

Krausz Industries Ltd

PRODUCT APPRAISAL REPORT No 1702

HYMAX GRIP[®] Restrained Wide Tolerance Mechanical Couplings,
Flanged Adapters and End Caps

EN 14525:2005 Ductile iron wide tolerance couplings and
flange adaptors for use with pipes of different materials:
ductile iron, Grey iron, Steel, PVC-U, PE, Fibre- cement

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Name/Title	Organisation	Date
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Carl Radford, Product Appraisal Manager	WSAA	5 December 2019

Overview of WSAA

The Water Services Association of Australia (WSAA) is the peak industry body representing the urban water industry. Our members provide water and sewerage services to over 20 million customers in Australia and New Zealand and many of Australia's largest industrial and commercial enterprises.

Based around our vision of 'customer driven, enriching life', WSAA facilitates collaboration, knowledge sharing, networking and cooperation within the urban water industry. We are proud of the collegiate attitude of our members which has led to industry-wide approaches to national water issues.

WSAA can demonstrate success in the standardisation of industry performance monitoring and benchmarking, as well as many research outcomes of national significance. The WSAA Executive retains strong links with policy makers and legislative bodies and their influencers, to monitor emerging issues of importance to the urban water industry.

WSAA was formed in 1995 as a non-profit organisation to foster the exchange of information between industry, government and the community, and to promote sustainable water resource management.

The urban water industry is committed to anchoring its services to customers' values, and to enrich communities where water services have broad economic, environmental and social values. In line with this our main activities focus on four areas:

1. influencing national and state policies on the provision of urban water services and sustainable water resource management
2. promoting debate on environmentally sustainable development and management of water resources and the community health requirements of public water supplies
3. improving industry performance and establishing benchmarks and industry leading practices for water service processes; and
4. fostering the exchange of information on education, training, research, water and wastewater management and treatment and other matters of common interest.

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1 EXECUTIVE SUMMARY

Krausz Industries Ltd has an operating history dating back to the 1920's when Armin Krausz commenced a machining company in what is now modern day Bratislava in the Slovak Republic. The World War 2 disruption led to re-establishment of the company in Tel Aviv, Israel in 1942 and the company has now developed to be a leading manufacturer and marketer of products and services used in transmission, distribution and measurement of water. The HYMAX[®] range of unrestrained couplings was introduced to the market in 1999 and the HYMAX GRIP[®] range of couplings was launched in 2014. USA based Mueller Water Products purchased the business in 2018.

This appraisal is for a range of HYMAX GRIP[®] wide tolerance couplings from DN 40 to DN 300, flanged adapters from DN 80 to DN 300 and end caps in sizes DN 40 to DN 300. The couplings are nominated as PN16 classification. See Section 3 for details.

The Krausz patented HYMAX GRIP socket is a restrained joint intended for coupling various pipe materials including DI, CI, PE and steel with a wide range of outside diameters. The couplings are not suitable for use with PVC, AC or GRP pipes¹. The design of the socket consists of a grip chain that offers circular restraint around the pipe thereby avoiding point loads on the pipe surface.

Sealing is accomplished by tightening two top-operated Grade 316 stainless steel fasteners, one on each end of the coupling. The grip chain is then activated by tightening four additional top-operated bolts, two on each end.

The sealing gasket features a two-layer design whereby the inner layer can be removed to allow larger pipes to be accommodated.

The couplings and flanged adapters are supplied with polymeric coated ductile iron barrels and end rings, except for sizes less than DN 80, which have polymeric cast steel end rings. Grade 316 stainless steel fasteners with an anti-galling compound are utilised. The sealing gaskets are manufactured from EPDM rubber. The flanges are compatible with AS/NZS 4087 PN16.

When using the couplings on PE pipes Krausz recommends that a stainless-steel stiffener is inserted into the end of the pipe prior to installation.

Krausz has a Quality Management System licence to ISO 9001 and the products are covered by ISO Type 5 product certification to EN 14525:2005.

The Krausz HYMAX GRIP couplings, flanged adapters and end caps described within this appraisal meet the requirements of WSA PS 271 *Mechanical couplings and flange adapters, end thrust restraint, for pressure applications – water supply and sewerage* and are therefore deemed as 'fit for purpose'.

1.1 Recommendations

It is recommended that WSAA members subject to any specific requirements of the member, accept or authorise Krausz HYMAX GRIP couplings, flanged adapters and end caps as listed in this report, for use in water supply and sewerage pressure pipelines, provided they are installed in accordance with any relevant conditions relating to the design, installation, and acceptance testing provided in relevant standards, WSAA Codes and the manufacturer's requirements.

¹ WSAA does not recommend the use of gripping mechanisms on PVC or GRP pipes, due to the known propensity of failure at points of induced scratches or scores in the pipe wall. Accordingly, the use of HYMAX GRIP products on PVC or GRP pipes is not endorsed in this Appraisal.

2 THE APPLICANT

The Applicant is Krausz Industries Limited.

2.1 The Manufacturer

Krausz Industries Ltd has an operating history dating back to the 1920's when Armin Krausz commenced a machining company in what is now modern day Bratislava in the Slovak Republic. The World War 2 disruption led to re-establishment of the company in Tel Aviv, Israel in 1942 and the company has now developed to be a leading manufacturer and marketer of products and services used in transmission, distribution and measurement of water. USA based Mueller Water Products purchased the business in 2018.

3 THE PRODUCT

HYMAX GRIP® restrained wide tolerance mechanical couplings, flanged adapters and caps are designed to suit a wide range of pipe OD's.

