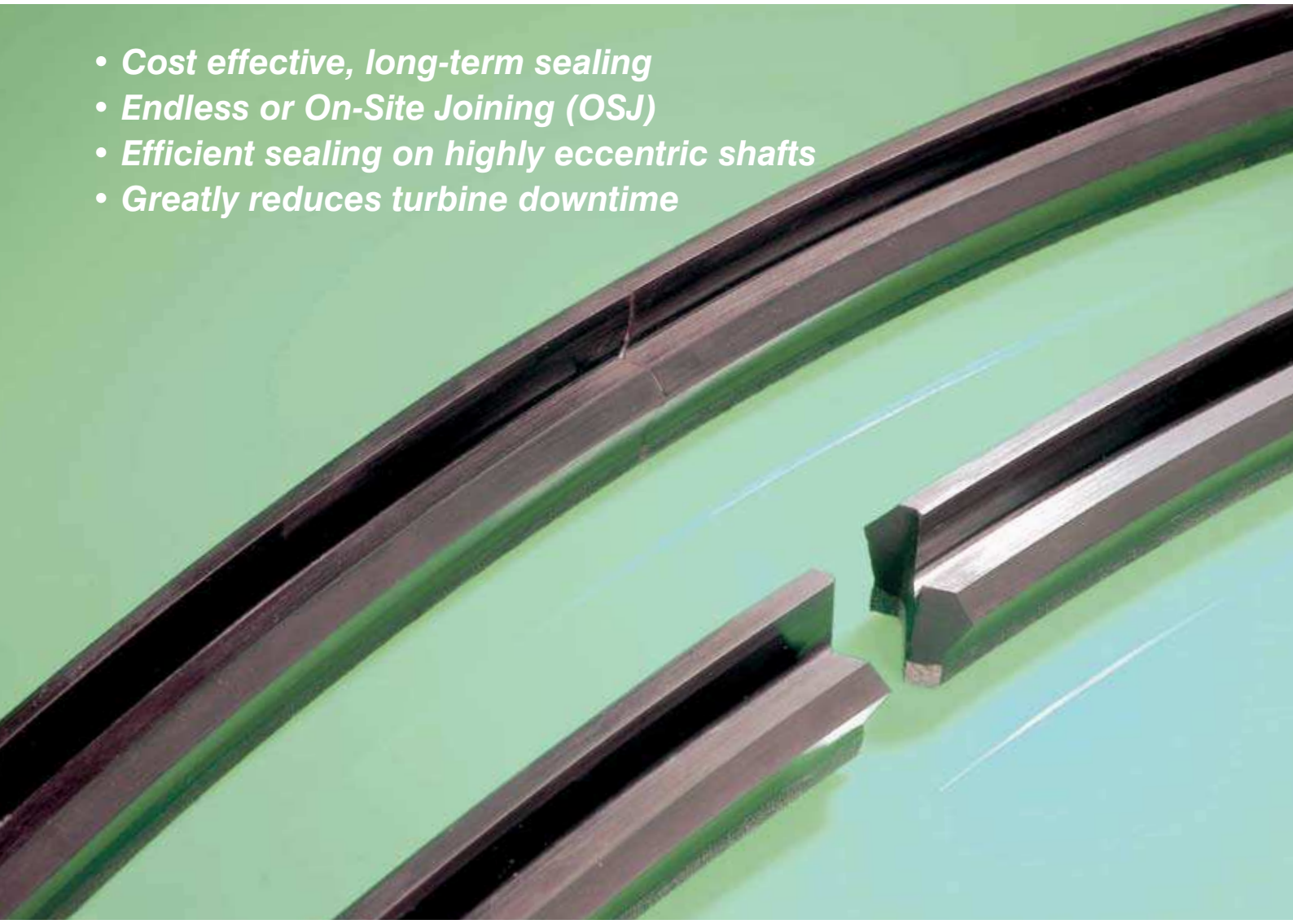
James Walker®

Solosele® KB Hydro – for Kaplan turbine blade roots

- *Cost effective, long-term sealing*
- *Endless or On-Site Joining (OSJ)*
- *Efficient sealing on highly eccentric shafts*
- *Greatly reduces turbine downtime*



High Performance Sealing Technology

James Walker

Solosele® KB Hydro

Solosele® KB Hydro is an innovative product developed specifically to seal the blade roots of Kaplan water turbines.

