



AS21438
YAF Series
 (MS21438)

AS21439
YAT Series
 (MS21439)

AS24465
YAD Series
 (MS24465)

AS24466
YAF Series
 (MS24466)

AS24461
YAG Series
 (MS24461)

AS21432
HRS Series
 (MS21432)

AS21447
CHRS Series
 (MS21447)

AS5927
YAF-XD Series

AS5928
YAT-XD Series

AS5929
CHRS-XD Series



Aerospace Bearings

Introduction

Smith Aircraft Bearings presented in this section have been designed to meet the standards of the aerospace industry and conform to military and other appropriate national standards. When selecting these bearings for your application, it is recommended that you review the engineering data provided, along with any appropriate military or national specifications.

Smith Bearing® has been a leader in the design and manufacture of specialized bearings for the unique requirements of jet engines. We have kept pace with the ever increasing demands for anti-friction bearings to operate at higher temperatures. Thrust reversers, afterburners, and divergent nozzles are some of the areas in which **Smith Bearing®** Bearings are currently functioning. Contact our engineering department for recommendations and design assistance.

Military Qualifications

The products listed meet the military requirements of **SAE AS 39901**

Smith Aircraft Bearings are marked with the bearing designation including bearing type code. Many of these bearings are supplied pre-lubricated to meet the OEM's special requirements. When ordering, attention must be paid to the original manufacturers parts list requirements so that proper identification can be provided.

Federal Aviation Administration Parts Manufacturing Approval FAA PMA

Smith manufactures bearings to meet the provisions of the Federal Aviation Regulations (**FAR**) for Parts Manufacturing Approval (**PMA**).

Smith Bearing® maintains an active list identifying all of our **FAA PMA** parts and where they are applicable. This list is available upon request.

Bearing Selection

YAF (AS21438) & YAT (AS21439)

YAF and **YAT** Series Yoke Type bearings have heavy outer ring sections and were designed for application as track rollers where the bearing O.D. is unsupported. These bearings will support heavy rolling or oscillating loads in cam or track roller applications. The **YAF-Series (single row)** needle bearings have a crowned outer race. The **YAT-Series (double row)** needle bearings have large blended outside corner radiuses to help distribute stresses. The outer race is hard-chrome plated and all other exposed surfaces are cadmium plated for corrosion protection. These bearings can be re-lubricated thru the inner ring bore. When mounting, care should be taken to properly support the end plates to eliminate the possibility of bearing separation due to thrust loads. These bearings are dimensionally interchangeable with the corresponding YAD and YAS Series.

YAD (AS24465) & YAS (AS24466)

YAD and **YAS** Series Yoke Type bearings are dimensionally similar to the YAF and YAT Series. These bearings were designed for track roller applications where the outer race of the bearing is unsupported. They will handle heavy rolling or oscillating motion. The outer race is hard-chrome plated and all other exposed surfaces are cadmium plated for corrosion protection. The bearing is held together using a swedged ring inserted around the inside of the end washers. These bearings are generally considered for replacement in existing applications. For new applications and current designs use the YAF and YAT Series.

YAG (AS24461)

YAG Series Yoke Type bearings were designed for applications where the bearing is mounted inside the housing. These bearings handle slow rotating or oscillating motions. All external surfaces except the bore are cadmium plated for corrosion protection. The bearing is held together using a swedged ring inserted around the inside of the end washer.

HRS (AS21432) & CHRS (AS21447)

HRS and **CHRS** Series Stud Type bearings are of non-separable construction and are used in applications involving high-static loads or oscillating motion. The **HRS-Series** - straight cylindrical outer race and the **CHRS-Series** - crowned outer race were designed for airframe usage in flap tracks, canopies, and landing gear. When misalignment is a concern, the CHRS (crowned) Series is preferred. The outer races are hard-chrome plated and all other exposed surfaces are cadmium plated for corrosion protection.

Aerospace Bearings

Load Ratings

Aircraft Static Capacity (ASC)

is the maximum load which can be placed on a housing mounted needle roller bearing without seriously brinelling the raceways (approx. 0.0001 inch deep) or deforming the rolling elements.

Limit Load Rating

is the maximum static load that can be applied without impairing the subsequent function of the bearing.

Ultimate Static Fracture Load Rating

is a minimum of 1.5 times the Limit Load Rating

Track Roller Bearings

YAF, YAT, YAD, and **YAS** Series bearings are designed for use as a Track Roller and therefore operate with an unsupported outer race. For this reason deformation of the outer race must be taken into consideration. The dynamic rating method used for track roller bearings is the **Rating as a Track Roller** which equals 1/3 **ASC** (Aircraft Static Capacity). The **Limit Load Rating** for track roller bearings equals 4/9 **ASC** (Aircraft Static Capacity).

HRS and **CHRS** Series bearings with integral stud are designed for use as a track roller. For these bearings the **Limit Load Rating** equals 2/3 **ASC** (Aircraft Static Capacity).

Housing Mounted Bearings:

YAG Series bearings must be mounted inside a housing and are not used as a track roller. For these types of bearings the **Ultimate Load Rating** is equal to the **ASC** (Aircraft Static Capacity). **The Limit Load Rating** equals 2/3 **ASC** (Aircraft Static Capacity).

Smith Aircraft & Military Bearings

SMITH Bearing® Model	Description	SAE Standard	Military Standard	ABMA Number	NAS Standard
YAF	Yoke Type • Single Row • Track Roller	AS21438	MS21438	N/A	N/A
YAT	Yoke Type • Double Row • Track Roller	AS21439	MS21439	N/A	N/A
YAD	Yoke Type • Single Row • Track Roller	AS24465	MS24465	NBF	NAS 502
YAS	Yoke Type • Double Row • Track Roller	AS24466	MS24466	NBL	NAS 503
YAG	Yoke Type • Housing Mounted	AS24461	MS24461	NBC	NAS 505
HRS	Stud Type • Track Roller	AS21432	MS21432	HRS	NAS 562
CHRS	Stud Type • Crowned • Track Roller	AS21447	MS21447	CHRS	N/A
YAF-XD	SS • Yoke Type • Single Row • Track Roller	AS5927	N/A	N/A	N/A
YAT-XD	SS • Yoke Type • Double Row • Track Roller	AS5928	N/A	N/A	N/A
CHRS-XD	SS • Stud Type • Crowned • Track Roller	AS5929	N/A	N/A	N/A

Temperature

Unsealed aircraft bearings can be operated at temperatures up to 400 °F provided that suitable lubrication is present. Higher temperature exposure will result in loss of capacity. The operating temperature for sealed bearings is limited to 250 °F due to the seal material.

