

# KUBOTA Hazard Resilient Ductile Iron Pipe (HRDIP)

3" ~ 104" (75 ~ 2600mm)



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# KUBOTA Corporation

# “Hazard Resilient” For safe and secure water supply

Kubota is a leading manufacturer of a wide range of technically advanced products for water systems in cities, industry and irrigation. In 1893 Kubota began supplying iron pipes for the safe delivery of drinking water in Japan. Since then, Kubota has been working continuously on technical innovations and developing superior pipe products. In 1974, Kubota released the world's first Earthquake Resistant Ductile Iron Pipe (ERDIP).

ERDIP is not only resistant to earthquakes, but also effective against various natural hazards such as landslides, ground subsidence, liquefaction, as well as many others. Hence, the superior performance of ERDIP is also available as Hazard Resilient Ductile Iron Pipe (HRDIP). Same Company, same Quality, same Superior Performance. ERDIP/HRDIP by Kubota, here to serve your community's water supply needs.

The demand for HRDIP in Japan has increased rapidly after the 1995 Kobe earthquake. Though a lot of water pipelines were damaged, HRDIP kept supplying water to the regional municipalities and their residents. Since its development in 1974, HRDIP has had no documented failures or leaks caused by any earthquakes, including the 2011 Great East Japan earthquake, nor any other natural hazards.

As HRDIP's presence and hazard resilient performance has been recognized widely, its share has increased and now it holds over 90% share of ductile iron pipe market in Japan. More than 41,000 miles (66,000 kilometers) of HRDIP has been installed so far and it's enough to travel around the Earth one and a half times!

With Kubota's history of innovation and success in Japan, HRDIP is increasingly accepted and employed globally. Besides Japan, the United States, Canada, Singapore and Nepal are the lead countries that introduce HRDIP into their water pipelines. Manufactured in sizes ranging from 3" to 104", Kubota's HRDIP is suitable for both Distribution and Transmission lines.

Kubota believes that HRDIP will contribute to the development of hazard mitigation plan and improve the resilience and reliability of water supply for years to come.

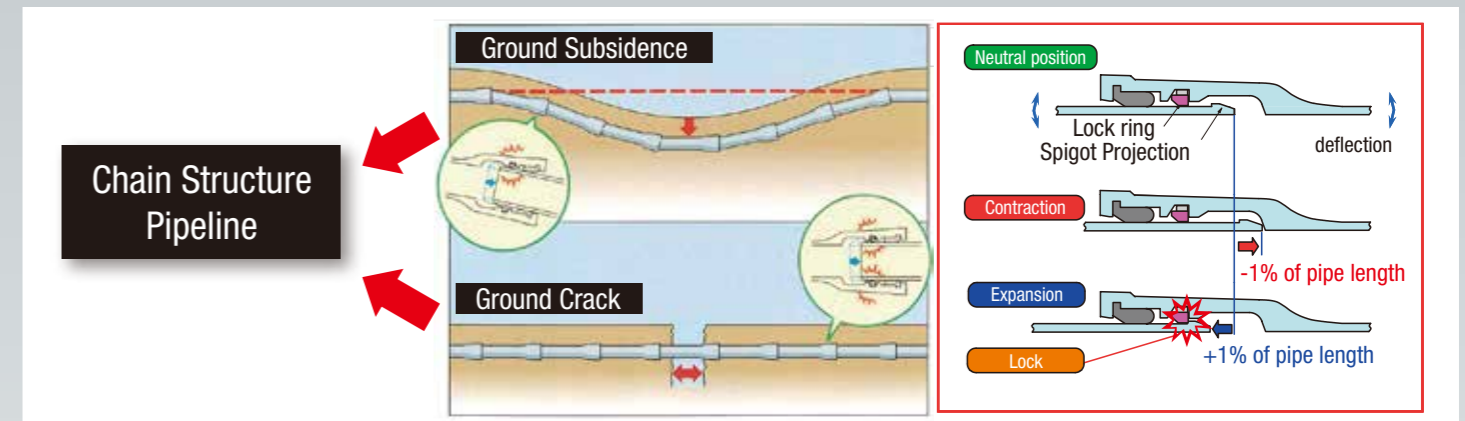


Hazard Resilient Ductile Iron Pipe (HRDIP)

## Concept

Hazard Resilient Ductile Iron Pipe (HRDIP) absorbs the large ground displacement such as ground subsidence and crack by joints extension/contraction, deflection, and anti-pull out structure. When one joint fully extends, the joint can pull the next pipes one after another like a buried chain.

