

ECLA**EUROPEAN CLASSIFICATION****F16C****SHAFTS; FLEXIBLE SHAFTS; ELEMENTS OR CRANKSHAFT MECHANISMS; ROTARY BODIES OTHER THAN GEARING ELEMENTS; BEARINGS****Notes**

1. In this subclass the following expression is used with the meaning indicated:

- "rotary bodies other than gearing elements" covers any element which rotates so far as its features are affected only by the fact that it rotates.

2. Attention is drawn to the following places:

A01B71/04	Bearings for agricultural machines
B21B31/07	Adaptation of roll bearings for metal-rolling mills
B61C17/10	Connecting-rods, bearings for driving wheels of railway locomotives
B61F15/00	Axle-boxes for railway vehicles
B62K21/06	Bearings for steering heads
E06B9/174 , E06B9/50	Bearings specially adapted for roller shutters or for roller blinds
E21B10/22	Bearings for drill bits
F01C21/02	Arrangement of bearings in rotary-piston machines or engines
F01D25/16	Arrangement of bearings in non-positive displacement machines or engines
F02C7/06	Arrangement of bearings in gas-turbine plants
G01C19/16	Bearings for gyroscopes
G01D11/02	Bearings or suspensions for moving parts of measuring instruments
G01G21/02	Arrangements of bearings in weighing apparatus
G01R1/10	Arrangements of bearings in instruments for measuring electric variables
G01R11/12	Arrangements of bearings for apparatus for measuring time integral of electric power or current
G02C5/22	Hinges for spectacles
G04B31/00	Bearings for clockwork
H02N15/00	Magnetic levitation devices.

F16C1/00

Flexible shafts (flexible shafts in dental machines for boring or cutting [A61C1/18](#)); Mechanical means for transmitting movement in a flexible sheathing

- F16C1/02 . for conveying rotary movements
- F16C1/04 . . Articulated shafts
- F16C1/06 . . with guiding sheathing, tube or box ([F16C1/04](#) takes precedence; guiding sheathings [F16C1/26](#))
- F16C1/08 . . End connections
- F16C1/10 . Means for transmitting linear movement in a flexible sheathing, e.g. "Bowden-mechanisms" ([guiding-sheathings F16C1/26](#))

- F16C1/10D . . [N: Intermediate connectors for joining portions of split flexible shafts and/or sheathings] [N1204]
- F16C1/10M . . [N: Arrangements to mount end fittings of the sheathings to support walls or brackets] [N1204]
- F16C1/10M2 . . . [N: to a hole in the wall or bracket] [N1204]
- F16C1/10M4 . . . [N: to a slot in the bracket] [N1204]
- F16C1/10P . . [N: Plurality of transmitting means, e.g. two or more parallel "Bowden cables"] [N1204]
- F16C1/10S . . [N: Sealing details] [N1204]
- F16C1/10V . . [N: Reducing or controlling of vibrations, e.g. by resilient damping of noise] [N1204]
- F16C1/12 . . Arrangements for transmitting movement to or from the flexible member
- F16C1/14 . . . Construction of the end-piece of the flexible member; Attachment thereof to the flexible member
- F16C1/14A [N: Attachment of the end-piece to the flexible member] [N1204]
- F16C1/16 . . . in which the end-piece is guided rectilinearly
- F16C1/18 . . . in which the end portion of the flexible member is laid along a curved surface of a pivoted member
- F16C1/20 . . Construction of flexible members moved to and fro in the sheathing
- F16C1/20C . . . [N: Details of the outer surface of the flexible member, e.g. coatings] [N1204]
- F16C1/22 . . Adjusting; Compensating length
- F16C1/22C . . . [N: by adjusting the effective length of the flexible member] [N1204]
- F16C1/22S . . . [N: by adjusting the effective length of the sheathing] [N1204]
- F16C1/24 . Lubrication; Lubricating equipment
- F16C1/26 . Construction of guiding-sheathings or guiding-tubes
- F16C1/26B . . [N: End fittings; Attachment thereof to the sheathing or tube] [N1204]
- F16C1/26B2 . . . [N: with a swivel tube connected to the end-fitting of a sheathing, e.g. with a spherical joint] [N1204]
- F16C1/26C . . [N: Details of the inner surface of the sheathing or tube, e.g. coatings] [N1204]
- F16C1/28 . . with built in bearings [N:, e.g. sheathing with rolling elements between the sheathing and the core element] [N1204]

F16C3/00 **Shafts** (flexible shafts [F16C1/00](#); marine propeller shafts, paddle wheel shafts [B63H23/34](#)); **Axles; Cranks; eccentrics**

- F16C3/02 . Shafts; Axles
- F16C3/02B . . [N: made of several parts, e.g. by welding] [N1204]
- F16C3/02F . . [N: Shafts made of fibre reinforced resin]
- F16C3/03 . . telescopic ([axially displaceable couplings F16D3/06](#))
- F16C3/035 . . . with built-in bearings
- F16C3/04 . Crankshafts, eccentric-shafts; Cranks, eccentrics
- F16C3/06 . . Crankshafts
- F16C3/08 . . . made in one piece ([features relating to lubrication F16C3/14](#), [to cooling F16C3/16](#))

- F16C3/10 . . . assembled of several parts, e.g. by welding [N: by crimping]
- F16C3/12 releasably connected
- F16C3/14 . . . Features relating to lubrication
- F16C3/16 . . . Features relating to cooling
- F16C3/18 . . Eccentric-shafts
- F16C3/20 . . Shape of crankshafts or eccentric-shafts having regard to balancing
- F16C3/22 . . Cranks; Eccentrics ([constructional features of crank-pins F16C11/02](#))
- F16C3/24 . . . with return cranks, i.e. a second crank carried by the crank-pin
- F16C3/26 . . . Elastic crank-webs; Resiliently-mounted crank-pins [N1204]
- F16C3/28 . . . Adjustable cranks or eccentrics [N1204]
- F16C3/30 . . . with arrangements for overcoming dead-centres

- F16C5/00** **Crossheads; Constructions of connecting-rod heads or piston-rod connections rigid with crossheads (piston-rods, i.e. rods rigidly connected to the piston, F16J7/00) [N1204]**

- F16C7/00** **Connecting-rods or like links pivoted at both ends (coupling-rods for locomotive driving-wheels B61C17/10); Construction of connecting-rod heads (heads rigid with crossheads F16C5/00) [N1204]**

- F16C7/02 . Constructions of connecting-rods with constant length [N1204]
- F16C7/02B . . [N: for piston engines, pumps or the like] [N9412]
- F16C7/02F . . [N: made of fibre reinforced resin] [N1204]

- F16C7/04 . with elastic intermediate part of fluid cushion

- F16C7/06 . Adjustable connecting-rods

- F16C7/08 . made from sheet metal

- F16C9/00** **Bearings for crankshafts or connecting-rods; Attachment of connecting-rods (lubrication of connecting-rods in connection with crankshafts [F16C3/14](#); connections to crossheads [F16C5/00](#); to pistons [F16J1/14](#))**

- F16C9/02 . Crankshaft bearings
- F16C9/03 . . Arrangements for adjusting play

- F16C9/04 . Connecting-rod bearings; Attachments thereof
- F16C9/04B . . [N: the bearing cap of the connecting rod being split by fracturing] [N1204]
- F16C9/06 . . Arrangements for adjusting play in bearings, operating either automatically or not [N1204]

- F16C11/00** **Pivots; Pivotal connections ([arrangements of steering linkage connections B62D7/16](#))**

- F16C11/02 . Trunnions; Crank-pins ([fastening crank-pins to webs, crank-pins integral with cranks F16C3/06, F16C3/22](#))

