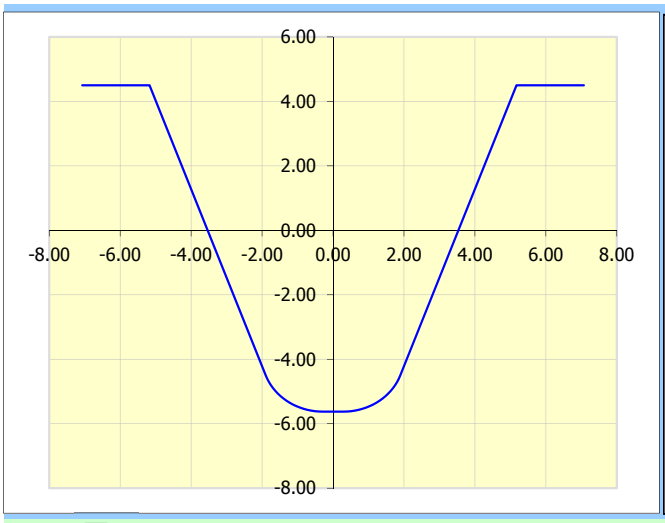
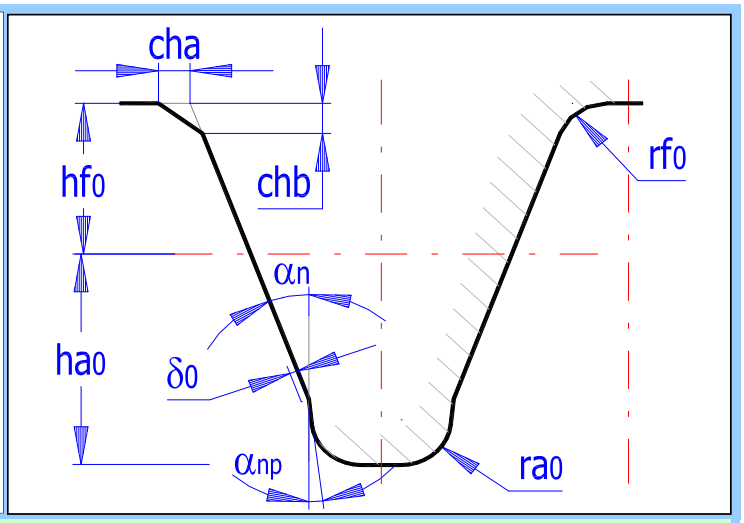
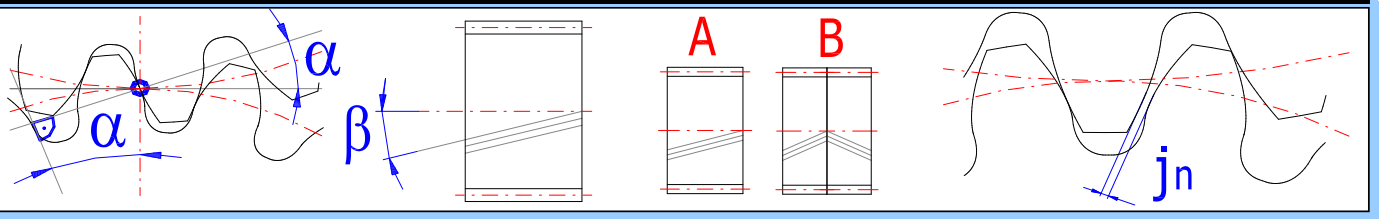
Spur gearing, Helical gearing [mm/ISO]

			Pinion	Gear	
i	**Calculation without errors.**				
ii	**Project information**				
?	**Input section**				
1.0	**Options of basic input parameters**				
1.1	Transferred power	Pw [kW]	100.000	99.050	
1.2	Speed (Pinion / Gear)	n [/min]	1000.00	395.8	[/min]
1.3	Torsional moment (Pinion / Gear)	Mk [Nm]	955.00	2389.72	[Nm]
1.4	Transmission ratio / from table	i	2.500		
1.5	Actual transmission ratio / deviation	i	2.526	1.04%	
2.0	**Options of material, loading conditions, operational and production parameters**				
2.1	Material identification according standard :		ISO		
2.2	Material of the pinion :		E,F...Alloy structural steel T2(683/7-70) (Rm=785 MPa) tooth face hard.		
2.3	Material of the gear :		E,F...Alloy structural steel T2(683/7-70) (Rm=785 MPa) tooth face hard.		
2.4	Loading of the gearbox, driving machine - examples		A...Continuous		
2.5	Loading of gearbox, driven machine - examples		A...Continuous		
2.6	Type of gearing mounting		A. Double-sided symmetrically supported gearing - type 1		
2.7	Accuracy grade - ISO1328 |Ra max|v max		6.....(Ra max.= 0.8 / v max.= 15)		
2.8	Coefficient of one-off overloading	KAS	2.00		
2.9	Desired service life	Lh	20000		[h]
2.10	Coefficient of safety (contact/bend)	SH / SF	1.30	1.60	
2.11	Automatic design				
3.0	**Parameters of the cutting tool and tooth profile**				
3.1	Standardized tool		1. DIN 867 (a=20deg, ha0=1.25, hf0=1.0, ra0=0.38, d0=0, anp=0deg, ca=0.25)		
3.2	Addendum of tool	ha0*	1.250	1.250	[modul]
3.3	Dedendum of tool	hf0*	1.000	1.000	[modul]
3.4	Fillet radius of tool	ra0*	0.380	0.380	[modul]
3.5	Root fillet radius of tool	rf0*	0.000	0.000	[modul]
3.6	Chamfer of root	cha*	0.000	0.000	[modul]
3.7	Chamfer of root	chb*	0.000	0.000	[modul]
3.8	Protuberance hight	δ0*	0.000	0.000	[modul]
3.9	Protuberance angle	αnp	0.000	0.000	[°]
3.10	Min. unit head clearance	ca*min	0.2500	0.2500	[modul]
3.11	Unit head clearance	ca*	0.2500	0.2500	[modul]