The PN16 range includes couplings from DN 40 to DN 300, flanged adapters from DN 80 to DN 300 and end caps in sizes DN 40 to DN 300. See Figure 1.

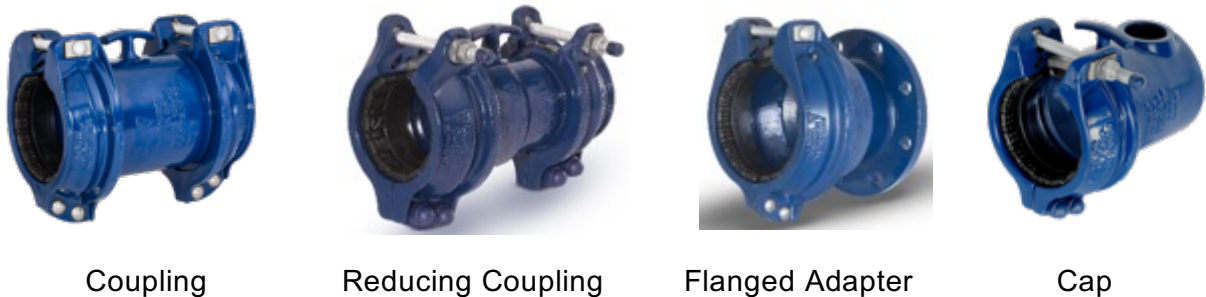


FIGURE 1 HYMAX GRIP COUPLING RANGE

The Krausz patented HYMAX GRIP socket is a restrained joint intended for coupling various pipe materials including DI, CI, PE and steel with a wide range of outside diameters. The couplings are not suitable for use with PVC, AC or GRP pipes¹. The design of the socket consists of a grip chain that offers circular restraint around the pipe thereby avoiding point loads on the pipe surface.

Sealing is accomplished by tightening two top-operated Grade 316 stainless steel fasteners, one on each end of the coupling. The grip chain is then activated by tightening four additional top-operated bolts, two on each end.

The patented sealing gasket features a two-layer design whereby the inner layer can be removed to allow larger pipes to be accommodated. The seal also incorporates a pressure activated sealing mechanism.

The couplings, flanged adapters and caps are supplied with polymeric coated ductile iron barrels and end rings, except for sizes less than DN 80, where polymeric cast steel end rings are supplied. Grade 316 stainless steel fasteners with an anti-galling compound are utilised. The sealing gaskets are manufactured from EPDM rubber. The flanges are compatible with AS/NZS 4087 PN16. See Section 6.2.7.

The caps have two 2" BSP parallel thread radial outlets.

¹ WSAA does not recommend the use of gripping mechanisms on PVC or GRP pipes, due to the known propensity of failure at points of induced scratches or scores in the pipe wall. Accordingly, the use of HYMAX GRIP products on PVC or GRP pipes is not endorsed in this Appraisal.

When using the couplings on PE pipes Krausz recommends that a stainless-steel stiffener is inserted into the end of the pipe prior to installation.

Details of the product range are given in Tables 1 to 4.

TABLE 1
HYMAX GRIP COUPLINGS

DN	Reach
40/50	39-67
65	59-87
80	80-106
100	104-130
125	130-162
150	158-190
175/200	198-230
175	190-240
200	214-264
250	266-316
300	312-362

TABLE 2
HYMAX GRIP REDUCING COUPLINGS

DN	Reach 1	Reach 2
40/50-65	39-67	59-87
65-80	59-87	80-106
80-100	80-106	104-130
100-125	104-130	130-162
100-150	104-130	158-190
125-150	130-162	158-190
125-175/200	130-162	198-230
150-175/200	158-190	188-230
150-200	158-190	214-264
175-200	190-240	214-264
200-250	214-264	266-316
250-300	266-316	312-362

TABLE 3
HYMAX GRIP FLANGED ADAPTERS

Flange DN	Socket DN	Reach
80	80	80-106
100	100	104-130
125	125	130-162
150	150	158-190
200	175/200	198-230
200	175	190-240
200	200	214-264
250	250	266-316
300	300	312-362

TABLE 4
HYMAX GRIP END CAPS WITH BSP OUTLETS

DN	Reach	BSP Tapping
40-50	39-67	2"
65	59-87	2"
80	80-106	2"
100	104-130	2"
125	130-162	2"
150	158-190	2"
175/200	198-230	2"
175	190-240	2"
200	214-264	2"
250	266-316	2"
300	312-362	2"

4 SCOPE OF THE APPRAISAL

The scope of this appraisal includes a range of HYMAX GRIP couplings, flanged adapters and caps in sizes from DN 40 to DN 300 as detailed in section 3 and included on the ISO Type 5 Kiwa Product Schedule attached in Appendix B.

5 APPRAISAL CRITERIA

5.1 Quality Assurance Requirements

The WSAA Product Appraisal Technical Advisory Group accepts ductile iron thrust restraint mechanical couplings and flanged adapters manufactured in compliance with EN14525 *Ductile iron wide tolerance couplings and flange adaptors for use with pipes of different materials: ductile iron, Grey iron, Steel, PVC-U, PE, Fibre-cement* and duly certified by means of an ISO Type 5 product certification scheme undertaken by a JAS-ANZ accredited Certification Assessment Body (CAB) or by a CAB accredited by an international accreditation system recognised by JAS-ANZ.