- F16C11/04 . Pivotal connections (hinges for doors, windows or wings E05D) [N1204]
- F16C11/04B . . [N: with at least a pair of arms pivoting relatively to at least one other arm, all arms being mounted on one pin (crank-pins F16C11/02)]
- F16C11/06 . . Ball-joints; Other joints having more than one degree of angular freedom, i.e. universal joints (universal joints in which flexibility is produced by means of pivots or sliding or rolling connecting parts F16D3/16) [N1204]
- F16C11/06A . . . [N: Construction of the male part] [N1204]
- F16C11/06A2 [N: made from two or more parts] [N1204]
- F16C11/06B . . . [N: the female part of the joint being open on two sides]
- F16C11/06C . . . [N: the female part comprising a blind socket receiving the male part]
- F16C11/06C3 [N: Construction or details of the socket member] [N9506]
- F16C11/06C3B [N: with linings] [N9506]
- F16C11/06C3B2 [N: the linings being made of plastics] [N9506]
- F16C11/06C3B2B {7 dots} [N: characterised by geometrical details] [N9506]
- F16C11/06C3C [N: Special features of the plug or cover on the blind end of the socket] [N9506]
- F16C11/06C3F [N: Special features relating to adjustment for wear or play; Wear indicators] [N9506]
- F16C11/06C3G [N: combined with a damper other than elastic linings] [N9506]
- F16C11/06C3H [N: the socket member being mainly made of plastics] [N9506]
- F16C11/06D . . . [N: the two co-operative parts each having both convex and concave interfaces]
- F16C11/06E . . . [N: Sealing means between the socket and the inner member shaft]
- F16C11/06E2 [N: allowing operative relative movement of joint parts due to flexing of the sealing means]
- F16C11/06E3 [N: allowing operational relative movement of joint parts due to sliding between parts of the sealing means]
- F16C11/06L . . . [N: Special features relating to lubrication] [N1204]
- F16C11/06M . . . [N: Manufacture of ball-joints and parts thereof, e.g. assembly of ball-joints] [N1204]
- F16C11/06M2 [N: with at least one separate part to retain the ball member in the socket; Quick-release systems] [N1204]
- F16C11/06R . . . [N: Mounting of ball-joints, e.g. fixing them to a connecting rod] [N1204]
- F16C11/08 . . . with resilient bearings
- F16C11/08E [N: by means of parts of rubber or like materials] [N1204]
- F16C11/08E2 [N: with an elastomeric member in the blind end of a socket] [N1204]
- F16C11/10 . . Arrangements for locking [N1204]
- F16C11/10B . . . [N: frictionally clamped]
- F16C11/10B2 [N: for ball joints]
- F16C11/12 . . incorporating flexible connections, e.g. leaf springs

- F16C13/00** **Rolls, drums, discs, or the like (guide rollers in feeding webs B65H27/00; calender rolls, bearings therefor D21G1/02; rotary drums or rollers for heat-exchange or heat-transfer apparatus F28F5/02 ; special adaptations, see the relevant classes); Bearings or mountings therefor [N1204]**

- F16C13/00C . [N: Bowed or curved rolls (rollers with a bowed axis as tentering devices for tensioning, smoothing or guiding webs [B65H23/025B](#))]
- F16C13/00G . [N: Guiding rollers, wheels or the like, formed by or on the outer element of a single bearing or bearing unit, e.g. two adjacent bearings, whose ratio of length to diameter is generally less than one] [C9604]
- F16C13/02 . Bearings [N1204]
- F16C13/02H . . [N: supporting a hollow roll mantle rotating with respect to a yoke or axle] [N1204]
- F16C13/02H2 . . . [N: adjustable for positioning, e.g. radial movable bearings for controlling the deflection along the length of the roll mantle] [N1204]
- F16C13/02H2P [N: by fluid pressure] [N1204]
- F16C13/02H2P2 [N: with a plurality of supports along the length of the roll mantle, e.g. hydraulic jacks] [N1204]
- F16C13/04 . . Bearings with only partial enclosure of the member to be borne; Bearings with local support at two or more points [N1204]
- F16C13/06 . . self-adjusting
- F16C15/00** **Construction of rotary bodies to resist centrifugal force (flywheels, correction weights [F16F15/30](#), [F16F15/32](#))**
- Guide heading:** **Bearings for rotary parts ([F16C9/00](#), [F16C13/02](#) take precedence; allowing for linear movement also [F16C31/00](#))**
- F16C17/00** **Sliding-contact bearings for exclusively rotary movement ([F16C32/06](#) takes precedence; adjustable bearings [F16C23/00](#), [F16C25/00](#)) [C0904]**
- F16C17/02 . for radial load only
- F16C17/02B . . [N: with a pair of essentially semicircular bearing sleeves] [N1204]
- F16C17/02F . . [N: with flexible leaves to create hydrodynamic wedge, e.g. radial foil bearings] [N1204]
- F16C17/02G . . [N: with helical grooves in the bearing surface to generate hydrodynamic pressure, e.g. herringbone grooves] [N1204]
- F16C17/02W . . [N: with fixed wedges to generate hydrodynamic pressure, e.g. multi-lobe bearings] [N1204]
- F16C17/03 . . with tiltably-supported segments, e.g. Michell bearings [N: (hydrostatic bearings with tiltably supported bearing pads [F16C32/06C3](#); made from a plurality of rods [F16C33/26](#); with flexible leaves [F16C17/12B](#); hydrodynamic bearings with chambers [F16C33/10B3](#))]
- F16C17/03B . . . [N: the segments being integrally formed with, or rigidly fixed to, a support-element]
- F16C17/04 . for axial load only
- F16C17/04F . . [N: with flexible leaves to create hydrodynamic wedge, e.g. axial foil bearings] [N1204]
- F16C17/04G . . [N: with grooves in the bearing surface to generate hydrodynamic pressure, e.g. spiral groove thrust bearings] [N1204]
- F16C17/04W . . [N: with fixed wedges to generate hydrodynamic pressure] [N1204]

- F16C17/06 . . with tiltably-supported segments, e.g. Michell bearings [N: (with flexible leaves [F16C17/12B](#); hydrostatic [F16C32/06C3](#))]
- F16C17/06B . . . [N: the segments being integrally formed with, or rigidly fixed to, a support-element]
- F16C17/08 . . for supporting the end face of a shaft or other member, e.g. footstep bearings
- F16C17/10 . for both radial and axial load
- F16C17/10G . . [N: with grooves in the bearing surface to generate hydrodynamic pressure] [\[N1204\]](#)
- F16C17/10G2 . . . [N: with at least one bearing surface providing angular contact, e.g. conical or spherical bearing surfaces] [\[N1204\]](#)
- F16C17/10G4 . . . [N: with at least one surface for radial load and at least one surface for axial load] [\[N1204\]](#)
- F16C17/12 . characterised by features not related to the direction of the load
- F16C17/14 . . specially adapted for operating in water
- F16C17/18 . . with floating brasses or brushing, rotatable at a reduced speed [N: ([F16C17/03](#), [F16C17/06](#) take precedence)]
- F16C17/20 . . with emergency supports or bearings
- F16C17/22 . . with arrangements compensating for thermal expansion
- F16C17/24 . . with devices affected by abnormal or undesired positions, e.g. for preventing overheating, for safety
- F16C17/24T . . . [N: related to temperature and heat, e.g. for preventing overheating] [\[N1204\]](#)
- F16C17/24W . . . [N: related to wear, e.g. sensors for measuring wear] [\[N1204\]](#)
- F16C17/26 . Systems consisting of a plurality of sliding-contact bearings

- F16C19/00** **Bearings with rolling contact, for exclusively rotary movement** ([adjustable bearings F16C23/00](#), [F16C25/00](#); [N: electrically insulating bearings [H02K5/173](#)]) [\[C0904\]](#)
- F16C19/02 . with bearing balls essentially of the same size in one or more circular rows
- F16C19/04 . . for radial load mainly [\[N1205\]](#)
- F16C19/06 . . . with a single row or balls
- F16C19/08 . . . with two or more rows of balls
- F16C19/10 . . for axial load mainly
- F16C19/12 . . . for supporting the end face of a shaft or other member, e.g. footstep bearings
- F16C19/14 . . for both radial and axial load
- F16C19/16 . . . with a single row of balls
- F16C19/16A [N: with angular contact] [\[N1205\]](#)
- F16C19/16A4 [N: Four-point-contact ball bearings] [\[N1205\]](#)
- F16C19/18 . . . with two or more rows of balls
- F16C19/18A [N: with angular contact] [\[N1205\]](#)
- F16C19/18A1 [N: in tandem arrangement] [\[N1205\]](#)
- F16C19/18A2 [N: with two rows at opposite angles] [\[N1205\]](#)
- F16C19/18A2O [N: in O-arrangement] [\[N1205\]](#)
- F16C19/18A2O2 {7 dots} [N: with two raceways provided integrally on a part other