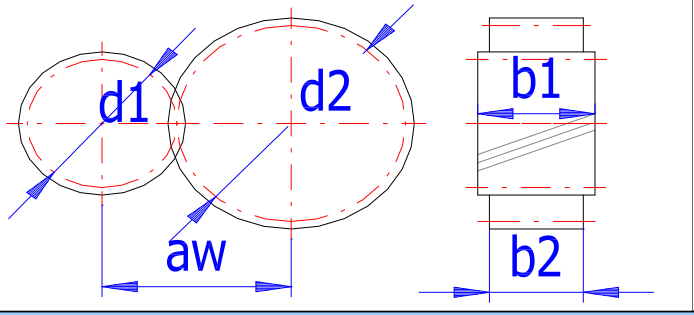


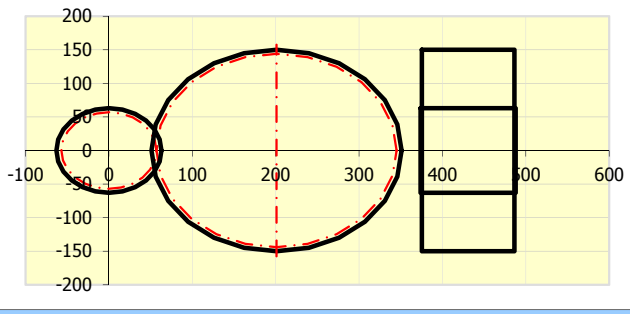


4.0 Design of a module and geometry of toothing



4.1	Number of teeth Pinion / Gear	z	19	48	
4.2	Normal pressure angle	α	20		[°]
4.3	Base helix angle	β	0		[°]
4.4	Setting of the ratio of the width of the pinion to its diameter				
4.5	The ratio of the pinion width to its diameter	$\Psi_{d\,/\,max}$	1.00	< 1.1	
4.6	Module / Standardized value	mn [mm]	6		[mm]
4.7	Reference diameter Pinion / Gear	d1/d2	114.00	288.00	[mm]
4.8	Recommended width of gearing		67 - 125		[mm]
4.9	Face width (Pinion / Gear)	b1/b2	114.00	111.00	[mm]
4.10	Working face width	bw	111		[mm]
4.11	The ratio of the pinion width to its diameter	$\Psi_{d\,/\,max}$	1.00	< 1.1	
4.12	Working center distance	aw	201.000		[mm]
4.13	Approximate weight of the gearing	m	65.235		[kg]
4.14	Minimum coefficient of safety	SH / SF	1.40	3.61	



