WSAA PRODUCT APPRAISAL CERTIFICATE

Kwik-Zip Pty Ltd

Kwik-ZIP® HDX Series Casing Spacers

This appraisal is for a range of kwik-ZIP® HDX Series casing spacers used to maintain the position of a carrier pipe (watermain or sewer) within an encasing pipe for pipe-in-pipe applications such as slip lining and cased crossings.

The system can be used for medium to heavy weight pipe materials including steel, ductile iron, GRP, FRP, concrete, PVC and PE and is suitable for both pressure and non-pressure pipelines in grouted and un-grouted installations.

The HDX casing spacers utilise a segmented design that allows the system to be used on a range of carrier pipes from 100mm OD to 1668mm OD. The components of the spacer are manufactured from injection moulded inert engineering thermoplastics that incorporate low friction high abrasion resistant wear pads, attached to load sharing runners. The number of segments required for each spacer is determined by the outside diameter of the carrier pipe.

The HDX casing spacers are offered with four runner heights: 38mm, 65mm, 90mm, and 125mm. Spacer runner heights can also be customised by combining different runners together into a single spacer.

Quality Certification details are referenced in Schedule A.

Product Category	Casing Spacers
PA Number	PA 1523 Issue 2
Supplier	Kwik-Zip Pty Ltd
Brand	Kwik-ZIP
WSAA Product Specification	WSA PS - 324 *Casing Spacers*
Issue date	21 April 2021
Expiry date	20 April 2026
Recommendations	It is recommended that WSAA members, subject to any specific requirements of the member, accept or authorise the kwik-ZIP HDX Series casing spacers, as detailed in this report, for use in pipe-in-pipe pressure or non-pressure applications such as slip lining and cased crossings for carrier pipes from 100mm OD to 1668mm OD, provided the casing spacers are designed and installed in accordance with WSAA Codes and manufacturer's requirements.
Disclaimer	The disclaimer on Page 2 explains a number of very important limits on your ability to rely on the information in this Product Appraisal Certificate and the assessment criteria used to underlie it. Please read it carefully and take into account when considering the content in this Certificate.

1. Disclaimer

This Product Appraisal Certificate (Certificate) is issued by WSAA on the understanding that:

This Certificate applies to the product(s) as submitted in Schedule A. Any changes to the product(s) either minor or major shall void this Certificate.

To maintain the recommendations of this Certificate any such changes shall be detailed and notified to the Product Appraisal Manager for consideration and review of the Certificate including the product appraisal criteria underlying it and appropriate action. Appraisals and their recommendations will be the subject of continuous review dependent upon the satisfactory performance of products.

WSAA reserves the right to undertake random audits of product manufacture and installation. Where products fail to maintain appraised performance requirements the appraisal and its recommendations may be modified and reissued. Certificates will be reviewed and reissued at regular intervals not exceeding five (5) years.

WSAA reserves the right to withdraw this Certificate at any time in its sole and absolute discretion for any reason.

The following information explains a number of very important limits on your ability to rely on the information in this Certificate. Please read it carefully and take it into account when considering the contents of this Certificate.

Any enquiries regarding this Certificate should be directed to the Product Appraisal Manager Phone: 03 8605 7601 email carl.radford@wsaa.asn.au.

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This Certificate has been published and/or prepared by WSAA and nominated Project Manager and peer group of technical specialists (the Publishers).

The Certificate and the underlying product appraisal criteria have been prepared for use within Australia only by technical specialists that have expertise in the function of products such as those appraised in the Certificate (the Recipients).

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The Publisher(s) do[es] not, in any way, warrant that steps have been taken to verify or audit the accuracy or completeness of the information in this Certificate, or the accuracy, completeness or reasonableness of any recommendation in this Certificate.

QUALITY AND PRODUCT CERTIFICATIONS

A copy of the following Quality Certificate is available from WSAA.

