TCS LAB MOTOR - BEARINGS

* It will be very important that we remove <u>all</u> axial/radial clearance.

* As bearing is mountrd on shaft/in housing, an interferance fit or transition fit should be used.

* Using two "single row angular contact" bearings seatrd in a back to back arrangement will allow us to remove all clearance as we preload the bearing. SEE pg A-5
  A-20
  A-22

* I have selectrd SINGLE ROW ANGULAR CONTACT

  Bore - 10 mm ∅
  Housing - 30 mm ∅
  Width - 9 mm
  Contact Angle = 30°

  COST BETWEEN $50-200 pr.

* Bearing tolerance class P4 (ABEC 7) SEE pg A52

* Bearing fits to be transition or interferance :

  ∴ on 10 mm shaft we require js5 $\Rightarrow \begin{matrix}+.003\\-.003\end{matrix}$ mm
  or
  h5 $\Rightarrow \begin{matrix}+.000\\-.006\end{matrix}$ mm

I found St. Steel ground shaft 10mm ∅ in the NORDEX calalogue with $\begin{matrix}+.000\\-.005\end{matrix}$ tolerance and 25μm finish for approx. $8.00/ft.

∴ on 30 mm housing we req. JS6 $\Rightarrow \begin{matrix}+.0065\\-.0065\end{matrix}$

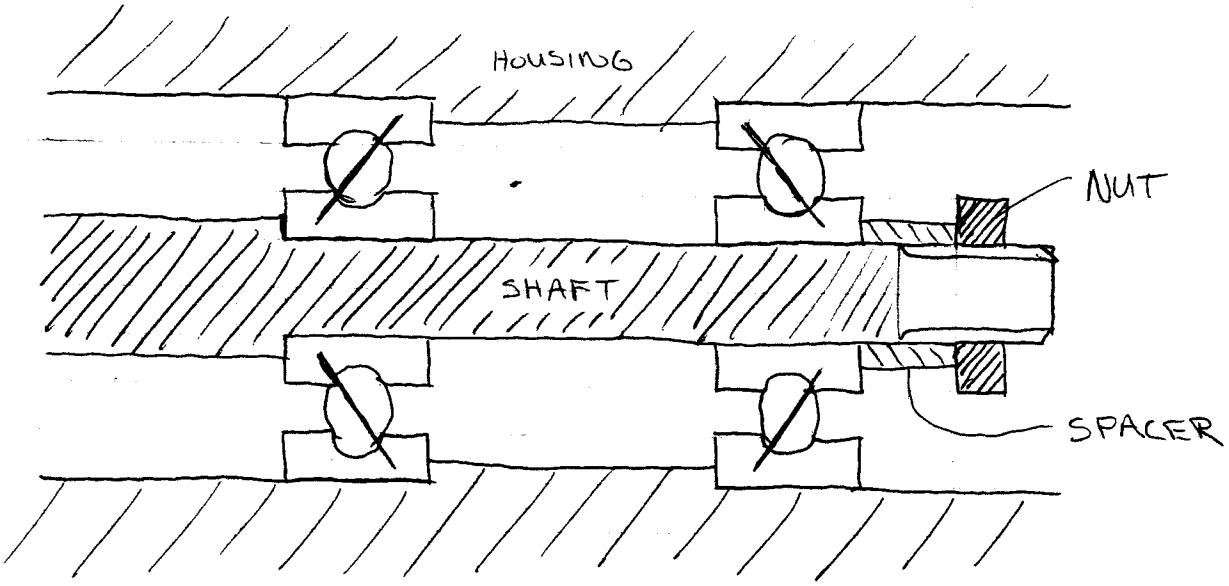
or H6 $\Rightarrow \begin{matrix}+.013\\-.000\end{matrix}$

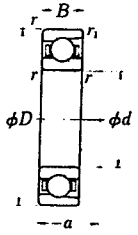
I would prefer to go with the JS6 tolerance on the hole. ie. tolerance should read:

$30.0 \begin{matrix}+.0065\\-.0065\end{matrix}$ mm

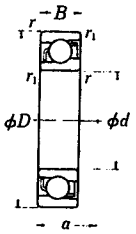
SEE pg A80 - A85

* To remove all axial/radial clearance, preload should be applied using a nut, or cap & bolts capable of adjusting preload in the axial direction. SEE pg A106