		than a race ring, e.g. a shaft or housing] [N1205]
F16C19/18A2O3	. . . . .	{7 dots} [N: with three raceways provided integrally on parts other than race rings, e.g. third generation hubs] [N1205]
F16C19/18A2O4	. . . . .	{7 dots} [N: with all four raceways integrated on parts other than race rings, e.g. fourth generation hubs] [N1205]
F16C19/18B	. . . .	[N: with at least one row for radial load in combination with at least one row for axial load] [N1205]
F16C19/20	. .	with loose spacing bodies, e.g. balls, between the bearing balls [N1205]
F16C19/22	. .	with bearing rollers essentially of the same size in one or more circular rows, e.g. needle bearings
F16C19/22B	. .	[N: Details of the ribs supporting the end of the rollers] [N1205]
F16C19/24	. .	for radial load mainly [N1205]
F16C19/26	. . .	with a single row of rollers
F16C19/28	. . .	with two or more rows of rollers
F16C19/30	. .	for axial load mainly
F16C19/30S	. . .	[N: consisting of rollers held in a cage] [N1205]
F16C19/32	. . .	for supporting the end face of a shaft or other member, e.g. footstep bearings
F16C19/34	. .	for both radial and axial load
F16C19/36	. . .	with a single row of rollers
F16C19/36C	. . . .	[N: with cylindrical rollers] [N1205]
F16C19/36C2	. . . . .	[N: the rollers being crossed within the single row] [N1205]
F16C19/36T	. . . .	[N: with tapered rollers, i.e. rollers having essentially the shape of a truncated cone] [N1205]
F16C19/38	. . .	with two or more rows of rollers [N1205]
F16C19/38B	. . . .	[N: with at least one row for radial load in combination with at least one row for axial load] [N1205]
F16C19/38T	. . . .	[N: with tapered rollers, i.e. rollers having essentially the shape of a truncated cone] [N1205]
F16C19/38T2	. . . . .	[N: with two rows, i.e. double-row tapered roller bearings] [N1205]
F16C19/38T2O	. . . . .	[N: in O-arrangement] [N1205]
F16C19/38T4	. . . . .	[N: with four rows, i.e. four row tapered roller bearings] [N1205]
F16C19/40	. .	with loose spacing bodies between the rollers [N1205]
F16C19/44	. .	Needle bearings
F16C19/46	. . .	with one row or needles
F16C19/46C	. . . .	[N: consisting of needle rollers held in a cage, i.e. subunit without race rings] [N1205]
F16C19/46S	. . . .	[N: comprising needle rollers and an outer ring, i.e. subunit without inner ring] [N1205]
F16C19/48	. . .	with two or more rows of needles
F16C19/49	. .	Bearings with both balls and rollers
F16C19/49A	. .	[N: with two or more rows with angular contact] [N1205]
F16C19/49A2	. . .	[N: with two rows] [N1205]
F16C19/49A2O	. . . .	[N: in O-arrangement] [N1205]
F16C19/50	. .	Other types of ball or roller bearings

- F16C19/50A . . [N: with rolling elements in rows not forming a full circle] [N1205]
- F16C19/50D . . [N: with the diameter of the rolling elements of one row differing from the diameter of those of another row] [N1205]
- F16C19/50R . . [N: with rolling elements journaled in one of the moving parts, e.g. stationary rollers to support a rotating part] [N1205]
- F16C19/52 . with devices affected by abnormal or undesired conditions
- F16C19/52L . . [N: related to load on the bearing, e.g. bearings with load sensors or means to protect the bearing against overload] [N1205]
- F16C19/52T . . [N: related to temperature and heat, e.g. insulation] [N1205]
- F16C19/52V . . [N: related to vibration and noise] [N1205]
- F16C19/54 . Systems consisting of a plurality of bearings with rolling friction ([spindle bearings F16C35/08](#))
- F16C19/54A . . [N: Systems consisting of juxtaposed rolling bearings including at least one angular contact bearing] [N1205]
- F16C19/54A2 . . . [N: with two rolling bearings with angular contact] [N1205]
- F16C19/54A2O [N: in O-arrangement] [N1205]
- F16C19/54B . . [N: Systems comprising at least one rolling bearing for radial load in combination with at least one rolling bearing for axial load] [N1205]
- F16C19/54D . . [N: Systems with spaced apart rolling bearings including at least one angular contact bearing] [N1205]
- F16C19/54D2 . . . [N: with two angular contact rolling bearings] [N1205]
- F16C19/54D2O [N: in O-arrangement] [N1205]
- F16C19/55 . . with intermediate floating [N: or independently-driven] rings rotating at reduced speed [N: or with other differential ball or roller bearings] [C9604]
- F16C19/56 . . in which the rolling bodies of one bearing differ in diameter from those of another
- F16C21/00** **Combinations of sliding-contact bearings with ball or roller bearings, for exclusively rotary movement** ([F16C17/24](#), [F16C19/52](#) take precedence) [C0904]
- F16C21/00C . [N: the external zone of a bearing with rolling members, e.g. needles, being cup-shaped, with or without a separate thrust-bearing disc or ring, e.g. for universal joints ([seals F16C33/72](#), [F16D3/38](#))]
- F16C23/00** **Bearings for exclusively rotary movement adjustable for aligning or positioning** ([F16C27/00](#) takes precedence; [N: hydrostatic bearings [F16C32/06C7](#)]) [C0904]
- F16C23/02 . Sliding-contact bearings
- F16C23/04 . . self-adjusting
- F16C23/04E . . . [N: with edge relief] [N1205]
- F16C23/04S . . . [N: with spherical surfaces, e.g. spherical plain bearings] [N1205]
- F16C23/04S2 [N: for radial load mainly, e.g. radial spherical plain bearings] [N1205]
- F16C23/04S2S [N: with split outer rings] [N1205]
- F16C23/04S4 [N: for axial load mainly] [N1205]
- F16C23/06 . Ball or roller bearings

- F16C23/08 . . self-adjusting
- F16C23/08B . . . [N: by means of at least one substantially spherical surface]
- F16C23/08B2 [N: sliding on a complementary spherical surface]
- F16C23/08B3 [N: forming a track for rolling elements]
- F16C23/08C . . . [N: by means of crowning] [N1205]

- F16C23/10 . Bearings, parts of which are eccentrically adjustable with respect to each other

- F16C25/00** **Bearings for exclusively rotary movement adjustable for wear or play (F16C27/00 takes precedence) [N1205]**

- F16C25/02 . Sliding-contact bearings
- F16C25/04 . . self-adjusting
- F16C25/04M . . . [N: with magnetic means to preload the bearing] [N1205]

- F16C25/06 . Ball or roller bearings
- F16C25/08 . . self-adjusting
- F16C25/08B . . . [N: with resilient means acting axially on a race ring to preload the bearing] [N1205]
- F16C25/08M . . . [N: with magnetic means to preload the bearing] [N1205]

- F16C27/00** **Elastic or yielding bearings or bearing supports, for exclusively rotary movement (shock-damping bearings for watches or clocks G04B31/02) [N1205]**

- F16C27/02 . Sliding-contact bearings [N1205]

- F16C27/04 . Ball or roller bearings, e.g. with resilient rolling bodies [N1205]
- F16C27/04F . . [N: with a fluid film, e.g. squeeze film damping] [N1205]

- F16C27/06 . by means of parts of rubber or like materials (F16C27/08 takes precedence; with sliding surfaces of rubber or synthetic rubber F16C33/22) [N1204]
- F16C27/06B . . [N: Sliding contact bearings] [N9601]
- F16C27/06C . . [N: Ball or roller bearings] [N9601]

- F16C27/08 . primarily for axial load, e.g. for vertically-arranged shafts

- Guide heading:** **Other bearings [N: (for bridges E01D19/04)]**

- F16C29/00** **Bearings for parts moving only linearly (F16C32/06 takes precedence; incorporated in flexible shafts F16C1/28) [N: parts of bearings in general and special methods for making bearings or parts thereof in general F16C33/00] [C0703]**

- F16C29/00A . [N: adjustable for alignment or positioning] [N0703]
- F16C29/00E . [N: Elastic or yielding linear bearings or bearing supports] [N0703]
- F16C29/00F . [N: Fixing of a carriage or rail, e.g. rigid mounting to a support structure or a movable part] [N0703]