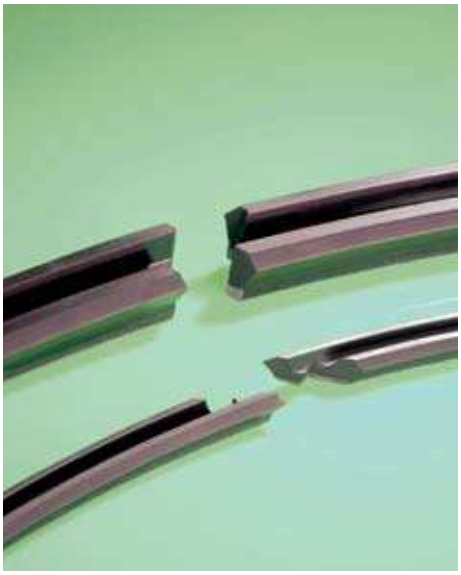
It has operated with great success for many years on turbine blades at hydroelectric schemes around the world — both as an OEM fit and as retrofit on older equipment.

Solosele KB Hydro has out-performed and run significantly longer than many multi-lip seals and other types at these sites.

In operation it:

- **Proves very cost effective.**
- **Has excellent low and high pressure sealing capability under fluctuating conditions.**
- **Works in a back-to-back arrangement to keep oil in and water out.**
- **Efficiently seals shafts that run eccentrically on worn bearings.**
- **Is easy to retrofit using our special On-Site Joining (OSJ) method.**
- **Significantly reduces turbine downtime and maintenance costs.**

We based the design of this new seal on our highly successful Solosele® G single element seal, widely renowned for its compact, robust construction and high integrity sealing under difficult mechanical conditions



Description

Solosele® KB Hydro is a profiled elastomeric seal. It is reinforced at the base with an integral anti-extrusion element of rubber-proofed fabric that is securely mould-bonded to the lip portion.

The anti-extrusion element is sufficiently tough to stop the seal from 'stretching and bunching' when the shaft rotates, yet is remarkably flexible for ease of fitting.

The very short axial length of this seal saves valuable housing space in new equipment. On older equipment with deeper housings, spacer rings can be supplied to move the sealing elements to unworn areas of the shaft.

Operation

A Solosele KB Hydro sealing arrangement typically comprises two seals fitted back-to-back in the blade root housing. This keeps lubricant in the system and prevents the ingress of water and abrasive particles.

When the seal is installed in its housing, the radial squeeze on its elastomeric body provides low pressure sealing suitable for stationary and turbine start-up conditions.

As system pressure rises, the seal responds accordingly to maintain a constant sealing force under fluctuating and reversing pressure differentials (including negative pressure) between the oil and water. In addition, the seal's highly developed profile enables it to overcome high levels of eccentricity or shaft offset caused by bearing wear at the blade root.

Installation

As Solosele KB Hydro does not need axial compression, housing length tolerances can be relaxed and installation becomes a very simple procedure. This is particularly valuable to OEMs when fitting endless-type seals during plant assembly.

On-Site Joining

Days of unnecessary turbine downtime and associated labour costs are saved when you fit Solosele KB Hydro + OSJ®.

Using our special On-Site Joining (OSJ) method, the split single-element Solosele KB Hydro is efficiently joined to form an endless seal around a shaft. Our method gives you the performance of a fully moulded seal with the maintenance benefits of a split seal — at best value price.

We have developed this system to help customers who want a simple yet highly efficient seal that can be fitted swiftly and easily on site without removing the blade. Before Solosele KB Hydro + OSJ®, the only answer was to use an expensive split multi-lip seal that demands great skill in fitting to obtain effective results.