SCHEDULE A1

KWIK-ZIP PTY LTD – MANAGEMENT SYSTEMS

3 Barnard Street Bunbury WA	
Quality Systems Standard	ISO 9001:2015
Certification Licence No.	FS 647308
Certifying Agency	BSI
First Date of Certification	18 December 2015
Current Date of Certification	12 January 2021
Expiry Date of Certification	31 December 2023

PRODUCT LITERATURE

HDX Series

kwik-ZIP®

Application

A non corroding, non-metallic casing spacer for Pipe-in-Pipe (PIP) applications such as slip lining and cased crossings for all medium to heavy weight pipe materials including steel, DICL, MSCL, GRE, PVC and HDPE. Suitable for all diameters from 100mm OD to 1600mm OD and beyond by addition of multiple segments.

Construction & Features

- Made from Kwik-ZIP's modified Acetal (POM) engineering thermoplastic blend with high flexural strength, high temperature resistance, low co-efficient of friction, abrasion resistance and outstanding chemical resistance.
- Integrated rubber grip pads under collars to prevent slippage. No requirement to pre-wrap pipe.
- Load sharing suspension system allowing heavy loads to be shared across multiple runners reducing point loading and increasing the overall load capacity of the spacer.
- Minimizes spacer weight bearing capacity and reduces point loading via a unique load sharing runner system.
- Ability to combine different runner heights in the same spacer ring to assist in borehole grade correction.
- Larger diameters are accommodated by joining additional segments.
- Requires only a flat blade screwdriver for installation.

Models

Model	Runner Height	Part #	Operating Temp (Deg C / F)	Recommended for use on Pipe Diameter	Units per carton	Carton Dimensions (L x W x H)	Gross Carton Weight
HDX 38	38mm / 1 ½"	00038	- 20 C to 80 C - 4 F to 176 F in certain applications (temperatures above 50 C / 122 F may require closer intervals)	100mm OD & greater	20	370mm x 350mm x 300mm 14.6" x 13.8" x 11.8"	11 Kg / 24.2 lbs
HDX 65	65mm / 2.56"	00065			20	370mm x 350mm x 330mm 14.6" x 13.8" x 12.9"	13 Kg / 28.6 lbs
HDX 90	90mm / 3.54"	00090			20	370mm x 350mm x 365mm 14.6" x 13.8" x 14.4"	14.6 Kg / 32.1 lbs
HDX 125	125mm / 4.92"	00125			20	370mm x 350mm x 405mm 14.6" x 13.8" x 15.9"	17 Kg / 37.4 lbs

Compliance

- Manufactured under a certified ISO 9001 Quality Management System.
- Compliant with AS/NZS 4020:2005 Products for use in contact with drinking water.
- Compliant with lead free requirements of Section 1417 of the US Safe Water Drinking Act.
- Compliant with WSAA Product Specification # 324 – Casing Spacers.
- Approved by MRWA and SEQ IPAM.

Size table & setting guide

NPS (ASME)	*Carrier Pipe OD (mm)	*Carrier Pipe OD (Inches)	**Carrier Pipe Nominal Size (DN)	Rec # Segments	Banding	Approx Setting Guide Position
3.5	101.60	4.00		2	No	0
	110.00	4.33		2	No	10
	122.00	4.80	100	2	No	30
4.5	127.00	5.00		2	No	40
5	141.30	5.56		2	No	65
	160.00	6.30		3	No	15
6	168.27	6.62		3	No	20
	177.00	6.97	150	3	No	30
	200.00	7.87		3	No	55
8	219.08	8.63		4	No	10
	232.00	9.13	200	4	No	20
	259.00	10.20	225	4	No	40
10	273.05	10.75		5	No	10
	286.00	11.26	250	5	No	20
12	323.85	12.75		5	No	40
	345.00	13.58	300	6	No	20
16	406.40	16.00		7	No	20
	426.00	16.77	375	7	No	30
	453.00	17.83	400	8	No	20
20	507.00	19.96	450	9	No	20
22	560.00	22.05	500	10	No	15
24	609.60	24.00		11	No	15
	630.00	24.80		11	No	20
	667.00	26.26	600	12	No	15
28	711.20	28.00		12	No	25
30	762.00	30.00		13	No	25
	800.00	31.50		14	Yes	20
	826.00	32.52	750	14	Yes	25
	900.00	35.43		15	Yes	25
	1000.00	39.37		17	Yes	25
42	1066.80	42.00		18	Yes	30
44	1117.60	44.00		19	Yes	30
48	1219.20	48.00		21	Yes	30
52	1320.80	52.00		22	Yes	35
	1400.00	55.12		23	Yes	30
	1564.00	61.57		25	Yes	35
	1600.00	62.99		26	Yes	35
	1668.00	65.67		27	Yes	35