The manufacturer is generally expected to have a production management and control system that has been duly accredited in accordance with AS/NZS ISO 9001 as a prerequisite to undergoing a product certification audit.

The ISO Type 5 Product Certification Scheme shall meet the criteria described in WSA TN-08.

5.2 Performance Requirements

The Krausz range of HYMAX GRIP wide tolerance couplings, flanged adapters and end caps have been appraised for compliance to EN14525 *Ductile iron wide tolerance couplings and flange adaptors for use with pipes of different materials: ductile iron, Grey iron, Steel, PVC-U, PE, Fibre-cement*

Appraisal criteria are also determined by the WSAA Product Appraisal Technical Advisory Group and regularly reviewed to ensure that the criteria reflect the requirements of WSAA members.

The following Product Specification is relevant to this application:

WSA PS 271 *Mechanical couplings and flange adapters, end thrust restraint, for pressure applications – water supply and sewerage.*

A copy of the above Product Specification can be found in Appendix C or downloaded from the WSAA members website

6 COMPLIANCE WITH APPRAISAL CRITERIA

6.1 Compliance with Quality Assurance Requirements

Krausz has submitted the following quality certificates:

- ISO 9001:2015 Certificate of Registration No 90452 issued to Krausz Industries Ltd by The Standards Institute of Israel (SII).
- EN14525:2004 ISO Type 5 product certification licence No K101431/01 issued to Krausz Industries Ltd by Kiwa Nederland B.V.
- ISO 9001:2015 Certificate of Registration No 103803 issued to Ein Shemer Rubber Industries Ltd by The Standards Institute of Israel (SII).

Copies of the primary Quality Assurance and Product Certification licences have been included in Appendix B and other copies are available from WSAA.

6.2 Compliance with Performance Requirements

6.2.1 Ductile Iron

EN14525 Clause 4.3.1 specifies that DI shall have a minimum tensile strength of 420 MPa and a minimum elongation of 5%.

Krausz has submitted a typical material test certificate to demonstrate compliance with this requirement.

For sizes up to DN 80, the end rings are cast steel. EN 14525 does not include cast steel components within the Standard however Krausz has provided material certificates to indicate that the tensile strength and elongation properties of the steel is 490/35, which exceeds the required properties of DI. The steel components are FBE coated and are therefore deemed as acceptable.

6.2.2 Wall thickness

The minimum wall thicknesses are specified in EN14525 as 4mm for fittings less than or equal to DN200 and 5mm for fittings greater than DN200 and less than or equal to DN300. Krausz has provided a drawing to confirm that the fittings exceed these minimum requirements.

6.2.3 Performance tests

The HYMAX GRIP socket is a patented restrained joint intended for coupling various pipe materials including DI, CI, PE and steel with a wide range of outside diameters.

EN14525 nominates that type testing carried out on at least one joint in the range from DN 32 to DN 125 will qualify all sizes in that range where the design is based on the same design parameters. Similarly, a Type Test on one joint in the range DN150 to DN300 will qualify all sizes in that range.

Krausz has submitted copies of type test reports for DN 100, DN 150 and DN 200 couplings conducted by SKZ-Testing GmbH to demonstrate compliance to the requirements of EN14525 for PN16 rating.

The tests nominate positive pressure tests, negative pressure tests and dynamic pressure tests with 24,000 cycles. The test parameters include testing without external restraint at maximum annulus and are conducted with and without joint deflection. A shear load is applied to the tests undertaken on rigid pipes.

Although type testing has demonstrated compliance with PN16 rating the Kiwa product certification nominates a maximum water pressure of 1MPa. The nominated PN16 rating is deemed acceptable based on the type tests.

6.2.4 Elastomeric seals

The elastomeric seals are EPDM conforming to EN681.1. Test reports have been provided to demonstrate conformance.

6.2.5 Joint gap, depth of engagement and angular deflection

Krausz has advised that the allowable joint deflection is 4° degrees per joint, which exceeds the minimum joint deflection requirements of 3° in EN14525.

The maximum allowable joint gap and minimum depth of engagement is nominated in Table 3, which meet the requirements of EN14525.

TABLE 3
HYMAX GRIP MAXIMUM JOINT GAP AND MINIMUM DEPTH OF ENGAGEMENT

DN	Maximum Joint Gap	Minimum Depth of Engagement
40/50	20	95
65	20	95
80	20	95
100	25	95

125	25	95
150	25	95
175	35	125
200	35	125
250	55	125
300	55	125

6.2.6 Polymeric coatings.

HYMAX GRIP coupling components are coated with Akzo Nobel Resicoat R4-FB, a fusion bonded epoxy powder coating.

The Resicoat R4 powder has an ISO Type 5 StandardsMark product certification licence to AS/NZS 4158 issued by SAI Global. A copy is retained on file by WSAA.

The coating is applied in house by Krausz, utilising the fluidized bed technique.

A type test was conducted by Prove Standards and Engineering, a NATA certified laboratory (Accreditation No.18640) based in Melbourne, on two coupling samples to demonstrate AS/NZS 4158 compliance.

It should be noted that the coating application is applied in compliance with EN 14901. Whilst the attributes align well with the requirements of AS/NZS 4158, batch release testing frequencies are less stringent in EN 14901 compared to AS/NZS 4158.

The coating application process is audited as part of the product certification licensing procedures by IAPMO R&T Oceana.

6.2.7 Flanges

The flanges incorporated on the HYMAX GRIP fittings comply with the physical dimensions of EN1092-2 (PN16) and/or ANSI 125/150 and are drilled to match AS/NZS 4087 Fig B5 (PN16) configurations.