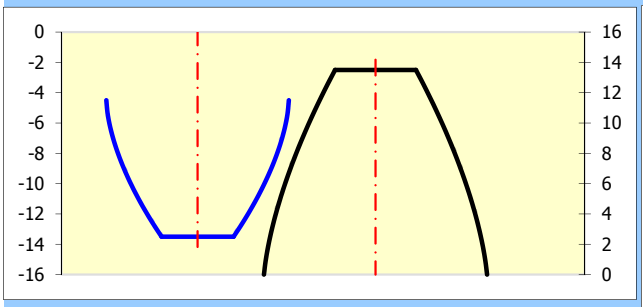


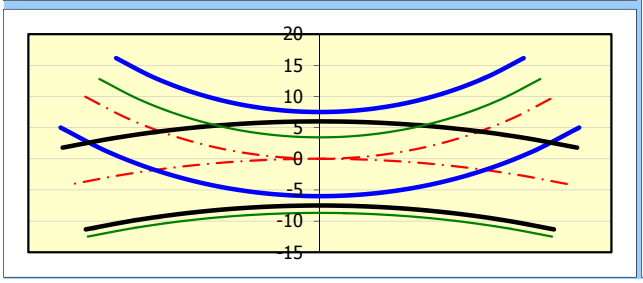
4.15 Normal backlash

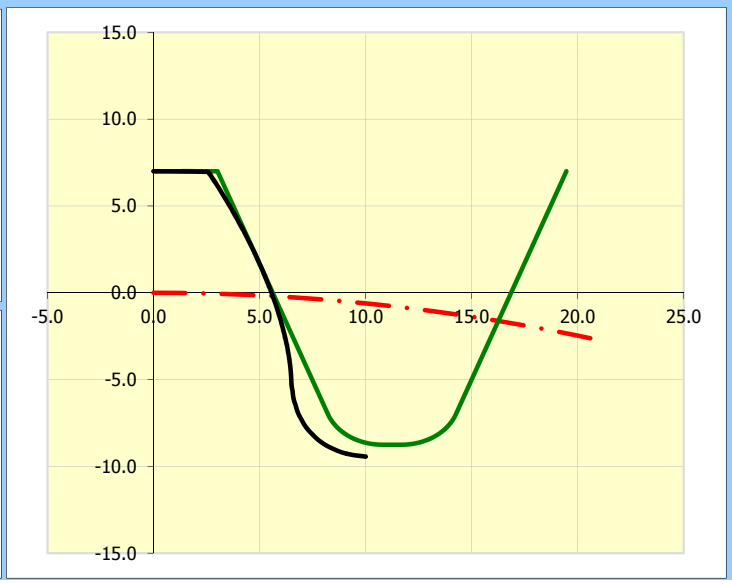
4.16	- Recommended min. | max. value		0.085	0.340	[mm]
4.17	- Selected normal backlash	jn	0.0000		[mm]

5.0 Correction of toothing (Addendum modification)

5.1	**Types**					
5.2	- Permissible undercutting of teeth (min. value)		-0.263	-0.708	Σ=	-0.971
5.3	- Preventing undercutting of teeth (min. value)		-0.105	-0.646	Σ=	-0.751
5.4	- Prevents tapering of teeth (min. value)		0.194	-1.683	Σ=	-1.488
5.5	Pinion addendum modification coefficient setting					
5.6	Addendum modification coefficient Pinion / Gear	x	0.0000	0.0000		[modul]
5.7	Sum of addendum modification coefficients | min. value	Σx	0.0000	> -1.372		[modul]
5.8	Transverse / Total contact ratio	εα/εγ	1.6456	1.6456		
5.9	Unit tooth thickness on the tip diameter	sa*	0.6886	0.7729		
5.10	Specific sliding on tooth root	ϑA1/ϑE2	-5.3758	-1.3551		
5.11	Specific sliding on tooth tip	ϑE1/ϑA2	0.5754	0.8432		
5.12	Sum of all specific slidings	Sum|ϑ|	8.1494			
5.13	Safety coefficient for surface durability	SH	1.40	1.64		
5.14	Safety coefficient for bending durability	SF	3.61	3.85		
5.15	Display of tooth and tool turn for:	Gear		0	[°]	