- F16C29/00G . [N: Guide rails or tracks for a linear bearing, i.e. adapted for movement of a carriage or bearing body there along] [N0703]
- F16C29/00H . [N: Hybrid linear bearings, i.e. including more than one bearing type, e.g. sliding contact bearings as well as rolling contact bearings] [N0703]
- F16C29/00P . [N: Systems with a plurality of bearings, e.g. four carriages supporting a slide on two parallel rails] [N0703]
- F16C29/02 . Sliding-contact bearings
- F16C29/02H . . [N: Hydrostatic or aerostatic (this type of bearing for rotary parts [F16C32/06](#))]
- F16C29/04 . Ball or roller bearings
- F16C29/04B . . [N: having rollers crossed within a row]
- F16C29/04M . . [N: with two massive rectangular rails having facing grooves] [N1205]
- F16C29/04R . . [N: having rolling elements journaled in one of the moving parts] [N1205]
- F16C29/04R2 . . . [N: with balls journaled in pockets] [N1205]
- F16C29/04S . . [N: with thin walled races, e.g. tracks of sheet metal] [N1205]
- F16C29/06 . . in which the rolling bodies circulate partly without carrying load
- F16C29/06C . . . [N: Details of the bearing body or carriage or parts thereof, e.g. methods for manufacturing or assembly] [N0703]
- F16C29/06C2 [N: of the load bearing section] [N0703]
- F16C29/06C2R [N: of parts or members for retaining the rolling elements, i.e. members to prevent the rolling elements from falling out of the bearing body or carriage] [N0703]
- F16C29/06C3 [N: of the ends of the bearing body or carriage where the rolling elements change direction, e.g. end caps] [N0703]
- F16C29/06C4 [N: of the return passages, i.e. the passages where the rolling elements do not carry load] [N0703]
- F16C29/06S . . . [N: with a shoe type bearing body, e.g. a body facing one side of the guide rail or track only] [N0703]
- F16C29/06S1 [N: for supporting load essentially in a single direction] [N0703]
- F16C29/06S1R [N: with rollers or needles] [N0703]
- F16C29/06S2 [N: for supporting load in essentially two directions, e.g. by multiple points of contact or two rows of rolling elements] [N0703]
- F16C29/06S2B [N: with balls] [N0703]
- F16C29/06S2R [N: with rollers] [N0703]
- F16C29/06S2R1 [N: crossed within a row] [N0703]
- F16C29/06T . . . [N: with a bearing body, e.g. a carriage or part thereof, provided between the legs of a U-shaped guide rail or track] [N0703]
- F16C29/06U . . . [N: with a bearing body defining a U-shaped carriage, i.e. surrounding a guide rail or track on three sides] [N0703]
- F16C29/06U1 [N: whereby the return paths are provided as bores in a main body of the U-shaped carriage, e.g. the main body of the U-shaped carriage is a single part with end caps provided at each end] [N0703]
- F16C29/06U1B [N: with balls] [N0703]
- F16C29/06U1B2 [N: with two rows of balls, one on each side of the rail] [N0703]

F16C29/06U1B4	. . . . .	[N: with four rows of balls] [N0703]
F16C29/06U1B4O	. . . . .	{7 dots} [N: with load directions in O-arrangement] [N0703]
F16C29/06U1B4X	. . . . .	{7 dots} [N: with load directions in X-arrangement] [N0703]
F16C29/06U1R	. . . . .	[N: with rollers] [N0703]
F16C29/06U2	. . . . .	[N: whereby the return paths are at least partly defined by separate parts, e.g. covers attached to the legs of the main body of the U-shaped carriage] [N0703]
F16C29/06U2B	. . . . .	[N: with balls] [N0703]
F16C29/06U2B2	. . . . .	[N: with two rows of balls, one on each side of the rail] [N0703]
F16C29/06U2B4	. . . . .	[N: with four rows of balls] [N0703]
F16C29/06U2B4O	. . . . .	{7 dots} [N: with load directions in O-arrangement] [N0703]
F16C29/06U2B4X	. . . . .	{7 dots} [N: with load directions in X-arrangement] [N0703]
F16C29/06U2R	. . . . .	[N: with rollers] [N0703]
F16C29/06U3	. . . . .	[N: whereby the main body of the U-shaped carriage is an assembly of at least three major parts, e.g. an assembly of a top plate with two separate legs attached thereto in the form of bearing shoes (bearing shoes per se F16C29/06S)] [N0703]
F16C29/06U3B	. . . . .	[N: with balls] [N0703]
F16C29/06U3R	. . . . .	[N: with rollers] [N0703]
F16C29/06W	. . . . .	[N: with a bearing body or carriage almost fully embracing the guide rail or track, e.g. a circular sleeve with a longitudinal slot for the support posts of the rail] [N0703]
F16C29/06X	. . . . .	[N: with a bearing body, i.e. the body carrying the circulating rolling elements, provided in the interior of a sleeve-like guide member defining the opposing raceways, e.g. in a telescopic shaft (telescopic shafts with built-in bearings F16C3/035; yielding coupling allowing axial displacement by rolling elements F16D3/06B)] [N0703]
F16C29/06Z	. . . . .	[N: with the bearing body fully encircling the guide rail or track] [N0703]
F16C29/06Z1	. . . . .	[N: the bearing body encircles a rail or rod of circular cross-section, i.e. the linear bearing is not suited to transmit torque] [N0703]
F16C29/06Z1B	. . . . .	[N: with balls] [N0703]
F16C29/06Z1B1	. . . . .	[N: whereby a sleeve surrounds the circulating balls and thicker part of the sleeve form the load bearing tracks] [N0703]
F16C29/06Z1B2	. . . . .	[N: whereby discrete load bearing elements, e.g. discrete load bearing plates or discrete rods, are provided in a retainer and form the load bearing tracks] [N0703]
F16C29/06Z2	. . . . .	[N: the bearing body encircles a guide rail or track of non-circular cross-section, e.g. with grooves or protrusions, i.e. the linear bearing is suited to transmit torque (telescopic shafts with built-in bearings F16C3/035; yielding coupling allowing axial displacement by rolling elements F16D3/06B)] [N0703]
F16C29/06Z2B	. . . . .	[N: with balls] [N0703]
F16C29/06Z2B2	. . . . .	[N: with polygonal guide rail or track] [N0703]
F16C29/08	. . . . .	Arrangements for covering or protecting the ways [N: (protective coverings for parts of machine tools B23Q11/08)] [C9604]
F16C29/08B	. . . . .	[N: fixed to the way]
F16C29/08C	. . . . .	[N: fixed to the carriage or bearing body movable along the guide rail or track] [C0703]

- F16C29/08C2 . . . [N: Seals being essentially U-shaped, e.g. for a U-shaped carriage] [N0703]
- F16C29/08C3 . . . [N: Seals extending in the longitudinal direction of the carriage or bearing body] [N0703]
- F16C29/10 . Arrangements for locking the bearings [N1204]
- F16C29/12 . Arrangements for adjusting play [N0703]
- F16C29/12E . . [N: using elastic means] [N0703]
- F16C29/12W . . [N: using tapered surfaces or wedges] [N0703]

F16C31/00 Bearings for parts which both rotate and move linearly

- F16C31/02 . Sliding-contact bearings
- F16C31/04 . Ball or roller bearings
- F16C31/06 . . in which the rolling bodies circulate partly without carrying load

F16C32/00 Bearings not otherwise provided for

- F16C32/02 . Knife-edge bearings [N1204]
- F16C32/04 . using magnetic or electric supporting means [N1204]
- F16C32/04C . . [N: combined with other supporting means, e.g. hybrid bearings with both magnetic and fluid supporting means] [N1205]
- F16C32/04E . . [N: Electrostatic bearings] [N1205]
- F16C32/04M . . [N: Magnetic bearings] [N1205]
- F16C32/04M2 . . . [N: Passive magnetic bearings] [N1205]
- F16C32/04M2A [N: with permanent magnets on one part attracting the other part] [N1205]
- F16C32/04M2A2 [N: for radial load mainly] [N1205]
- F16C32/04M2A2A [N: with facing axial projections] [N1205]
- F16C32/04M2A4 [N: for axial load mainly] [N1205]
- F16C32/04M2A4R [N: with facing radial projections] [N1205]
- F16C32/04M2A6 [N: for both radial and axial load] [N1205]
- F16C32/04M2R [N: with permanent magnets on both parts repelling each other] [N1205]
- F16C32/04M2R2 [N: for radial load mainly] [N1205]
- F16C32/04M2R4 [N: for axial load mainly] [N1205]
- F16C32/04M2R6 [N: for both radial and axial load, e.g. conical magnets] [N1205]
- F16C32/04M2R6B [N: with bearings for axial load combined with bearings for radial load] [N1205]
- F16C32/04M2R8 [N: for parts moving linearly] [N1205]
- F16C32/04M2S [N: with a conductor on one part movable with respect to a magnetic field, e.g. a body of copper on one part and a permanent magnet on the other part] [N1205]
- F16C32/04M2S2 [N: with a superconducting body, e.g. a body made of high temperature superconducting material such as YBaCuO] [N1205]
- F16C32/04M4 . . . [N: Active magnetic bearings] [N1205]

