

Combined Bearings & Profiles



WINKEL GmbH of Germany in Joint Venture with Inteltek Automation offers an economical solution in India for vertical and horizontal linear motion in both machines and lifting units. Winkel GmbH operating since more than 25 years in the field of linear systems and material handling. They are market leaders in the field of heavy load linear systems and have delivered thousands of handling systems.

Their components are a part of a unit Construction system that enables simple and cost saving designs. The product range include:

Combined Bearings and Profiles

The combined bearings system comprising of combined bearings and strong profiles takes up high radial and axial loads. The system can be designed for loads from 10 kg to 100 tons.

The combined bearings are a combination of two bearings; their orientation being at 90° w.r.t each other.



Carefully designed, both the bearings are assembled in a compact housing. Outer bearing takes up the radial loads (upto 13.9 tons) and inner the axial loads (upto 4.6 tons). The bearings can be welded to support structures or jigs & fixture

The outer rings of the bearings are made from case hardened steel UNI 16CrNi 4 hardened at 62+2 HRC. The inner rings are made from bearing steel En 31-SAE 52100 hardened at 62-2 HRC. The cylindrical rollers have flat ground heads, made from En 31-SAE 52100 steel hardened at 59 – 64 HRC. The welding bolts are made from UNI FE 510.C. The bearings are lubricated with grade 3 grease.

They are available with the axial bearing fixed, axial bearing eccentric adjustable, Vulkollan coated bearings for silent run, plain radial bearings with welding bolt, adjustable combined

bearing with oil amid (high resistant and self-lubricant polyamide) insert and ATC-Armolloy coated corrosion resistant bearings.

Selection of Combined Bearings

Dimensioning/Calculation of the Reel Load:

Q= Load Capacity (N)

L= Load distance to suspension point (mm)

P= Suspension Point

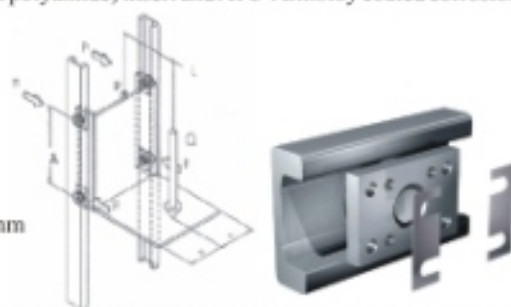
A= Bearing Distance (mm) recommended 500-1000mm

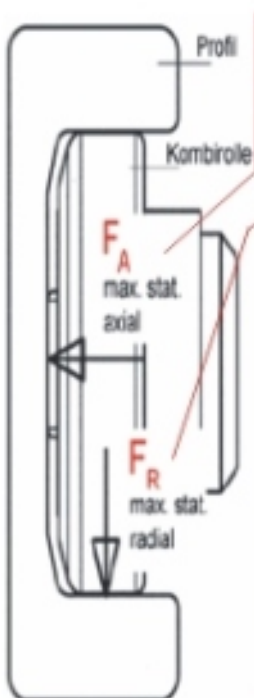
Formula

Maximum Load F_{max} [N] = (Q*L) / (2*A)

Once you have selected the Combined Bearing you can easily select the respective Flange Plate and Profile for the selected Bearing from the table itself.

Flange Plates, Insert Washers and Clamp Flanges are available to facilitate quick assembling, reducing your designing and production cost. All Bearing Components are easily exchangeable...





Radial Bearing	Combined Bearing Axial Bearing Fix	Combined Bearing Axial Bearing Adjustable	Combined Bearing Axial Bearing Adjustable	Combined Bearing with Eccentric Bearing	Combined Bearing with Combined Bolt	F,KN Max. Stat. Radial	F,KN Max. Stat. Radial	Profiles		
	4.052 P	-	-	-	-	0.80	0.40	A	-	-
	4.053	-	-	-	-	5.23	1.68	S	-	-
(PR) 2.054	(PR) 4.054	(PR) 4.054	(PR) 4.072	JC 4.054	KB (PR) 4.072	9.40	3.10	0 NB	PR 0 NB	-
(PR) 2.055	(PR) 4.055	(PR) 4.455	(PR) 4.073	JC 4.055	KB (PR) 4.073	11.30 (8.99)	3.73 (2.86)	1 NB	PR 1 NB	(3018)
(PR) 2.056	(PR) 4.056	(PR) 4.456	(PR) 4.074	JC 4.056	KB (PR) 4.074	11.72	3.87	2 NB	PR 2 NB	-
	4.057	4.057	4.075	-	-	(8.92)	(2.97)	-	-	(3019)
(PR) 2.058	(PR) 4.058	(PR) 4.458	(PR) 4.076	JC 4.058	KB (PR) 4.076	20.47 (15.57)	6.76 (5.19)	3 NB	PR 3 NB	(3020)
-	4.059	4.059	4.077	-	-	(15.47)	(5.15)	-	-	(2912)
-	4.060	4.060	4.078	-	-	(16.49)	(5.49)	-	-	(3100)
(PR) 2.061	(PR) 4.061	(PR) 4.461	(PR) 4.0784	JC 4.061	KB (PR) 4.0784	21.68	7.16	4 NB	PR 4 NB	-
(PR) 2.062	(PR) 4.062	(PR) 4.462	(PR) 4.079	JC 4.062	KB (PR) 4.079	30.92 (23.52)	10.20 (7.84)	5 NB	PR 5 NB	(3353)
(PR) 2.063	(PR) 4.063	(PR) 4.463	-	JC 4.060	-	34.02	17.80	6 NB	PR 6 NB	-
-	-	-	(PR) 4.080	-	KB (PR) 4.080	37.81	17.80	6 NB	PR 6 NB	-
-	-	(PR) 4.085	-	-	-	64.70	19.40	8 NB	PR 8 NB	-
-	-	4.089	-	-	-	41.71	13.91	10	-	-
-	-	4.090	-	-	-	58.00	19.40	16	-	-
-	-	4.091	-	-	-	84.00	26.00	18	-	-
-	-	4.092	-	-	-	101.50	33.90	28	-	-
-	-	4.093	-	-	-	139.40	46.50	36	42	-