Therefore, this pipeline is called chain structure pipeline.

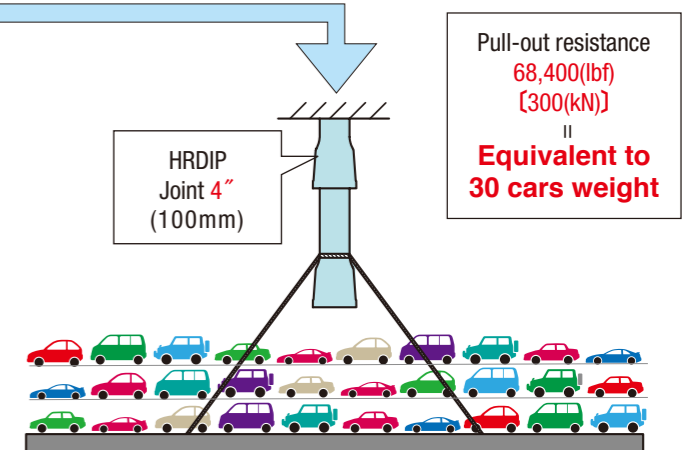


## Performance of the Joint

The joint performance of HRDIP is the highest rank in ISO 16134:2020.

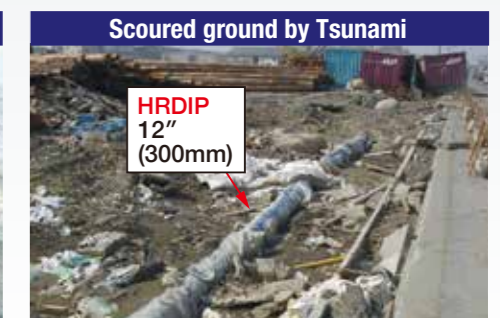
| Property                        | Performance   | ISO 16134:2020 |
|---------------------------------|---|----------------|
| Amount of expansion/contraction | ±1% of L  | Class S-1      |
| Pull-out resistance             | 3D kN<br>17,100D <sub>in</sub> (lbf)<br>[3D <sub>mm</sub> (kN)] | Class A        |
| Joint deflection angle          | 8° *1   | Class M-1      |

Note) L : Nominal pipe length  
D<sub>in</sub> : Nominal diameter of pipe (inches)  
D<sub>mm</sub> : Nominal diameter of pipe (millimeters)  
\*1) In case of size 3"~16"



## No failure

HRDIP has had no documented failures not only in the past seismic events but also in the past natural disasters such as heavy rain, typhoon and tsunami.



# Lineup of HRDIP

## Pipes

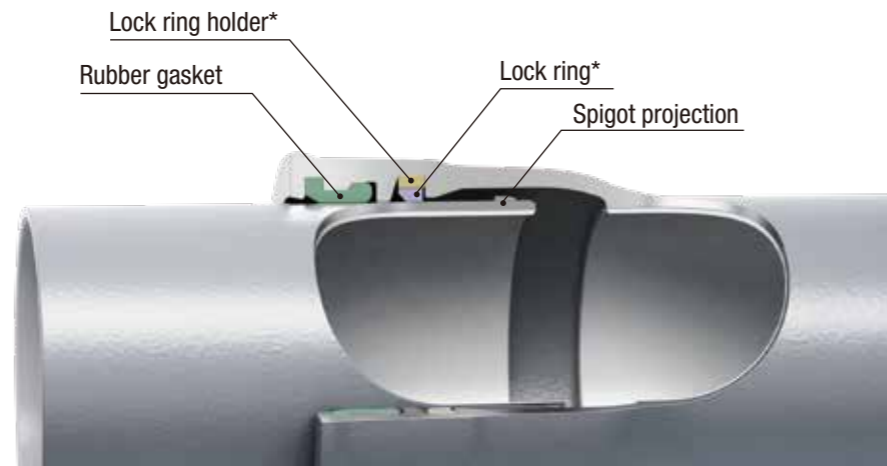
**GENEX®**

Nominal Diameter  
**3" ~ 16"**  
(75mm) ~ (400mm)

