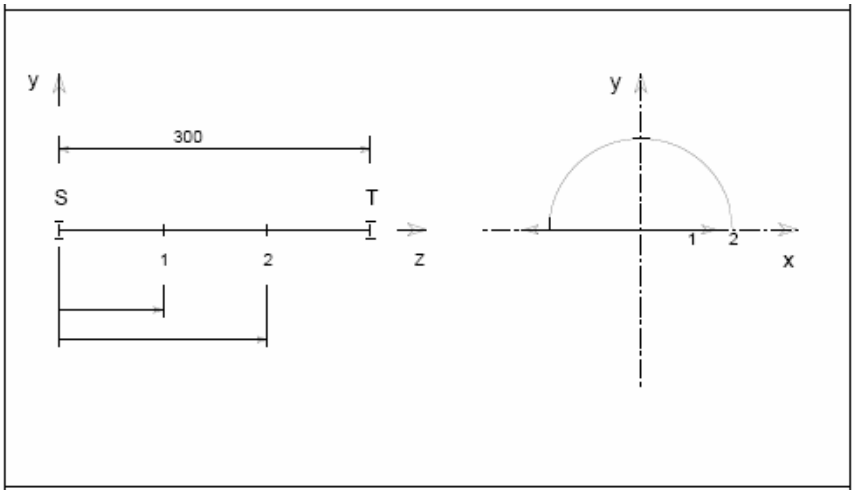
CRV

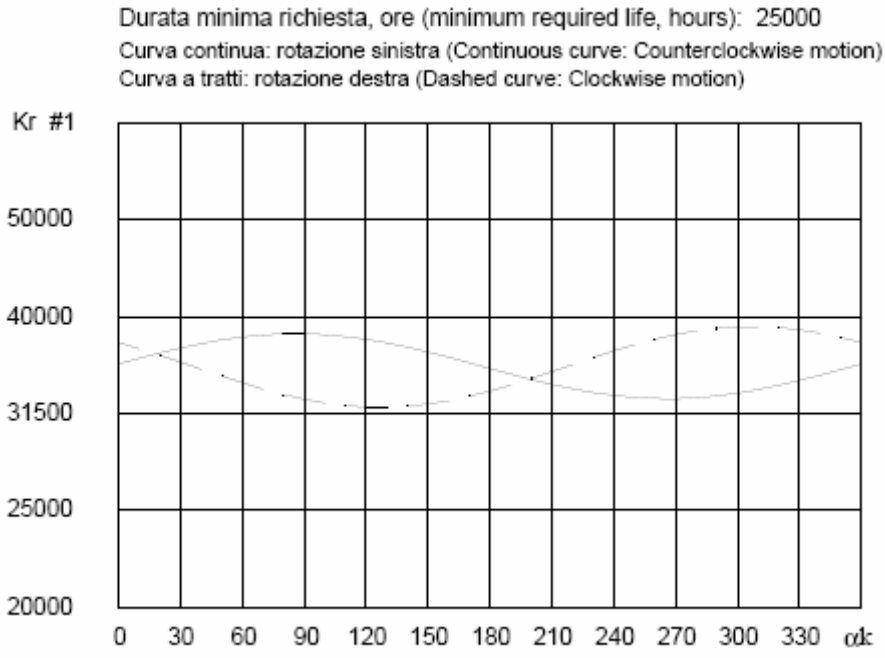
These are two examples of calculation .

In the first example, we start from the geometric data : span between the bearings of the axis in question , operating pitch diameters of the gears mounted on the shaft and their position with respect to the span (up to 6 possible) , operating transverse pressure angles and eventual operating helix angle, the load angle . We introduce the load data : the torque and rpm on the axis, any axial load external axis , the data bearing catalog (including their installation type) and the type of transmission.

You get the life time according to ISO 281 L10 without corrective factors , bending moments in different sections of the axis if required , and the graph layout to control of loads. Giving the torque and specifying the type of transmission the program will calculate the forces and reactions on the bearings automatically. Any type of transmission is possible.

