https://www.tribology-abc.com/calculators/e2_6b.htm

TOOTH bending strength (ISO 6336-3)

	pinion	gear	
number of teeth z >= 12	18	15	
profile shift coeff. $x=V/m_n$= 0...0.5	0	0	
module m		10	mm
pressure angle (ISO)		20	deg.
face width b		2	mm
permissible tooth-root stress test gear $\sigma_{F\ lim}$ (table)		363.4	MPa
factor $\sigma_{FP} / \sigma_{F\ lim} = (Y_{ST} \cdot Y_{NT} \cdot Y_\delta \cdot Y_R \cdot Z_X) / S_F$		1	
load factor $\sigma_F / \sigma_{F0} = K_A \cdot K_v \cdot K_{F\alpha} \cdot K_{F\beta}$		1	

Solve Reset

	pinion		gear	
diameter d=m·z	180	mm	150	mm
diameter roll circle d_w	179.9999	mm	149.9999	mm
form factor Y_{Fa}	3.025000		3.320000	
stress correction factor Y_{Sa}	1.58		1.542	

center distance a			165	mm
contact ratio ε_α			03558883	
contact ratio factor Y_ε			0.748140	
permissible tooth-root stress σ_{FP}			363.4	MPa
roll pressure angle α_w			20	deg.
Max tangential force $F_{t\ max}$	2.032	**kN**	1.897	**kN**
Max torque pinion $T_{max}=F_{t\ max} \cdot d_w / 2$	182.93	**Nm**		

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Friction Coeficient	0,3	
Brake Normal Force (Measured)	6.322	N
Brake Surface	45,480	mm2
Real Normal Pressure	139,0	Mpa
Real Tangential Force (Friction)	1,897	KN
Tangential Force FtMax (Set up)	1,897	KN
Max Expected Tooth-Root Stress σFP	363,4	Mpa
Maximum VM Stress Measured at tooth	368,7	Mpa
Maximum Deviation	1,4%	