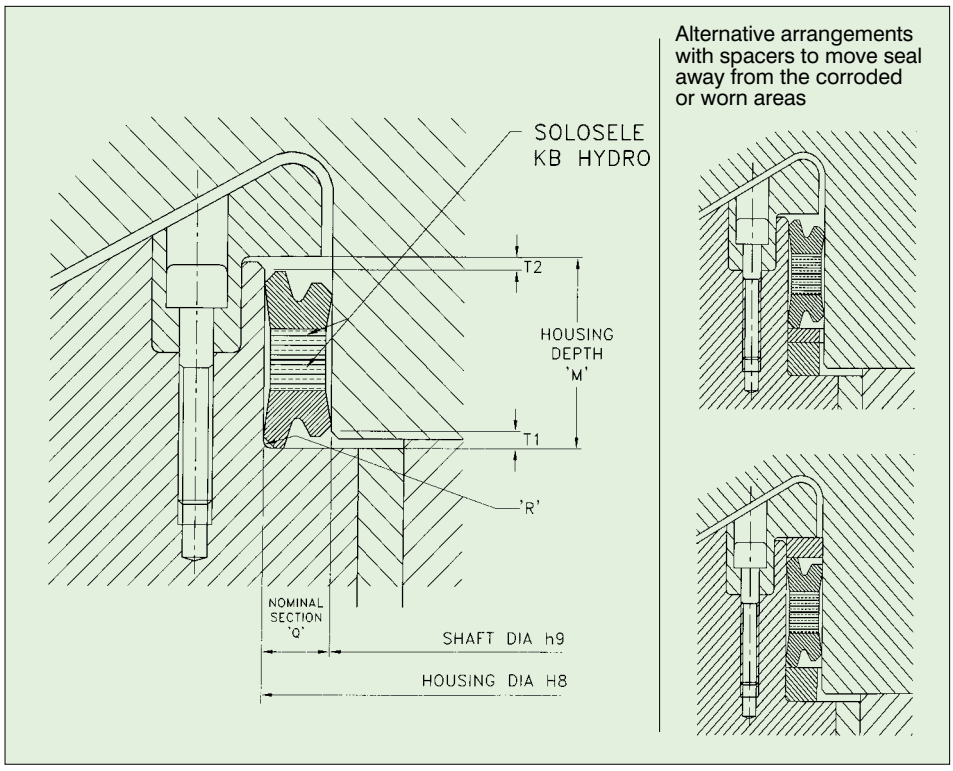
Training for On-Site Joining

Successful application of the Solosele KB Hydro + OSJ® method relies on careful adherence to all stages of the joining process.

This process is described step-by-step in the detailed fitting instructions supplied with each seal kit.

However, we recommend that first-time users attend one of our hands-on training sessions. These can be carried out on-site or at any of our premises worldwide.

Housing & seal configuration



Recommended dimensions

Nominal housing section 'Q' (Seal section)	Tolerance on housing section 'Q'	Maximum shaft diameter 'h9' (See 'Sizes & housing details')	Lead-in chamfer depth		Minimum housing depth 'M' (Without spacer rings)	'R' max
			'T1' max	'T2' max		
mm	mm	mm	mm	mm	mm	mm
10	+0.58 -0.44	575	3.0	2.4	24	1.6
12.5	+0.69 -0.53	700	4.0	3.0	31	2.0
16	+0.81 -0.66	900	5.0	4.0	40	2.5
19	+1.01 -0.80	1100	6.0	4.5	47	3.0
25	+1.21 -0.96	Consult James Walker	8.0	6.0	64	4.0

Seal availability

Solosele® KB Hydro is supplied in a number of formats:

- Endless seals that are ideal for OEM installation.
- Split seals with OSJ (On-Site Joining) kits for retrofitting.
- In a range of radial sections to suit Kaplan blade root housings.

Materials

We recommend our medium nitrile (NBR) elastomer for normal blade root sealing applications. This material has excellent resistance to all types of oil and is suitable for the temperature ranges encountered by virtually all Kaplan water turbines.

Sizes & housing details

Solosele KB Hydro is readily available in a range of radial sections and diameters. The 'Recommended dimensions' chart on this page shows the ratio of seal section to maximum diameter that we recommend.

Other section to diameter ratios can be accommodated, so if the seal dimensions you require are not listed, please consult your local James Walker company or distributor.

Specification & ordering

Please quote **James Walker Solosele® KB Hydro**, and the following (in mm):

- Seal inside diameter (ie, shaft diameter 'h9')
- Nominal housing section 'Q' (ie, seal section)
- Total housing depth 'M'.
- Also note any special considerations concerning your application.

Then contact your local James Walker company or distributor. They will provide expert technical advice, and are more than willing to discuss the exact details of your application before you place an order.

James Walker®

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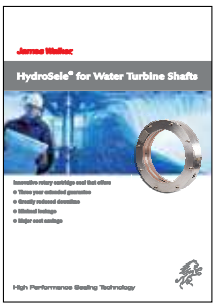
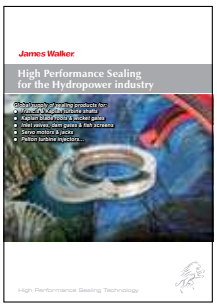
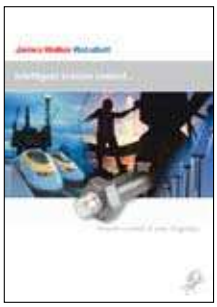
Please ask your local James Walker company for your copy of these free guides.
Many of these guides can also be downloaded in pdf form from our website www.jameswalker.biz.

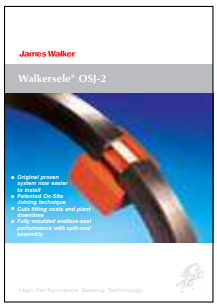


Hydrosele®



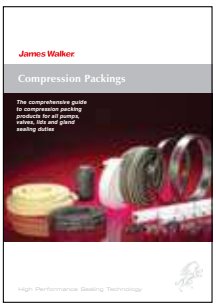
Hydropower Industry Guide


Rotabolt®



Walkersele® OSJ-2


Hydraulic Seals



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