F16C32/04M4A	. . . . .	[N: with devices affected by abnormal, undesired or non-standard conditions such as shock-load, power outage, start-up or touchdown] [N1205]
F16C32/04M4C	. . . . .	[N: Details of devices to control the actuation of the electromagnets] [N1205]
F16C32/04M4C2	. . . . .	[N: Determination of the actual position of the moving member, e.g. details of sensors] [N1205]
F16C32/04M4C2B	. . . . .	[N: by using the electromagnet itself as sensor, e.g. sensorless magnetic bearings] [N1205]
F16C32/04M4C4	. . . . .	[N: Details of controllers, i.e. the units determining the power to be supplied, e.g. comparing elements, feedback arrangements with P.I.D. control] [N1205]
F16C32/04M4C4B	. . . . .	[N: for controlling two axes, i.e. combined control of x-axis and y-axis] [N1205]
F16C32/04M4C4D	. . . . .	[N: including digital signal processing (DSP) and analog/digital conversion (A/D, D/A)] [N1205]
F16C32/04M4C6	. . . . .	[N: Details of the power supply to the electromagnets] [N1205]
F16C32/04M4D	. . . . .	[N: Details of the magnetic circuit] [N1205]
F16C32/04M4D2	. . . . .	[N: of stationary parts of the magnetic circuit] [N1205]
F16C32/04M4D2E	. . . . .	[N: with electromagnetic bias, e.g. by extra bias windings] [N1205]
F16C32/04M4D2P	. . . . .	[N: with permanent magnets provided in the magnetic circuit of the electromagnets] [N1205]
F16C32/04M4D4	. . . . .	[N: of moving parts of the magnetic circuit, e.g. of the rotor] [N1205]
F16C32/04M4H	. . . . .	[N: Details of housings; Mounting of active magnetic bearings] [N1205]
F16C32/04M4L	. . . . .	[N: for linear movement] [N1205]
F16C32/04M4R	. . . . .	[N: for rotary movement] [N1205]
F16C32/04M4R1	. . . . .	[N: with active support of one degree of freedom, e.g. axial magnetic bearings] [N1205]
F16C32/04M4R1P	. . . . .	[N: with permanent magnets to support radial load] [N1205]
F16C32/04M4R2	. . . . .	[N: with active support of two degrees of freedom, e.g. radial magnetic bearings] [N1205]
F16C32/04M4R2C	. . . . .	[N: with three electromagnets to control the two degrees of freedom] [N1205]
F16C32/04M4R3	. . . . .	[N: with active support of three degrees of freedom] [N1205]
F16C32/04M4R4	. . . . .	[N: with active support of four degrees of freedom] [N1205]
F16C32/04M4R5	. . . . .	[N: with active support of five degrees of freedom, e.g. two radial magnetic bearings combined with an axial bearing] [N1205]
F16C32/04M4R5C	. . . . .	[N: with electromagnets acting in axial and radial direction, e.g. with conical magnets] [N1205]
F16C32/04M4R6	. . . . .	[N: integrated in an electrodynamic machine, e.g. self-bearing motor] [N1205]
F16C32/04M4R6A	. . . . .	[N: generating torque and axial force] [N1205]
F16C32/04M4R6R	. . . . .	[N: generating torque and radial force] [N1205]
F16C32/06	. . . . .	with moving member supported by a fluid cushion formed, at least to a large extent, otherwise than by movement of the shaft, e.g. hydrostatic air-cushion bearings
F16C32/06A	. . . . .	[N: supported by a gas cushion, e.g. an air cushion] [N1205]
F16C32/06A2	. . . . .	[N: the gas being retained in a gap, e.g. squeeze film bearings] [N1205]
F16C32/06A2V	. . . . .	[N: by means of vibrations] [N1205]

- F16C32/06A4 . . . [N: the gas being supplied under pressure, e.g. aerostatic bearings] [N1205]
- F16C32/06A4P [N: via porous material] [N1205]
- F16C32/06A4R [N: via nozzles, restrictors] [N1205]
- F16C32/06A4S [N: via supply slits] [N1205]
- F16C32/06L . . [N: supported by a liquid cushion, e.g. oil cushion] [N1205]
- F16C32/06L2 . . . [N: the liquid being retained in a gap] [N1205]
- F16C32/06L2M [N: by a magnetic field, e.g. ferrofluid bearings] [N1205]
- F16C32/06L4 . . . [N: the liquid being supplied under pressure] [N1205]
- F16C32/06L4C [N: Details of devices to control the supply of liquids to the bearings] [N1205]
- F16C32/06L4C2 [N: by sensors or pressure-responsive control devices in or near the bearings] [N1205]
- F16C32/06L4D [N: Details of the bearing area per se] [N1205]
- F16C32/06L4D2 [N: of supply openings] [N1205]
- F16C32/06L4D4 [N: of pockets or grooves] [N1205]
- F16C32/06P . . [N: Details of hydrostatic bearings independent of fluid supply or direction of load] [N1205]
- F16C32/06P2 . . . [N: of bearing pads] [N1205]
- F16C32/06P5 . . . [N: of bearings adjustable for aligning, positioning, wear or play] [N1205]
- F16C32/06P5L [N: by means of pre-load on the fluid bearings] [N1205]
- F16C32/06P7 . . . [N: of elastic or yielding bearings or bearing supports] [N1205]
- F16C32/06R . . [N: Construction or mounting aspects of hydrostatic bearings, for exclusively rotary movement, related to the direction of load] [N1205]
- F16C32/06R2 . . . [N: for radial load only] [N1205]
- F16C32/06R2F [N: with floating bearing elements] [N1205]
- F16C32/06R4 . . . [N: for axial load only] [N1205]
- F16C32/06R6 . . . [N: for both radial and axial load] [N1205]

Guide heading: **Details or accessories of bearings**

F16C33/00 **Parts of bearings; Special methods for making bearings or parts thereof (metal-working or like operations, see the relevant classes) [N1204]**

- F16C33/02 . . Parts of sliding-contact bearings
- F16C33/04 . . . Brasses; Bushes; linings
- F16C33/04C [N: Sliding surface consisting mainly of ceramics, cermets or hard carbon, e.g. diamond like carbon [DLC]] [N1205]
- F16C33/04D [N: divided or split, e.g. half-bearings or rolled sleeves] [N1205]
- F16C33/06 Sliding surface mainly made of metal ([F16C33/24](#) to [F16C33/28](#) take precedence; [N: casting metal bearing surfaces [F16C31C24B](#), [B22D15/02](#), [B22D19/08](#)])
- F16C33/08 Attachment of brasses, bushes or linings to the bearing housing
- F16C33/10 Construction relative to lubrication [N: (lubrication in general F16N)]
- F16C33/10A [N: with gas, e.g. air, as lubricant] [N1205]
- F16C33/10A5 [N: Details of the bearing surface, e.g. means to generate pressure

