Flat Belt Drive Design Calculator		
Blue cells editable		
diameter of the small pulley d =	0.355	m
radius small pulley r =	0.178	m
diameter of the large pulley D =	0.500	m
cross-sectional area of the belt A =	0.000350	m^2
distance between the pulley centers C =	1.800	m
belt speed (velocity) V =	1500.000	rev/min
belt speed (velocity) V =	27.882	m/s
maximum permissible belt stress σ_{max} =	11000000	N/m^2
belt tension in the slack side F_2 =	2.00	N
belt tension in the tight side F_1 =	60.00	N
mass per unit of belt m =	0.00350	kg/m^3
Results		
Eq. 1, angle of contact belt - small pulley θ_d =	3.061	rad
Eq. 1, angle of contact belt - small pulley θ_d =	175.383	deg
Eq. 2, angle of contact belt - large pulley θ_D =	3.222	rad
Eq. 2, angle of contact belt - large pulley θ_D =	184.617	deg
Eq.3, length of the belt L =	4.946	m
Eq. 4, Power transmitted P =	1.617e+3	Watts
Eq. 5, torque T =	10.295	N-m
Eq. 7, centrifugal forces F_c =	7875.000	N

Required cross-sectional area Calculator		
belt tension in the tight side F_1 =	12000.000	N
belt tension in the slack side F_2 =	2.000	N
stress belt tight side σ_1 =	2.300e+008	N/m^2
stress belt slack side σ_2 =	3.000e+002	N/m^2
Results		
required cross-sectional area from stress A =	5.217e-5	m^2
required cross-sectional area from stress A =	0.0522	mm^2

Power capacity of belt Calculator		
diameter of the large pulley D =	0.500	m
diameter of the small pulley d =	0.355	m
radius small pulley r =	0.178	m
distance between the pulley centers C =	1.500	m
flat belt thickness t =	0.00350	m
flat belt width w =	0.10000	m
belt speed (velocity) V =	1500.00	rev/min
coefficient of friction μ =	0.800	-
density of belt ρ =	1100.000	kg/m^3
maximum permissible belt stress σ_{max} =	11000000	N/m^3
Results		
Eq. 1, angle of contact belt - small pulley θ_d =	3.0449	rad
Eq. 1, angle of contact belt - small pulley θ_d =	174.459	deg
Eq. 2, angle of contact belt - large pulley θ_D =	3.061	rad
Eq. 2, angle of contact belt - large pulley θ_D =	175.383	deg
flat belt cross section area A =	3.500e-4	m^2
belt tension in the tight side F_1 =	3850.00	N
belt speed (velocity) V =	27.882	m/s
mass per unit length m =	0.385	kg/m
centrifugal forces F_c =	299.293	N
Eq. 7a, belt tension on slack side F_2 =	610.045	N
Eq. 4, power capacity P =	90335.25	Watts