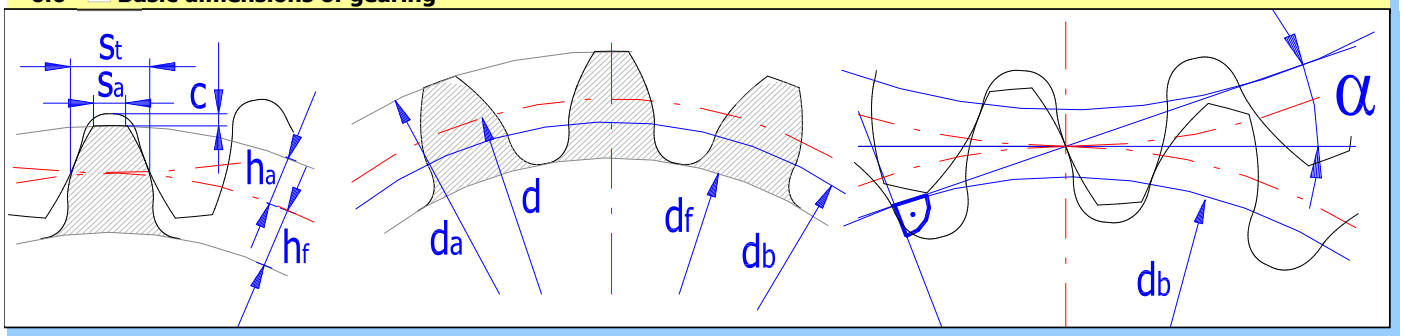






Results section

6.0 Basic dimensions of gearing

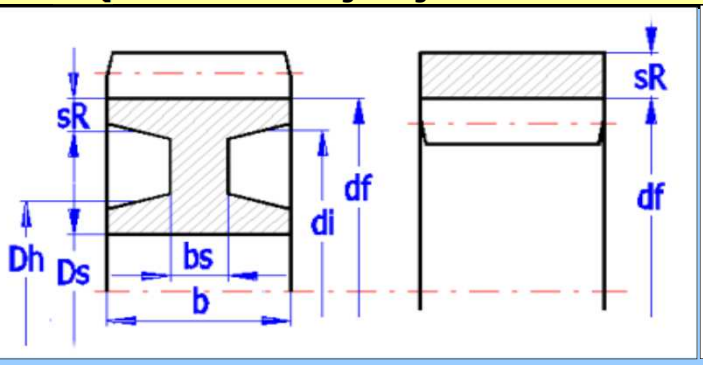


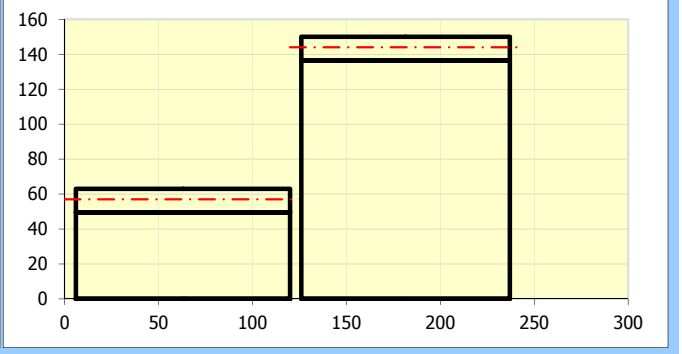
6.1	Number of teeth Pinion / Gear	z	19	48	
6.2	Face width (Pinion / Gear)	b	114	111	[mm]
6.3	Normal module	mn	6		[mm]
6.4	Transverse module	mt	6.0000		[mm]
6.5	Circular pitch	p	18.850		[mm]
6.6	Transverse circular pitch	pt	18.850		[mm]
6.7	Base circular pitch	ptb	17.713		[mm]
6.8	Center distance (pitch)	a	201.0000		[mm]
6.9	Center distance (production)	av	201.0000		[mm]
6.10	Center distance (working)	aw	201.0000		[mm]
6.11	Pressure angle	α	20.00		[°]
6.12	Transverse pressure angle	αt	20.0000		[°]
6.13	Pressure angle at the pitch cylinder	αwn	20.0000		[°]
6.14	Transverse pressure angle at the pitch cylinder	αwt	20.0000		[°]
6.15	Helix angle	β	0.00		[°]
6.16	Base helix angle	β b	0.0000		[°]
6.17	Tip diameter	da	126.0000	300.0000	[mm]
6.18	Reference diameter	d	114.0000	288.0000	[mm]
6.19	Base diameter	db	107.1250	270.6315	[mm]
6.20	Root diameter	df	99.0000	273.0000	[mm]
6.21	Operating pitch diameter	dw	114.0000	288.0000	[mm]
6.22	Addendum	ha	6.0000	6.0000	[mm]
6.23	Dedendum	hf	7.5000	7.5000	[mm]
6.24	Tooth thickness on the tip diameter	sna	4.1314	4.6375	[mm]
6.25	Tooth thickness on the tip diameter (transverse)	sta	4.1314	4.6375	[mm]
6.26	Tooth thickness on the pitch diameter	sn	9.4248	9.4248	[mm]
6.27	Tooth thickness on the pitch diameter (transverse)	st	9.4248	9.4248	[mm]
6.28	Tooth thickness on the root diameter	sb	9.6602	13.0028	[mm]
6.29	Unit tooth thickness on the tip diameter	sa*	0.6886	0.7729	[modul]
6.30	Unit correction	dY	0.0000		[modul]
6.31	Total unit correction	x1+x2	0.0000		[modul]
6.32	Addendum modification coefficient	x	0.0000	0.0000	[modul]
6.33	**Achieve the requested tip diameter with change the unit head clearance ca* [3.11]**				
6.34	Unit head clearance	ca*	0.2500	0.2500	[modul]
6.35	Tip diameter can be varied from-to	da min/max	123/126	297/300	[mm]
6.36	Requested tip diameter	da req	124.000	298.000	

7.0 Supplemental parameters of gearing

7.1	Number of teeth	z	19	48	
7.2	Virtual number of teeth of a helical gear	zn	19.000	48.000	
	Minimum number of teeth:				
7.3	- Permissible undercutting	zmin1	14	14	
7.4	- Without undercutting	zmin2	17	17	
7.5	- Without tapering	zmin3	22	22	