		such as lobes or wedges] [N1205]
F16C33/10A5G	. . . . .	{7 dots} [N: Pressure generating grooves] [N1205]
F16C33/10G	. . . . .	[N: with grease as lubricant] [N1205]
F16C33/10L	. . . . .	[N: with liquid, e.g. oil, as lubricant] [N1205]
F16C33/10L2	. . . . .	[N: retained in or near the bearing] [N1205]
F16C33/10L2M	. . . . .	{7 dots} [N: by a magnetic field acting on a magnetic liquid] [N1205]
F16C33/10L2P	. . . . .	{7 dots} [N: in a porous body, e.g. oil impregnated sintered sleeve] [N1205]
F16C33/10L4	. . . . .	[N: Details of supply of the liquid to the bearing] [N1205]
F16C33/10L4C	. . . . .	{7 dots} [N: Conditioning, e.g. metering, cooling, filtering] [N1205]
F16C33/10L4S	. . . . .	{7 dots} [N: from radial inside, e.g. via a passage through the shaft and/or inner sleeve] [N1205]
F16C33/10L5	. . . . .	[N: Details of distribution or circulation inside the bearings, e.g. details of the bearing surfaces to affect flow or pressure of the liquid] [N1205]
F16C33/10L5D	. . . . .	{7 dots} [N: Grooves on a bearing surface for distributing or collecting the liquid] [N1205]
F16C33/10L5G	. . . . .	{7 dots} [N: Grooves for generating pressure] [N1205]
F16C33/10L5L	. . . . .	{7 dots} [N: Wedges, e.g. ramps or lobes, for generating pressure] [N1205]
F16C33/10L5P	. . . . .	{7 dots} [N: with a plurality of elements forming the bearing surfaces, e.g. bearing pads] [N1205]
F16C33/10L5R	. . . . .	{7 dots} [N: Channels or passages to recirculate the liquid in the bearing] [N1205]
F16C33/10L8	. . . . .	[N: Lubricant compositions or properties, e.g. viscosity] [N1205]
F16C33/10S	. . . . .	[N: with solids as lubricant, e.g. dry coatings, powder] [N1205]
F16C33/12	. . . . .	Structural composition; Use of special materials or surface treatments, e.g. for rust-proofing [N1204]
F16C33/12B	. . . . .	[N: Use of special materials] [N1205]
F16C33/12L	. . . . .	[N: Multilayer structures of sleeves, washers or liners] [N1205]
F16C33/12L2	. . . . .	[N: Details of overlays] [N1205]
F16C33/12L4	. . . . .	[N: Details of bearing layers, i.e. the lining] [N1205]
F16C33/12L6	. . . . .	[N: Details of intermediate layers, e.g. nickel dams] [N1205]
F16C33/12P	. . . . .	[N: Porous bearings, e.g. bushes of sintered alloy] [N1205]
F16C33/14	. . . . .	Special methods of manufacture; Running-in
F16C33/14P	. . . . .	[N: of sintered porous bearings] [N1205]
F16C33/16	. . . . .	Sliding surface consisting mainly of graphite
F16C33/18	. . . . .	Sliding surface consisting mainly of wood or fibrous material
F16C33/20	. . . . .	Sliding surface consisting mainly of plastics (F16C33/22 to F16C33/28 take precedence) [N1204]
F16C33/20B	. . . . .	[N: Composition of the plastic] [N1205]
F16C33/20L	. . . . .	[N: Multilayer structures, e.g. sleeves comprising a plastic lining] [N1205]
F16C33/20L2	. . . . .	[N: with two layers] [N1205]
F16C33/20L3	. . . . .	[N: with three layers] [N1205]
F16C33/20M	. . . . .	[N: Methods of manufacture, e.g. shaping, applying coatings] [N1205]
F16C33/22	. . . . .	Sliding surface consisting mainly of rubber or synthetic rubber (F16C33/24 to

		F16C33/28 take precedence) [N1204]
F16C33/24	. . .	with different areas of the sliding surface consisting of different materials
F16C33/26	. . .	made from wire coils; made from a number of discs, rings, rods, or other members [N1204]
F16C33/28	. . .	with embedded reinforcements shaped as frames or meshed materials
F16C33/30	. . .	Parts of ball or roller bearings
F16C33/30H	. . .	[N: of hybrid bearings, e.g. rolling bearings with steel races and ceramic rolling elements] [N1205]
F16C33/30S	. . .	[N: Means to synchronise movements] [N1205]
F16C33/32	. . .	Balls
F16C33/34	. . .	Rollers; Needles
F16C33/36	. . .	with bearing-surfaces other than cylindrical, e.g. tapered; with grooves in the bearing surfaces
F16C33/36G	. . . .	[N: with grooves in the bearing-surfaces] [N1205]
F16C33/36T	. . . .	[N: Tapered rollers, i.e. rollers generally shaped as truncated cones] [N1205]
F16C33/37	. . .	Loose spacing bodies [N1205]
F16C33/37C	. . .	[N: with concave surfaces conforming to the shape of the rolling elements, e.g. the spacing bodies are in sliding contact with the rolling elements] [N0703]
F16C33/37R	. . .	[N: with other rolling elements serving as spacing bodies, e.g. the spacing bodies are in rolling contact with the load carrying rolling elements] [N0703] [M1207]
F16C33/372	. . .	rigid [N0703]
F16C33/374	. . .	resilient [N0703]
F16C33/38	. . .	Ball cages [C0703]
F16C33/38B	. . .	[N: Details of interaction of cage and race, e.g. retention, centring] [N1205]
F16C33/38C	. . .	[N: formed of interconnected segments, e.g. chains] [N1205]
F16C33/38D	. . .	[N: formed of unconnected segments] [N1205]
F16C33/38F	. . .	[N: formed as a flexible belt, e.g. spacers connected by a thin film] [C0703]
F16C33/38H	. . .	[N: with hybrid structure, i.e. with parts made of distinct materials] [N1205]
F16C33/38M	. . .	[N: Massive or moulded cages having cage pockets surrounding the balls, e.g. machined window cages] [N1205]
F16C33/38M1	. . . .	[N: formed as one-piece cages, i.e. monoblock cages] [N1205]
F16C33/38M1M	. . . . .	[N: made from metal, e.g. cast or machined window cages] [N1205]
F16C33/38M1P	. . . . .	[N: made from plastic, e.g. injection moulded window cages] [N1205]
F16C33/38M2	. . . . .	[N: comprising two annular parts joined together] [N1205]
F16C33/38M2M	. . . . .	[N: made from metal, e.g. two cast parts joined by rivets] [N1205]
F16C33/38M2P	. . . . .	[N: made from plastic, e.g. two injection moulded parts joined by a snap fit] [N1205]
F16C33/38M4	. . . . .	[N: with more than three parts, e.g. two end rings connected by individual stays] [N1205]
F16C33/38P	. . .	[N: Details of individual pockets, e.g. shape or ball retaining means] [N1205]
F16C33/38R	. . .	[N: with rolling elements with smaller diameter than the load carrying balls, e.g. cages with counter-rotating spacers] [N1205]
F16C33/40	. . .	for multiple rows of balls

