

SERVICE FACTOR (Fs)

Table - 8

SPEED INCREASING DRIVES		TYPES OF PRIME MOVERS					
		Soft Starts			Heavy Starts		
For Speed increasing Drives, Multiply Fs by : 1.00 for speed Ratio 1.00 to 1.24 1.05 for speed Ratio 1.25 to 1.74 1.11 for speed Ratio 1.75 to 2.49 1.18 for speed Ratio 2.50 to 3.49 1.25 for speed Ratio 3.50 and over		Soft Starts Electric Motors A.C. - Star - Delta start D.C. - Shunt wound I.C.-Engines with 4 or more cylinders All prime movers fitted with Centrifugal clutch, fluid or Powder Couplings			Heavy Starts Electric Motors A.C. - Direct - on-line start D.C. - Series and compound wound I.C.-Engines with less than 4 cylinders Line Shafts, clutches.		
TYRES OF DRIVEN MACHINES		Operational Hours Per Day			Operational Hours Per Day		
		Up to 10 hrs.	Over 10 to 16 hrs	Over 16 hrs	Up to 10 hrs.	Over 10 to 16 hrs	Over 16 hrs
Light Duty	Agitators (uniform density), Blowers, Exhausters, Centrifugal Pumps and Compressors, fans upto 7.5 Kw and Belt conveyors (light duty)	1.0	1.1	1.2	1.1	1.2	1.3
Medium Duty	Agitators and Mixers (variable density), Blowers, Exhausters, and fans and dough mixers over 7.5 Kw, positive displacement rotary pumps and compressors, Belt conveyors (Not uniformly loaded), generators, lineshafts, laundry machinery, machine tools, punches, presses and shears, printing machinery, revolving and vibrating screens.	1.1	1.2	1.3	1.2	1.3	1.4
Heavy Duty	Brick Machinery, bucket elevators, exciters, reciprocating compressors and pumps, Conveyors (drag-pan-screw), hammer mills, paper mill beaters, pulverizers, saw mill and wood working machinery. Textile machinery, Rubber machinery.	1.2	1.3	1.4	1.4	1.5	1.6
Extra Heavy Duty	Crushers (gyratory-law-roll), Mills (Ball-rod-tube), hoists Rubber (calenders, extruder mills)	1.3	1.4	1.5	1.5	1.6	1.8

DRIVE DESIGN PROCEDURE FOR V-BELTS

To obtain the best performance from V-Belts the drive should be designed correctly. The procedure	
STEP - 1	: Calculate speed Ratio, SR Speed Ratio, SR = $\frac{\text{rpm of faster shaft}}{\text{rpm of slower shaft}}$
STEP - 2	: Select Service Factor, Fs Service factor is obtained from Table-8 (Page - 6)
STEP - 3	: Calculate Design Power, Pd Design Power, Pd = Driver Power, P x Service Factor, Fs
STEP - 4	: Select Belt Cross Section Belt cross section is obtained from Figure 1 and 2 (Page 3) When the point of intersection falls on or near the diverging line, feasibility of both cross sections should be checked.
STEP - 5	: Calculate Belt Pitch Length, (Lp) Belt Pitch Length, $L_p = 2C + 1.57 (D+d) + \frac{(D-d)^2}{4C}$ where D & d are pitch diameters of larger and smaller pulleys respectively.
STEP - 6	: Determine Power Rating, R Refer Table - 5 to determine the Power Rating, R Power Rating per belt, R = Rated power + Additional power for speed Ratio (SR)
STEP - 7	: Find Arc of contact correction Factor, Fc Refer to Table - 7 (Page 5)
STEP - 8	: Find Power Correction Factor for Belt Length, FL
STEP - 9	: Find Number of Belts, N : Number of belts, $N = \frac{P_d}{R \times F_L \times F_c}$: Use next whole number if the number of belts is in a fraction.