



Selection Methods:

D-Flex, PARA-FLEX, GRID-LIGN, GEAR, POLY-DISC, & Rigid Couplings

HP/100 METHOD

Step 1: Obtain required service factor from Service Factor Tables on pages PT1-70 and PT1-71.

Step 2: Determine the application HP per 100 RPM:

$$\text{HP} / 100 \text{ RPM} = \frac{\text{Motor HP} \times 100 \times \text{Service Factor}}{\text{Coupling RPM}}$$

Step 3: From Rating Tables, find a rating equal to or greater than the HP/100 RPM. Note coupling size from lefthand column.

Step 4: Check maximum RPM capability.

Step 5: Check maximum bore capacity. If maximum bore is exceeded, move to larger size with adequate bore-but be sure maximum RPM of coupling is not exceeded

NOTE: If spring set motor brake is used, and brake HP is greater than prime mover, use brake HP in place of motor HP.

TORQUE METHOD:

Step 1: Obtain required service factor from Service Factor Tables on pages PT1-70 and PT1-71

Step 2: Determine torque required for application.

$$\text{Torque (In - lbs)} = \frac{63025 \times \text{HP} \times \text{SF}}{\text{Coupling RPM}}$$

Step 3: From Rating Tables, find a rating equal to or greater than the torque. Note coupling size from lefthand column.

Step 4: Check maximum RPM capability

Step 5: Check maximum bore capacity. If maximum bore is exceeded, move to larger size with adequate bore-but be sure maximum RPM of coupling is not exceeded

NOTE: If system peak torque is known and is non-reversing, start at Step 3. If system peak torque is known and reversing, multiply by 2.0 and start at Step 3

CHAIN COUPLINGS

DESIGN HP METHOD:

Step1: Obtain required service factor from Service Factor Tables on pages PT1-70 and PT1-71

Step 2: Determine application HP:
HP Design = HP x SF

Step 3: From rating tables, select appropriate coupling RPM column and find a rating equal to or greater than HP design. Note coupling size from left hand column.

Step 4: Check maximum RPM capability

Step 5: Check maximum bore capacity. If maximum bore is exceeded, move to larger size with adequate bore-but be sure maximum RPM of coupling is not exceeded.