Stainless Steel

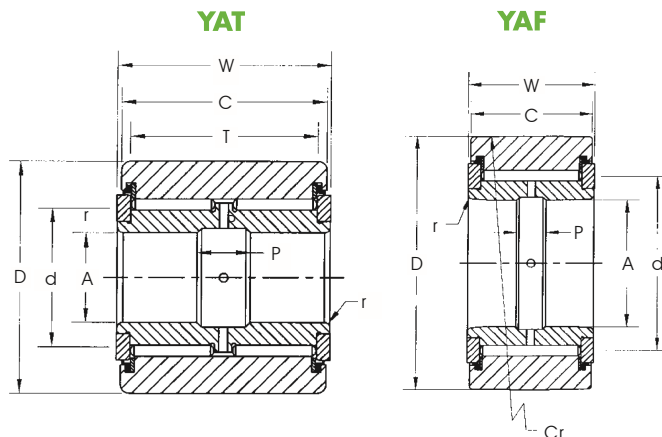
Smith Bearing® produces Stainless Steel airframe bearings which are dimensionally interchangeable to our standard line of bearings listed in this section. The special grade of stainless steel used has extremely high strength and corrosion resistance. Material used is per AMS 5925 or AMS 5898 for inner races, outer races, studs and rolls and AMS 5621 for end washers. Consult our engineering department for exact specifications and applications.

AS21438 (MS21438)

YAF SERIES • Single Row

AS21439 (MS21439)

YAT SERIES • Double Row



General Information

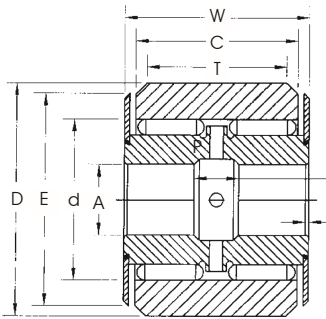
The **YAF Single Row** & **YAT Double Row** Series bearings are manufactured in accordance with **AS21438** & **AS21439** standards. The bearings are used in track roller applications with each bearing consisting of an inner race, outer race, needle rollers, end washers & thrust seals. Relubrication holes and grooves are provided. For wear and corrosion protection the outer ring surface is hard-chrome plated. Other exposed surfaces are cadmium or zinc-nickel plated. Inner rings may be black-oxide coated. Consult our Engineering Department for further specific requirements and special designs.

These bearings can be produced from stainless steel grade AMS 5898 & AMS 5925.

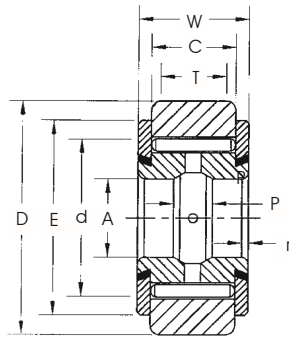
Dimensional Data (inches)

SMITH Bearing® Number	AS/MS Number Military	A Bore +.0000 -.0007	D Roller O.D. +.0000 -.0010	W Overall Width +.000 -.005	C Outer Race Width +.000 -.005	T Track Contact Width Min.	Cr Crown radius	d Min. Clamp Dia.	P Lube Groove Width	r Radius	Limit Load Rating (lbf)	Rating As A Track Roller (lbf)	Track Capacity 40HRC (lbf)	Recommended Shaft Diameter				Weight Approx. (lbs)
														Slip Fit		Press Fit		
														Max	Min	Max	Min	
YAF-03	21438-103	0.1900	0.7500	0.312	0.280	-	10.000	0.438	3/32	0.022	1200	900	290	0.1894	0.1889	0.1902	0.1897	0.030
YAF-04	21438-104	0.2500	0.8750	0.375	0.345	-	10.000	0.516	1/8	0.022	1910	1430	575	0.2494	0.2489	0.2502	0.2497	0.051
YAF-06	21438-106	0.3750	1.0625	0.500	0.455	-	10.000	0.672	3/16	0.022	3600	2700	1000	0.3744	0.3739	0.3752	0.3747	0.103
YAF-08	21438-108	0.5000	1.3125	0.625	0.580	-	12.500	0.844	3/16	0.032	5780	4300	1785	0.4994	0.4989	0.5002	0.4997	0.187
YAF-10	21438-110	0.6250	1.5000	0.750	0.705	-	17.500	0.953	1/4	0.032	8530	6400	2600	0.6244	0.6239	0.6252	0.6247	0.279
YAF-12	21438-112	0.7500	1.7500	1.000	0.950	-	25.000	1.109	1/4	0.032	14200	10700	4050	0.7494	0.7489	0.7502	0.7497	0.520
YAF-14	21438-114	0.8750	2.0000	1.125	1.075	-	27.500	1.219	1/4	0.032	19300	14400	5350	0.8744	0.8739	0.8752	0.8747	0.749
YAF-20	21438-120	1.2500	2.5000	1.250	1.200	-	30.000	1.625	3/8	0.032	25300	18900	7100	1.2494	1.2488	1.2503	1.2497	1.160
YAF-24	21438-124	1.5000	3.0000	1.500	1.440	-	60.000	1.984	3/8	0.032	37900	28400	10900	1.4994	1.4988	1.5003	1.4997	2.360
YAF-28	21438-128	1.7500	3.4375	1.500	1.440	-	60.000	2.281	3/8	0.032	44100	33000	12400	1.7494	1.7488	1.7503	1.7497	2.710
YAF-32	21438-132	2.0000	3.8750	1.500	1.440	-	60.000	2.562	3/8	0.032	48900	36700	14000	1.9994	1.9987	2.0003	1.9996	3.420
YAF-36	21438-136	2.2500	4.3125	1.500	1.440	-	60.000	2.859	3/8	0.032	55000	41200	15600	2.2494	2.2487	2.2503	2.2496	4.230
YAF-40	21438-140	2.5000	4.7500	1.500	1.440	-	60.000	3.109	3/8	0.032	59900	44900	17200	2.4994	2.4987	2.5003	2.4996	5.140
YAF-44	21438-144	2.7500	5.0000	1.500	1.440	-	60.000	3.344	3/8	0.032	64800	48600	18100	2.7494	2.7487	2.7503	2.7496	5.490
YAT-06	21439-106	0.3750	1.1250	1.000	0.940	0.750	-	0.672	3/16	0.032	7130	5370	2600	0.3744	0.3739	0.3752	0.3747	0.239
YAT-08	21439-108	0.5000	1.3750	1.250	1.190	1.000	-	0.891	1/4	0.032	12500	9370	4250	0.4994	0.4989	0.5002	0.4997	0.437
YAT-10	21439-110	0.6250	1.6250	1.500	1.440	1.125	-	1.109	3/8	0.032	19900	15000	5650	0.6244	0.6239	0.6252	0.6247	0.728
YAT-12	21439-112	0.7500	1.8750	1.750	1.690	1.375	-	1.281	3/8	0.032	28500	21400	7950	0.7494	0.7489	0.7502	0.7497	1.130