Profiles

Bearings roll inside the profile made from high quality steel in UNI FE 510-C Nb. The profiles are sandblasted and fine straightened to an accuracy of ± 0.3 mm/m. The high strength profiles take up high static and dynamic loads (upto 42 tons) and the design allows for even dispersion of forces. The bearings are in contact with the inner surface of the profiles; the clearance being as low as 0.2 to 0.4 mm.

Standard Nb-Profiles

Winkel U-Profiles with 30% increased Load Capacity

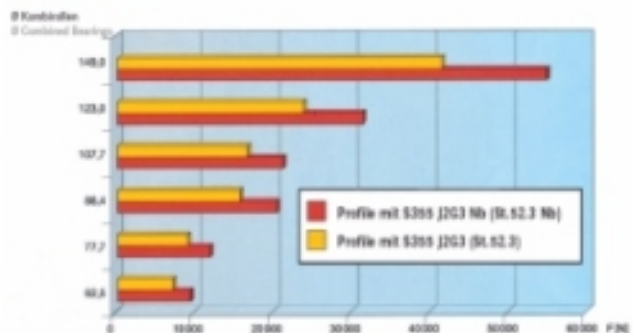
- Higher load capacity at same sizes by using profiles with steel grade UNI FE 510.C Nb
- Choice of Smaller Sizes (price advantage)
- Higher resistance against wear out effects

Comparison UNI FE 510.C – UNI FE 510.C Nb

Characteristic	UNI FE 510.C (Old)	UNI FE 510.C Nb (New)
Yield Point 1	min 355 N/mm ²	min 420 N/mm ²
Yield Point 2	min 345 N/mm ²	min 400 N/mm ²
Tensile Strength	490 - 630 N/mm ²	540 - 670 N/mm ²
Elongation	min 22%	min 20%
Max. Hertzian Pressure	750 N/mm ²	860 N/mm ²

Caused by micro alloying with niobium, the steel grade UNI FE 510.C Nb has a higher tensile and yield strength and a more fine-grained structure than a conventional UNI FE 510.C steel grade. Thus the steel grade UNI FE 510.C Nb has a better weldability and a higher resistance to brittle fracture. The higher bearing pressure of UNI FE 510.C Nb in comparison to UNI FE 510.C is shown by the figure below.

Bearing Pressures for Radial Bearings in Comparison



Corrosion Protection for Combined Bearings : ATC-coating

ATC-armoloy is a low temperature, multistate metal finishing process based from chrome-plating technology. Unlike

conventional chrome-plating processes, ATC-armoloy utilizes proprietary chemical solutions and application processes that are carefully monitored to produce its thin dense chromium coating, which follows the exact contours of the basis, metal with accurate deposit thickness

Advantages of the ATC-coating

- **Resists corrosion, longer life**
The inherently hard ATC surface is corrosion-resistant. The surface of the coated bearings becomes smoother. ATC coated surfaces have a lower coefficient of friction and get no oxidizing
- **Chromium coating and hardness**
ATC coatings consist of 99% pure chromium. The surface

increase to 72 HRC hardness.

- **Longer life, lower friction**

ATC coated surfaces have a lower friction coefficient and an increased lifetime.

All Winkel Components are designed for continuous use and have low maintenance, giving rigid and cost effective solutions. They are simple, modular, and have better resistant against dust and dirt. All these factors make Winkel more preferred choice in steel industry and Winkel components are gaining more popularity in Steel and Coil handling industry.

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