ENGINEERING/ TECHNICAL



Service Factors

Table 1

FACTOR Δ

APPLICATION (READ FOOTNOTES)	PARA - FLEX/ POLY- DISC	GRID CHAIN RIGID	D-FLEX	GEAR
AGITATORS				
Paddle or Propeller (Vert. or Horiz.)	1.00	1.00	1.25	1.00
Screw	1.00	1.00	1.25	1.00
BLOWERS				
Centrifugal	1.00	1.00	1.25	1.00
Lobe	1.50	1.25	1.50	1.25
Vane	1.00	1.25	1.25	1.25
BREWING & DISTILLING				
Bottling Machinery, Brew Kettle, Cooker (Continuous Duty), Mash Tub	1.00	1.00	1.25	1.00
Scale Hopper-Frequent Starting Peaks	1.50	1.75	◆	1.75
CAN FILLING MACHINE	1.00	1.00	1.25	1.00
CAR DUMPER	1.50	2.50	2.00	2.50
CAR PULLER	1.50	1.50	1.50	1.50
CLARIFIER	1.00	1.00	1.25	1.00
CLASSIFIER	1.00	1.00	1.25	1.00
CLAY-WORKING MACHINES				
Brick Press, Briquette Mach., Clay Work- ing Mach., Pug Mill	1.50	1.50	1.50	1.75
COMPRESSORS**				
Centrifugal, Lobe, Screw	1.00	1.00	1.25	1.00
Lobe, Rotary	2.00	1.25	2.00	1.25
Reciprocating				
1 cylinder - single acting	3.50	3.00	◆	3.00
1 cylinder - double acting	3.00	3.00	◆	3.00
2 cylinder - single acting	3.00	3.00	◆	3.00
2 cylinder - double acting	2.50	3.00	◆	3.00
3 cl. or more - single acting	2.50	3.00	◆	3.00
3 cl. or more - double acting	2.00	2.00	◆	2.00
CONVEYORS				
Apron, Assembly, Belt, Chain, Flight, Oven	1.00	1.00	1.25	1.00
Reciprocating	2.50	3.00	◆	3.00
Screw	1.00	1.00	1.25	1.00
CRANES AND HOISTS				
Main Hoist-Medium Duty	1.50	1.75	1.50	1.75
Main Hoist-Heavy Duty	2.00	2.00	2.00	2.00
Skip Hoist, Travel Motion, Trolley Motion, Slope	1.50	1.75	1.00	1.75
CRUSHERS				
Cane	2.00	2.00	2.00	2.00
Gyratory	2.50	2.50	◆	2.50
DREDGES				
Cable Reel, Screen Drive, Stacker	1.50	1.75	1.50	1.75
Conveyor	1.50	1.75	1.50	1.25
Cutter Head Drive, Jig Drive	2.50	2.00	2.00	2.00
Pump, Utility Winch	1.50	1.75	1.50	1.50
DYNAMOMETER	1.00	1.00	1.25	1.00
ELEVATORS				
Bucket, Freight	2.00	1.25	2.00	1.25
EXCITER	1.00	1.00	1.25	1.00
FANS				
Centrifugal	1.00	1.00	1.25	1.00
Cooling Tower	2.00	2.00	2.00	2.00
Heavy Duty (Forced Draft) and Induced Draft	1.50	1.50	2.00	1.50
Light	1.00	1.00	1.25	1.00
Propeller Indoor	1.50	1.50	2.00	1.50
FOOD INDUSTRY				
Beet Slicer	1.50	1.75	1.50	1.75
Cereal Cooker	1.00	1.25	1.25	1.25
Dough Mixer, Meat Grinder	1.50	1.75	1.50	1.75

FACTOR Δ

APPLICATION (READ FOOTNOTES)	PARA - FLEX/ POLY- DISC	GRID CHAIN RIGID	D-FLEX	GEAR
GENERATORS				
Even Load	1.00	1.00	1.25	1.00
Hoist or Railway Service	1.50	1.50	1.50	1.50
Welder Load	2.00	2.00	2.00	2.00
GRIZZLY	2.00	2.00	2.00	2.00
KILN	2.00	2.00	2.00	2.00
LAUNDRY MACHINES				
Tumbler Washer	2.00	2.00	2.00	2.00
LINE SHAFTS				
Driving Processing Machinery	1.00	1.50	1.25	1.50
Light	1.00	1.50	1.25	1.50
LUMBER INDUSTRY				
Band Resaw	1.50	1.50	1.50	1.50
Circular Resaw	1.50	1.50	1.50	1.75
Edger Head Rig, Hog, Log Haul	2.00	2.00	2.00	2.00
Planer	1.50	1.75	1.50	1.75
Rolls Non-Reversing	1.50	1.25	1.50	1.25
Rolls Reversing	2.00	2.00	2.00	2.00
Sawdust Conveyor	1.00	1.25	1.25	1.25
Slab Conveyor	1.50	1.75	1.50	1.75
Sorting Table	1.50	1.75	1.50	1.50
MACHINE TOOLS				
Auxiliary	1.00	1.00	1.25	1.00
Main Drive	1.50	1.75	1.50	1.50
Notching Press, Planer (Reversing), Plate Planer, Punch Press	1.50	1.75	1.50	1.75
Traverse	1.00	1.00	1.25	1.00
METAL FORMING MACHINES				
Draw Bench, Carriage, Main Drive, Extruder	2.00	2.00	1.50	2.00
Wire Drawing, Flattening Machine	2.00	2.00	1.50	1.75
MILLS Rotary Type				
Ball or Pebble direct or on LS Shaft Gear Reducer	2.50	2.00	2.00	2.00
on HS Shaft Gear Reducer	2.50	2.00	2.00	2.00
Dryer and Cooler	1.50	1.75	1.50	1.75
Rod or Tube direct or on LS Shaft Gear Reducer	2.50	2.00	2.00	2.00
on HS Shaft Gear Reducer	2.50	2.00	2.00	2.00
on HS Shaft Gear Reducer	2.00	1.50	1.50	1.50
Tumbling Barrel	1.50	1.75	2.00	1.75
MIXERS				
Concrete (Continuous or intermittent)	1.50	1.75	1.50	1.75
Muller-Simpson type	1.50	1.75	1.50	1.50
OIL INDUSTRY				
Chiller	1.00	1.25	1.25	1.25
Oil Well Pumping (Not over 150% peak torque)	2.00	2.00	2.00	2.00
Paraffin Filter Press	1.50	1.50	1.50	1.50
PAPER MILLS				
Agitator	1.00	2.00	1.25	2.00
Barking Drum	2.50	2.50	2.00	2.50
Beater and Pulper	1.50	1.75	1.50	1.75
Bleacher	1.00	1.00	1.25	1.00
Calender	2.00	1.75	2.00	1.75
Chipper	3.00	2.50	2.00	2.50
Couch Cylinder Dryer	1.50	1.75	1.50	1.75
Felt Stretcher	1.00	1.25	1.25	1.25
Fourdrinier	1.50	1.75	1.50	1.75
Jordan	2.00	2.00	2.00	2.00
Press	2.00	1.75	1.50	1.75
Pulp Grinder	2.00	1.75	2.00	1.75
Stock Chest	1.50	1.50	1.50	1.50
Stock Pump				
Reciprocating	2.00	2.00	◆	2.00
Rotary	1.50	1.50	1.50	1.50
Suction Roll	2.00	1.75	1.50	1.75
Winder	1.50	1.50	1.50	1.50