YAS



YAD



AS24465 (MS24465)

YAD SERIES • Single Row

AS24466 (MS24466)

YAS SERIES • Double Row

General Information

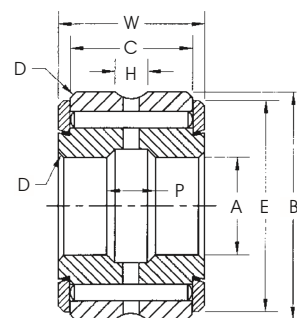
The **YAD Single Row** & **YAS Double Row** Series bearings are manufactured in accordance with **AS24465** & **AS24466** standards. The bearings are used in track roller applications with each bearing consisting of an inner race, outer race, needle rollers, end washers & thrust seals. Relubrication holes and grooves are provided. For corrosion protection the outer ring surface is hard chrome plated while all other exposed surfaces are cadmium or zinc-nickel plated. Consult our Engineering Department for further specific requirements and special designs.

Dimensional Data (inches)

SMITH Bearing® Number	AS/MS Military Number	ABMA Number	A Bore +0.000 -0.007	D Roller O.D. +0.000 -0.010	W Overall Width +0.000 -0.005	C Outer Race Width +0.000 -0.005	T Track Contact Width Min	E End Ring Dia.	d Min. Clamp Dia.	P Lube Groove Width	r Radius or 45° Chamfer	Limit Load Rating (lbf)	Rating As A Track Roller (lbf)	Track Capacity 40HRC (lbf)	Recommended Shaft Diameter				Weight Approx. (lbs)
															Slip Fit		Press Fit		
															Max	Min	Max	Min	
YAD-03	24465-3	3NBF512YJ	0.1900	0.7500	0.312	0.218	0.125	0.688	0.438	3/32	0.022	1200	900	290	0.1894	0.1889	0.1902	0.1897	0.029
YAD-04	24465-4	4NBF614YJ	0.2500	0.8750	0.375	0.281	0.218	0.750	0.516	1/8	0.022	1910	1430	575	0.2494	0.2489	0.2502	0.2497	0.049
YAD-06	24465-6	6NBF817YJ	0.3750	1.0625	0.500	0.375	0.312	0.938	0.672	3/16	0.022	3600	2700	1000	0.3744	0.3739	0.3752	0.3747	0.980
YAD-08	24465-8	8NBF1021YJ	0.5000	1.3125	0.625	0.500	0.438	1.188	0.844	3/16	0.032	5780	4300	1785	0.4994	0.4989	0.5002	0.4997	0.178
YAD-10	24465-10	10NBF1224YJ	0.6250	1.5000	0.750	0.625	0.562	1.375	0.953	1/4	0.032	8530	6400	2600	0.6244	0.6239	0.6252	0.6247	0.266
YAD-12	24465-12	12NBF1628YJ	0.7500	1.7500	1.000	0.875	0.750	1.625	1.109	1/4	0.032	14200	10700	4050	0.7494	0.7489	0.7502	0.7497	0.495
YAD-14	24465-14	14NBF1832YJ	0.8750	2.0000	1.125	1.000	0.875	1.875	1.219	1/4	0.032	19300	14400	5350	0.8744	0.8739	0.8752	0.8747	0.713
YAD-20	24465-20	20NBF2040YJ	1.2500	2.5000	1.250	1.049	0.938	1.906	1.625	3/8	0.032	25300	18900	7100	1.2494	1.2488	1.2503	1.2497	1.060
YAD-24	24465-24	24NBF2448YJ	1.5000	3.0000	1.500	1.229	1.172	2.875	1.984	3/8	0.032	37900	28400	10900	1.4994	1.4988	1.5003	1.4997	2.070
YAD-28	24465-28	28NBF2455YJ	1.7500	3.4375	1.500	1.229	1.172	3.312	2.281	3/8	0.032	44100	33000	12400	1.7494	1.7488	1.7503	1.7497	2.710
YAD-32	24465-32	32NBF2462YJ	2.0000	3.8750	1.500	1.229	1.172	3.750	2.562	3/8	0.032	48900	36700	14000	1.9994	1.9987	2.0003	1.9996	3.420
YAD-36	24465-36	36NBF2469YJ	2.2500	4.3125	1.500	1.229	1.172	4.188	2.859	3/8	0.032	55000	41200	15600	2.2494	2.2487	2.2503	2.2496	4.230
YAD-40	24465-40	40NBF2476YJ	2.5000	4.7500	1.500	1.229	1.172	4.625	3.109	3/8	0.032	59900	44900	17200	2.4994	2.4987	2.5003	2.4996	5.140
YAD-44	24465-44	44NBF2480YJ	2.7500	5.0000	1.500	1.229	1.172	4.875	3.344	3/8	0.032	64800	48600	18100	2.7494	2.7487	2.7503	2.7496	5.490
YAS-06	24466-6	6NBL1618YJ	0.3750	1.1250	1.000	0.875	0.750	1.000	0.672	3/16	0.032	7130	5370	2600	0.3744	0.3739	0.3752	0.3747	0.228
YAS-08	24466-8	8NBL2022YJ	0.5000	1.3750	1.250	1.125	1.000	1.250	0.891	1/4	0.032	12500	9370	4250	0.4994	0.4989	0.5002	0.4997	0.416
YAS-10	24466-10	10NBL2426YJ	0.6250	1.6250	1.500	1.375	1.125	1.500	1.109	3/8	0.032	19900	15000	5650	0.6244	0.6239	0.6252	0.6247	0.693
YAS-12	24466-12	12NBL2830YJ	0.7500	1.8750	1.750	1.625	1.375	1.750	1.281	3/8	0.032	28500	21400	7950	0.7494	0.7489	0.7502	0.7497	1.180