**Push-on joint**

Wall Thickness: D1/DS

6", 8" and 12" are available in AWWA size



※External coating: C-protect

\*Lock ring / Lock ring holder are preset

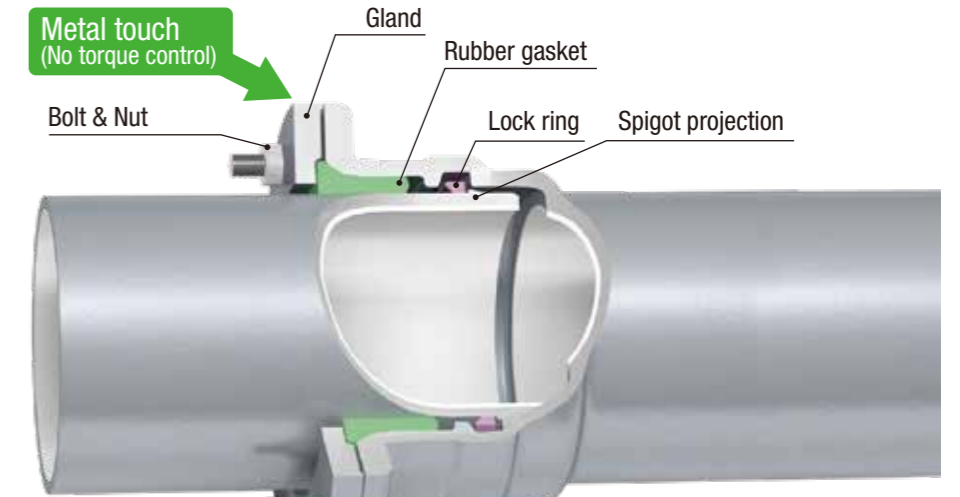
## Fittings

**GENEX®**

Nominal Diameter  
**3" ~ 16"**  
(75mm) ~ (400mm)

**Mechanical joint**

6", 8" and 12" are available in AWWA size



※External coating: C-protect

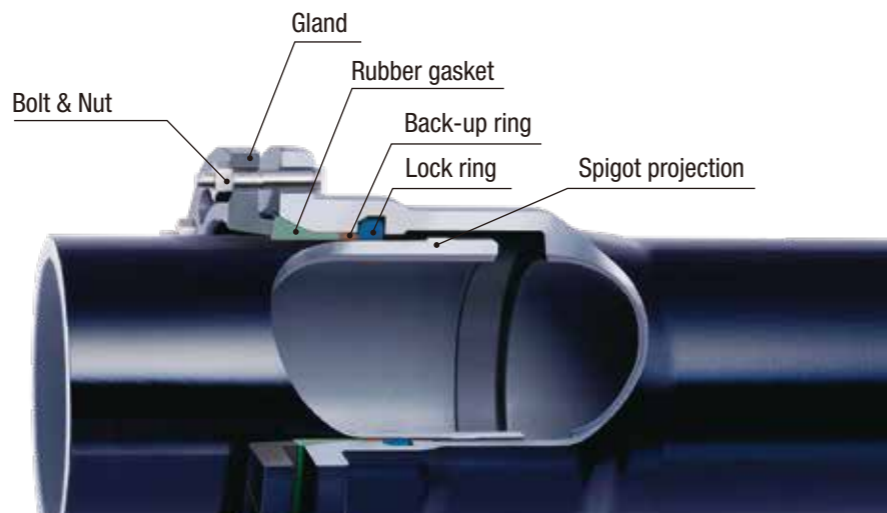
\*Lock ring is preset.