8.0 Qualitative indices of gearing





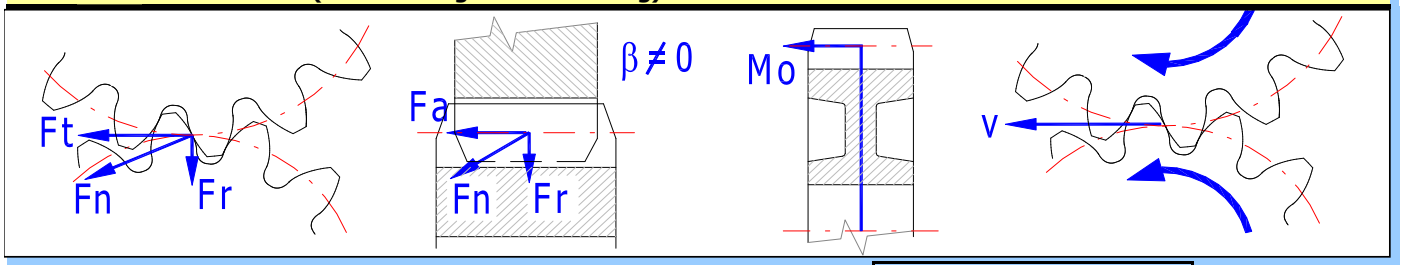
8.1	Transverse contact ratio / overlap ratio	ε_α | ε_β	1.6456	0.0000	
8.2	Total contact ratio	$\varepsilon\gamma$	1.6456		
8.3	**Definition of wheel dimensions**				
8.4	Recommended minimum diameter of the shaft	Ds_{min}	56.60	76.90	[mm]
8.5	Recommended minimum outer diameter of the hub	Dh_{min}	74.60	94.90	[mm]
8.6	Shaft diameter (max)	Ds_{max}	87.00	261.00	[mm]
8.7	Shaft diameter	Ds	0.00	0.00	[mm]
8.8	Outer diameter of the hub	Dh	0.00	0.00	[mm]
8.9	Coefficient of gear unloading (0 - 100)	di/df	0%	0%	[%df]
8.10	Central web thickness in % of the gear width (20-100)	bs	100%	100%	[%b]
8.11	Gear rim thickness	sR	49.50	136.50	[mm]
8.12	Central web thickness	bs	114.00	111.00	[mm]
8.13	Gear weight	m	8.918	56.317	[kg]
8.14	Relative individual gear mass per unit face width	m*	4.3138E-02	2.8430E-01	[kg/mm]
8.15	Moment of inertia	J	1.4109E-02	5.7782E-01	[kg*mm²]
8.16	Moment of inertia per unit face width	J*	1.2376E+02	5.2056E+03	[kg*mm²/mm]
8.17	Reduced mass of gear set	mred	0.037455076		[kg/mm]
8.18	Peripheral speed on the pitch diameter	v | vmax	5.97	< 15	[m/s]
8.19	Tangential load per unit tooth width	wt	150.94	158.06	[N/mm]
8.20	Resonance speed	nE1 [/min]	11333.14		[/min]
8.21	Resonance ratio / lover limit	N | NS	0.088	0.850	
8.22	Approximate weight of the gearing	m	65.2348		[kg]
8.23	Efficiency of the gearing	μ	99.05%		