AS24461 (MS24461)

YAG SERIES • Single Row

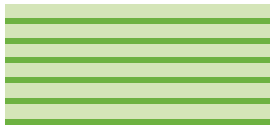


General Information

The **YAG Series Airframe Bearings** are manufactured in accordance with **AS24461** standards. The O.D. of these bearings are cadmium plated and designed to be mounted inside a housing. Each bearing consists of an inner race, outer race, needle rollers & end washers. Relubrication holes and grooves are provided. For corrosion protection all external surfaces except the bore are cadmium plated. Inner race grooves are omitted from the -3, -4, and -5 sizes due to bolt strength limitations. Consult our Engineering department for further specific requirements and special designs.

Dimensional Data (inches)

SMITH Bearing® Number	AS/MS Military Number	ABMA Number	A Bore +0.000 -0.007	B Roller O.D. +0.000 -0.010	W Overall Width +0.000 -0.005	C Outer Race Width +0.000 -0.005	D Radius or 45° Chamfer	E End Ring Dia.	H Outer Race Groove Width	P Inner Ring Lube Width	d Min Clamp Dia.	Limit Load Rating (lbf)	Aircraft Static Capacity (lbf)	Weight Approx (lbs)
YAG-03-C	24461-3	3NBC511ZP	0.1900	0.6875	0.312	0.218	0.022	0.625	1/16	-	0.438	1800	2700	0.028
YAG-04-C	24461-4	4NBC612ZP	0.2500	0.7500	0.375	0.281	0.022	0.688	11/16	-	0.516	2870	4300	0.040
YAG-05-C	24461-5	5NBC713ZP	0.3125	0.8125	0.437	0.344	0.022	0.750	3/32	-	0.516	4070	6100	0.057
YAG-06	24461-6	6NBC914YZP	0.3750	0.8750	0.562	0.469	0.022	0.812	1/8	3/16	0.641	6330	9500	0.075
YAG-07	24461-7	7NBC1015YZP	0.4375	0.9375	0.625	0.531	0.032	0.875	1/8	3/16	0.703	8000	12000	0.097
YAG-08	24461-8	8NBC1012YZP	0.5000	1.1250	0.750	0.656	0.032	1.031	1/8	3/16	0.844	11600	17400	0.165
YAG-09	24461-9	9NBC1419YZP	0.5625	1.1875	0.875	0.781	0.032	1.094	5/32	3/16	0.891	15000	22500	0.207
YAG-10	24461-10	10NBC1620YZP	0.6250	1.2500	1.000	0.906	0.032	1.156	5/32	1/4	0.953	18900	28300	0.252
YAG-12	24461-12	12NBC1822YZP	0.7500	1.3750	1.125	1.000	0.032	1.281	5/32	1/4	1.078	23900	35800	0.336
YAG-14	24461-14	14NBC2026YZP	0.8750	1.6250	1.250	1.125	0.032	1.500	5/32	3/8	1.250	30500	45800	0.423
YAG-16	24461-16	16NBC2028YZP	1.0000	1.7500	1.250	1.125	0.032	1.625	5/32	3/8	1.375	33900	50900	0.510
YAG-20	24461-20	20NBC2032YZP	1.2500	2.0000	1.250	1.049	0.032	1.906	5/32	3/8	1.625	37900	56800	0.600
YAG-24	24461-24	24NBC2036YZP	1.5000	2.2500	1.250	1.049	0.032	2.156	5/32	3/8	1.875	44200	66300	0.710
YAG-28	24461-28	28NBC2040YZP	1.7500	2.5000	1.250	1.049	0.032	2.406	5/32	3/8	2.125	50500	75700	0.780
YAG-32	24461-32	32NBC2044YZP	2.0000	2.7500	1.250	1.049	0.032	2.656	5/32	3/8	2.375	56800	85200	0.880
YAG-36	24461-36	36NBC2048YZP	2.2500	3.0000	1.250	1.049	0.032	2.906	5/32	3/8	2.625	63100	94600	0.980
YAG-40	24461-40	40NBC2052YZP	2.5000	3.2500	1.250	1.049	0.032	3.156	5/32	3/8	2.875	69400	104100	1.060
YAG-44	24461-44	44NBC2056YZP	2.7500	3.5000	1.250	1.049	0.032	3.406	5/32	3/8	3.125	75700	113500	1.150
YAG-48	24461-48	44NBC2060YZP	3.0000	3.7500	1.250	1.049	0.032	3.656	5/32	3/8	3.375	82000	123000	1.240
YAG-52	24461-52	52NBC2064YZP	3.2500	4.0000	1.250	1.049	0.032	3.906	5/32	3/8	3.641	88300	132500	1.340
YAG-56	24461-56	56NBC2070YZP	3.5000	4.3750	1.250	1.049	0.044	4.219	5/32	3/8	3.969	96700	145100	1.730
YAG-60	24461-60	60NBC2074YZP	3.7500	4.6250	1.250	1.049	0.044	4.469	5/32	3/8	4.219	103000	154500	1.840
YAG-64	24461-64	64NBC2078YZP	4.0000	4.8750	1.250	1.049	0.044	4.719	5/32	3/8	4.469	109000	164000	1.990



AS24461 (MS24461)

YAG SERIES • Single Row

(continued)

“A” Bore Tolerance

YAG-3 to YAG 52	+0.0000 / -0.0007
YAG-56 to YAG 64	+0.0000 / -0.0008

“D” Outer Diameter Tolerance

YAG-3 to YAG 16	+0.0000 / -0.0005
YAG-23 to YAG 36	+0.0000 / -0.0006
YAG-40 to YAG 60	+0.0000 / -0.0008
YAG 64	+0.0000 / -0.0010