Please refer to the relevant product series installation guide for additional information

* For PE Pipe refer to the nearest Carrier Pipe OD.
** OD for Nominal Size (DN) designations is a guide only. If unsure please confirm actual carrier pipe OD.

For pipe greater than 800mm OD (e.g. DN 750 and above), for very heavy weight pipe, or if the pipe material is slippery, it is recommended that 12mm stainless steel worm drive banding be applied over the collars. Contact kwik-ZIP for further information.

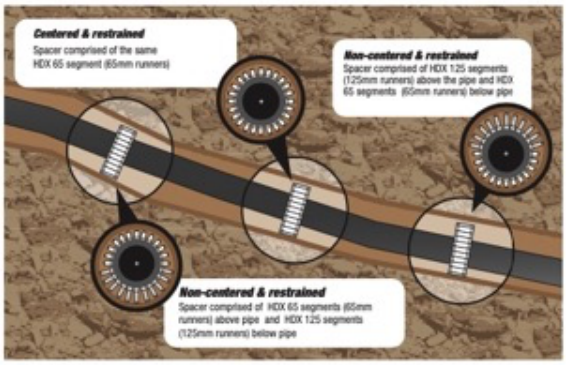
HDX Spacers are generally suitable for heavy pipe run lengths up to 300m (approx. 1,000 ft) in good condition casings. Longer run lengths may be possible with casing lubrication, banding, and/or closer spacer intervals. Contact kwik-ZIP for further advice.

Load sharing

Using a unique "load sharing runner" system, each HDX segment maximises its weight bearing capacity by distributing the pipe load across multiple runners. This reduces point loading at any one location, boosting and optimising the overall support capacity of the spacer exponentially as pipe size increases. The "load sharing runner" system also delivers a suspension and dampening effect, reducing the transfer of potentially damaging vibration and movement from the outer casing to the carrier pipe. This may be beneficial in tectonically active regions or high traffic areas where ongoing external vibration affects the outer casing.

When used in accordance with the Installation Guide, HDX Spacers will easily handle weights equivalent to a standard Ductile Iron Cement Lined (DICL) pipe full of fluid.

For specific advice on load capacities please contact sales@kwikzip.com (Australasia) or usa@kwikzip.com (USA).



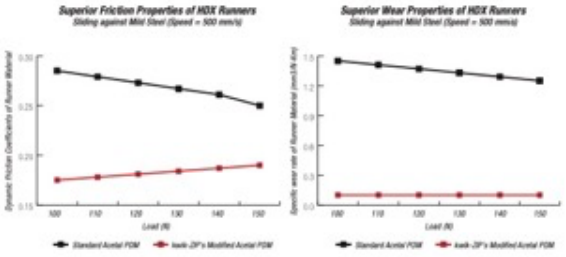
Friction and Wear capabilities

Acetal (POM) is well known as being one of the best materials for applications requiring excellent abrasion / wear resistance and a low coefficient of friction. It performs better than alternative materials such as Nylon and HDPE.

HDX Spacers are fitted with wear pads made from kwik-ZIP's modified Acetal (POM) engineering thermoplastic blend to achieve even better abrasion resistance and a lower coefficient of friction, especially under high load conditions.

These properties allow for greater run lengths and lower insertion forces during carrier pipe installation.

The graphs below compare the dynamic coefficient of friction, and the wear rate (against carbon steel) of the material used to make the HDX wear pads versus standard Acetal (POM).