Service Factors

Table 1 (cont)

APPLICATION (READ FOOTNOTES)	FACTOR Δ			
	PARA-FLEX/ POLY-DISC	GRID CHAIN RIGID	D-FLEX	GEAR
PARAFFIN FILTER PRESS	1.50	1.50	1.50	1.50
PRINTING PRESS	1.50	1.50	1.50	1.50
PROPELLER Marine	1.50	1.50	◆	1.50
PULLERS				
Barge Hall	2.50	2.00	2.00	1.50
PULVERIZERS				
Hammermill-Light Duty	1.50	1.50	1.50	1.50
Hammermill-Heavy Duty	2.00	1.75	2.00	1.75
Hog	2.00	1.75	2.00	1.75
Roller	1.50	1.50	1.50	1.50
PUMPS				
For Stock Pumps See Paper Mills				
Centrifugal	1.00	1.00	1.25	1.00
Descaling Gear Type	1.50	1.25	1.50	1.25
Oil Well Pumping (Not over 150% peak torque)	2.00	2.00	2.00	2.00
Rotary -other than ear	1.50	1.25	1.50	1.25
Reciprocating				
1 cylinder-single acting	2.50	3.00	◆	3.00
1 cylinder-double acting	2.00	3.00	◆	3.00
2 cylinder-single acting	2.00	2.00	◆	2.00
2 cylinder-double acting	1.50	1.75	◆	1.75
3 cylinder or more	1.50	1.50	◆	1.50
RUBBER INDUSTRY				
Banbury Mixer	2.50	2.50	2.00	2.50
Calender	2.00	2.00	2.00	2.00
Cracker Mixing Mill Plasticator	2.50	2.50	2.00	2.50
Refiner, Sheeter, Tire-Building Machine	2.00	2.50	2.00	2.50
Tire and Tube Press Opener Based on Peak Torque	1.00	1.00	1.25	1.00
Tuber and Strainer	1.50	1.75	1.50	1.75
Warming Mill	2.00	2.00	2.00	2.00
Washer	2.50	2.50	2.00	2.50