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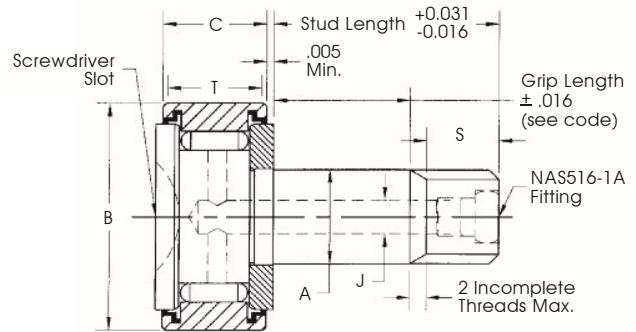
Recommended Shaft Diameter				Recommended Housing Bore Diameter			
Slip Fit		Press Fit		Slip Fit		Press Fit	
Max	Min	Max	Min	Max	Min	Max	Min
0.1894	0.1889	0.1902	0.1897	0.6867	0.6872	0.6874	0.6879
0.2494	0.2489	0.2502	0.2497	0.7492	0.7497	0.7499	0.7504
0.3119	0.3114	0.3127	0.3122	0.8117	0.8122	0.8124	0.8129
0.3744	0.3739	0.3752	0.3747	0.8742	0.8747	0.8749	0.8754
0.4369	0.4364	0.4377	0.4372	0.9367	0.9372	0.9374	0.9379
0.4994	0.4989	0.5002	0.4997	1.1242	1.1247	1.1249	1.1254
0.5619	0.5614	0.5627	0.5622	1.1867	1.1872	1.1874	1.1879
0.6244	0.6239	0.6252	0.6247	1.2492	1.2497	1.2499	1.2504
0.7494	0.7489	0.7502	0.7497	1.3741	1.3747	1.3749	1.3755
0.8744	0.8739	0.8752	0.8747	1.6241	1.6247	1.6249	1.6255
0.9994	0.9989	1.0002	0.9997	1.7491	1.7497	1.7499	1.7505
1.2494	1.2488	1.2503	1.2497	1.9991	1.9997	1.9999	2.0005
1.4994	1.4988	1.5003	1.4997	2.2488	2.2496	2.2499	2.2507
1.7494	1.7488	1.7503	1.7497	2.4988	2.4996	2.4999	2.5007
1.9994	1.9987	2.0003	1.9996	2.7488	2.7496	2.7499	2.7507
2.2494	2.2487	2.2503	2.2496	2.9988	2.9996	2.9999	3.0007
2.4994	2.4987	2.5003	2.4996	3.2485	3.2495	3.2498	3.2508
2.7494	2.7487	2.7503	2.7496	3.4985	3.4995	3.4998	3.5008
2.9994	2.9987	3.0003	2.9996	3.7485	3.7495	3.7498	3.7508
3.2494	3.2486	3.2504	3.2496	3.9985	3.9995	3.9998	4.0008
3.4994	3.4986	3.5004	3.4996	4.3735	4.3745	4.3748	4.3758
3.7494	3.7486	3.7504	3.7496	4.6235	4.6245	4.6248	4.6258
3.9994	3.9986	4.0004	3.9996	4.8735	4.8745	4.8748	4.8758

AS21432 (MS21432)

HRS SERIES

NAS562

Integral Stud Type



General Information

The HRS Series **Integral Stud Type** airframe bearings are manufactured in accordance with **AS21432** standards. The bearings consist of an inner stud, outer race, needle rollers, end washer and if required, seals. Relubrication holes and fittings are optional as shown below. For corrosion protection the outer race is hard-chrome plated while all other exposed surfaces are cadmium or zinc-nickel plated. Consult our Engineering Department for special variations.

Coding Example:

AS21432 - 8 FEE 20 AG
(MS21432)

Cam Follower Need Bearing 1.125" roller, 0.0500" stud, sealed bearing, lubricator in flanged end of stud, 1.2500 grip length

G = Mil-G-81322 grease; no code = Mil-G-23827 grease.

A = No cotter pin hole (Not required for types T or TEE) Omit for cotter pin hole.

Grip length in .0625 inch increments.

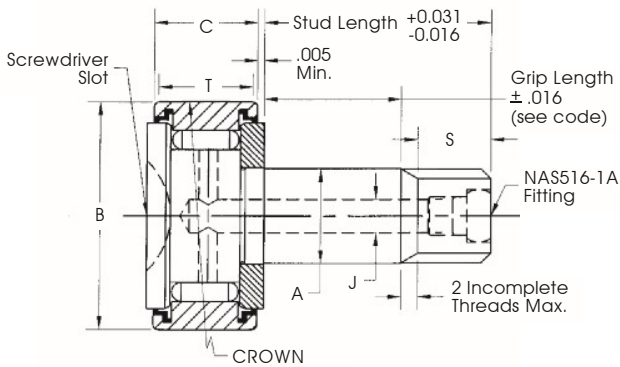
Bearing | FEE = sealed with lubricator in flanged end of stud
 | TEE = sealed with lubricator in threaded end of stud, no cotter pin hole.
 | R = sealed bearing without lubrication

Stud diameter in 0.0625" increments.

Document Number

Dimensional Data (inches)

SMITH Bearing® Number	AS/MS Bearing Number	NAS562 Number	A Stud Dia. +.0000 -0.0015	B Roller O.D. +.0010 -0.0005	C Roller Width +.000 -0.005	D Min	S Thread Length	Thread Size	P Cotter Pin Hole Dia.	T Track Contact Length (Min)	J Dia. (Ref)	Track Capacity 40HRC (lbf)	Limit Load Rating (lbf)	Load Rating As A Track Roller (lbf)	Housing Bore Diameter For Stud	
															Max	Min
HRS1	21432-3	NAS562-3	0.1900	0.5000	0.281	0.211	0.344	10-32	0.070	0.230	N/A	385	790	395	0.1905	0.1900
HRS2	21432-4	NAS562-4	0.2500	0.6875	0.281	0.224	0.344	1/4-28	0.076	0.232	0.076	525	940	470	0.2505	0.2500
HRS3	21432-5	NAS562-5	0.3125	0.7500	0.344	0.234	0.359	5/16-24	0.076	0.290	0.076	725	1,660	830	0.3125	0.3120
HRS4	21432-6	NAS562-6	0.3750	0.8750	0.469	0.265	0.359	3/8-24	0.106	0.380	0.106	1,100	2,720	1,360	0.3755	0.3750
HRS5	21432-7	NAS562-7	0.4375	1.0000	0.531	0.283	0.422	7/16-20	0.106	0.430	0.106	1,425	3,860	1,930	0.4375	0.4370
HRS6	21432-8	NAS562-8	0.5000	1.1250	0.656	0.314	0.422	1/2-20	0.106	0.530	0.106	1,975	6,080	3,040	0.5005	0.5000