9.0 Coefficients for safety calculation

9.1	**Setting the parameters for calculation**				
9.2	Dynamic factor KV (max. value)	KV_{max}	5.00	KV (B) ..2006	
9.3	Face load factor contact stress KHbeta (max. value)	$KH\beta_{max}$	5.00	Calculation ISO6336-1(2006)	
9.4	Reversals of the load (factor YA)		Without reversals (YA=1)		
9.5	Calculation of "Work hardening factor ZW"		Automatic		
9.6	Tooth profile modification (KHalfa, KHbeta)		Optimum profile modification		
9.7	Oil type (ZL)		Synthetic oil		
9.8	Used / Recomended lubricant viscosity	v50	178	178	[mm²/sec]
9.9	Tooth roughness (factor ZR)	Ra	Auto (0.8)	Auto (0.8)	[µm]
9.10	Roughness in the tooth root fillets (factor YR)	Ra	Auto (1.6)	Auto (1.6)	[µm]
9.11	**Common for the gearing**				
9.12	Theoretical single stiffness	c'_{th}	16.451		[N/(µm*mm)]
9.13	Stiffness of a tooth pair (single stiffness)	c'	12.832		[N/(µm*mm)]
9.14	Meshing stiffness per unit face width	$c_{\gamma\alpha}$	19.045		[N/(µm*mm)]
9.15	Application factor	KA	1.000		
9.16	Dynamic factor	KV	1.075		
9.17	Number of cycles	NK	1.20E+09	4.75E+08	
9.18	**For pitting safety calculation**				
9.19	Face load factor (contact stress)	$K_{H\beta}$	1.497		
9.20	Transverse load factor (contact stress)	$K_{H\alpha}$	1.000		
9.21	Total factor of additional loads	KH	1.610		
9.22	Elasticity factor	ZE	189.81		
9.23	Zone factor	ZH	2.495		
9.24	Helix angle factor	Z_β	1.000		
9.25	Contact ratio factor	Z_ε	0.886		
9.26	Work hardening factor	ZW	0.955	1.000	
9.27	Size factor	ZX	1.000	1.000	
9.28	Lubricant factor	ZL	1.154	1.154	
9.29	Peripheral speed factor	ZV	0.984	0.984	
9.30	Roughness factor affecting surface durability	ZR	0.968	0.968	
9.31	Life factor for contact stress	ZNT	0.916	0.946	n=∞; ZNT=0.85
9.32	Single pair tooth contact factor	ZB/ZD	1.080	1.000	
9.33	**For bending safety calculation**				
9.34	Face load factor (root stress)	$K_{F\beta}$	1.426		
9.35	Transverse load factor (root stress)	$K_{F\alpha}$	1.000		
9.36	Total factor of additional loads	KF	1.534		
9.37	Helix angle factor	Y_β	1.000		
9.38	Rim thickness factor	YB	1.000	1.000	
9.39	Deep tooth factor	YDT	1.000	1.000	
9.40	Notch sensitivity factor	Y_δ	0.992	0.996	
9.41	Size factor	YX	0.990	0.990	
9.42	Tooth-root surface factor	YR	1.004	1.004	
9.43	Alternating load factor	YA	1.000		
9.44	Production technology factor	YT	1.000		
9.45	Life factor for bending stress	YNT	0.887	0.904	n=∞; YNT=0.85
9.46	Stress correction factor	YST	1.000	1.000	
9.47	Form factor (bending)	YF	1.606	1.344	
9.48	Stress correction factor	YS	1.807	2.018	
9.49	Stress correction factor for gears with notches in fillets	YSg	2.015	2.363	

10.0	**Stress and safety coefficients**				
10.1	Safety coefficient for surface durability	SH	1.40	1.64	
10.2	Safety coefficient for bending durability	SF	3.61	3.85	
10.3	Safety in contact in one-time overloading	SHst	2.17	2.35	
10.4	Safety in bending in one-time overloading	SFst	7.24	7.54	
10.5	Variability coefficient for calculation of probability of a failure	vH/vF	0.06	0.1	
10.6	Probability of a failure	P	1.37		[%]
10.7	Nominal contact stress	SigmaH0	570.25		[MPa]
10.8	Contact stress	SigmaH	781.25	723.56	[MPa]
10.9	Pitting stress limit	SigmaHG	1095.62	1184.77	[MPa]
10.10	Permissible contact stress	SigmaHP	842.79	911.36	[MPa]
10.11	Nominal tooth-root stress	SigmaF0	71.10	68.25	[MPa]
10.12	Tooth-root stress	SigmaF	109.06	104.69	[MPa]
10.13	Tooth-root stress limit	SigmaFG	393.40	402.57	[MPa]
10.14	Permissible bending stress	SigmaFP	245.87	251.61	[MPa]
11.0	**Check dimensions of gearing, ISO 1328 system of accuracy**				
11.1	**Check dimensions of gearing**				
11.2	Number of measured teeth	zw	3	6	
11.3	Number of measured teeth	zw	3	6	
11.4	Chordal dimension	W	45.8786	101.4539	[mm]
11.5	Pin/Ball diameter	dt	10.5000	10.5000	[mm]
11.6	Pin/Ball diameter	dt	10.5000	10.5000	[mm]
11.7	Dimension over pins/balls	M	128.3642	303.0482	[mm]
11.8	**Achieve the requested W and M with change the addendum modification coefficient x1 and sumX**				
11.9	Chordal dimension can be varied from-to	Wmin/max	44.8/52.03	98.5/107.6	[mm]
11.10	Requested chordal dimension	W req	**77.000**	**260.000**	
11.11	Dimension over pins/balls can be varied from-to	Mmin/max	125.7/140.5	294.6/317.4	[mm]
11.12	Requested dimension over pins/balls	M req	**240.000**	**760.000**	
11.13	**Cylindrical gears - ISO 1328 system of accuracy - Part 1**				
11.14	Accuracy grade	Q	6.....(Ra max.= 0.8 / v max.= 15)		
11.15	Module	mn	6.000		[mm]
11.16	Reference diameter	d	114.000	288.000	[mm]
11.17	Face width	b	114.000	111.000	[mm]
11.18	Total contact ratio	εγ	1.6456		
11.19	Single pitch deviation	fpt	9.0	11.0	[µm]
11.20	Number of teeth for cumulative pitch deviation (1...z1,z2)	k	2	2	
11.21	Cumulative pitch deviation	Fpk	18.0	20.0	[µm]
11.22	Total cumulative pitch deviation	Fp	28.0	47.0	[µm]
11.23	Total profile deviation	Fα	13.0	17.0	[µm]
11.24	Total helix deviation	Fβ	17.0	18.0	[µm]
11.25	Tooth-to-tooth tangential composite deviation	f'i	20.0	23.0	[µm]
11.26	Total tangential composite deviation	F'i	47.0	70.0	[µm]
11.27	Profile form deviation	ffα	10.0	13.0	[µm]
11.28	Profile slope deviation	fHα	8.5	11.0	[µm]
11.29	Helix form deviation	ffβ	12.0	13.0	[µm]
11.30	Helix slope deviation	fHβ	12.0	13.0	[µm]
11.31	**Cylindrical gears ISO1328 - 2 system of accuracy**				
11.32	Tooth-to-tooth radial composite deviation	f''i	22.0	22.0	[µm]
11.33	Total radial composite deviation	F''i	44.0	60.0	[µm]
11.34	Run out tolerance	Fr	22.0	38.0	[µm]

