



Calculation of shaped couplings of shafts with hubs

i Calculation: A = OK; B = Error; C = OK; D = Error

ii Project information

1.0 Common input data

1.1 Calculation units	SI Units (N, mm, kW...)		1.16 Shaft material (min. tensile strength) [hardness]	
1.2 Transferred power	P	9.60 [kW]	1.17 C...Refined and Alloyed Steel (600) [HB 300-350 HRC 33-38]	<input checked="" type="checkbox"/>
1.3 Shaft speed	n	116.5 [/min]	1.18 Ultimate tensile strength	S_{Umin} 600 [MPa]
1.4 Torque	T	786.96 [Nm]	1.19 Permissible pressure	ρ_A 200 [MPa]
1.5 Loading conditions, operational parameters			1.20 Permitted stress in shear	τ_A 275 [MPa]
1.6 Power source	Light shock		1.21 Hub material (min. tensile strength) [hardness]	
1.7 Loading conditions	Light shock		1.22 G...Cast iron with spherical graphite (400)	<input checked="" type="checkbox"/>
1.8 Character of operation	Unidirectional		1.23 Ultimate tensile strength	S_{Umin} 400 [MPa]
1.9 Number of start-ups in thousands	100		1.24 Permissible pressure	ρ_A 135 [MPa]
1.10 Desired service life of the coupling	20000 [h]		1.25 Permitted stress in shear	τ_A 140 [MPa]
1.11 Coupling type, preliminary design of the shaft diameter			1.26 Operational coefficients	
1.12 Coupling design	Fixed connection		1.27 Coupling design factor	K_d 1.0
1.13 Hollow shaft inner diameter	d_h	0.000 [mm]	1.28 Application factor	K_a 1.3
1.14 Desired safety	S_r	1.70	1.29 Fatigue-life factor	K_f 0.5
1.15 Shaft minimum diameter	d_{min}	40.1 [mm]	1.30 Wear life factor	K_w 1.0

A Parallel side keys

2.0 Coupling parameters, key material, dimensional design

3.0 Strength checks of the coupling

B Woodruff's keys

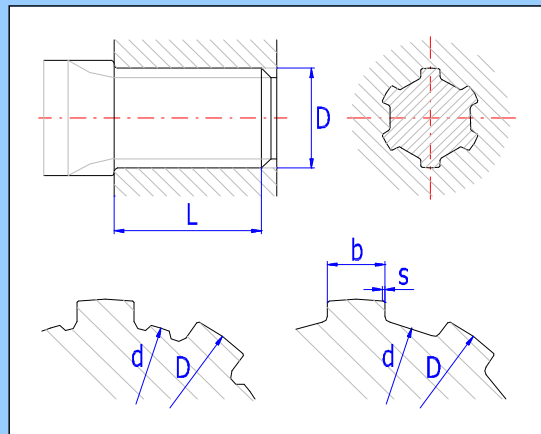
4.0 Coupling parameters, key material, dimensional design

5.0 Strength checks of the coupling

C Straight-sided splines

6.0 Coupling parameters, dimensional design

6.1 Coupling parameters		
6.2 Splines type	E ... ISO 14 - Medium series	
6.3 Load distribution factor	K_L	0.75
6.4 Total service factor	K_S	2.60 <input checked="" type="checkbox"/>
6.5 Design of coupling dimensions		
6.6 Splines for diameters		14 ~ 125 [mm]
6.7 Min. shaft diameter	d_{min}	40.1 [mm]
6.8 Spline		82 - 10x72x82
6.9 Spline outer diameter	D	82 [mm]
6.10 Spline inner diameter	d	72 [mm]
6.11 Number of grooves	n	10
6.12 Tooth width	b	12 [mm]
6.13 Chamfer (radius)	s	0.5 [mm]
6.14 Min. functional spline length	L_{min}	22.4 [mm]
6.15 Chosen spline length	L	69.000 [mm] <input type="checkbox"/>



7.0 Strength checks of the coupling

D Involute splines

8.0 Coupling parameters, dimensional design

9.0 Strength checks of the coupling

Additions section

10.0 Comparative table

11.0 Graphical output, CAD systems