The flanges have minor differences in outside diameter and raised face diameter compared to the AS/NZS flanges, however these differences do not prevent compatibility.

A comparison of nominal flange thicknesses is provided in Table 4. The flanges proposed for this appraisal are deemed acceptable.

TABLE 4 COMPARISON OF EN AND AS/NZS NOMINAL FLANGE THICKNESSES

DN	EN 1092-2 PN16	Krausz Flange Thickness	AS/NZS 4087 PN16
80	19	20	18
100	19	20	20
125	19	22	-
150	19	22	23
200	20	24	23
250	22	24	24
300	24.5	29	30

6.2.8 Contact with drinking water

The materials in contact with water are the polymeric coating and the EPDM seal. Akzo Nobel maintains AS/NZS 4020 certification as a component of their product certification and a test report is held on file by WSAA.

Krausz has supplied a copy of a test report from Australian Water Quality Centre dated May 2016 to demonstrate compliance of the EPDM material to AS/NZS 4020:2005.

7 FITTING INSTRUCTIONS, TRAINING AND INSTALLATION

A copy of HYMAX GRIP Installation Instructions is included in Appendix A. Additional training is available through the Australian agent. See Appendix D for contact details.

8 PRODUCT MARKING

Marking requirements as specified in EN14525 are as follows:

- Manufacturer's name or mark
- Year of manufacture
- "Ductile" or "D.I."
- DN
- PN
- EN14525 and Kiwa logo
- Range of applicable OD's

In addition, the following information is required to accompany the product:

- Maximum joint gap
- Minimum depth of engagement
- Maximum allowable angular deflection
- Pipe materials compatible
- Need for supporting sleeves
- Bolt torque
- Jointing instructions

Please note that the markings on the fittings nominate PVC as a compatible pipe material, however WSAA does not recommend the use of mechanical gripper mechanisms on PVC pipes.

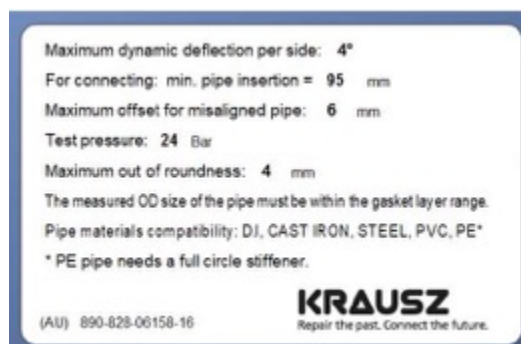


FIGURE 4 EXAMPLE OF MARKING

9 PACKAGING AND TRANSPORTATION

Each HYMAX GRIP coupling is wrapped in bubble wrap to prevent in-transit damage and to avoid ingress of foreign matter. The coupling is then packed into a cardboard carton. See Figure 5.



FIGURE 5 EXAMPLE OF PACKAGING

10 PRODUCT WARRANTY

The products are covered by the normal commercial and legal requirements of the *Competition and Consumer Act 2010 (Cth)*, which covers manufacture to the relevant standard, and details of Krausz's warranty is included in their terms and conditions

11 WATER AGENCY EXPERIENCE WITH THE PRODUCT OR FIELD-TESTING REPORT

Krausz HYMAX GRIP couplings have been supplied extensively within Europe and USA since they were first introduced into the market in 2014. This Appraisal is a pre-requisite to obtain water agency approvals in Australia. Similar products have been in general use within the industry for many years and a field trial is not deemed necessary.

12 OUTCOMES OF EXPERT PANEL PRODUCT REVIEW

No issues were raised.

13 FUTURE WORKS

No future work items have been identified.

14 DISCLAIMERS

This Product Appraisal Report (Report) is issued by the Water Services Association of Australia Limited on the understanding that:

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

To maintain the recommendations of this Report any such changes shall be detailed and notified to the Product Appraisal Manager for consideration and review of the Report 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. Appraisal reports will be reviewed and reissued at regular intervals not exceeding five (5) years.

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

Any enquiries regarding this report should be directed to the Program Manager, Carl Radford, Phone: 03 8605 7601 email carl.radford@wsaa.asn.au.

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This Report has been published and/or prepared by the Water Services Association of Australia Limited and nominated Project Manager and peer group of technical specialists (the Publishers).

The Report has been prepared for use within Australia only by technical specialists that have expertise in the function of products such as those appraised in the Report (the Recipients).

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HYMAX GRIP®

Wide Range Restraint Solutions

The Unique Gripping System That Makes The Difference.



HYMAX GRIP Restraint Solutions®

Gasket Bridge
Type 316 Stainless Steel

Progressive Pressure-Assisted Gasket
Double layer detachable gasket

Universal Grip Chain
Reseals metal and plastic pipes

Nuts & Bolts
1 top being bolt on each side, for faster, easier and safer installation
Type 316 Stainless Steel

Eng Ring
40mm - 80mm Cast Steel
100mm - 300mm Ductile Iron Casting

Coating
100% fusion bonded epoxy for enhanced corrosion protection

Center Ring + T Handle
Ductile Iron Casting for long term durability

SUITABLE FOR THESE PIPE MATERIALS:

Icons representing various pipe materials: Cast Iron, Ductile Iron, Steel, PVC, and HDPE.

