

# Shaft Fits

## Radial Ball and Cylindrical Roller Bearings



This chart is a guideline for specifying **shaft fits** related to particular operating conditions.

SHAFT											
Ball Bearings (For all nominal diameters)			Operating Conditions	Examples	Cylindrical Roller Bearings (Except 5200 Series)						
Loads		Shaft Tolerance Symbol			Loads		Shaft Diameter mm	Shaft Tolerance Symbol <sup>(1)</sup>	Shaft Diameter inch		
Lower Load Limit	Upper Load Limit				Lower Load Limit	Upper Load Limit					
Inner Ring Stationary											
0	C <sub>e</sub> <sup>(7)</sup>	g6	Inner ring to be easily displaced on shaft	Wheels Non-rotating shafts	0	C <sup>(6)</sup>	All	g6	All		
0	C <sub>e</sub>	h6	Inner ring does not need to be easily displaced	Tension pulleys	0	C	All	h6	All		
Inner Ring Rotating or Indeterminate							over	incl.		over	incl.
0	0.07 C <sub>e</sub>	j6 <sup>(2)</sup>	Light loads	Electrical apparatus Machine tools Pumps Ventilators Industrial trucks	0	0.08C	0 40 140 320 500	40 140 320 500 –	j6 <sup>(8)</sup> k6 <sup>(4)</sup> m6 <sup>(5)</sup> n6 p6	0 1.57 5.51 12.60 19.68	1.57 5.51 12.60 19.68 –
0.07 C <sub>e</sub>	0.15 C <sub>e</sub>	k5	Normal loads	Electrical motors Turbines Pumps Combustion engines Gear transmissions etc.	0.08C	0.18C	0 40 100 140 320 500	40 100 140 320 500 –	k5 m5 m6 n6 p6 r6	0 1.57 3.94 5.51 12.60 19.68	1.57 3.94 5.51 12.60 19.68 –
0.15 C <sub>e</sub>	C <sub>e</sub>	m5	Heavy loads Shock loads	Rail vehicles Traction motors	0.18C	C	0 40 65 140 320 500	40 65 140 320 500 –	m5 <sup>(3)</sup> m6 <sup>(3)</sup> n6 <sup>(3)</sup> p6 <sup>(3)</sup> r6 <sup>(3)</sup> r7 <sup>(3)</sup>	0 1.57 2.56 5.51 12.60 19.68	1.57 2.56 5.51 12.60 19.68 –
Thrust Loads							Not suggested, consult your Timken representative.				
0	C <sub>e</sub>	j6 <sup>(3)</sup>	Pure thrust loads	All							

<sup>(1)</sup> For solid shaft. See pages A61 in the Timken Products Catalog for numerical values.

<sup>(2)</sup> Use j5 for accurate applications.

<sup>(3)</sup> Bearings with greater than nominal clearance must be used.

<sup>(4)</sup> Use k5 for accurate applications.

<sup>(5)</sup> Use m5 for accurate applications.

<sup>(6)</sup> C = Dynamic Load Rating.

<sup>(7)</sup> C<sub>e</sub> = Extended Dynamic Load Rating (Ball Bearings).

<sup>(8)</sup> Use j5 for accurate applications.

# Housing Fits

## Radial Ball and Cylindrical Roller Bearings



This chart is a guideline for specifying **housing fits** related to particular operating conditions.

HOUSING			
Operating Conditions	Examples	Housing Tolerance Symbol <sup>(1)</sup>	Outer Ring Displaceable Axially
Outer Ring Rotating			
Heavy loads with thin-wall housing	Crane support wheels Wheel hubs (roller bearings) Crank bearings	P6	No
Normal to heavy loads	Wheel hubs (ball bearings) Crank bearings	N6	No
Light loads	Conveyor rollers Rope sheaves Tension pulleys	M6	No
Indeterminate Load Direction			
Heavy shock loads	Electric traction motors	M7	No
Normal to heavy loads, axial displacement of outer ring not required.	Electric motors Pumps Crankshaft main bearings	K6	No, normally
Light to normal loads, axial displacement of outer ring desired.	Electric motors Pumps Crankshaft main bearings	J6	Yes, normally
Outer Ring Stationary			
Shock loads, temporary complete unloading	Heavy rail vehicles	J6	Yes, normally
All loads	One-piece housing	General applications Heavy rail vehicles	Easily
	Radially split housing	Transmission drives	Easily
Heat supplied through shaft	Drier cylinders	G7	Easily

\* Below this line, housing can either be one piece or split; above this line, a split housing is not suggested.

<sup>(1)</sup> Cast iron steel housing. See pages A61 to A72 in the Timken Products Catalog for numerical values.

Where wider tolerances are permissible, P7, N7, M7, K7, J7 and H7 values may be used in place of P6, N6, M6, K6, J6, and H6 values respectively.