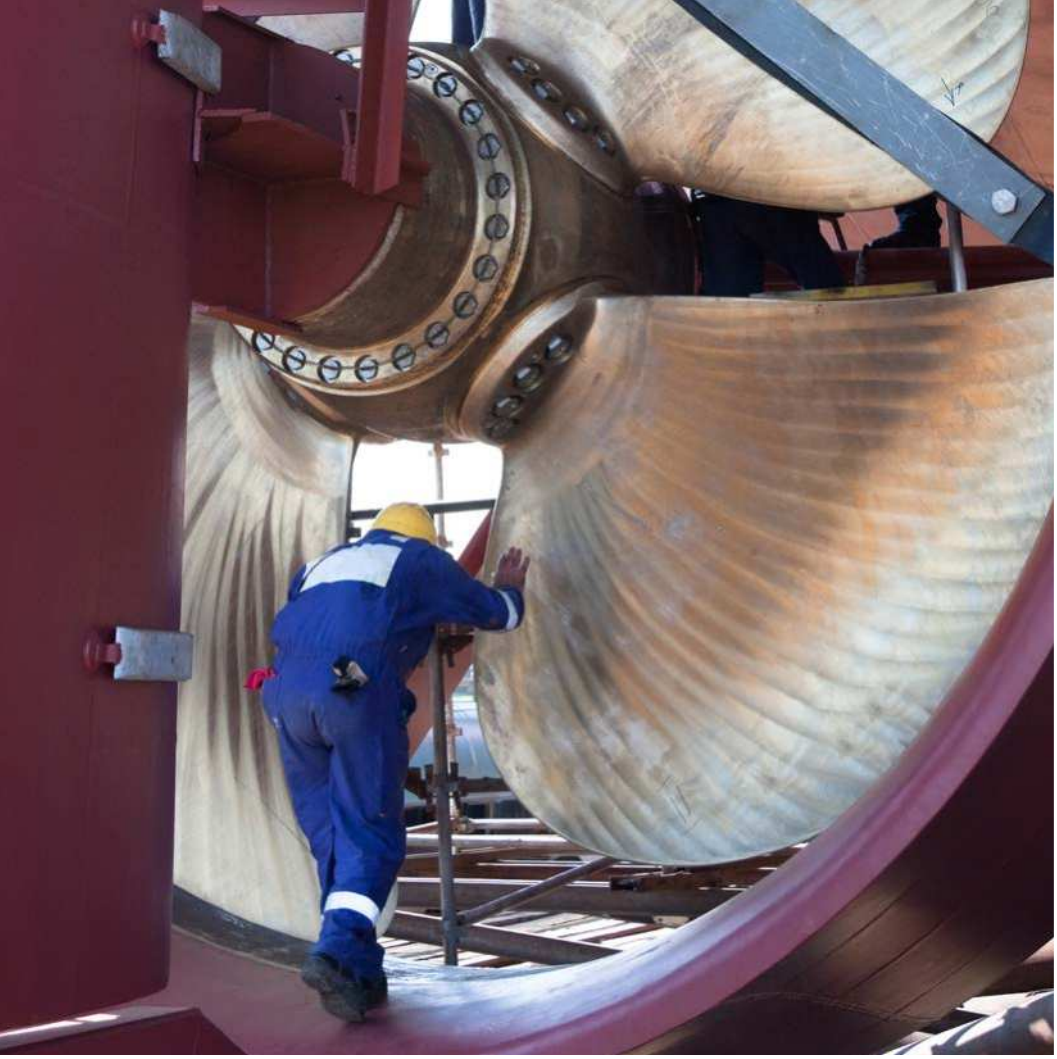
SKF Hydraulic nuts for marine applications

for fitting propellers, rudder pintles and tillers



20 minutes for driving a 50-ton propeller up the shaft and just 10 minutes for dismounting

Operations that used to take hours or even days have been replaced by a fast, accurate and controllable procedure by using the SKF oil injection method for mounting and dismounting heavy marine components.

Comprehensive range of hydraulic rings and nuts are available

The table shown in this brochure gives examples of our standard heavy duty hydraulic rings (type OKTC) for marine applications. Hydraulic nuts (type OKTH) for marine applications are also available and these are individually designed to suit your application.