APPLICATION (READ FOOTNOTES)	FACTOR Δ			
	PARA-FLEX/ POLY-DISC	GRID CHAIN RIGID	D-FLEX	GEAR
SCREENS				
Air Washing	1.00	1.00	1.25	1.00
Coal and Sand Rotary	1.50	1.50	1.50	1.50
Vibrating	2.50	2.50	2.00	2.50
Water	1.00	1.00	1.25	1.00
SEWAGE DISPOSAL EQUIPMENT	1.00	1.00	1.25	1.00
SHOVEL	2.00	2.00	2.00	2.00
SHREDDER	1.50	1.50	1.50	1.50
STEEL INDUSTRY				
Cold Mills				
Coiler up or down	1.50	2.00	◆	1.50
Strip, Temper	2.00	2.00	◆	2.00
Hot Mills				
Coiler up or down, Edger Drive	1.50	2.00	◆	1.50
Feed Roll Blooming	3.00	2.50	◆	3.00
Roughing Mill Delivery	3.00	2.50	◆	2.50
Non-reversing, Sheet Strip	3.00	2.50	◆	2.50
Rod Mill	2.50	2.50	◆	2.00
Soaking Pit Cover Drive Lift	3.00	1.50	◆	1.00
Soaking Pit Cover Drive Travel	3.00	1.50	◆	2.00
STEERING GEAR	1.00	1.00	1.25	1.00
STOKER		1.00	1.25	1.00
TEXTILE MILLS				
Batcher	1.00	1.25	1.25	1.25
"Calender, Card Machine, D Can"	1.50	1.50	1.50	1.50
Dyeing Machine	1.00	1.25	1.25	1.25
Loom	1.50	1.50	1.50	1.50
Mangel, Napper, Soaper	1.00	1.25	1.25	1.25
Spinner, Tenter Frame	1.50	1.50	1.50	1.50
WINDLASS	1.50	1.50	1.50	1.50
WOODWORKING MACHINES	1.00	1.00	1.25	1.00

SYSTEM SERVICE FACTOR CALCULATION

To determine the system service factor, the driver service factor adder (Table 1A) must be added to the driven service factor. (Table 1) Example: Determine the system service factor for a PARA-FLEX coupling used to couple a barking drum and a six-cylinder diesel engine.

$$\text{Driven S.F.} + \text{Driver S.F. Adder} = \text{System S.F.}$$

$$2.5 + .5 = 3.0$$

Δ The service factors listed are intended only as a general guide. Where substantial shock occurs or starting and stopping is frequent as on some "inching" drives and on some reversing drives or where the power source is an internal combustion engine with less than four cylinders-Consult DODGE. Where torsional vibrations occur as in,

for example, internal combustion engine or reciprocating compressor or pump applications, check the coupling stiffness for the possible development of damaging large-amplitude vibrations. A complete system torsional analysis may be necessary.

** Add 0.5 to factor if without flywheel

◆ CONSULT DODGE FOR SELECTION ASSISTANCE

Table 1A-Driver Service Factor Adders

Type of Coupling	Electric Motor Std. Torque	High TorqueMotors	Turbines	Reciprocating Engine Number of Cylinders				
				12 or More	8 to 11	6 to 7	4 to 5	Less than 4
PARA-FLEX	0.00	0.00	0.00	0.00	0.50	0.50	0.50	◆
METALLIC	0.00	0.00	0.00	0.00	0.50	0.50	1.00	◆
D-FLEX	0.00	IF SF < 1.25 ADD 0.25 IF SF > 1.25 ADD 0.5	IF SF < 1.5 SUBTRACT 0.25 IF SF > 1.5 SUBTRACT 0.5		IF SF < 1.25 ADD 0.25 IF SF > 1.25 ADD 0.5			◆ ◆





COMPARATIVE TABLE

Coupling Type	Misalignment		End Float
	Angular	Parallel	
PARA-FLEX(PX, PS) (1) (2)	4°	.125"	± 0.156"
PARA-FLEX(PH, PF)	1°	0.0625"	± 0.094"
GRID-LIGN	1/2°	0.012"	0.375"
CHAIN	2°	.015"	0.300"
POLY-DISC	2°	0.032"	
NYLIGN	1-1/2°	0.022"	± 0.125"