	DN (mm)	Working Range (mm)
 <p>HYMAX GRIP® Restraint Coupling</p>	40-100 125-175 175-300	26-28 32 50
 <p>HYMAX GRIP® Flange Adaptor</p>	80-100 125-175 175-300	26 32 50
 <p>HYMAX GRIP® Reducer</p>	40-100 125-175 175-300	26-28 32 50
 <p>HYMAX GRIP® End Cap</p>	40-100 125-175 175-300	26-28 32 50

* Picture is based on HYMAX GRIP DN 125 - materials may vary among different product sizes.





HYMAX GRIP COUPLING RESTRAINT (40mm - 300mm)



INSTALLATION INSTRUCTIONS

DO NOT DISASSEMBLE THE COUPLING. DO NOT LUBRICATE THE BOLTS.

GENERAL INSTRUCTIONS:

THE HYMAX GRIP COUPLING IS A STAB-ON TYPE RESTRAINT THAT IS APPROVED FOR USE WITH METAL AND PLASTIC PIPES.

WARNING: DO NOT ATTEMPT TO USE THE HYMAX GRIP ON AC OR FRP PIPE!

PRECAUTIONS FOR HDPE PIPE: THE USE OF FULL CIRCLE STIFFENERS IS REQUIRED WHEN USING THE HYMAX GRIP ON HDPE PIPE.

FOR OTHER MATERIALS, PLEASE CONTACT YOUR KRAUSZ DEALER.

STEP 1



Prepare both pipe ends of the pipe by de-scaling if required. Clean the pipe as required with water. Make sure that the pipe is clean from debris and defects that interfere with HYMAX's proper seal.

NOTE: Except steel, PVC, and PE pipes, all rough-surfaced pipes must be lubricated with a water-based gasket lubricant in order to achieve a proper seal.

STEP 2



Measure the pipe's outer diameter and make sure the coupling's size fits properly.

NOTE: Each coupling's size range is shown on the product's label. Make sure that the pipe is not out of round! The pipe should be free of scratches, dents, flats or other defects which may interfere with the coupling's proper seal. The coupling may not fit well or function properly on a pipe which is damaged or is out of round.

STEP 3

Unpack the coupling. Carefully remove the coupling from its packaging. Inspect the coupling and end rings for shipping damage and assure all parts are present. Inspect the end rings. If they are not centered on the coupling - DO NOT USE! Contact your distributor for return and replacement.

NOTE: HYMAX GRIP is a stab-on type coupling. Do not loosen or remove the end ring bolts.

NOTE: Bolts are pre-lubricated with a MAG coating. This embedded zinc lubrication will prevent cold weld. Do not lubricate the bolts and nuts. Greasing or lubricating bolts or nuts voids the manufacturer's warranty.

INSTALLATION INSTRUCTIONS

HYMAX® GRIP COUPLING RESTRAINT 40mm - 300mm

**STEP 4**

Mark each pipe end to a minimum required stab depth. This mark indicates the required stab depth for the coupling.

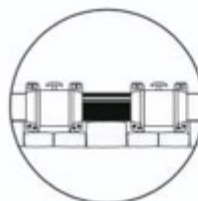
Sizes	Min. Stab Depth
40-175mm (Range 32mm)	95mm
175-300mm (Range 50mm)	125mm

STEP 5

The HYMAX GRIP fits a wide range of pipe sizes. Each coupling's range is shown on the product's label.

Size the gasket.

The GRIP Coupling has two gaskets; a removable inner gasket and a hydraulically-assisted outer gasket. The inner gasket can be removed to accommodate larger OD pipes. **DO NOT** remove the inner gasket unless the OD falls within the upper range of the Coupling. The proper range sizes are shown on the product label. If the inner layer of the gasket must be removed, fold the inner layer and separate the two gaskets by inserting a screwdriver between the two layers, and pull the layer out of the product.



Make sure that the pipes are properly supported. The HYMAX GRIP is not designed to carry the weight of the pipes.

STEP 6

Slide the two HYMAX GRIPs on both sides the replacement pipe. Lower the replacement pipe and the two grips positioned on it into the ditch.

INSTALLATION INSTRUCTIONS

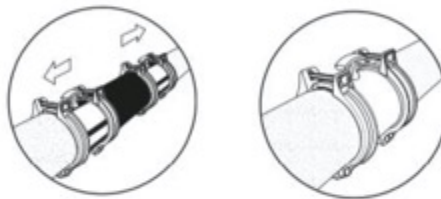
HYMAX® GRIP COUPLING RESTRAINT 40mm - 300mm



STEP 7

Slide the two HYMAX GRIPs from the replacement pipe in the direction of the two old pipes until they reach the pipe marks shown in step 4.

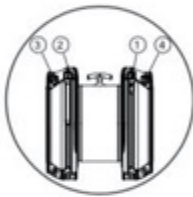
NOTE: Make sure that the pipes are not touching each other inside the body of the HYMAX GRIP. There must be space between the pipes in order for "Continuous Dynamic Deflection" (CDD) to take place.



STEP 8

Tighten the end rings using a torque wrench, to the correct torque shown on the product's label. By tightening bolts the couplings are steadily stabbed on the pipe.

NOTE: Use a torque wrench to tighten the bolts - this is required. A torque wrench will assure a proper torque has been applied to the coupling.



In products with 50mm range please tighten bolts as follows:

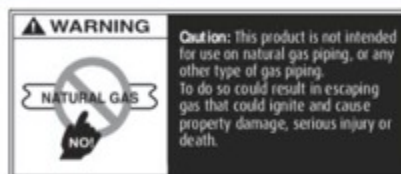
A. Tighten bolts 1+2 to the specified torque to activate gasket seal.

