

# BALL SCREW

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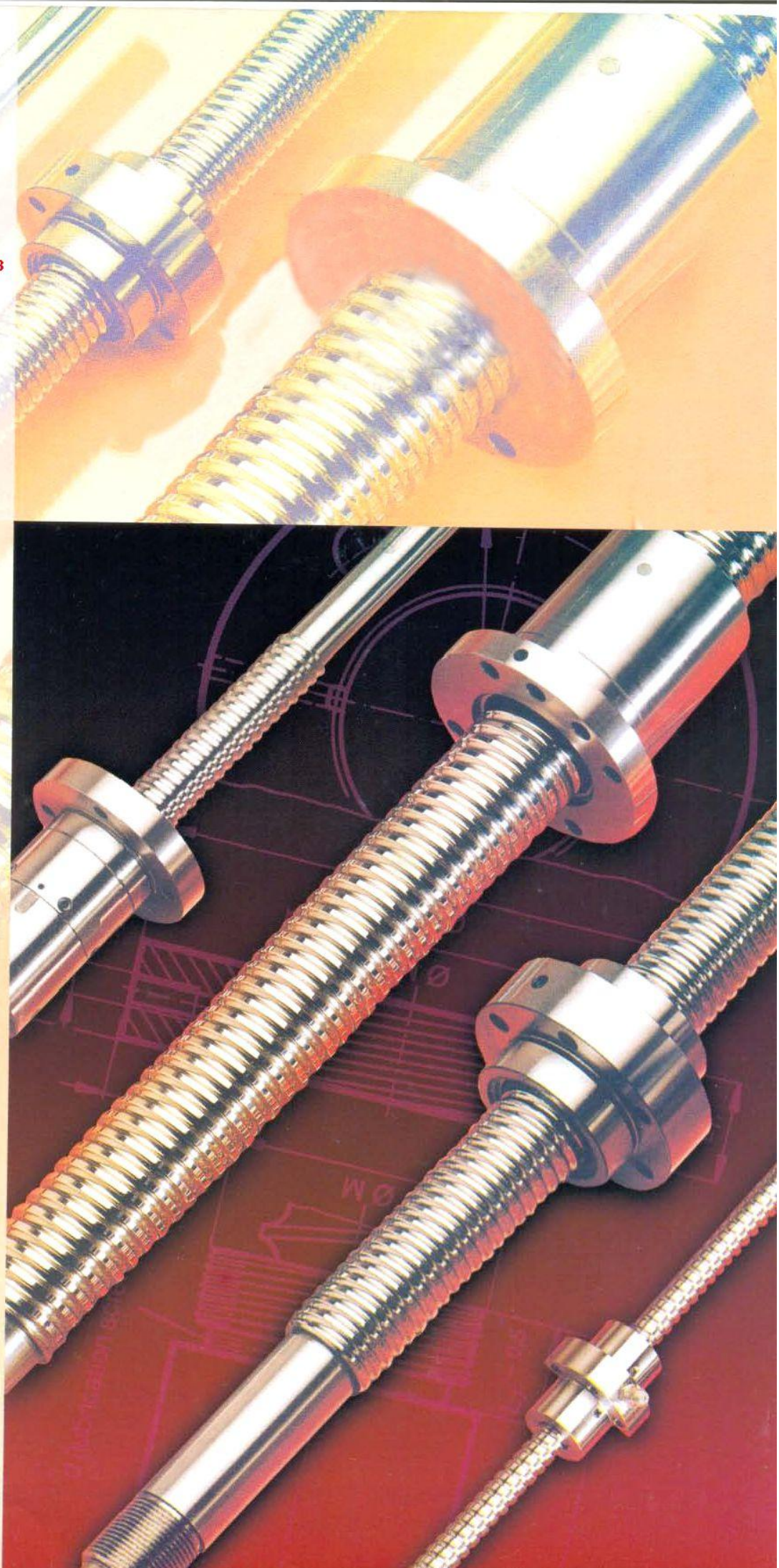
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**RWTÜV**



## IAR BALL LEAD SCREWS

**INSTITUTE OF APPLIED RESEARCH** is a research organisation established in 1974 and right from its inception is engaged in the **BASIC RESEARCH** work in the field of non-conventional energy resources and machine tools.