Hydraulic nuts are supplied with a nut locking device as standard. Both the hydraulic rings and nuts are supplied with low maintenance teflon bronze seals, which are superior to O-rings and rubber type seals.

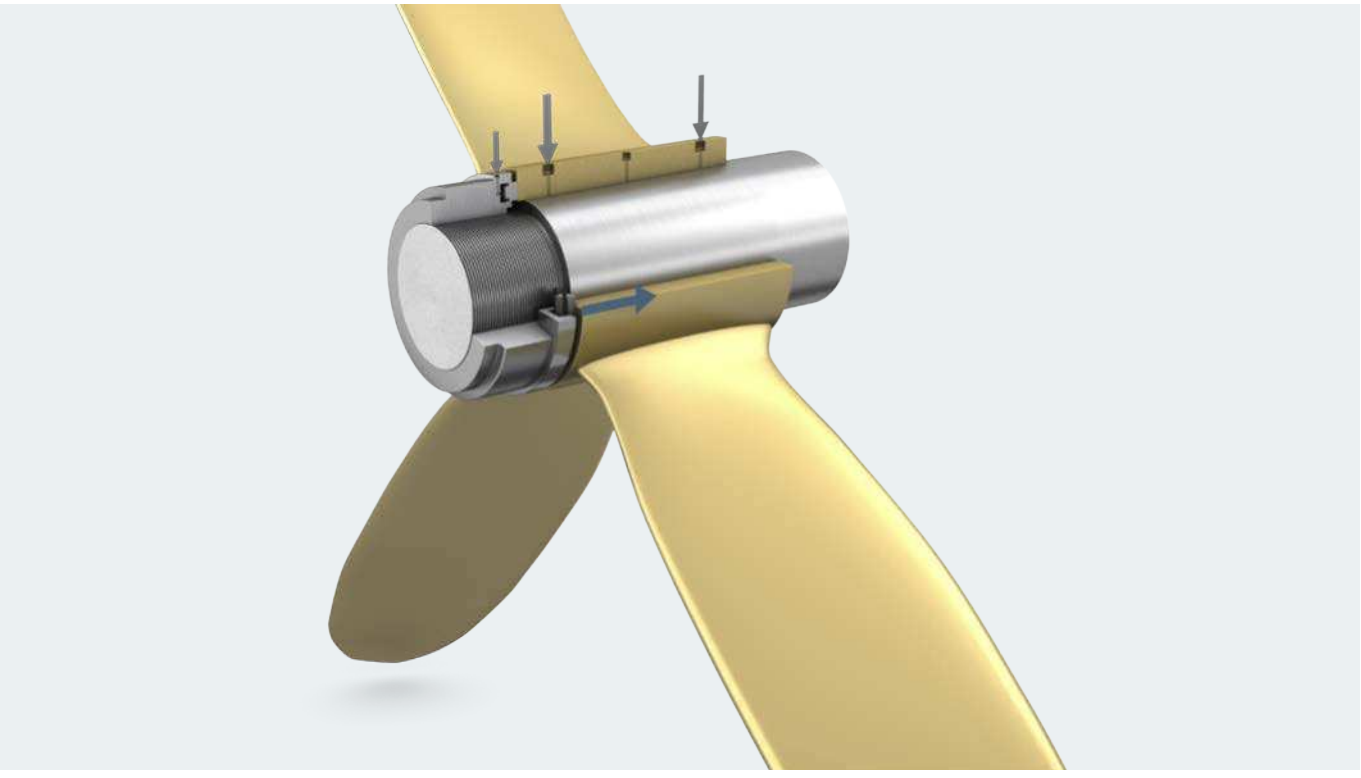
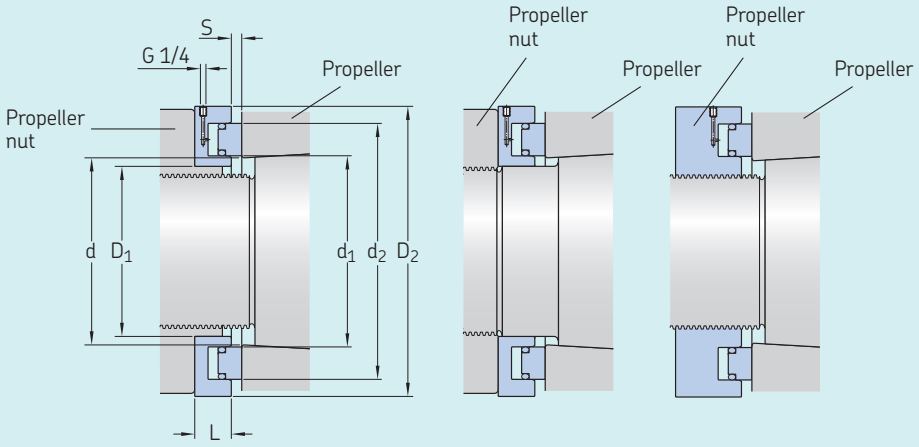