B. Tighten bolts 3+4 to the specified torque to engage restraining mechanism.

C. Tighten bolts 1+2 and 3+4 by alternating between them until they have reached the specified torque.

STEP 9

Recharge the line and check for leaks. If any leakage is evident, reduce the pressure in the line and increase bolt's torque by up to 50%. Verify again no leaks are evident along the seal.





HYMAX® GRIP FLANGE ADAPTOR (80mm - 300mm)



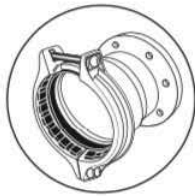
EN

INSTALLATION INSTRUCTIONS

DO NOT DISASSEMBLE THE COUPLING. DO NOT LUBRICATE THE BOLTS.

GENERAL INSTRUCTIONS:

THE HYMAX GRIP FLANGE ADAPTOR IS A STAB-ON TYPE RESTRAINT THAT IS APPROVED FOR USE WITH METAL AND PLASTIC PIPES.

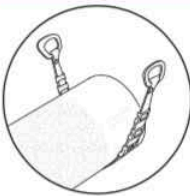


WARNING: DO NOT ATTEMPT TO USE THE HYMAX GRIP ON AC OR FRP PIPE!

PRECAUTIONS FOR HDPE PIPE: THE USE OF FULL CIRCLE STIFFENERS IS REQUIRED WHEN USING THE HYMAX GRIP FLANGE ADAPTOR ON HDPE PIPE.

FOR OTHER MATERIALS, PLEASE CONTACT YOUR KRAUSZ DEALER.

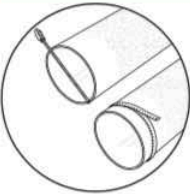
STEP 1



Prepare pipe end by de-scaling if required. Clean the pipe as required with water. Make sure that the pipe is clean from debris and defects that interfere with HYMAX GRIP's proper seal.

NOTE: Except steel, PVC, and PE pipes, all rough-surfaced pipes must be lubricated with a water-based gasket lubricant in order to achieve a proper seal.

STEP 2



Measure the pipe's Outer Diameter and make sure the coupling's size fits properly.

NOTE: Each coupling's size range is shown on the product's label. Make sure that the pipe is not out of round! The pipe should be free of scratches, dents, flats or other defects which may interfere with the HYMAX GRIP Flange Adaptor's proper seal. The GRIP Flange Adaptor may not fit well or function properly on a pipe which is damaged or is out of round.

STEP 3

Unpack the HYMAX GRIP Flange Adaptor carefully. Inspect the product and end ring for shipping damage and assure all parts are present.

Inspect the end ring. If it is not centered on the HYMAX GRIP Flange Adaptor - DO NOT USE! Contact your distributor for return and replacement.

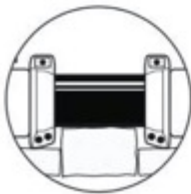
NOTE: HYMAX GRIP Flange Adaptor is a stab-on type product. Do not loosen or remove the end ring bolts.

NOTE: Make sure that the product fits the flange standard of the flanged product you need to connect it to. The Flanged standard types appear in the submittal drawings.

INSTALLATION INSTRUCTIONS
HYMAX® GRIP FLANGE ADAPTOR 80mm - 300mm



Size the gasket.
The GRIP Flange Adaptor has two gaskets; a removable inner gasket and a hydraulically-assisted outer gasket. The inner gasket can be removed to accommodate larger OD pipes. DO NOT remove the inner gasket unless the OD falls within the upper range of the Flange Adaptor. The proper range sizes are shown on the product label. If the inner layer of the gasket must be removed, fold the inner layer and separate the two gaskets by inserting a screwdriver between the two layers, and pull the layer out of the product.



NOTE: Make sure that the pipe is properly supported. HYMAX GRIP Flange Adaptor cannot support the weight of the pipe by itself.
NOTE: Bolts are pre-lubricated with a MAG coating. This embedded zinc lubrication will prevent cold weld. Do not lubricate the bolts and nuts. Greasing or lubricating bolts or nuts voids the manufacturer's warranty

STEP 4



Mark pipe end to a minimum required stab depth. This mark indicates the required stab depth for the HYMAX GRIP Flange Adaptor.

Sizes	Min. Stab Depth
40-175mm (Range 32mm)	95mm
175-300mm (Range 50mm)	125mm

The HYMAX GRIP Flange Adaptor fits a wide range of pipe sizes. Each product's range is shown on the product's label.

STEP 5

Place gasket (not provided by Krausz) between the GRIP flange and the flanged product. Connect the HYMAX GRIP Flange Adaptor to the existing flange and tighten bolts. Bring in the pipe. Stab the pipe onto the GRIP Flange Adaptor so it covers the mark on the pipe drawn in step #4 above.

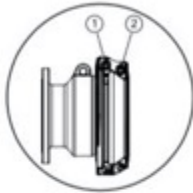


INSTALLATION INSTRUCTIONS

HYMAX® GRIP FLANGE ADAPTOR 80mm - 300mm



STEP 6



Tighten the end ring using a torque wrench, to the correct torque shown on the product's label.

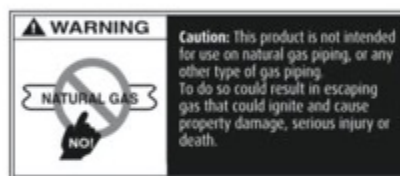
NOTE: Use a torque wrench to tighten the bolts - this is required. A torque wrench will assure a proper torque has been applied to the coupling.