**N S**

Nominal Diameter  
**20" ~ 40"**  
(500mm) ~ (1000mm)

**Mechanical joint**

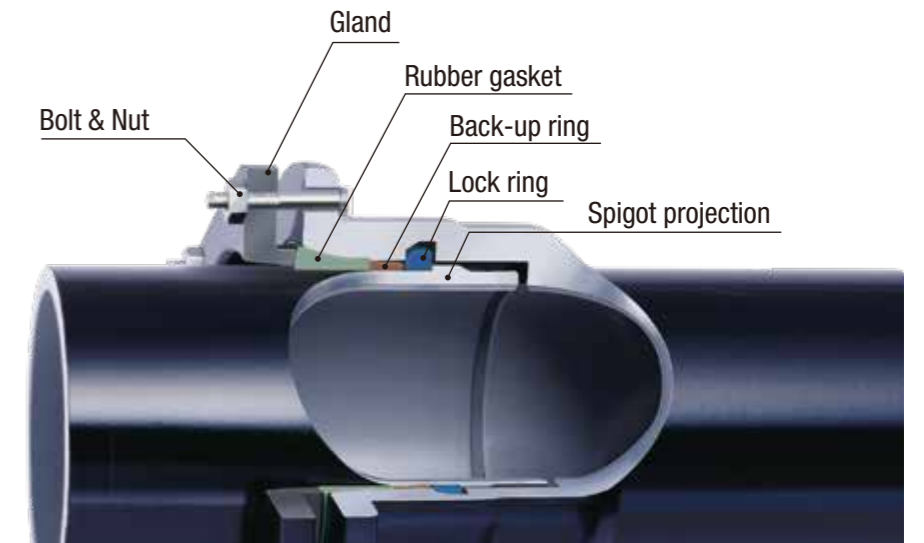
Wall Thickness: DS



**N S**

Nominal Diameter  
**20" ~ 40"**  
(500mm) ~ (1000mm)

**Mechanical joint**

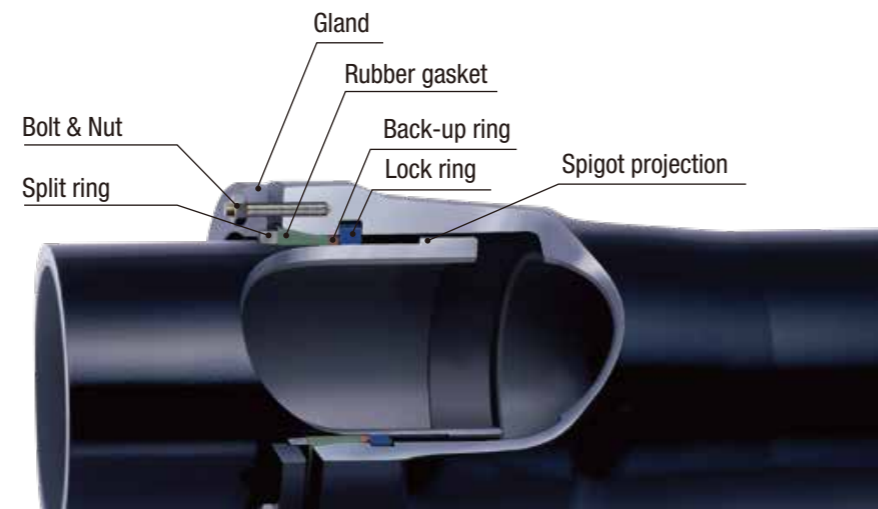


**S**

Nominal Diameter  
**44" ~ 104"**  
(1100mm) ~ (2600mm)

**Mechanical joint**

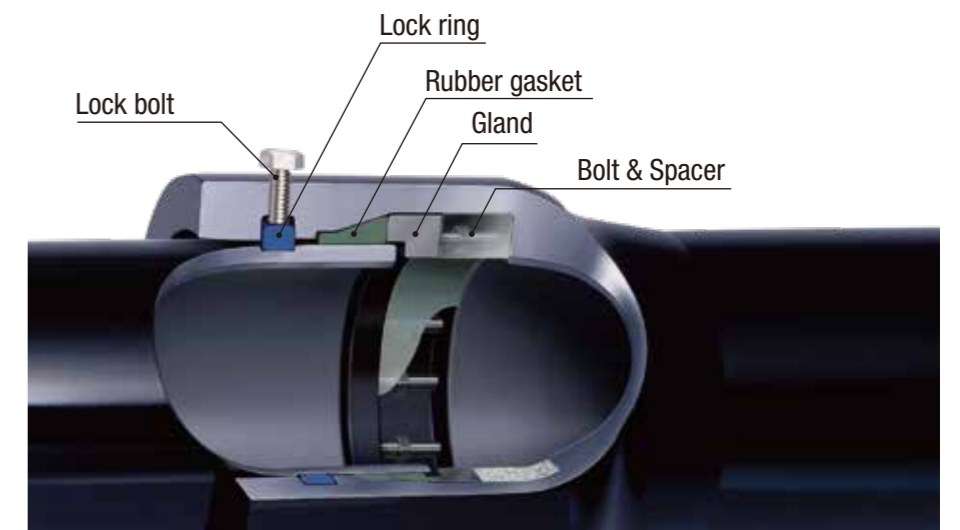
Wall Thickness: D1/D2/D3



**U F**

Nominal Diameter  
**32" ~ 104"**  
(800mm) ~ (2600mm)

