



## Transmission support calculations

?

### Optimizing of parameters of a gearbox with spur gears

#### 1.0 Gearbox dimension optimization

?

### Number of teeth optimization for exact transmission ratio

#### 2.0 Single reduction gearing

2.1	Desired total transmission ratio	$i_{1,2}$	3,38000
2.2	Min. number of teeth (Pinion)	$z_{1min}$	15
2.3	Max. number of teeth (Pinion)	$z_{1max}$	30
2.4	Presentation of results		

	$z_1$	$z_2$	$\Delta i$	$i$	$\Delta i$ [%]
1	29	98	0,00069	3,37931	0,02040%
2	21	71	0,00095	3,38095	0,02818%
3	26	88	0,00462	3,38462	0,13655%
4	16	54	0,00500	3,37500	0,14793%
5	24	81	0,00500	3,37500	0,14793%
6	18	61	0,00889	3,38889	0,26298%
7	27	91	0,00963	3,37037	0,28490%
8	23	78	0,01130	3,39130	0,33445%
9	19	64	0,01158	3,36842	0,34257%
10	28	95	0,01286	3,39286	0,38039%

#### 3.0 Double reduction gearing

3.1	Desired total transmission ratio	$i_{1,4}$	12,70000
3.2	Desired transmission ratio of gearing I	$i_{1,2}$	3,56371
3.3	Desired transmission ratio of gearing II	$i_{3,4}$	3,56371
3.4	Gearbox optimization for:		Weight <input type="checkbox"/>
3.5	Min/max number of teeth (gearing I)	$z_1$ min/max	15 30
3.6	Min/max number of teeth (gearing II)	$z_3$ min/max	20 40
3.7	Presentation of results		

	$z_1$	$z_2$	$z_3$	$z_4$	$\Delta i$	$i$	$\Delta i$ [%]
1	23	102	22	63	0,00040	12,69960	0,00311%
2	16	71	29	83	0,00043	12,70043	0,00339%
3	24	107	33	94	0,00051	12,69949	0,00398%
4	19	85	31	88	0,00051	12,69949	0,00401%
5	17	75	33	95	0,00053	12,70053	0,00421%
6	30	133	37	106	0,00090	12,70090	0,00709%
7	29	130	24	68	0,00115	12,70115	0,00905%
8	29	130	30	85	0,00115	12,70115	0,00905%
9	29	130	36	102	0,00115	12,70115	0,00905%
10	26	115	31	89	0,00149	12,69851	0,01172%

#### 4.0 Triple reduction gearing

4.1	Desired total transmission ratio	$i_{1,6}$	11,37000
4.2	Desired transmission ratio of gearing I	$i_{1,2}$	2,55527
4.3	Desired transmission ratio of gearing II	$i_{3,4}$	2,47351
4.4	Desired transmission ratio of gearing III	$i_{5,6}$	1,79891
4.5	Gearbox optimization for:		Length <input type="checkbox"/>
4.6	Min/max number of teeth (gearing I)	$z_1$ min/max	12 25

4.7	Min/max number of teeth (gearing II)	z3 min/max	15	30
4.8	Min/max number of teeth (gearing III)	z5 min/max	20	40

4.9 Presentation of results

	z1	z2	z3	z4	z5	z6	delta i	i	delta i [%]
1	22	57	22	54	33	59	0,000023	11,37002	0,00020%
2	16	41	22	54	26	47	0,000026	11,36997	0,00023%
3	25	63	17	43	37	66	0,000048	11,37005	0,00042%
4	12	31	22	54	29	52	0,000094	11,36991	0,00083%
5	24	62	22	54	29	52	0,000094	11,36991	0,00083%
6	12	31	29	72	22	39	0,000094	11,36991	0,00083%
7	24	62	29	72	22	39	0,000094	11,36991	0,00083%
8	12	31	23	56	26	47	0,000123	11,37012	0,00108%
9	24	62	23	56	26	47	0,000123	11,37012	0,00108%
10	15	38	21	52	32	58	0,000159	11,36984	0,00140%