Modern engineering technology requires a highly efficient system for the smooth and precise transmission of rotary motion into linear motion to operate slides and other machine components. To keep pace with the modern technology, IAR developed **BALL LEAD SCREW** for high efficiency and accurate transmission of rotary motion into linear motion and vice-versa.

The recent trend has been to replace all conventional lead screws with precision **BALL SCREWS** and hence the demand for **BALL SCREWS** is increasing day by day.

## MAIN FEATURES

### **HIGH ACCURACY**

IAR **BALL SCREWS** are manufactured to accuracy **GRADE 10** as per **DIN 69051, part3** i.e. 0.010 mm lead error in 300 mm threaded length.

### **HIGH STIFFNESS**

IAR **BALL SCREWS** are preloaded which in turn makes it more stiff.

### **HIGH EFFICIENCY**

Since Sliding friction in conventional lead screw is replaced by rolling friction in **BALL SCREWS**, the transmission efficiency is considerably increased and very low driving power is required. (Refer Fig 1) the torque requirement is one third of the conventional lead screw.

### **ZERO BACKLASH**

With precise preloading, zero backlash is achieved in IAR **BALL SCREWS**. However desired backlash can be maintained as per customers requirement.

### **LONGER LIFE**

Because of the rolling contact of the steel ball between screw and nut, the friction wear in the hardened screw grooves is very small resulting into longer life of **BALL SCREWS** without reducing its original accuracy. This eliminates frequent compensating adjustments in machine slides.

### **NO STICK - SLIP EFFECT**

Since the rolling contact of the ball is utilised, the starting friction is minimised and tendency of inertia while fast positioning is eliminated. Very small accurate increments of movements may be obtained through rolling contact.

In machine tool slide applications, this can result in a tremendous increase in tool life.

### **PRECISE POSITIONING**

Due to zero backlash precise positioning accuracy is achieved even at low speeds.

### **LESSER HEAT GENERATION**

Even high load causes minimum heating up which means better positioning accuracy. This is achieved by smaller ball circuit.

### **COMPACTNESS**

IAR manufactures **BALL SCREWS** with internal Ball return system, which enables use of smaller nut size. There are fewer balls per circuit, therefore less friction and reduced wear & tear.

### **PRELOAD**

Preload may be defined as the use of one group of ball grooves in opposition to another group to eliminate backlash. (Refer Fig. 2). IAR **BALL SCREWS** are preloaded with double nuts to eliminate axial play, to increase overall stiffness and to improve positioning accuracy. IAR **BALL SCREWS** are preloaded to 10 % of the dynamic load rating value. Higher values than this gives increased torque, lower efficiency and reduced service life.

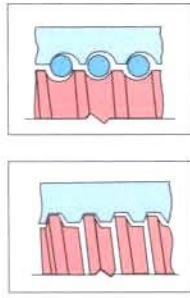
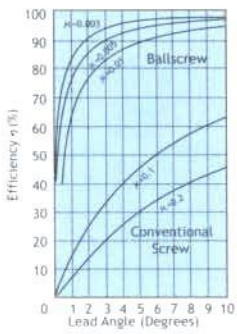