**Mechanical joint**



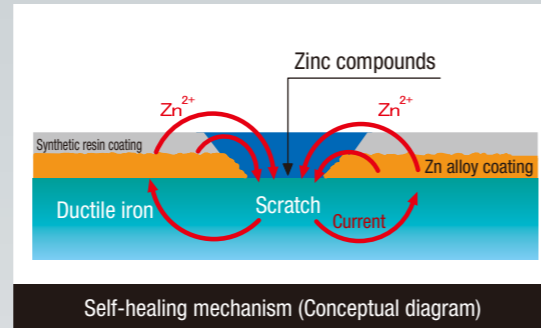
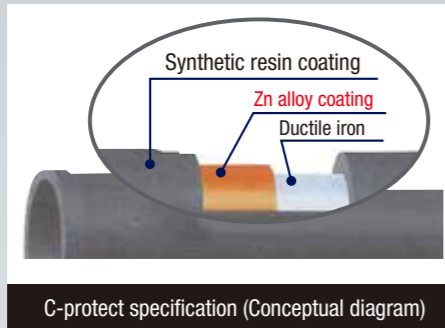
# External coating

Pipes and fittings will be coated externally as the following table.

| GENEX®<br>3"~16" (75mm~400mm)<br>C-protect | NS<br>20"~40" (500mm~1000mm)<br>Zinc rich paint followed by a synthetic resin paint | S<br>44"~104" (1100mm~2600mm)<br>Zinc rich paint followed by a synthetic resin paint |
|--|---|--|
|--|---|--|

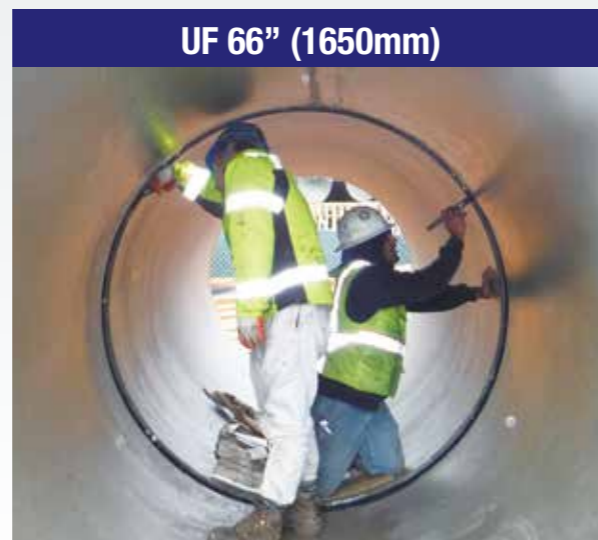
# C-protect (anti-corrosion external coating)

- C-protect (External coating) has excellent anti-corrosion performance.
- C-protect also has self-healing performance against scratches through the effect of sacrificial protection.
- C-protect is made of Zinc alloy, and synthetic resin coating.