Table #

Dimensions



Designation	d	D_1	d_1	d_2	D_2	L	$S_{max.}$	Max. force (at 70 MPa)	Mass
	mm							kN	kg
OKTC 245	260–275	245	275	340	390	55	15	2 195	31
OKTC 265	275–295	265	295	365	415	55	15	2 540	35
OKTC 285	295–315	285	315	385	435	55	15	2 690	37
OKTC 305	315–335	305	335	415	465	55	15	3 295	42
OKTC 325	335–365	325	365	445	510	70	20	3 560	66
OKTC 345	365–385	345	385	470	535	70	20	3 995	72
OKTC 365	385–405	365	405	495	560	70	20	4 450	77
OKTC 385	405–425	385	425	520	585	70	20	4 935	84
OKTC 405	425–445	405	445	545	610	70	20	5 440	90
OKTC 425	445–465	425	465	570	635	70	20	5 975	96
OKTC 445	465–485	445	485	595	660	70	20	6 530	103
OKTC 465	485–505	465	505	620	685	70	20	7 110	110
OKTC 485	505–525	485	525	645	710	70	20	7 715	116
OKTC 505	525–545	505	545	670	735	70	20	8 350	123
OKTC 525	545–565	525	565	695	760	70	20	9 005	130
OKTC 545	565–595	545	595	725	805	90	25	9 430	195
OKTC 565	595–615	565	615	750	830	90	25	10 130	205
OKTC 585	615–635	585	635	775	855	90	25	10 850	216
OKTC 605	635–655	605	655	800	880	90	25	11 595	226
OKTC 625	655–675	625	675	825	905	90	25	12 370	238
OKTC 645	675–695	645	695	860	940	90	25	14 105	260
OKTC 670	695–720	670	720	885	965	90	25	14 560	267
OKTC 690	720–740	690	740	915	995	90	25	15 920	285
OKTC 720	740–770	720	770	955	1 050	100	30	17 545	360
OKTC 750	770–800	750	800	985	1 080	100	30	18 155	372
OKTC 770	800–820	770	820	1 010	1 105	100	30	19 115	387
OKTC 790	820–840	790	840	1 035	1 130	100	30	20 100	402

Tailor-made for you

This list is designed as a guide. If the ring you require is not listed, please contact your local SKF partner and we will design a ring for you on receipt of the following information:

a. Dimensions of propeller boss.
b. Maximum power, kW.
c. Speed, r/min.
d. Safety factor.
e. Modulus of elasticity for boss and shaft respectively, N/mm^2.
f. Temperature coefficient of linear expansion for boss and shaft respectively.
g. Yield point for shaft and boss, N/mm^2.

N.B: If drive-up force and drive-up length are to be calculated by the customer, that information together with the propeller shaft thread and the small inner diameter of the propeller boss only are required.

SKF pumps for trouble-free operation

728619 E hand pump*

Can be used for mounting most propellers, rudder stocks and pintles, where a pressure of up to 150 MPa is required. May also be used with the hydraulic ring or nut (sizes OKTC 485 and smaller).

It is supplied complete with a 3 m hose, quick connection coupling and nipple (G 1/4 external thread) and is pre-filled with SKF mounting fluid LHMF 300 (300 CSt at 20 °C). Supplied in a metal box. Weight: 11,4 kg.