Figure - 1

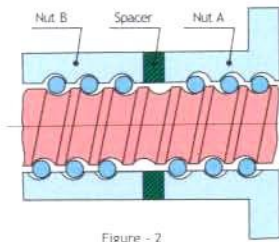


Figure - 2

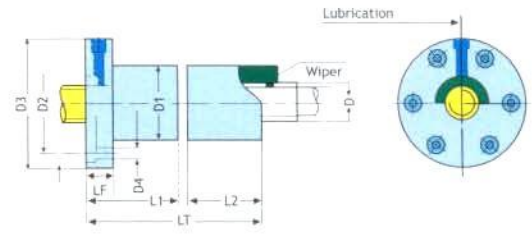


Figure - 3

MODEL	Nut Dimensions													Load Rating, N.		Stiffness						
	NOM DIA.	PITCH	BALL DIA.	NO.OF CKTS	D	D1	D2	D3	D4	LF	L1	L2	LT	DYNAMIC	STATIC	N/micron						
IAR 1605	16	5	3.175	3	16	31	41	60	5.5	8	37	35	77	7,900	17,100	910						
			3.175	4													42	40	88	8,500	19,600	1200
IAR 2005	20	5	3.175	3	20	38	46	64	6.5	10	37	35	77	9,500	21,000	960						
				4													42	40	88	13,000	28,000	1,260
IAR 2010	20	10	3.175	3	20	38	48	62	5.5	12	60	55	121	7,500	19,000	960						
			3.175	4													71	65	140	11,200	25,500	1260
IAR 2505	25	5	3.175	3	24	40	54	70	6.5	10	37	35	77	10,800	26,000	1240						
				4													42	40	88	14,500	35,000	1660
				5													47	45	98	17,000	44,000	2040
IAR 2510	25	10	3.175	3	24	42	56	72	6.5	12	60	55	121	9,600	21,000	1240						
				4													71	65	140	12,300	32,000	1660
IAR 3205	32	5	3.175	3	30	48	62	78	8.5	12	37	35	77	12,300	34,000	1500						
				4													42	40	88	16,500	45,250	2020
				5													47	45	98	19,250	57,000	2540
IAR 3210	32	10	6.350	3	30	55	66	82	8.5	14	60	55	119	29,000	65,500	1500						
				4													70	65	139	38,000	88,000	2020
				5													80	75	159	45,000	1,10,000	2540
IAR 4005	40	5	3.175	3	38	56	67	82	8.5	14	42	37	83	13,500	43,000	1800						
				4													47	42	93	18,500	57,000	2400
				5													52	47	103	21,000	71,000	3000
IAR 4010	40	10	6.350	3	38	63	76	94	10.5	16	62	57	123	33,250	83,500	1800						
				4													72	67	143	44,500	1,11,500	2400
				5													82	77	163	51,500	1,39,000	3000
IAR 4020	40	20	6.350	3	38	64	78	98	10.5	16	105	100	213	46,800	93,300	2,330						
				6													92	87	183	60,500	1,68,000	3600
				6													92	87	183	68,000	2,11,500	4,100
IAR 5005	50	5	3.175	5	48	70	84	102	8.5	16	57	47	103	30,500	88,000	3300						
				6													59	51	113	34,000	1,02,000	4000
				6													62	57	123	38,000	1,05,000	2,050
IAR 5010	50	10	6.350	3	48	73	86	105	10.5	16	72	67	143	50,500	1,41,000	2,700						
				4													82	77	163	58,250	1,76,500	3,400
				5													92	87	183	68,000	2,11,500	4,100
IAR 5020	50	20	6.350	3	48	75	89	109	10.5	16	105	100	213	49,700	1,17,000	2,470						
				6													122	117	245	1,02,000	2,98,000	4500
IAR 6310	63	10	6.350	6	60	89	106	133	13	22	94	89	189	83,000	2,42,000	3,700						
				8													122	117	245	1,02,000	2,98,000	4500
IAR 6320	63	20	6.350	4	60	91	108	135	13	22	135	132	273	64,000	1,92,000	3500						
				8													122	117	245	1,15,000	2,98,000	4100
IAR 7010	70	10	6.350	6	70	100	117	143	13	22	94	89	189	96,000	2,56,000	3900						
				8													122	117	245	1,15,000	2,98,000	4100
IAR 7020	70	20	9.525	5	70	105	123	150	13	22	160	155	321	1,19,000	3,09,000	3600						
				6													94	89	189	1,07,700	3,21,000	4200
IAR 8010	80	10	6.350	6	80	110	127	153	13	22	94	89	189	1,07,700	3,21,000	4200						
				4													80	115	132	158	13	22

- NOTE :**
- ALL DIMENSIONS ARE IN MM.
  - STANDARD SUPPLY IS RHS BALL SCREWS. BALL SCREWS WITH LHS ORIENTATION CAN BE SUPPLIED ON REQUEST
  - LUBRICATION HOLE UPTO 32 X 10 BALL SCREW IS M6 & FOR HIGHER SIZES IS M8
  - THE STATIC AND DYNAMIC LOADS OF IAR BALL SCREWS ARE OBTAINED ACCORDING TO THE DIN 69051.
  - BALL SCREWS UPTO 3800MM THREADED LENGTH ARE MANUFACTURED BY IAR.
  - WE RESERVE THE RIGHT TO CHANGE THE SPECIFICATION OF OUR PRODUCTS WITHOUT ANY NOTICE