PRODUCT SELECTION GUIDE

The table below shows Model details, Part # and maximum operating temperatures:

Model & (Runner Height)	Part #	Max Operating Temp (Deg C/F)	Recommended for use on Pipe Diameter:
HDX 38 : (1 ½ " / ~ 38mm)	00038	- 20 C to 80 C - 4 F to 176 F in certain applications (temperatures above 50 C / 122 F may require closer intervals).	3.5" NPS (101.6 mm OD & greater)
HDX 65 : (2.56" / ~ 65mm)	00065		
HDX 90 : (3.54" / ~ 90mm)	00090		
HDX 125: (4.92" / ~ 125mm)	00125		

HDX Spacers are made with rubber grip pads under the collars to prevent slippage on the pipe, however banding of collars with 12mm stainless steel worm drive banding may be required in certain circumstances.

HDX Spacer runners incorporate a load sharing suspension system allowing heavy loads to be shared across multiple runners, thereby reducing point loading and increasing the overall load capacity of the spacer.

Selecting Model (Runner Height): The HDX Model # corresponds to the runner height. To select the correct runner height, calculate the annular clearance between the inner pipe and the outer casing (assuming centralisation in the casing). The annular clearance is half the difference between the outer casing ID and the inner pipe OD.

For ease of insertion it is recommended that the selected runner height is at least 10mm (0.3937") less than the annular clearance. The runner height should also be at least 15mm (0.59") greater than the height of the bell.

Different casing positions can be achieved by combining different runner heights in the same spacer, including centred, or restrained. Contact kwik-ZIP if assistance is required.

Spacer Interval: Subject to project specifications, recommended intervals for medium to heavy weight pipe (including Standard Ductile Iron) up to 1200 DN (48" NPS) are 1m (3.28 ft) in the case of an un-grouted annulus, and 2m (6.56 ft) when the annulus is grouted. A spacer should also be placed within 500mm (20") of each end of the pipe. For pipe diameters greater than 1200 DN (48" NPS), please contact kwik-ZIP for further advice. Flange weight should also be considered on large diameter Flanged Ductile Iron.

If installing on heavy weight pipe with an annular clearance of greater than 200mm (7.875") (more than 400mm (15.75") difference between inner pipe OD and casing ID), contact kwik-ZIP for confirmation of the interval between spacers.

Subject to project specifications & pipe sag between spacers, intervals of up to 3m (9.84 ft) can be used on light to medium weight pipe (e.g. PVC & HDPE) when the annulus is to be grouted.

INSTALLATION INSTRUCTIONS

Step 1. When you have established the appropriate setting guide position (see table on rear page), place the segments on a flat surface and insert the male section of each segment into the mouth of the screw housing on the next segment as indicated by the arrows (Fig. 1). Ensure that the collar straps extend beyond and are fed under the strap deflector (Fig. 2).

Fig. 1

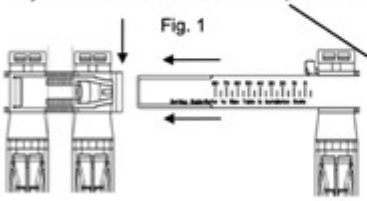


Fig. 2

Step 2. Line up the leading edge of each screw housing (Fig 1.) with the appropriate number on the Setting Guide.

Step 3. Once all segments are set, they can be wrapped around the pipe and the final joints can be fastened. This method allows the centralizer to be made up mostly by hand. Alternatively a cordless drill with screw driver attachment can be used provided care is taken not to over torque the screws.

All screws must be tightened and always tighten the screws underneath the pipe last as this will provide greater tension and better grip.

A flat screwdriver of approx. 6mm ($^5/_{16}$") is used to tighten the screws once the segments are fixed to the pipe.

Important Notes:
Do not over tension the screws as this may cause damage to the thread. Maximum torque of 10 inch-lbs is recommended.

kwik-ZIP® products should not be exposed to a naked flame or sparks from welding. Failure to shield the product whilst welding may result in damage.

SUPPLIER CONTACT

Blick are the regional distributor of kwik-ZIP centraliser and spacer systems in New Zealand and the Pacific Islands.

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