F16C33/40B	. . . .	[N: with two or more juxtaposed cages joined together or interacting with each other] [N1205]
F16C33/41	. . . .	comb-shaped [N1204]
F16C33/41M	. . . .	[N: Massive or moulded comb cages, e.g. snap ball cages] [N1205]
F16C33/41M1	. . . . .	[N: formed as one-piece cages, i.e. monoblock comb cages] [N1205]
F16C33/41M1P	. . . . .	[N: made from plastic, e.g. injection moulded comb cages] [N1205]
F16C33/41P	. . . .	[N: Details of individual pockets, e.g. shape or ball retaining means] [N1205]
F16C33/42	. . . .	made from wire or sheet metal strips (F16C33/40 , F16C33/41 take precedence)
F16C33/42S	. . . .	[N: made from sheet metal] [N1205]
F16C33/42S1	. . . . .	[N: from a single part, e.g. ribbon cages with one corrugated annular part] [N1205]
F16C33/42S2	. . . . .	[N: from two parts, e.g. ribbon cages with two corrugated annular parts] [N1205]
F16C33/44	. . . .	Selection of substances (F16C33/40 , F16C33/41 take precedence)
F16C33/44C	. . . .	[N: Coatings] [N1205]
F16C33/46	. . . .	Cages for rollers or needles [C0703]
F16C33/46B	. . . .	[N: Details of interaction of cage and race, e.g. retention or centring] [N1205]
F16C33/46H	. . . .	[N: with hybrid structure, i.e. with parts made of distinct materials] [N1205]
F16C33/46M	. . . .	[N: Massive or moulded cages having cage pockets surrounding the rollers, e.g. machined window cages] [N1205]
F16C33/46M1	. . . . .	[N: formed as one-piece cages, i.e. monoblock cages] [N1205]
F16C33/46M1M	. . . . .	[N: made from metal, e.g. cast or machined window cages] [N1205]
F16C33/46M1P	. . . . .	[N: made from plastic, e.g. injection moulded window cages] [N1205]
F16C33/46M2	. . . . .	[N: comprising two annular parts joined together] [N1205]
F16C33/46M2M	. . . . .	[N: made from metal, e.g. two cast parts joined by rivets] [N1205]
F16C33/46M2P	. . . . .	[N: made from plastic, e.g. two injection moulded parts joined by a snap fit] [N1205]
F16C33/46M3	. . . . .	[N: comprising three annular parts, i.e. three piece roller cages] [N1205]
F16C33/46M4	. . . . .	[N: with more than three parts, e.g. two end rings connected by individual stays] [N1205]
F16C33/46P	. . . .	[N: Details of individual pockets, e.g. shape or roller retaining means] [N1205]
F16C33/46P2	. . . . .	[N: of the stays separating adjacent cage pockets, e.g. guide means for the bearing-surface of the rollers] [N1205]
F16C33/46P4	. . . . .	[N: of the end walls, e.g. interaction with the end faces of the rollers] [N1205]
F16C33/46R	. . . .	[N: with rolling elements with smaller diameter than the load carrying rollers, e.g. cages with counter-rotating spacers] [N1205]
F16C33/46S	. . . .	[N: Single-split roller or needle cages] [N1205]
F16C33/48	. . . .	for multiple rows of rollers or needles
F16C33/48B	. . . . .	[N: with two or more juxtaposed cages joined together or interacting with each other] [N1205]
F16C33/49	. . . .	comb-shaped [N1204]
F16C33/49B	. . . . .	[N: applied as pairs for retaining both ends of the rollers or needles] [N1205]
F16C33/49B2	. . . . .	[N: joined by rods] [N1205]
F16C33/49M	. . . .	[N: Massive or moulded comb cages] [N1205]
F16C33/49M1	. . . . .	[N: formed as one piece cages, i.e. monoblock comb cages] [N1205]

F16C33/49M1M	. . . . .	[N: made from metal, e.g. cast or machined comb cages] [N1205]
F16C33/49M1P	. . . . .	[N: made from plastic, e.g. injection moulded comb cages] [N1205]
F16C33/50	. . .	formed of interconnected members, e.g. chains
F16C33/50A	. . . . .	[N: formed of arcuate segments retaining one or more rollers or needles] [N1205]
F16C33/50A2	. . . . .	[N: with two segments, e.g. two semicircular cage parts] [N1205]
F16C33/50F	. . . . .	[N: formed as a flexible belt] [N1205]
F16C33/50H	. . . . .	[N: formed of links having an H-shape, i.e. links with a single stay placed between two rollers and with two end portions extending along the end faces of the two rollers] [N1205]
F16C33/51	. . .	formed of unconnected members
F16C33/51A	. . . . .	[N: formed of arcuate segments for carrying one or more rollers] [N1205]
F16C33/51A2	. . . . .	[N: with two segments, e.g. double-split cages with two semicircular parts] [N1205]
F16C33/52	. . .	with no part entering between, or touching, the bearing surfaces of the rollers (F16C35/50 takes precedence)
F16C33/52P	. . . . .	[N: with pins extending into holes or bores on the axis of the rollers] [N1205]
F16C33/52P2	. . . . .	[N: extending through the rollers and joining two lateral cage parts] [N1205]
F16C33/54	. . .	made from wire, strips, or sheet metal (F16C33/48, F16C33/49 take precedence) [N1204]
F16C33/54P	. . . . .	[N: Details of individual pockets, e.g. shape or roller retaining means] [N1205]
F16C33/54S	. . . . .	[N: made from sheet metal] [N1205]
F16C33/54S1	. . . . .	[N: from a single part] [N1205]
F16C33/54S1B	. . . . .	[N: rolled from a band] [N1205]
F16C33/54S1M	. . . . .	[N: with a M- or W-shaped cross section] [N1205]
F16C33/54S2	. . . . .	[N: from two parts, e.g. two discs or rings joined together] [N1205]
F16C33/54S4	. . . . .	[N: with more than three parts, e.g. two end rings connected by a plurality of stays or pins] [N1205]
F16C33/56	. . .	Selection of substances (F16C33/48, F16C33/49 take precedence) [N1204]
F16C33/56C	. . . . .	[N: Coatings] [N1205]
F16C33/58	. .	Raceways; Race rings
F16C33/58C	. . .	[N: integral with other parts, e.g. with housings or machine elements such as shafts or gear wheels] [N1205]
F16C33/58D	. . .	[N: Details of specific parts of races] [N1205]
F16C33/58D4	. . . . .	[N: of raceways, e.g. ribs to guide the rollers] [N1205]
F16C33/58D6	. . . . .	[N: outside the space between the races, e.g. end faces or bore of inner ring] [N1205]
F16C33/58S	. . .	[N: Races of sheet metal] [N1205]
F16C33/60	. . .	divided [N: or split, e.g. comprising two juxtaposed rings]
F16C33/60B	. . . . .	[N: with a separate retaining member, e.g. flange, shoulder, guide ring, secured to a race ring, adjacent to the race surface, so as to abut the end of the rolling elements, e.g. rollers, or the cage]
F16C33/61	. . . . .	formed by wires
F16C33/62	. . .	Selection of substances

- F16C33/64 . . . Special methods of manufacture [N1204]
- F16C33/66 . . Special parts or details in view of lubrication [N1204]
- F16C33/66G . . . [N: with grease as lubricant] [N1205]
- F16C33/66G2 [N: Retaining the grease in or near the bearing] [N1205]
- F16C33/66G2P [N: in a porous or resinous body, e.g. a cage impregnated with the grease] [N1205]
- F16C33/66G2R [N: in recesses or cavities provided in retainers, races or rolling elements] [N1205]
- F16C33/66G2S [N: in a reservoir in the sealing means] [N1205]
- F16C33/66G4 [N: Details of supply and/or removal of the grease, e.g. purging grease] [N1205]
- F16C33/66G4C [N: Controlling or conditioning the grease supply] [N1205]
- F16C33/66G5 [N: Details of distribution or circulation inside the bearing, e.g. grooves on the cage or passages in the rolling elements] [N1205]
- F16C33/66G8 [N: Grease properties or compositions, e.g. rheological properties] [N1205]
- F16C33/66L . . . [N: with liquid lubricant] [N1205]
- F16C33/66L2 [N: Retaining the liquid in or near the bearing] [N1205]
- F16C33/66L2M [N: by a magnetic field acting on a magnetic liquid] [N1205]
- F16C33/66L2P [N: in a porous or resinous body, e.g. a cage impregnated with the liquid] [N1205]
- F16C33/66L2R [N: in recesses or cavities provided in retainers, races or rolling elements] [N1205]
- F16C33/66L2S [N: in a reservoir in the sealing means] [N1205]
- F16C33/66L4 [N: Details of supply of the liquid to the bearing, e.g. passages or nozzles] [N1205]
- F16C33/66L4A [N: the liquid being carried by air or other gases, e.g. mist lubrication] [N1205]
- F16C33/66L4B [N: from an oil bath in the bearing housing, e.g. by an oil ring or centrifugal disc] [N1205]
- F16C33/66L4C [N: related to conditioning, e.g. cooling, filtering] [N1205]
- F16C33/66L4M [N: related to the amount supplied, e.g. gaps to restrict flow of the liquid] [N1205]
- F16C33/66L4S [N: from radial inside, e.g. via a passage through the shaft and/or inner ring] [N1205]
- F16C33/66L5 [N: Details of distribution or circulation inside the bearing, e.g. grooves on the cage or passages in the rolling elements] [N1205]
- F16C33/66L6 [N: Details of collecting or draining, e.g. returning the liquid to a sump] [N1205]
- F16C33/66L8 [N: Lubricant compositions or properties, e.g. viscosity] [N1205]
- F16C33/66L8L [N: Liquids other than oil, e.g. water, refrigerants, liquid metal] [N1205]
- F16C33/66S . . . [N: with solids as lubricant, e.g. dry coatings, powder] [N1205]

- F16C33/72 . . Sealings [N1204]
- F16C33/72C . . [N: Shaft end sealing means, e.g. cup-shaped caps or covers] [N9809]
- F16C33/72V . . [N: with means to vent the interior of the bearing] [N1205]
- F16C33/74 . . of sliding-contact bearings

