

CALCULATION SHEET (FOR LATERAL MOVEMENT OF 4 mm)**INPUTS**

SPRING TYPE		OUTER	INNER	SET
NOMINAL DIAMETER OF WIRE	d [mm]	42.50	31.50	-
MEAN DIAMETER	D [mm]	267.00	173.00	-
NOMINAL FREE LENGTH	L0 [mm]	310.00	310.00	310
VERTICAL STIFFNESS	Kv [N/mm]			958
LATERAL STIFFNESS	Kl [N/mm]			984±15%

OUTPUTS

SPRING TYPE		OUTER	INNER	SET
NUMBER OF ACTIVE COILS	n [-]			
NUMBER OF INACTIVE COILS	nz [-]			
NUMBER OF GROUND END	nb [-]			
OUTSIDE DIAMETER	De [mm]			
INSIDE DIAMETER	Di [mm]			
GAP BETWEEN SPRING	nt [-]			
TOTAL NO. OF COILS	l [mm]			
EXTENDED LENGTH OF SPRING				
MASS OF BAR	mb [kg]			
MASS OF SPRING	ms [kg]			
PITCH	m [mm]			
SPRING INDEX	w [-]			
STRESS CONCENTRATION FACTOR	k [-]			
FUNDAMENTAL FREQUENCY	fe [Hz]			
SPRING RATE	R [N/mm]			
FLEXIBILITY	P [mm/10kN]			
SUM OF MINIMUM GAPS	Sa [mm]			
INCREASE OF OUTSIDE DIAMETER	ΔDe [mm]			
SOLID LENGTH	Lc [mm]			
MINIMUM PERMISSIBLE LENGTH	Ln [mm]			
DEFLECTION @ AW0	L0 [mm]			
DEFLECTION @ AW2	L1 [mm]			
DEFLECTION @ AW2 *1.3	L2 [mm]			
DEFLECTION @ AW3	L3 [mm]			
DEFLECTION @ AW3 *1.3	L4 [mm]			

DATA

SPRING TYPE	OUTER	INNER
Material	52CrMoV4	51CrV4
E [N/mm ²]	206000	206000
G [N/mm ²]	78500	78500
G/E [-]	0.38	0.38
δ [kg/dm ³]	7.85	7.85

FORCE	SET
AW2[N]	67200
AW3[N]	72000

FORCE	DEFLECTION
AW0	67200
AW3[N]	72000

OUTER

LOADING	FORCE F[N]	DEFLECTION s[mm]	LENGTH L[mm]	UNCOR. STRESS σ [MPa]	COR. STRESS σ [MPa]
1.3*AW3					
0.7*AW2					
1.3*AW2					

INNER

LOADING	FORCE F[N]	DEFLECTION s[mm]	LENGTH L[mm]	UNCOR. STRESS σ [MPa]	COR. STRESS σ [MPa]
1.3*AW3					
0.7*AW2					
1.3*AW2					

GOODMAN DIAGRAM FOR OUTER SPRING (0.7*AW2 to 1.3*AW2)**GOODMAN DIAGRAM FOR INNER SPRING (0.7*AW2 to 1.3*AW2)**

CALCULATION SHEET (FOR LATERAL MOVEMENT OF 10 mm)

INPUTS

SPRING TYPE		OUTER	INNER	SET
NOMINAL DIAMETER OF WIRE	d [mm]	42.50	31.50	-
MEAN DIAMETER	D [mm]	267.00	173.00	-
NOMINAL FREE LENGTH	L0 [mm]	310.00	310.00	310
VERTICAL STIFFNESS	Kv [N/mm]			958
LATERAL STIFFNESS	Kl [N/mm]			984±15%

OUTPUTS

SPRING TYPE		OUTER	INNER	SET
NUMBER OF ACTIVE COILS	n [-]			
NUMBER OF INACTIVE COILS	nz [-]			
NUMBER OF GROUND END	nb [-]			
OUTSIDE DIAMETER	De [mm]			
INSIDE DIAMETER	Di [mm]			
GAP BETWEEN SPRING	nt [-]			
TOTAL NO. OF COILS	l [mm]			
EXTENDED LENGTH OF SPRING				
MASS OF BAR	mb [kg]			
MASS OF SPRING	ms [kg]			
PITCH	m [mm]			
SPRING INDEX	w [-]			
STRESS CONCENTRATION FACTOR	k [-]			
FUNDAMENTAL FREQUENCY	fe [Hz]			
SPRING RATE	R [N/mm]			
FLEXIBILITY	P [mm/10kN]			
SUM OF MINIMUM GAPS	Sa [mm]			
INCREASE OF OUTSIDE DIAMETER	ΔDe [mm]			
SOLID LENGTH	Lc [mm]			
MINIMUM PERMISSIBLE LENGTH	Ln [mm]			
DEFLECTION @ AW0	L0 [mm]			
DEFLECTION @ AW2	L1 [mm]			
DEFLECTION @ AW2 *1.3	L2 [mm]			
DEFLECTION @ AW3	L3 [mm]			
DEFLECTION @ AW3 *1.3	L4 [mm]			

DATA

SPRING TYPE	OUTER	INNER
Material	52CrMoV4	51CrV4
E [N/mm2]	206000	206000
G [N/mm2]	78500	78500
G/E [-]	0.38	0.38
δ [kg/dm3]	7.85	7.85

FORCE	SET
AW2[N]	67200
AW3[N]	72000

OUTER

LOADING	FORCE F[N]	DEFLECTION s[mm]	LENGTH L[mm]	UNCOR. STRESS σ [MPa]	COR. STRESS σ [MPa]
1.3*AW3					
0.7*AW2					
1.3*AW2					

INNER

LOADING	FORCE F[N]	DEFLECTION s[mm]	LENGTH L[mm]	UNCOR. STRESS σ [MPa]	COR. STRESS σ [MPa]
1.3*AW3					
0.7*AW2					
1.3*AW2					

GOODMAN DIAGRAM FOR OUTER SPRING (0.7*AW2 to 1.3*AW2)

GOODMAN DIAGRAM FOR INNER SPRING (0.7*AW2 to 1.3*AW2)