(1) PX40 is 4° Angular / .06" Parallel/ ±.094" End Float

(2) PX110 is 4° Angular/1.25" Parallel/±.125" End Float

TEMPERATURE RANGE

Coupling Type	°F
PARA-FLEX PX, PS	-45°F (1) to +180°F(1)
PH, PF	-45°F (1) to +180°F(1)
D-FLEX EPDM	-30°F to +275°F
NEOPRENE	0°F to +200°F
HYTREL	-65°F to +250°F
GRID-LIGN	-35°F to +210°F
CHAIN	-30°F to +225°F
GEAR	-30°F to +250°F
POLY-DISC	-90°F to +170°F
NYLIGN	0°F to +170°F

(1) -40°F to +210°F for neoprene element.

D-FLEX MISALIGNMENT (1)

Size	Types JE, JN, E & N			Types H & HS (4)		
	Parallel (1)	Angular (2)	End Float (3)	Parallel (1)	Angular (2)	End Float (3)
3	0.010	1°	± 0.030	-	-	-
4	0.010	1°	± 0.030	-	-	-
5	0.015	1°	± 0.046	-	-	-
6	0.015	1°	± 0.060	.010	1/4°	± 0.060
7	0.020	1°	± 0.060	.012	1/4°	± 0.060
8	0.020	1°	± 0.096	.015	1/4°	± 0.096
9	0.025	1°	± 0.096	.017	1/4°	± 0.096
10	0.025	1°	± 0.125	.020	1/4°	± 0.125
11	0.032	1°	± 0.125	.022	1/4°	± 0.125
12	0.032	1°	± 0.125	.025	1/4°	± 0.125
13	0.040	1°	± 0.125	.030	1/4°	± 0.125
14	0.045	1°	± 0.125	.035	1/4°	± 0.125
16	0.062	1°	± 0.125	-	1/4°	-

NOTE: (1) All dimensions are in inches

(2) Values are for when 1/4 or more of the rated torque is transmitted.
Reduce values by 50% for lower torques

(3) Increase E dimension by this amount to accommodate end float.

(4) Types H & HS should not be used as direct replacements for EPDM or Neoprene sleeves





PARA-FLEX COUPLINGS BOLT TORQUE INFORMATION

Size	Standard				
	Clamp Ring Bolts (5) Torque (In.-Lbs.)			PS Shaft Hub Bolts (3)	
	No.	2-Piece Assy	3-Piece Assy	No.	Torque (In.-Lbs.)
PX40	4	130	130	4	130
PX50	5	130	130	4	180
PX60	5	290	290	5	180
PX70	5	290	290	5	180
PX80	6	290	290	5	300
PX90	6	480	480	6	300
PX100	6	480	480	6	300
PX110	6	480	480	6	300
PX120	6	1080	1080	6	720
PX140	8	1080	1080	5	720
PX160 (2)	8	2160	1150	6	1296
PX200	12	2160	2400	8	1296
PX240	12	3600	4020	-	-
PX280	14	4320	6600	-	-
PX320	16	4320	6600	-	-

(2) PX160 steel flanges have 10 clamp ring bolts

(3) SAE Grade 8

(5) SAE Grade 8. FB style couplings utilize class 10.9 metric clamping ring bolts

PARA-FLEX HIGH SPEED & FLYWHEEL BOLT TORQUE INFORMATION

Size	For Flange (3)		For Bolt Ring (3)
	Iron Fig.	Steel Fig.	
87	290	290	180
96	290	290	300
116	480	480	360
131	480	480	420
172	1080	1150	600
192	2160	1150	780
213	2160	2160	840
252	3600	3600	2880