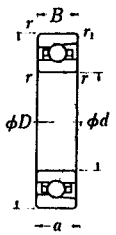




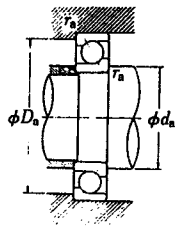
With machined cage



With pressed cage



ACH



Boundary dimensions (mm)					Basic load ratings (kN)				Limiting speeds[1] (rpm)		Bearing No.[2]	Load center (mm)	Mounting dimensions (mm)			(Refer.) Mass
					With machined cage		With pressed cage									
d	D	B	r min.	r_1 min.	C_r	C_{or}	C_r	C_{or}	Grease lub.	Oil lub.		a	d_a min.	D_a max.	r_a max.	(kg)
10	22	6	0.3	0.15	3.00	1.50	—	—	52 000	69 000	7900C	5.2	12.5	19.5	0.3	0.008
	26	8	0.3	0.15	5.00	2.35	—	—	34 000	42 000	7000	9.2	12.5	23.5	0.3	0.021
	26	8	0.3	0.15	4.65	2.15	—	—	25 000	33 000	7000B	11.6	12.5	23.5	0.3	0.021
	26	8	0.3	0.15	5.30	2.45	—	—	47 000	62 000	7000C	6.4	12.5	23.5	0.3	0.021
	30	9	0.6	0.3	4.65	2.20	5.40	2.75	29 000	37 000	7200	10.4	14.5	25.5	0.6	0.031
	30	9	0.6	0.3	4.30	2.00	4.95	2.50	22 000	29 000	7200B	13.1	14.5	25.5	0.6	0.031
	30	9	0.6	0.3	5.00	2.35	5.80	2.95	40 000	54 000	7200C	7.2	14.5	25.5	0.6	0.031
	35	11	0.6	0.3	8.50	3.75	9.30	4.30	27 000	33 000	7300	12.0	14.5	30.5	0.6	0.054
12	24	6	0.3	0.15	3.20	1.70	—	—	48 000	62 000	7901C	5.4	14.5	21.5	0.3	0.010
	28	8	0.3	0.15	5.40	2.75	—	—	29 000	37 000	7001	9.8	14.5	25.5	0.3	0.024
	28	8	0.3	0.15	4.95	2.50	—	—	23 000	30 000	7001B	12.4	14.5	25.5	0.3	0.024
	28	8	0.3	0.15	5.80	2.95	—	—	40 000	54 000	7001C	6.7	14.5	25.5	0.3	0.024
	32	10	0.6	0.3	7.45	3.65	8.00	4.05	27 000	34 000	7201	11.5	16.5	27.5	0.6	0.038
	32	10	0.6	0.3	6.95	3.40	7.40	3.75	20 000	27 000	7201B	14.4	16.5	27.5	0.6	0.038
	32	10	0.6	0.3	7.90	3.85	8.50	4.30	38 000	50 000	7201C	8.0	16.5	27.5	0.6	0.038
	37	12	1	0.6	10.2	4.60	11.2	5.25	24 000	31 000	7301	13.1	17.5	31.5	1	0.065
15	28	7	0.3	0.15	4.75	2.65	—	—	39 000	52 000	7902C	5.9	17.5	25.5	0.3	0.015
	32	9	0.3	0.15	6.10	3.45	—	—	26 000	32 000	7002	11.3	17.5	29.5	0.3	0.035
	32	9	0.3	0.15	5.55	3.15	—	—	19 000	25 000	7002B	14.4	17.5	29.5	0.3	0.035
	32	9	0.3	0.15	6.60	3.70	—	—	35 000	47 000	7002C	7.6	17.5	29.5	0.3	0.035
	35	11	0.6	0.3	8.10	4.25	8.10	4.25	24 000	29 000	7202	12.9	19.5	30.5	0.6	0.048
	35	11	0.6	0.3	7.45	3.95	7.45	3.95	18 000	24 000	7202B	16.2	19.5	30.5	0.6	0.048
	35	11	0.6	0.3	8.65	4.55	8.65	4.55	33 000	43 000	7202C	8.9	19.5	30.5	0.6	0.048
	42	13	1	0.6	12.5	6.45	13.4	7.20	20 000	25 000	7302	15.0	20.5	36.5	1	0.088
17	30	7	0.3	0.15	5.00	2.95	—	—	36 000	47 000	7903C	6.7	19.5	27.5	0.3	0.016
	35	10	0.3	0.15	7.65	5.00	—	—	23 000	28 000	7003	12.6	19.5	32.5	0.3	0.045

(Notes) 1) Rotation speed limits shown above are applicable to machined cage bearings.
Rotation speed limits of pressed cage bearings should be kept to under 80 % of this value.
For bearings with 15° contact angle, this figure is applied to the high precision bearings ranked higher than class 5, used with machined cage or molded cage.
2) B, C or no indication after the bearing number indicates nominal contact angle of 40°, 15° and 30° respectively.

(Remark) Standard cage types used for the above bearings are described earlier in this section.