AS21447 (MS21447)

CHRS SERIES

Integral Stud Type

Crowned

General Information

The **CHRS** Series **Integral Stud Type** airframe bearings are manufactured in accordance with **AS21447** standards. The outer races on the CHRS Series are **Crowned**. The bearings consist of an inner stud, outer race, needle rollers, end washer, and if required seals. Relubrication holes and fittings are optional as shown below. For corrosion protection the outer race is hard-chrome plated while all other exposed surfaces are cadmium or zinc-nickel plated. Consult our Engineering Department for special variations.

Coding Example:

AS21447 - 8 F 20 A G
(MS21447)

Cam Follower needle bearing 1.1250" roller, stud, sealed with crown radius on the O.D. Lubrication in flanged end of stud. 1.250 grip length 1.672 stud length without cotter pin hole, with Mil-G-23827 grease.

G = Mil-G-81322 grease; no designator = Mil-G-23827 grease.

A = No cotter pin hole (Not required for type T) Omit for cotter pin hole.

Grip length in .0625 inch increments.

Bearing | F = Lubrication in flanged end of stud
| T = Lubrication in threaded end of stud. No cotter pin hole.
| R = sealed bearing without lubrication

Stud diameter in 0.0625" increments.

Document Number

Dimensional Data (inches)

SMITH Bearing® Number	AS/MS Bearing Number	A Stud Dia. +.0000 -0.0015	B Roller O.D. +.0010 -0.0005	C Roller Width +.000 -0.005	D (Min)	S Thread Length	Thread Size	P Cotter Pin Hole Dia.	T Track Contact Length (Min)	J Dia. (Ref)	Track Capacity 40HRC (lbf)	Limit Load Rating (lbf)	Load Rating As A Track Roller (lbf)	Housing Bore Diameter For Stud	
														Max	Min
CHRS1	21447-3	0.1900	0.5000	0.281	0.211	0.344	10-32	0.070	0.230	None	385	790	395	0.1905	0.1900
CHRS2	21447-4	0.2500	0.6875	0.281	0.224	0.344	1/4-28	0.076	0.230	0.076	525	940	470	0.2505	0.2500
CHRS3	21447-5	0.3125	0.7500	0.344	0.234	0.359	5/16-24	0.076	0.290	0.076	725	1,660	830	0.3125	0.3120
CHRS4	21447-6	0.3750	0.8750	0.469	0.265	0.359	3/8-24	0.106	0.380	0.106	1,100	2,720	1,360	0.3755	0.3750
CHRS5	21447-7	0.4375	1.0000	0.531	0.283	0.422	7/16-20	0.106	0.430	0.106	1,425	3,860	1,930	0.4375	0.4370
CHRS6	21447-8	0.5000	1.1250	0.656	0.314	0.422	1/2-20	0.106	0.530	0.106	1,975	6,080	3,040	0.5005	0.5000

AS5927

YAF-XD SERIES

Stainless Steel

Single Row

AS5928

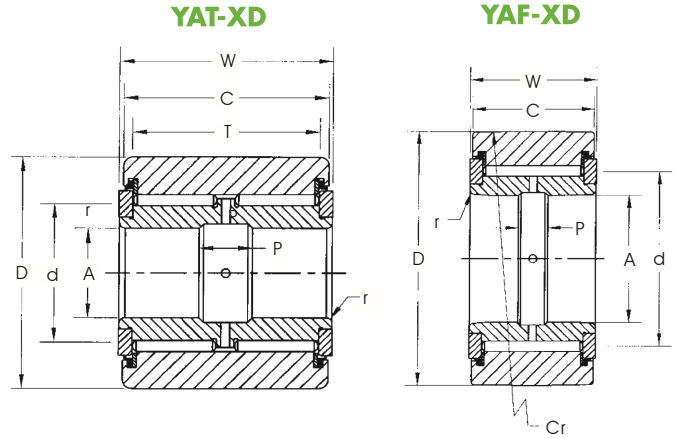
YAT-XD SERIES

Stainless Steel

Double Row



Corrosion Resistant



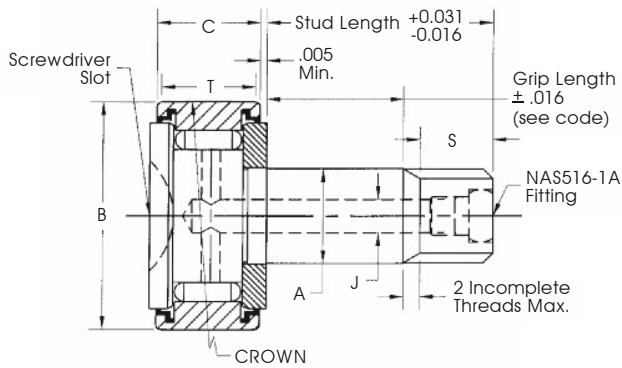
General Information

The **YAF-XD Single Row** & **YAT-XD Double Row** Series bearings are manufactured in accordance with **AS5927** & **AS5928** standards. The bearings are used in track roller applications with each bearing consisting of an inner race, outer race, needle rollers, end washers & thrust seals. Relubrication holes and grooves are provided. The materials for the components are made from corrosion resistant stainless steel. Consult our Engineering Department for further specific requirements and special designs.

Produced from stainless steel grade AMS 5898 & AMS 5925.

