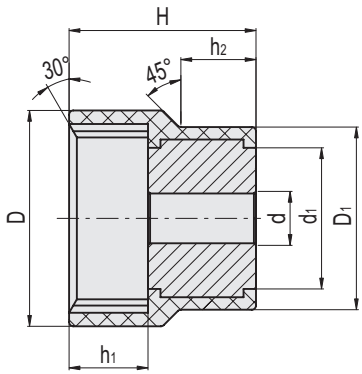
Application examples



ZGD-M



ZGD-F



ZGD-M

Code	Description	d1	Module M	No. of teeth Z	D	H	dH7	l	s	# [mm]	* [°]	## [mm]	** [Nm]	⚖
551016	ZGD-1.5-20-M	20	1.5	20	25	23	6	8.1	2.8	0	5	5	18	24
551026	ZGD-1.5-24-M	24	1.5	24	30	25	8	8.1	2.8	0	4	5	22	38
551036	ZGD-1.5-28-M	27	1.5	28	33	26	10	8.1	5.1	0	4	5	25	48

ZGD-F

Code	Description	d1	Module M	No. of teeth Z	D	D1	H	dH7	h1	h2	# [mm]	* [°]	## [mm]	** [Nm]	⚖
551011	ZGD-1.5-20-F	25	1.5	20	40	33	40	6	17	15	0	5	5	18	50
551021	ZGD-1.5-24-F	30	1.5	24	48	38	42	10	17	18	0	4	5	22	68
551031	ZGD-1.5-28-F	38	1.5	28	53	44	45	12	19	18.5	0	4	5	25	104

Maximum lateral misalignment allowed.

* Maximum angular misalignment allowed.

Maximum axial misalignment allowed.

** Maximum torque for operation with perfectly axial shafts (misalignments equal to 0° and 0 mm).

elesa+Ganter

Find out more on **elesa-ganter.com**

ELESA S.p.A.
Via Pompei 29
20900 Monza (MB)
Italy
+39 039 28 11 1
info@elesa.com
elesa.com

OTTO GANTER GmbH & Co. KG
Triberger Straße 3
78120 Furtwangen
Germany
+49 7723 65 07 0
info@ganternorm.com
ganternorm.com

DESIGNED
FOR ENGINEERING

ZDEPEGGEARENG26