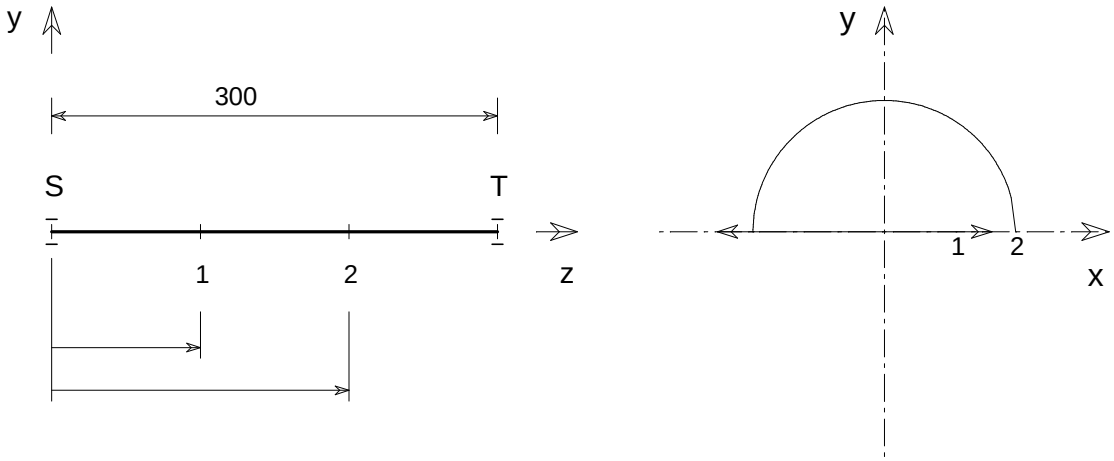


In the second example, provided the geometric data and load, it prescribes a required life time of the bearings and the program calculates in table and diagram from 0 ° to 360 °, the radial load on the outside of the axis can be rotated right and left .



PROVA TEST CRV

Albero isostatico - Isostatic shaft. Unità di misura - Unit system: mm , N , Nm , DEG
Giri/min - Speed: n = 315 r.p.m.
Carico coassiale esterno - External coaxial load: Kz-est = 0
Campata tra mezzerie cuscinetti - Span between bearing middles: l = 300



PUNTI CARICHI - LOADING POINTS

#1 - (Ruota dentata cilindrica - Cylindrical Gear) :

k = 100	αk = 0		Mt = 2250
dm' = 72,727	αt' = 22,2766	ßm' = 13,1548	
Kr = 25347	Kt = 61875	Ka = 14461	

#2 - (Ruota dentata cilindrica - Cylindrical Gear) :

k = 200	αk = 180		Mt = -2250
dm' = 315,1	αt' = 22,157	ßm' = 15,565	
Kr = 5815,5	Kt = -14281	Ka = -3978	

PROVA TEST CRV

DATI DEI CUSCINETTI - BEARING DATA:

Disposizione ad X - X arrangement.

Cuscinetto S a rulli conici: 32315 - Giuoco interno normale

X1 = 1	Y1 = 0	X2 = 0,4	Y2 = 1,7
C = 336000	Z = 0,5	cS = 9	d = 75

Cuscinetto T a rulli conici: 32315 - Giuoco interno normale

X1 = 1	Y1 = 0	X2 = 0,4	Y2 = 1,7
C = 336000	Z = 0,5	cT = 9	d = 75

CARICO EQUIVALENTE E DURATA - EQUIVALENT LOAD AND BEARING LIFE

Scegliere i risultati più sfavorevoli tra i seguenti -
Compare following results and choose the most conservative ones:

Calcolo convenzionale -
- conventional ratings:

FrS = 47850	αS = 76,5
KzS = 0	FaS = 14070
cS = 9	ΔlS = -9
FqS = 47850	LhS = 35090
FrT = 30790	αT = 74,3
KzT = 10480	FaT = 24560
cT = 9	ΔlT = -9
FqT = 54060	LhT = 23360

Centri di spinta - Reaction centres, Ref.:
Castellani, Organi di Trasmissione, n.1/79

FrS = 46570	αS = 76,5
KzS = 0	FaS = 13700
cS = 10,58	ΔlS = -10,58
FqS = 46570	LhS = 38410
FrT = 32070	αT = 74,3
KzT = 10480	FaT = 24180
cT = 22,58	ΔlT = -22,58
FqT = 53930	LhT = 23540

MOMENTI FLETTENTI [Nm] in sezioni a distanza z dalla mezzeria di S
BENDING MOMENTS [Nm] at distance z from the middle of bearing S

A sinistra: Calcolo convenzionale -
At the left: Conventional ratings.

A destra: Centri di spinta calcolati -
At the right: Rated reaction centres.

A sinistra della sezione - At the left of the point considered:

z = 100	Mfxz = -1019,6	z = 100	Mfxz = -969,9
Mf = 4354,1	Mfyz = -4233	Mf = 4163,8	Mfyz = -4049,3

A destra della sezione - At the right of the point considered:

z = 100	Mfxz = -1545,4	z = 100	Mfxz = -1495,8
Mf = 4506,3	Mfyz = -4233	Mf = 4316,7	Mfyz = -4049,3

A sinistra della sezione - At the left of the point considered:

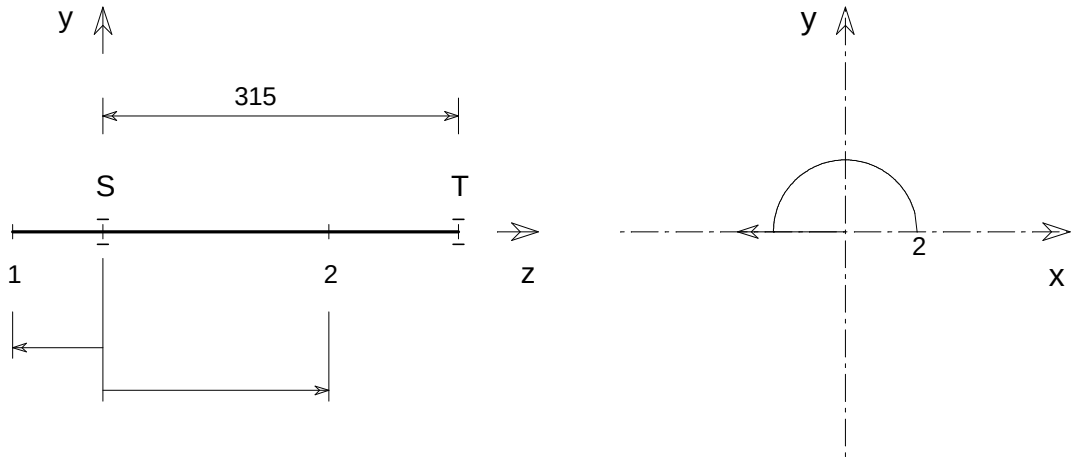
z = 200	Mfxz = -131,1	z = 200	Mfxz = -45,7
Mf = 2700,4	Mfyz = -2697,2	Mf = 2390,7	Mfyz = -2390,2

A destra della sezione - At the right of the point considered:

z = 200	Mfxz = -757,8	z = 200	Mfxz = -672,4
Mf = 2801,6	Mfyz = -2697,2	Mf = 2483	Mfyz = -2390,2

PROVA TEST CRV

Albero isostatico - Isostatic shaft. Unità di misura - Unit system: mm , N , Nm , DEG
Giri/min - Speed: n = 500 r.p.m.
Carico coassiale esterno - External coaxial load: Kz-est = 0
Campata tra mezzerie cuscinetti - Span between bearing middles: l = 315



PUNTI CARICHI E DURATA RICHIESTA - LOADING POINTS AND REQUIRED LIFE

#1 -
k = -80 αk variabile (Unsettled) - Carico radiale variabile (Unsettled radial load)

#2 - (Ruota dentata cilindrica - Cylindrical Gear) :

k = 200	αk = 180		Mt = 1800
dm' = 362,5	αt' = 22,253	ßm' = 11,125	
Kr = 4063,5	Kt = 9931	Ka = 1952,9	

Durata minima richiesta, ore (minimum required life, hours): 25000

PROVA TEST CRV

DATI DEI CUSCINETTI - BEARING DATA:

Disposizione ad X - X arrangement.

Cuscinetto S a rulli conici: 32315

X1 = 1	Y1 = 0	X2 = 0,4	Y2 = 1,7
C = 336000	Z = 0,5	cS = 9	d = 75

Cuscinetto T a rulli conici: 32315

X1 = 1	Y1 = 0	X2 = 0,4	Y2 = 1,7
C = 336000	Z = 0,5	cT = 9	d = 75

Senso di rotazione base (sinistro)

αk	Kr #1	LhS	LhT
0	35576	25000	78600
10	36052	25000	76000
20	36514	25000	73860
30	36946	25000	72170
40	37333	25000	70930
50	37663	25000	70110
60	37923	25000	69740
70	38105	25000	69810
80	38201	25000	70330
90	38209	25000	71300
100	38127	25000	72750
110	37959	25000	74680
120	37711	25000	77130
130	37392	25000	80100
140	37013	25000	83620
150	36588	25000	87720
160	36130	25000	92430
170	35655	25000	97760
180	35178	25000	103700
190	34714	25000	110300
200	34275	25000	117500
210	33874	25000	125200
220	33523	25000	132900
230	33229	25000	139600
240	33001	25000	142400
250	32844	25000	139400
260	32761	25000	132900
270	32754	25000	125400
280	32825	25000	118000
290	32970	25000	111100
300	33187	25000	104800
310	33470	25000	99040
320	33812	25000	93890
330	34205	25000	89290
340	34639	25000	85220
350	35100	25000	81660
360	35576	25000	78600

Senso di rotazione opposto

αk	Kr #1	LhS	LhT
0	37410	25000	182500
10	36880	25000	193100
20	36310	25000	205300
30	35718	25000	219400
40	35124	25000	235300
50	34545	25000	253100
60	33999	25000	272600
70	33501	25000	293300
80	33063	25000	314100
90	32697	25000	332500
100	32410	25000	343300
110	32211	25000	341400
120	32102	25000	328100
130	32086	25000	309300
140	32163	25000	289200
150	32333	25000	269600
160	32590	25000	251500
170	32930	25000	234900
180	33344	25000	220100
190	33823	25000	206800
200	34355	25000	195100
210	34924	25000	184900
220	35515	25000	176100
230	36110	25000	168600
240	36690	25000	162400
250	37235	25000	157400
260	37728	25000	153600
270	38151	25000	150900
280	38488	25000	149500
290	38727	25000	149200
300	38858	25000	150100
310	38877	25000	152200
320	38784	25000	155500
330	38581	25000	160100
340	38276	25000	166100
350	37881	25000	173500
360	37410	25000	182500

PROVA TEST CRV

Durata minima richiesta, ore (minimum required life, hours): 25000

Curva continua: rotazione sinistra (Continuous curve: Counterclockwise motion)

Curva a tratti: rotazione destra (Dashed curve: Clockwise motion)