(3) SAE Grade 8

TORSIONAL STIFFNESS

PARA-FLEX		HIGH SPEED PARA-FLEX	
Size	In-Lbs/Degree (4)	Size	In-Lbs/Degree (4)
PX40	120	PH 87	1000
PX50	224	PH 96	1190
PX60	414	PH 116	2182
PX70	544	PH 131	2566
PX80	876	PH 172	6737
PX90	1088	PH 192	13893
PX100	1530	PH 213	23143
PX110	2420	PH 252	39008
PX120	4014		
PX140	8296		
PX160	12,000		
PX200	29,000		
PX240	48,000		
PX280	98,000		
PX320	151,000		

(4) Values are nominal and may vary +/- 20%. To convert static values to approximate dynamic values, multiply the static values by 1.2

D-FLEX TORSIONAL STIFFNESS*

Size	EPDM & Neoprene (In-Lbs/radian)	Hytrel (In-Lbs/radian)
3	229	-
4	458	-
5	916	-
6	1,718	10,000
7	2,769	20,000
8	4,335	30,000
9	6,875	47,500
10	10,980	100,000
11	17,300	125,000
12	27,500	225,000
13	43,350	368,900
14	68,775	593,250
16	180,480	-

* Values shown are for an ambient temperature of 75°F

D-FLEX SPACER BOLT TORQUES

Size	Shaft Hub Bolts (1)	
	Number	Torque Ft-Lbs
5SCH	4	4
6SCH	4	9
7SCH	4	9
8SCH	4	18
9SCH	4	31
10SCH	4	50
11SCH	4	75
12SCH	4	150
13SCH	4	150
14SCH	4	150

(1) SAE Grade 8





ENGINEERING/ TECHNICAL



AGMA CLASS 1 FITS

Nom. Shaft Diameter (In.)	Bore Dimensions			
	Clearance		Interference	
	Nom. Shaft Dia. Less	Bore Tolerance	Nom. Shaft Dia. Less	Bore Tolerance
0 - 1-1/2	.000	+ .001 - .000	.001	+ .0005 - .000
1-1/2 - 2	.000	+ .001 - .000	.002	+ .001 - .000
2 - 3	.000	+ .0015 - .000	.002	+ .0015 - .000
3 - 4	.000	+ .0015 - .000	.003	+ .0015 - .000
4 - 5	.000	+ .002 - .000	.0035	+ .0015 - .000
5 - 6	.000	+ .002 - .000	.004	+ .0015 - .000

STANDARD KEYWAYS

Keyway Bore Size			Width	For Sq. Key	For Rec. Key
7/16	-	9/16	3/32	3/64	...
1/2	-	7/8	1/8	1/16	...
5/8	-	1-1/4	3/16	3/32	...
15/16	-	1-1/4	1/4	1/8	...
1-5/16	-	1-3/8	5/16	5/32	...
1-7/16	-	1-3/4	3/8	3/16	1/8
1-13/16	-	2-1/4	1/2	1/4	3/16
2-5/16	-	2-3/4	5/8	5/16	7/32
2-13/16	-	3-1/4	3/4	3/8	1/4
3-5/16	-	3-3/4	7/8	7/16	5/16
3-13/16	-	4-1/2	1	1/2	3/8
4-9/16	-	5-1/2	1-1/4	5/8	7/16

METRIC BORE STANDARD

MM Bore	MM Keyway Width	MM Hub Keyseat	MM Key
14	5	2.3	5x5
16	5	2.3	5x5
18	6	2.8	6X6
19	6	2.8	6X6
20	6	2.8	6X6
22	6	2.8	6X6
24	8	3.3	8X7
25	8	3.3	8X7
28	8	3.3	8X7
30	8	3.3	8X7
32	10	3.3	10X8
35	10	3.3	10X8
38	10	3.3	10X8
40	12	3.3	12X8
42	12	3.3	12X8
45	14	3.8	14X9
48	14	3.8	14X9
50	14	3.8	14X9
55	16	4.3	16X10
60	18	4.4	18X11
65	18	4.4	18X11
70 & 75	20	4.9	20X12
80 & 85	22	5.4	22X14
90	25	5.4	25X14
95	25	5.4	25X14
100	28	6.4	28X16

MM bore and keyway conform to ISO standard recommendation R773, for "FREE" fit