226400 E oil injector

Can be used when higher pressures, up to 300 MPa are required. Typical applications include gearhubs and SKF OK couplings.

It is supplied complete with an injector, oil reservoir, handle and repair kit. Packed in a robust plastic case. Weight: 2,2 kg.

729101/300MPA oil injector kit

The kit consists of the 226400 E oil injector, adapter block, high pressure pipe, various connection nipples (G 1/4 female to G 1/8 male, G 1/2 male and G 3/4 male) and a pressure gauge (0–300 MPa) packed in a sturdy plastic carrying case.

Type 729101/400MPA for pressures up to 400 MPa is also available. Weight: 10 kg.

THAP air driven pumps and injectors

Are used in applications where a large volume of oil is required, and can save considerable time compared to hand pumps or oil injectors. Application examples include large propellers and nuts over size OKTC 505.

They are available in four different types giving a maximum oil pressure output of 30 MPa, 150 MPa or 300 MPa.

The THAP pumps are available individually or in sets that include hoses or high pressure pipes, pressure gauges and other equipment.

Designations are THAP 030E, THAP 150E* , THAP 300E and THAP 400E. Use suffix/SK1 for THAP sets.

Packed in a sturdy carrying case. Weight: 11,5–24,5 kg depending on type.

Oil injection kit

* Suitable pumps for fitting propellers with hydraulic nuts are the 728619 E hand pump and the THAP 150E/SK1 air-driven pump set

THAP E/SK1 air driven pump kit series

Oil injector

THAP E air driven pump series

Traditionally, ship propellers are mounted on a tapered shaft end with a nut and key. The torque is transmitted through friction of the mating surfaces and the key performs a stand-by function if the friction is insufficient.

On mounting, the propeller is driven up the taper by heating the propeller hub and driving in keys between the nut and the hub, or by using a hydraulic press or even flogging the nut to achieve the required axial drive up.

All these methods are time-consuming and difficult to manage due to the high forces required. For large propellers these outdated methods are unsuitable.

These conventional methods are especially troublesome when dismounting propellers from shafts. Withdrawal forces are high and fretting damage often occurs on the contact surfaces. Due to the high forces, withdrawal tools are often bulky, expensive and difficult to handle. The dismounting process is therefore very time consuming.

Time-saving technology from SKF

The well-proven SKF oil injection method combined with a hydraulic ring or nut from SKF, solves all these problems and simultaneously eliminates the use of keys and keyways.

Using the SKF oil injection method, the propeller is pressed onto the tapered seating by a hydraulic ring or nut. The high drive up force needed to obtain the interference fit is greatly reduced by the oil forced between the mating surfaces during the entire assembly procedure. The thin film of oil that separates the surfaces not only reduces the friction forces but also minimises the risk of fretting damage to the contact surfaces.

When the required axial drive up is reached, the oil between the contact surfaces is released. A powerful grip is thus established between the hub and the shaft and all shaft surfaces can be utilized for power transmission.

Simple dismounting

When dismounting, oil is injected between the surfaces, and the propeller is released from its tapered seating by the axial component of the compression force. For safety reasons the hydraulic ring or nut is used to brake the propellers axial travel.

The same technique can be used for mounting components like rudder pintles and tillers.

It is very reassuring for the user to know that SKF can supply all the equipment to fit components by SKF oil injection method. A complete range of hydraulic rings and nuts, pumps and high pressure oil injectors are available.

Accepted by all leading societies

This method is fully accepted by all leading classification societies worldwide, and hundreds of references for all types of vessels are available.

- No need for machining of keys and keyways
- No weakening of shafts
- No high friction forces
- Reduces the risk for fretting damage
- No complicated and cumbersome tools
- Time saving and controllable

SKF Coupling System was established in the early 1940s when SKF's Chief Engineer, Erland Bratt, invented the SKF oil injection method. As a result of continuous development, SKF is currently a world leader in selected market niches.

Our business concept is to develop, produce and supply, products based on the SKF oil injection method. These products significantly reduce downtime and decrease maintenance costs of the capital intensive equipment in which they are used.

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