In products with 50mm range please tighten bolts as follows:

- A. Tighten bolt 1 to the specified torque to activate gasket seal
- B. Tighten bolt 2 to the specified torque to engage restraining mechanism
- C. Tighten bolts 1+2 by alternating between them until they have reached the specified torque

STEP 7

Recharge the line and check for leaks. If any leakage is evident, reduce the pressure in the line and increase bolt's torque by up to 50%. Verify again no leaks are evident along the seal.



APPENDIX B - QUALITY CERTIFICATIONS

Copies of the following Quality Certification Certificates are available for downloading from the WSAA members website.

**TABLE B1 KRAUSZ INDUSTRIES LTD
MANAGEMENT SYSTEMS**

1, Hapatish St., Tel Aviv, Israel	
Quality Systems Standard	ISO 9001:2015
Certification licence no.	90452
Certifying agency	The Standards Institute of Israel
First date of certification	17 October 1996
Current date of certification	8 January 2018
Expiry date of certification	22 November 2019

**TABLE B2 KRAUSZ INDUSTRIES LTD
PRODUCT CERTIFICATION**

1, Hapatish St., Tel Aviv, Israel	
Product Standard/Spec	EN14525:2004
Certificate No.	K101431/01
Certifying agency	Kiwa
First date of certification	Not listed on certificate
Current date of certification	1 December 2018
Expiry date of certification	Not listed on certificate - currency may be checked at: https://www.kiwa.com/en/media/certified-companies-and-organizations/certified-companies-and-organizations/

 <p>CERTIFIED QMS TO ISO 9001 2015 THE STANDARDS INSTITUTION OF ISRAEL</p>	<h1 style="text-align: center;">CERTIFICATE</h1> <p style="text-align: center;">This is to certify that the Quality Management System of KRAUSZ INDUSTRIES LTD. 1, Hapatish St. , Tel Aviv , Israel</p> <p style="text-align: center;">Has been audited and registered by SIQ-QCD as conforming to the requirements of : ISO 9001:2015</p> <p style="text-align: center;">This Certificate is Applicable to Develop, manufacture and sales of pipe joints and plastic forming of metal.</p> <table border="0" style="width: 100%;"><tr><td style="width: 33%;">Certificate No.: 90452</td><td style="width: 33%;">Certificate Issue Date: 08/01/2018</td><td style="width: 33%;"></td></tr><tr><td>Initial Certification Date: 17/10/1996</td><td>Certification Expiry Date: 22/11/2019</td><td></td></tr></table> <p><small>SIQ-QCD assumes no liability to any party other than the client, and then only in accordance with the agreed upon Certification Agreement. This certificate's validity is subject to the organization maintaining their system in accordance with SIQ-QCD requirements for system certification. The continued validity may be verified via scanning the code with a smartphone, or via website www.sii.org.il. This certificate remains the property of SIQ-QCD.</small></p> <div style="display: flex; justify-content: space-between;"><div data-bbox="239 672 414 1164"><p>IONet</p><p>MGMT. SYS. RvA C 096</p><p>INTERNATIONAL IAF ACCREDITED</p><p>מתי The Standards Institution of Israel</p></div><div data-bbox="414 672 1372 1164"><div style="display: flex; justify-content: space-between;"><div><p>Ilan Carmit Acting Director General</p></div><div><p>R.N 510560220</p></div><div><p>Eli Cohen-Kagan Director, Quality & Certification Division</p></div></div></div></div>	Certificate No.: 90452	Certificate Issue Date: 08/01/2018		Initial Certification Date: 17/10/1996	Certification Expiry Date: 22/11/2019	
Certificate No.: 90452	Certificate Issue Date: 08/01/2018						
Initial Certification Date: 17/10/1996	Certification Expiry Date: 22/11/2019						
Page 1 of 2	Our Vision: To Enhance Both Global Competitiveness of our Services, with our Uncompromised Quality and Integrity						



CERTIFICATE

2019/03/11

Product certificate K101431/01

Issued 2019-06-15

Replaces

Page 1 of 2



Ductile iron wide tolerance couplings

STATEMENT BY KIWA

With this product certificate, issued in accordance with the Kiwa Regulations for Certification, Kiwa declares that legitimate confidence exists that the products supplied by

Krausz Industries Ltd

as specified in this product certificate and marked with the Kiwa ®-mark in the manner as indicated in this product certificate may, on delivery, be relied upon to comply with Kiwa evaluation guideline

BRL-K775/04: "Ductile iron fittings for piping systems of ductile iron, grey iron, steel, PVC-U, PE or fibre-cement for the transport of drinking water", **dated: 01-12-2018**

which covers the requirements of

EN 14525: 2004: "Ductile iron wide tolerance couplings and flange adaptors for use with pipes of different materials: ductile iron, Grey iron, Steel, PVC-U, PE, Fibre-cement".

Ronald Karel
Kiwa

Publication of this certificate is allowed.

Advice: consult www.kiwa.nl in order to ensure that this certificate is still valid.