12.0 Force conditions (forces acting on the toothing)



12.1	Tangential force	Ft	16754.39		[N]
12.2	Normal force	Fn	17829.65		[N]
12.3	Axial force	Fa	0.00		[N]
12.4	Radial force	Fr	6098.10		[N]
12.5	Bending moment	Mo	0.00	0.00	[Nm]
12.6	Peripheral speed on the pitch diameter	v | vmax	5.97	< 15	[m/s]
12.7	Tangential load per unit tooth width / Unit load	wt | wt*	150.94	25.16	[N/mm | MPa]

13.0 Parameters of the chosen material

13.1	Density	Ro	7870	7870	[kg/m^3]
13.2	Young's Modulus (Modulus of Elasticity)	E	206	206	[GPa]
13.3	Tensile Strength, Ultimate	Rm	785	785	[MPa]
13.4	Tensile Strength, Yield	Rp0.2	539	539	[MPa]
13.5	Poison's Ratio		0.3	0.3	
13.6	Contact Fatigue Limit	SHlim	1140	1140	[MPa]
13.7	Bending Fatigue Limit	SFlim	450	450	[MPa]
13.8	Tooth Hardness - Side	VHV	600	600	[HV]
13.9	Tooth Hardness - Core	JHV	250	250	[HV]
13.10	Base Number of Load Cycles in Contact	NHlim	1.00E+08	1.00E+08	
13.11	Wohler Curve Exponent for Contact	qH	10	10	
13.12	Base Number of Load Cycles in Bend	NFlim	3.00E+06	3.00E+06	
13.13	Wohler Curve Exponent for Bend	qF	6	6	
13.14	Abbreviation for material designation		IF	IF	

Additions section

14.0 Calculation of gearing for the given axis distance

14.1	Required axis distance / Standardized	aw [mm]	315	201.00	
14.2	**List of solutions**		ID. z1 z2 i β Sum X		
14.3	Combination of the teeth number		4. | 29 | 74 | 2.552 | 11.201 | 1.0688		
14.4	Number of teeth Pinion / Gear	z1/z2	29	74	
14.5	Transmission ratio / Deviation	i	2.5517	2.03%	
14.6	**A. Change of the addendum modification**				
14.7	Base helix angle	β	0.0000		[°]
14.8	Total unit correction	Sum x	1.06878		[modul]
14.9	Distribution of correction		In reverse transmission ratio		
14.10	Type of distribution of corrections to the pinion and gear	x	0.3009	0.7679	[modul]
14.11	Press the button for transmitting values in to calculation				
14.12	**B. By a change of the helix angle**				
14.13	Base helix angle	β	11.2008		[°]
14.14	Total unit correction	Sum x	0.0000		[modul]
14.15	Press the button for transmitting values in to calculation				