Dimensional Data (inches)

SMITH Bearing® Number	AS Military Number	A Bore +0.000 -0.007	D Roller O.D. +0.000 -0.010	W Overall Width +0.00 -0.05	C Outer Race Width +0.00 -0.05	T Track Contact Width Min.	Cr Crown radius	d Min. Clamp Dia.	P Lube Groove Width	r Radius	Limit Load Rating (lbf)	Rating As A Track Roller (lbf)	Track Capacity 40HRC (lbf)	Recommended Shaft Diameter				Weight Approx. (lbs)
														Slip Fit		Press Fit		
														Max	Min	Max	Min	
YAF-03-XD	5927-103	0.1900	0.7500	0.312	0.280	-	10.000	0.438	3/32	0.022	1200	900	290	0.1894	0.1889	0.1902	0.1897	0.030
YAF-04-XD	5927-104	0.2500	0.8750	0.375	0.345	-	10.000	0.516	1/8	0.022	1910	1430	575	0.2494	0.2489	0.2502	0.2497	0.051
YAF-06-XD	5927-106	0.3750	1.0625	0.500	0.455	-	10.000	0.672	3/16	0.022	3600	2700	1000	0.3744	0.3739	0.3752	0.3747	0.103
YAF-08-XD	5927-108	0.5000	1.3125	0.625	0.580	-	12.500	0.844	3/16	0.032	5780	4300	1785	0.4994	0.4989	0.5002	0.4997	0.187
YAF-10-XD	5927-110	0.6250	1.5000	0.750	0.705	-	17.500	0.953	1/4	0.032	8530	6400	2600	0.6244	0.6239	0.6252	0.6247	0.279
YAF-12-XD	5927-112	0.7500	1.7500	1.000	0.950	-	25.000	1.109	1/4	0.032	14200	10700	4050	0.7494	0.7489	0.7502	0.7497	0.520
YAF-14-XD	5927-114	0.8750	2.0000	1.125	1.075	-	27.500	1.219	1/4	0.032	19300	14400	5350	0.8744	0.8739	0.8752	0.8747	0.749
YAF-20-XD	5927-120	1.2500	2.5000	1.250	1.200	-	30.000	1.625	3/8	0.032	25300	18900	7100	1.2494	1.2488	1.2503	1.2497	1.160
YAF-24-XD	5927-124	1.5000	3.0000	1.500	1.440	-	60.000	1.984	3/8	0.032	37900	28400	10900	1.4994	1.4988	1.5003	1.4997	2.360
YAF-28-XD	5927-128	1.7500	3.4375	1.500	1.440	-	60.000	2.281	3/8	0.032	44100	33000	12400	1.7494	1.7488	1.7503	1.7497	2.710
YAF-32-XD	5927-132	2.0000	3.8750	1.500	1.440	-	60.000	2.562	3/8	0.032	48900	36700	14000	1.9994	1.9987	2.0003	1.9996	3.420
YAF-36-XD	5927-136	2.2500	4.3125	1.500	1.440	-	60.000	2.859	3/8	0.032	55000	41200	15600	2.2494	2.2487	2.2503	2.2496	4.230
YAF-40-XD	5927-140	2.5000	4.7500	1.500	1.440	-	60.000	3.109	3/8	0.032	59900	44900	17200	2.4994	2.4987	2.5003	2.4996	5.140
YAF-44-XD	5927-144	2.7500	5.0000	1.500	1.440	-	60.000	3.344	3/8	0.032	64800	48600	18100	2.7494	2.7487	2.7503	2.7496	5.490
YAT-06-XD	5928-106	0.3750	1.1250	1.000	0.940	0.750	-	0.672	3/16	0.032	7130	5370	2600	0.3744	0.3739	0.3752	0.3747	0.239
YAT-08-XD	5928-108	0.5000	1.3750	1.250	1.190	1.000	-	0.891	1/4	0.032	12500	9370	4250	0.4994	0.4989	0.5002	0.4997	0.437
YAT-10-XD	5928-110	0.6250	1.6250	1.500	1.440	1.125	-	1.109	3/8	0.032	19900	15000	5650	0.6244	0.6239	0.6252	0.6247	0.728
YAT-12-XD	5928-112	0.7500	1.8750	1.750	1.690	1.375	-	1.281	3/8	0.032	28500	21400	7950	0.7494	0.7489	0.7502	0.7497	1.130



Corrosion Resistant

AS5929

CHRS-XD SERIES

Stainless Steel

Integral Stud Type

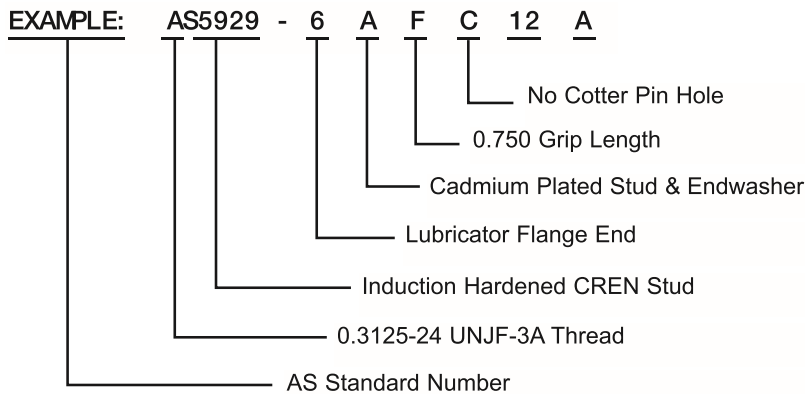
Crowned

General Information

The **CHRS-XD** Series **Integral Stud Type** airframe bearings are manufactured in accordance with **AS5929** standards. The outer races on the CHRS Series are **Crowned**. The bearings consist of an inner stud, outer race, needle rollers, end washer, and if required seals. Relubrication holes and fittings are optional as shown below. The materials for the components are made from corrosion resistant stainless steel. Consult our Engineering Department for special variations.

Produced from stainless steel grade AMS 5898, AMS 5925 & ASM 5930.