Kiwa Nederland B.V.
Sir Winston Churchilllaan 273
P.O.Box 70
2280 AB RIJSWIJK
The Netherlands
Tel. +31 88 998 44 00
Fax +31 88 998 44 20
info@kiwa.nl
www.kiwa.nl

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Markerkant 10-17	6 Hapatish Street
1316 AB ALMERE	6655906 TEL AVIV
The Netherlands	Israel
Tel. +31 36 548 76 20	Tel. +972 3 5154000
pamnederland@saint-gobain.com	info@krausz.com
www.pamline.nl	www.krausz.com



Certification process
consists of initial and
regular assessment of:

- quality system
- product

Product certificate

page 2 of 2

K101431/01

Ductile iron wide tolerance couplings

PRODUCT SPECIFICATION

The products mentioned below belong to this technical approval-with-product certificate

Type of coupling/fitting	Diameter range of pipe (mm)
HYMAX	40 up to and including 300
HYMAX GRIP	40 up to and including 300

Fitness for contact with drinking water

This product is approved on the basis of the requirements for hygienic aspects set in the "Regeling materialen en chemicaliën drink- en warm tapwatervoorziening" ("Materials and chemicals in the supply of drinking water and warm tap water Regulation" dated 01-07-2017; published in the Government Gazette).

These hygienic aspects are based on two main criteria. The product shall permanently comply with:

- The product recipe approved during the assessment procedure. This recipe is not to be changed without prior approval by Kiwa according to the Kiwa approval procedure for the hygienic aspects;
- Specific product requirements for the hygienic aspects.

The recipe and specific product requirements are laid down in the for confidentiality reasons undisclosed 'appendix hygienic aspects' to this certificate.

MARKING

The Kiwa[®]-mark products are marked with the word mark "KIWA"  or the abbreviated word mark 

Place of the mark:

- on the fitting

Compulsory specifications:

- manufacturer's name or logo;
- the last two digits of the production year;
- material specification;
- external diameter (mm) range of the piping with which the coupling can be used;
- nominal pressure.

Method of marking:

- non-erasable;
- visible after assembly.

APPLICATION AND USE

The products are intended to be used as part of a piping system for drinking water transport with a nominal diameter of DN 40 up to and including DN 600, at a maximum water pressure of 1 MPa and a water temperature of 30°C.

RECOMMENDATIONS FOR CUSTOMERS

Check at the time of delivery whether:

- the supplier has delivered in accordance with the agreement;
- the mark and the marking method are correct;
- the products show no visible defects as a result of transport etc.

If you should reject a product on the basis of the above, please contact:

- Saint-Gobain PAM Nederland BV
and, if necessary,
- Kiwa Nederland B.V.

Consult the supplier's processing guidelines for the proper storage and transport methods.

APPENDIX C - WSAA PRODUCT SPECIFICATION

WATER SERVICES ASSOCIATION of Australia

PRODUCT SPECIFICATION

WSA PS – 271 DUCTILE IRON WIDE TOLERANCE MECHANICAL COUPLINGS AND FLANGE ADAPTERS, END THRUST RESTRAINT, FOR PRESSURE APPLICATIONS – WATER SUPPLY AND SEWERAGE

271.1 SCOPE

This specification covers ductile iron wide tolerance mechanical couplings and flange adapters with end thrust restraint for use with ductile iron, polyethylene (PE), asbestos cement (AC) and steel pipes¹ in pressure applications for water supply² and sewerage.

271.2 REQUIREMENTS

- (a) Couplings and flange adapters shall comply with EN 14525:2004 *Ductile iron wide tolerance couplings and flange adaptors for use with pipes of different materials: ductile iron, grey iron, steel, PVC-U, PE, fibre-cement*.
- (b) Elastomeric joint seals shall be EPDM or NBR complying with AS 1646:2007 and AS 681.1:2008 (EN 681-1:1996).
- (c) Fasteners shall be Grade 316 Stainless Steel with galling prevention compound applied to the threads.
- (d) Joint seals, items of restraining systems and jointing lubricant shall comply with AS/NZS 4020:2018.

271.3 QUALITY ASSURANCE

- (a) Couplings shall have product certification (ISO Type 5) certification to EN 14525:2004. The ISO Type 5 Product Certification Scheme shall meet the criteria described in WSA TN-08³.
- (b) Polymeric coatings shall have product certification (ISO Type 5) to AS/NZS 4158:2003/Amdt 1:2005.
- (c) Components in contact with water shall have a certificate of compliance to AS/NZS 4020:2018.
- (d) All products shall be marked in accordance with the conformity assessment body's requirements where applicable.

271.4 AGENCY OR PROJECT SPECIFIC REQUIREMENTS

Pressure Class, PN	
Pipe material(s) to be joined	
Coupling length i.e. short series or long series	
Coupling type e.g. straight, stepped, flange adaptor	
Nominate the range of outside diameters to be joined	
For flange adaptors nominate the flange drilling Figure from AS/NZS 4087:2011/Amdt 1:2012 or other nominated flange Standard	
Alternative elastomeric material for joint seals	

NOTES:

- 1 Thrust restraint mechanisms are not recommended for use with PVC or GRP pipes.
- 2 Includes drinking water and recycled water supply. Colour differentiation is not required.

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WATER SERVICES ASSOCIATION of Australia

- 3 Water Services Association of Australia Technical Note (WSA TN-08) sets out additional product conformity assessment requirements that are associated with demonstration of conformity to EN 14525:2004.

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Issue: 06

October 2018

Doc Name: Product Specifications for Products & Materials

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APPENDIX D - SUPPLIER CONTACTS

Krausz Industries Ltd

6 Hapatish Street,

Tel Aviv, Israel.

Web: <https://krausz.com/>



WATER SERVICES
ASSOCIATION OF AUSTRALIA

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Docklands VIC 3008

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