15.0	**Power, warming-up, gearbox surface**					
15.1	Ambient air temperature		20.00		[°C]	
15.2	Maximum oil temperature		60.00		[°C]	
15.3	Coefficient of heat dissipation		10.00		[W/m2/K]	
15.4	Power losses		0.95		[kW]	
15.5	Gearbox surface (min.)		2.37		[m2]	
16.0	**Preliminary design of shaft diameters (steel)**					
16.1	**Recommended shaft diameter for:**		A...Common structural steel (Rm = 500)			
16.2	- Main power-transmitting shafts	DA	77.50	104.80	[mm]	
16.3	- Small, short shafts	DB	63.80	86.30	[mm]	
17.0	**Approximate module calculation from the existing gear**					
17.1	Number of teeth	z	20			
17.2	Tip diameter	da	34.00		[mm]	
17.3	Distance between teeth edges	u	0.00		[mm]	
17.4	Helix angle	β	10.00		[°]	
17.5	Module of tooth	mn	1.52		[mm]	
18.0	**Auxiliary calculations, calculation KHbeta, calculation YSg**					
18.1	Transmission ratio calculation using the number of teeth	z1,z2 = i	17	18	= 1.059	
18.2	Transmission ratio calculation using the speed	n1,n2 = i	700.0	350.0	= 2.000	
18.3	Power calculation using the pinion speed and torque moment	Mk1,n1=Pw1	1600.0	760.0	= 127.33	
18.4	**Definition of the factor KHbeta (method C)**					
18.5	Mean transverse tangential load at the reference circle	Fm	18018.97		[N]	
18.6	Shaft diameter (pinion)	dsh	74.80		[mm]	
18.7	Gear type		Spur and single helical gears			
18.8	Constant of the pinion position (with/without stiffening)	K'	-0.48	B. with stiffening		
18.9	Pitch of bearings	l	159.6		[mm]	
18.10	Center of pinion distance (s/l < 0.3)	s	0.0		[mm]	
18.11	Component of equivalent misatignment (pinion)	fsh	3.6		[µm]	
18.12	Component of equivalent misatignment (wheel)	fsh2	0.0		[µm]	
18.13	Mesh misalignment	fma	17.6		[µm]	
18.14	Deformation of the gear case	fca	0.0		[µm]	
18.15	Displacements of the bearings	fbe	0.0		[µm]	
18.16	Helix modification	B1,B2	5. Helix correction+central crowning			
18.17	Initial equivalent misalignment (before running-in)	Fβx	11.4	3. Favourable position of the contact pa		
18.18	Running-in allowance (equivalent misalignment)	yβ	1.7		[µm]	
18.19	Effective equivalent misalignment (after running-in)	Fβy	9.7		[µm]	
18.20	Face load factor (contact stress)	$K_{H\beta}$	**1.497**			
18.21	**Stress correction factor for gears with notches in fillets YSg**					
18.22	Maximum depth of grinding notch	tg	0.200	0.300	[mm]	
18.23	Radius of grinding notch	rg	4.000	3.000	[mm]	
18.24	Valid for ... (tg/rg)^0.5 < 2.0	$(tg/rg)^{0.5}$	0.224	0.316		
18.25	Stress correction factor for gears with notches in fillets	YSg	**2.015**	**2.363**		

19.0 Calculation of SHlim and SFlim based on ISO 6336-5, proposal of material properties

19.1	Material type				
19.2	11. Flame or induction hardened wrought and cast steels () [IF]				
19.3	Requirements for material quality and heat treatment		ML		
19.4	Surface hardness of calculated material (hardness range from - to)		552	HV	485 - 615
19.5	Contact Fatigue Limit	SHlim	1011	[MPa]	
19.6	Bending Fatigue Limit	SFlim	244	[MPa]	
19.7	Density	Ro	7870	[kg/m^3]	
19.8	Young's Modulus (Modulus of Elasticity)	E	206	[GPa]	
19.9	Tensile Strength, Ultimate	Rm	762	[MPa]	
19.10	Tensile Strength, Yield	Rp(0.2)	419	[MPa]	
19.11	Poison's Ratio		0.30		
19.12	Base Number of Load Cycles in Contact	NHlim	5.00E+07		
19.13	Wohler Curve Exponent for Contact	qH	13.00		
19.14	Maximum value	ZNT	1.60		
19.15	Base Number of Load Cycles in Bend	NFlim	3.00E+06		
19.16	Wohler Curve Exponent for Bend	qF	8.70		
19.17	Maximum value	YNT	2.50		
19.18	Abbreviation for material designation		IF	IF	
19.19	Material name in the material table		Flame or induction hardened wrought and cast steels (Rm=762 MPa		
19.20	Transfer to a table of materials, to line number:		1		

20.0 Graphical output, CAD systems

20.1	2D drawing output to:	DXF File			
20.2	2D Drawing scale	Automatic			
20.3	Detail:	Pinion			
			α [°]...	30	β [°]... 30
20.4	**Detailed drawing of tooth and wheel**				a [modul]... 1
20.5	Number of drawn teeth		4		
20.6	Number of points of tooth tip		20		
20.7	Number of points of tooth flank		100		
20.8	Rolling (turning) of a tool between the bite		0.5	[°]	Drawing without axes
20.9	Number of tooth copies in the picture of engagement check		20		

20.10	**Text description (Information for BOM)**	**Pinion**
	Row 1 (BOM attribute 1)	Spur gear - Pinion
	Row 2 (BOM attribute 2)	z1=19, mn=6, beta=0
	Row 3 (BOM attribute 3)	Material: T2(683/7-70)
		Gear
	Row 1 (BOM attribute 1)	Spur gear - Gear
	Row 2 (BOM attribute 2)	z2=48, mn=6, beta=0
	Row 3 (BOM attribute 3)	Material: T2(683/7-70)

20.11	Table of parameters	Table of pinion parameters