Coding Example:



Dimensional Data (inches)

SMITH Bearing® Number	AS Bearing Number	A Stud Dia. +0.000 -0.015	B Roller O.D. +0.010 -0.005	C Roller Width +0.00 -0.05	D (Min)	S Thread Length	Thread Size	P Cotter Pin Hole Dia.	T Track Contact Length (Min)	J Dia. (Ref)	Track Capacity 40HRC (lbf)	Limit Load Rating (lbf)	Load Rating As A Track Roller (lbf)	Housing Bore Diameter For Stud	
		Max	Min												
CHRS1-XD	5929-3	0.1900	0.5000	0.281	0.211	0.344	10-32	0.070	0.230	None	385	790	395	0.1905	0.1900
CHRS2-XD	5929-4	0.2500	0.6875	0.281	0.224	0.344	1/4-28	0.076	0.230	0.076	525	940	470	0.2505	0.2500
CHRS3-XD	5929-5	0.3125	0.7500	0.344	0.234	0.359	5/16-24	0.076	0.290	0.076	725	1,660	830	0.3125	0.312
CHRS4-XD	5929-6	0.3750	0.8750	0.469	0.265	0.359	3/8-24	0.106	0.380	0.106	1,100	2,720	1,360	0.3755	0.3750
CHRS5-XD	5929-7	0.4375	1.0000	0.531	0.283	0.422	7/16-20	0.106	0.430	0.106	1,425	3,860	1,930	0.4375	0.4370
CHRS6-XD	5929-8	0.5000	1.1250	0.656	0.314	0.422	1/2-20	0.106	0.530	0.106	1,975	6,080	3,040	0.5005	0.5000

AEROSPACE BEARINGS

INTERCHANGE TABLES

AS/MS MILITARY Standard Number	TORRINGTON Number	McGILL Number	SMITH® Number
24465-3	3NBF512YJ	3NBF512YJ	YAD-03
24465-4	4NBF614YJ	4NBF614YJ	YAD-04
24465-6	6NBF817YJ	6NBF817YJ	YAD-06
24465-8	8NBF1021YJ	8NBF1021YJ	YAD-08
24465-10	10NBF1224YJ	10NBF1224YJ	YAD-10
24465-12	12NBF1628YJ	12NBF1628YJ	YAD-12
24465-14	14NBF1832YJ	14NBF1832YJ	YAD-14
24465-20	20NBF2040YJ	20NBF2040YJ	YAD-20
24465-24	24NBF2448YJ	24NBF2448YJ	YAD-24
24465-28	28NBF2455YJ	28NBF2455YJ	YAD-28
24465-32	32NBF2462YJ	32NBF2462YJ	YAD-32
24465-36	36NBF2469YJ	36NBF2469YJ	YAD-36
24465-40	40NBF2476YJ	40NBF2476YJ	YAD-40
24465-44	44NBF2480YJ	44NBF2476YJ	YAD-44
24466-6	6NBL1618YJ	6NBL1618YJ	YAS-06
24466-8	8NBL2022YJ	8NBL2022YJ	YAS-08
24466-10	10NBL2426YJ	10NBL2426YJ	YAS-10
24466-12	12NBL2830YJ	12NBL2830YJ	YAS-12
21432-3	HRS-1C	HRS-1C	HRS-1C
21432-4	HRS-2C	HRS-2C	HRS-2C
21432-5	HRS-3C	HRS-3C	HRS-3C
21432-6	HRS-4C	HRS-4C	HRS-4C
21432-7	HRS-5C	HRS-5C	HRS-5C
21432-8	HRS-6C	HRS-6C	HRS-6C
21447-3	CHRS-1C	CHRS-1C	CHRS-1C
21447-4	CHRS-2C	CHRS-2C	CHRS-2C
21447-5	CHRS-3C	CHRS-3C	CHRS-3C
21447-6	CHRS-4C	CHRS-4C	CHRS-4C
21447-7	CHRS-5C	CHRS-5C	CHRS-5C
21447-8	CHRS-6C	CHRS-6C	CHRS-6C
21438-103	ATF-3	3 AFC 512	YAF-03
21438-104	ATF-4	4 AFC 614	YAF-04
21438-106	ATF-6	6 AFC 817	YAF-06
21438-108	ATF-8	8 AFC 1021	YAF-08
21438-110	ATF-10	10 AFC 1224	YAF-10
21438-112	ATF-12	12 AFC 1628	YAF-12

INTERCHANGE TABLES

AS/MS MILITARY Standard Number	TORRINGTON Number	McGILL Number	SMITH® Number
21438-114	ATF-14	14 AFC 1832	YAF-14
21438-120	ATF-20	20 AFC 2040	YAF-20
21438-124	ATF-24	24 AFC 2448	YAF-24
21438-128	ATF-28	28 AFC 2455	YAF-28
21438-132	ATF-32	32 AFC 2462	YAF-32
21438-136	ATF-36	36 AFC 2469	YAF-36
21438-140	ATF-40	40 AFC 2476	YAF-40
21438-144	ATF-44	44 AFC 2480	YAF-44
21439-106	ATL-6	6 AL 1618	YAT-06
21439-108	ATL-8	8 AL 2022	YAT-08
21439-110	ATL-10	10 AL 2426	YAT-10
21439-112	ATL-12	12 AL 2830	YAT-12
24461-3	3NBC511ZP	3NBC511ZP	YAG-03-C
24461-4	4NBC612ZP	4NBC612ZP	YAG-04-C
24461-5	5NBC713ZP	5NBC713ZP	YAG-05-C
24461-6	6NBC914YZP	6NBC914YZP	YAG-06
24461-7	7NBC1015YZP	7NBC1015YZP	YAG-07
24461-8	8NBC1218YZP	8NBC1218YZP	YAG-08
24461-9	9NBC1419YZP	9NBC1419YZP	YAG-09
24461-10	10NBC1620YZP	10NBC1620YZP	YAG-10
24461-12	12NBC1822YZP	12NBC1822YZP	YAG-12
24461-14	14NBC2026YZP	14NBC2026YZP	YAG-14
24461-16	16NBC2028YZP	16NBC2028YZP	YAG-16
24461-20	20NBC2032YZP	20NBC2032YZP	YAG-20
24461-24	24NBC2036YZP	24NBC2036YZP	YAG-24
24461-28	28NBC2040YZP	28NBC2040YZP	YAG-28
24461-32	32NBC2044YZP	32NBC2044YZP	YAG-32
24461-36	36NBC2048YZP	36NBC2048YZP	YAG-36
24461-40	40NBC2052YZP	40NBC2052YZP	YAG-40
24461-44	44NBC2056YZP	44NBC2056YZP	YAG-44
24461-48	48NBC2060YZP	48NBC2060YZP	YAG-48
24461-52	52NBC2064YZP	52NBC2064YZP	YAG-52
24461-56	56NBC2070YZP	56NBC2070YZP	YAG-56
24461-60	60NBC2074YZP	60NBC2074YZP	YAG-60
24461-64	64NBC2078YZP	64NBC2078YZP	YAG-64