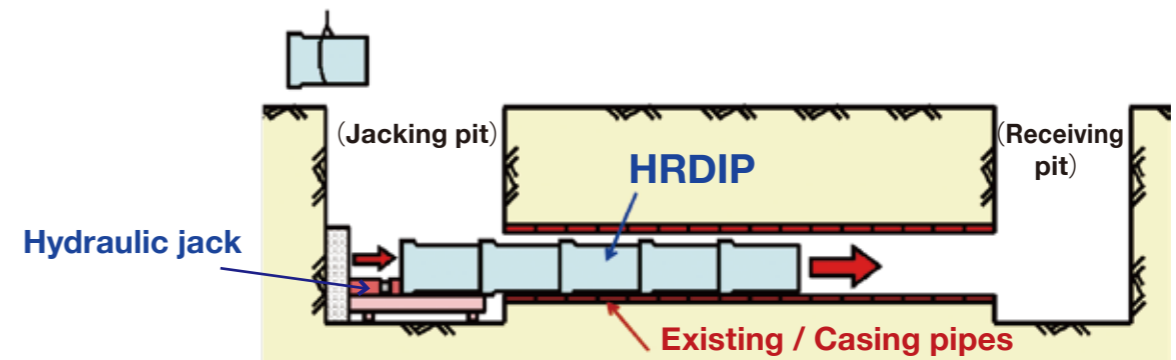
# Installation

HRDIP can be installed very easily by using simple jointing tools.



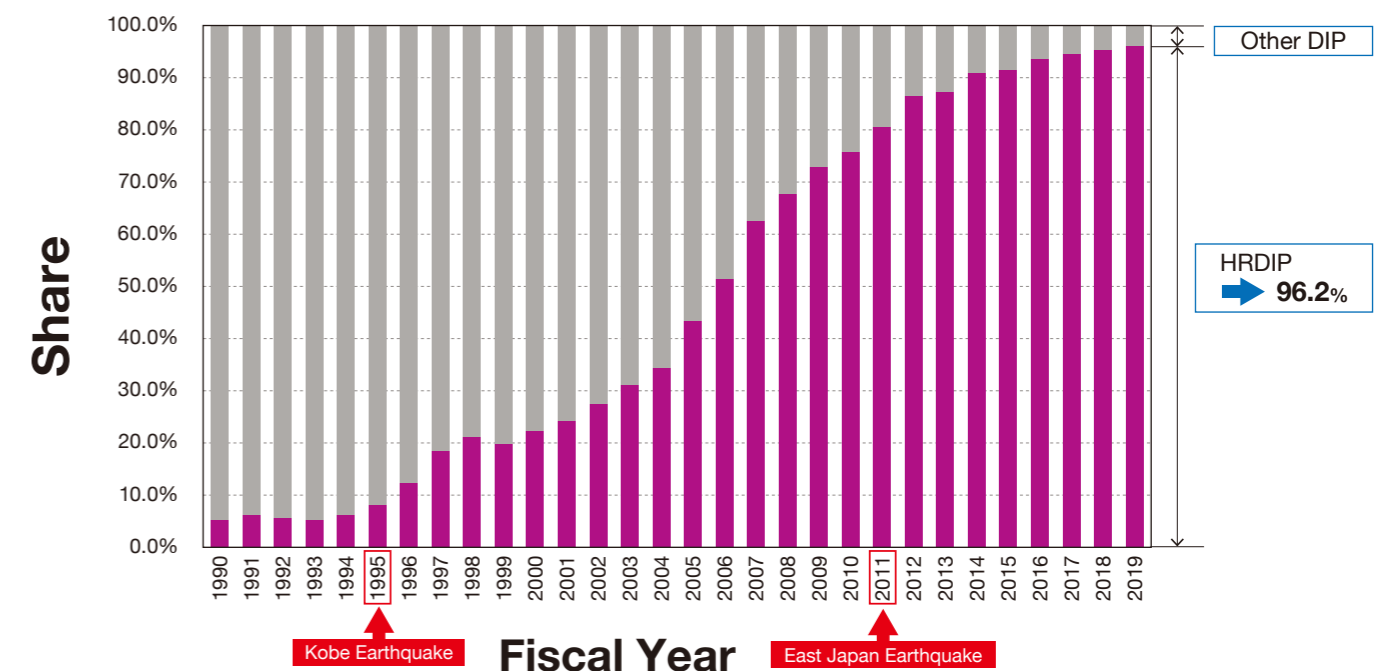
# HRDIP for Pipe-in-Pipe / Casing method installation

HRDIP is also available for pipe-in-pipe / casing method installation in the range of 12"(300mm) to 60"(1500mm), insert new HRDIP into the existing / casing pipes by trenchless method. For detail, please contact us.



# Share of HRDIP in Japan

The amount of installed HRDIP has increased drastically in Japan after the 1995 Kobe Earthquake.



$$\text{Share} = \frac{\text{HRDIP shipment}}{\text{All DIP shipment}} \quad (\text{in length})$$

Source: Japan Ductile Iron Pipe Association