F16C33/74L	. . .	[N: by means of a fluid] [N1205]
F16C33/74L2	. . . .	[N: retained in the sealing gap] [N1205]
F16C33/74L2C	. . . . .	[N: by capillary action] [N1205]
F16C33/74L2M	. . . . .	[N: by a magnetic field] [N1205]
F16C33/74L4	. . . . .	[N: flowing to or from the sealing gap, e.g. vacuum seals with differential exhaust] [N1205]
F16C33/76	. . .	of ball or roller bearings
F16C33/76B	. . .	[N: specifically for bearings with purely axial load]
F16C33/76L	. . .	[N: by means of a fluid] [N1205]
F16C33/76L2	. . . .	[N: retained in the sealing gap] [N1205]
F16C33/76L2M	. . . . .	[N: by a magnetic field] [N1205]
F16C33/76L2P	. . . . .	[N: by pumping action] [N1205]
F16C33/76R	. . .	[N: integral with the race] [N1205]
F16C33/76S	. . .	[N: between relatively stationary parts, i.e. static seals] [N1205]
F16C33/78	. . .	with a diaphragm, disc, or ring, with or without resilient members [N: F16C33/76B takes precedence]
F16C33/78B	. . . .	[N: suited for particular types of rolling bearings] [N1205]
F16C33/78B2	. . . . .	[N: for spherical roller bearings] [N1205]
F16C33/78B4	. . . . .	[N: for needle roller bearings] [N1205]
F16C33/78B6	. . . . .	[N: for tapered roller bearings] [N1205]
F16C33/78D	. . . .	[N: Details of the sealing or parts thereof, e.g. geometry, material] [N1205]
F16C33/78D2	. . . . .	[N: of the sealing region] [N1205]
F16C33/78D2L	. . . . .	[N: of sealing lips] [N1205]
F16C33/78D2S	. . . . .	[N: of the opposing surface cooperating with the seal, e.g. a shoulder surface of a bearing ring] [N1205]
F16C33/78D4	. . . . .	[N: of the mounting region] [N1205]
F16C33/78D8	. . . . .	[N: Special methods of manufacture] [N1205]
F16C33/78F	. . . .	[N: floating with respect to both races] [N1205]
F16C33/78G	. . . .	[N: mounted to a groove in the inner surface of the outer race and extending toward the inner race] [N1205]
F16C33/78G1	. . . . .	[N: with a single annular sealing disc] [N1205]
F16C33/78G1G	. . . . .	[N: with a gap between the annular disc and the inner race] [N1205]
F16C33/78G1G4	. . . . .	{7 dots} [N: Bearing shields made of sheet metal] [N1205]
F16C33/78G1L	. . . . .	[N: with one or more sealing lips to contact the inner race] [N1205]
F16C33/78G1L1	. . . . .	{7 dots} [N: with a single sealing lip] [N1205]
F16C33/78G2	. . . . .	[N: with a further sealing element] [N1205]
F16C33/78G2C	. . . . .	[N: mounted to the inner race e.g. a flinger to use centrifugal effect] [N1205]
F16C33/78G2L	. . . . .	[N: with sealing lips] [N1205]
F16C33/78L	. . . .	[N: mounted with a cylindrical portion to the inner surface of the outer race and having a radial portion extending inward] [N1205]
F16C33/78L1	. . . . .	[N: with a single sealing ring of generally L-shaped cross-section] [N1205]
F16C33/78L1L	. . . . .	[N: with sealing lips] [N1205]
F16C33/78L2	. . . . .	[N: with a further sealing ring] [N1205]

- F16C33/78L2B [N: mounted to the inner race and of generally L-shape, the two sealing rings defining a sealing with box-shaped cross-section] [N1205]
- F16C33/78M [N: mounted outside the gap between the inner and outer races, e.g. sealing rings mounted to an end face or outer surface of a race] [N1205]
- F16C33/78R [N: mounted to an inner race and extending toward the outer race] [N1205]
- F16C33/78S [N: mounted to a cage or integral therewith] [N1205]
- F16C33/78T [N: with two or more discrete sealings arranged in series] [N1205]
- F16C33/80 Labyrinth sealings [N: [F16C33/76B](#) takes precedence]
- F16C33/80D [N: in addition to other sealings, e.g. dirt guards to protect sealings with sealing lips] [N1205]
- F16C33/82 Arrangements for electrostatic or magnetic action against dust or other particles

F16C35/00 Rigid support of bearing units; Housings, e.g. caps, covers (F16C23/00 takes precedence) [N1204]

- F16C35/02 in the case of sliding-contact bearings
- F16C35/04 in the case of ball or roller bearings
- F16C35/04H [N: Housings for rolling element bearings for rotary movement] [N1205]
- F16C35/04H2 [N: with a radial flange to mount the housing] [N1205]
- F16C35/04H4 [N: with a base plate substantially parallel to the axis of rotation, e.g. horizontally mounted pillow blocks] [N1205]
- F16C35/06 Mounting [N: or dismounting] of ball or roller bearings; Fixing them onto shaft or in housing [N1205]
- F16C35/06D [N: mounting a plurality of bearings side by side]
- F16C35/06R [N: Dismounting of ball or roller bearings] [N1205]
- F16C35/063 Fixing them on the shaft (with interposition of an element [F16C35/07](#)) [N9602]
- F16C35/063B [N: the bore of the inner ring being of special non-cylindrical shape which co-operates with a complementary shape on the shaft, e.g. teeth, polygonal sections] [N9602]
- F16C35/067 Fixing them in a housing (with interposition of an element [F16C35/07](#)) [N9602]
- F16C35/07 Fixing them on the shaft or housing with interposition of an element [N9602]
- F16C35/073 between shaft and inner race ring [N9602]
- F16C35/077 between housing and outer race ring [N9602]
- F16C35/078 using pressure fluid as mounting aid
- F16C35/08 for spindles
- F16C35/10 with sliding-contact bearings
- F16C35/12 with ball or roller bearings [N: adjustable bearings [F16C23/00](#), [F16C25/00](#); elastic bearings [F16C27/00](#)]

F16C37/00 Cooling of bearings [N1204]

- F16C37/00F [N: of fluid bearings] [N1205]
- F16C37/00M [N: of magnetic bearings] [N1205]

- F16C37/00R . [N: of rolling bearings] [N1205]
- F16C39/00 Relieving load on bearings [N1204]**
- F16C39/02 . using mechanical means
- F16C39/04 . using hydraulic or pneumatic means
- F16C39/06 . using magnetic means
- F16C39/06A . . [N: Permanent magnets]
- F16C39/06A4 . . . [N: with opposing permanent magnets repelling each other] [N1205]
- F16C41/00 Other accessories, [N: e.g. devices integrated in the bearing not relating to the bearing function as such] [N1205]**
- F16C41/00B . [N: Integrated brakes or clutches for stopping or coupling the relatively movable parts] [N1205]
- F16C41/00C . [N: Conductive elements, e.g. to prevent static electricity] [N1205]
- F16C41/00E . [N: Electro-dynamic machines, e.g. motors, generators, actuators] [N1205]
- F16C41/00F . [N: Fluid passages not relating to lubrication or cooling] [N1205]
- F16C41/00M . [N: Encoders, e.g. parts with a plurality of alternating magnetic poles] [N1205]
- F16C41/00R . [N: Identification means, e.g. markings, RFID-tags; Data transfer means] [N1205]
- F16C41/02 . Arrangements for equalizing the load on a plurality of bearings or their elements [N1204]
- F16C41/04 . Preventing damage to bearing during storage or transport thereof or when otherwise out of use
- F16C41/04B . . [N: Devices for provisionally retaining needles or rollers in a bearing race before mounting of the bearing on a shaft]
- F16C43/00 Assembling bearings**
- F16C43/02 . Assembling sliding-contact bearings
- F16C43/04 . Assembling rolling-contact bearings
- F16C43/04S . . [N: Mounting or replacing seals] [N1205]
- F16C43/06 . . Placing rolling bodies in cages or bearings
- F16C43/06C . . . [N: in cages] [N1205]
- F16C43/08 . . . by deforming the cages or the races
- F16C43/08C [N: by plastic deformation of the cage] [N1205]
- F16C43/08R [N: by plastic deformation of the race] [N1205]