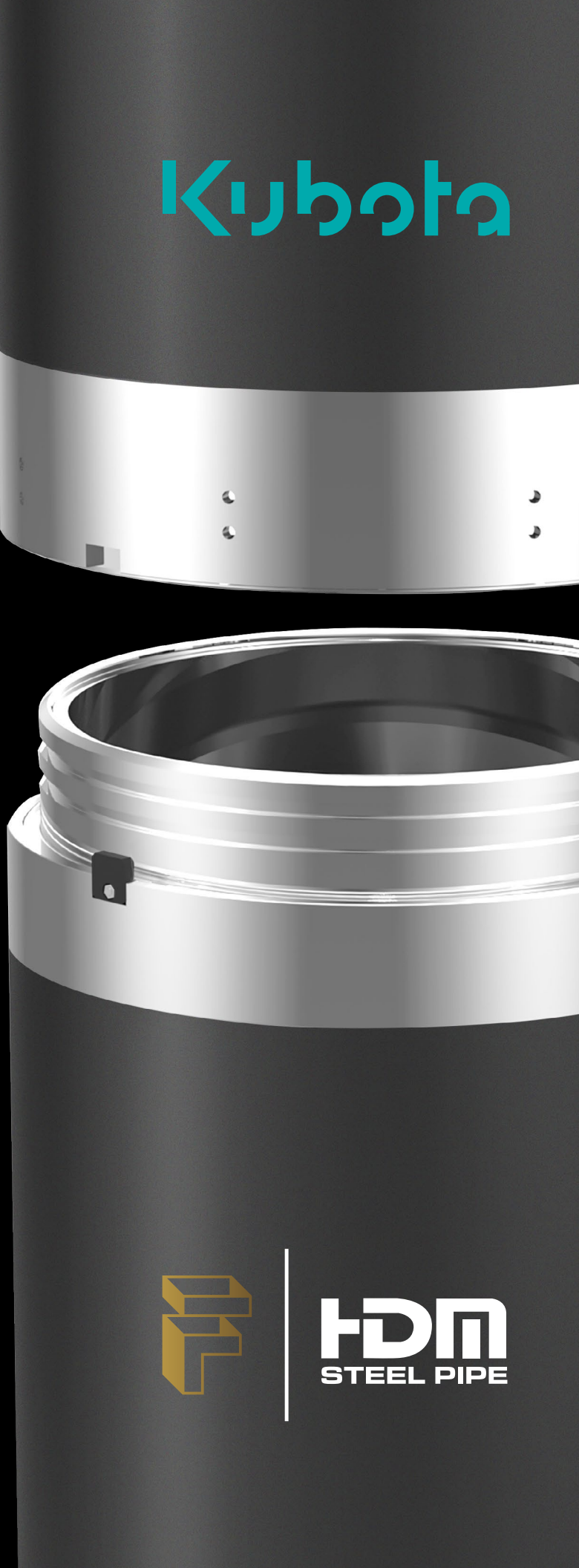
Kubota

High Capacity

Mechanical Joint

for Steel Pipe Pile

Laqnican Joint



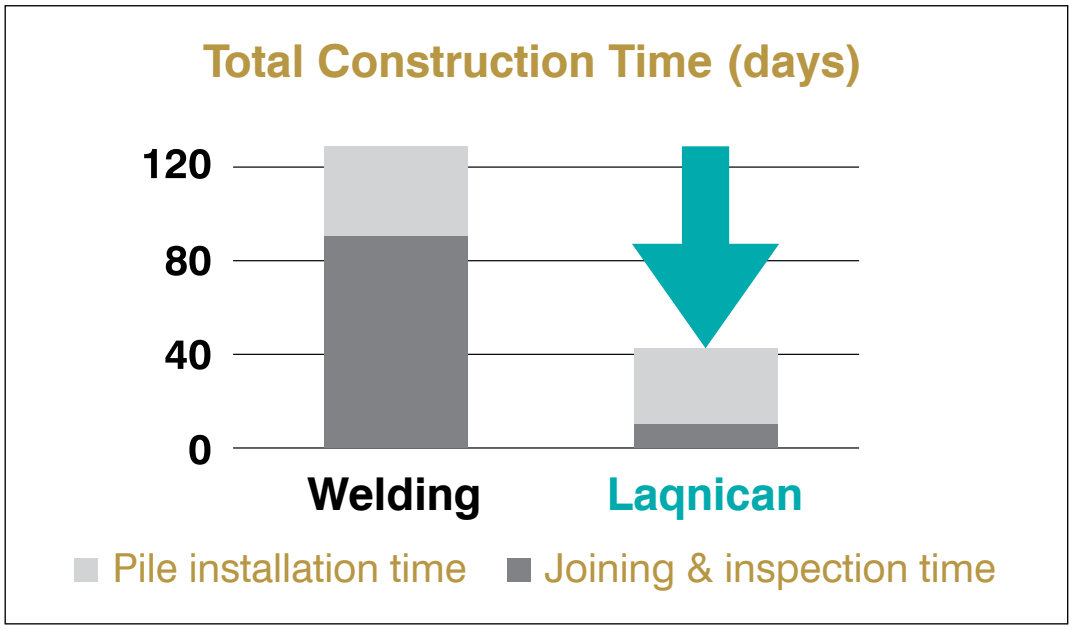
HDM STEEL PIPE

MECHANICAL SPLICE JOINT

Mechanism

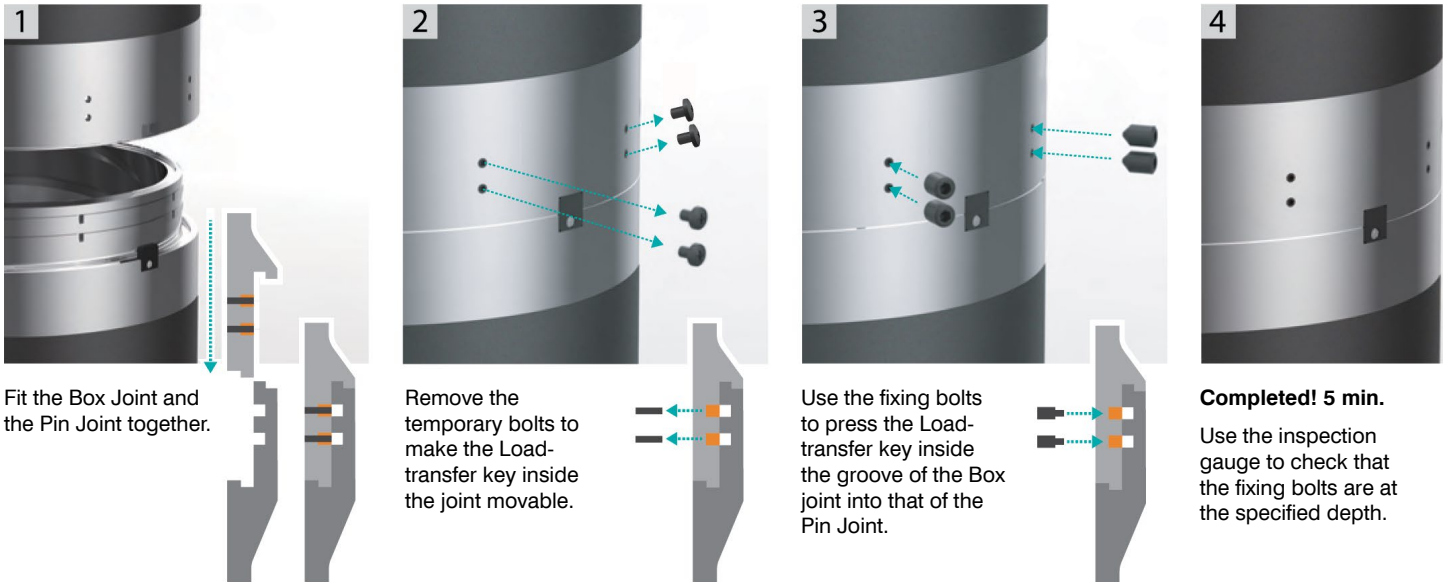
Laqnican Joint is a mechanical splice developed as an alternative to on-site welding of steel pipe piles. This assembly eliminates on-site welding and testing of spliced pipe piles, ensuring material quality, while reducing labor and equipment downtime.

Construction time can be reduced by 33%!



JOINING PROCEDURE

Laqnican Joint is joined as follows and takes about 5 minutes.



1 Fit the Box Joint and the Pin Joint together.

2 Remove the temporary bolts to make the Load-transfer key inside the joint movable.

3 Use the fixing bolts to press the Load-transfer key inside the groove of the Box joint into that of the Pin Joint.

4 **Completed! 5 min.**

Use the inspection gauge to check that the fixing bolts are at the specified depth.

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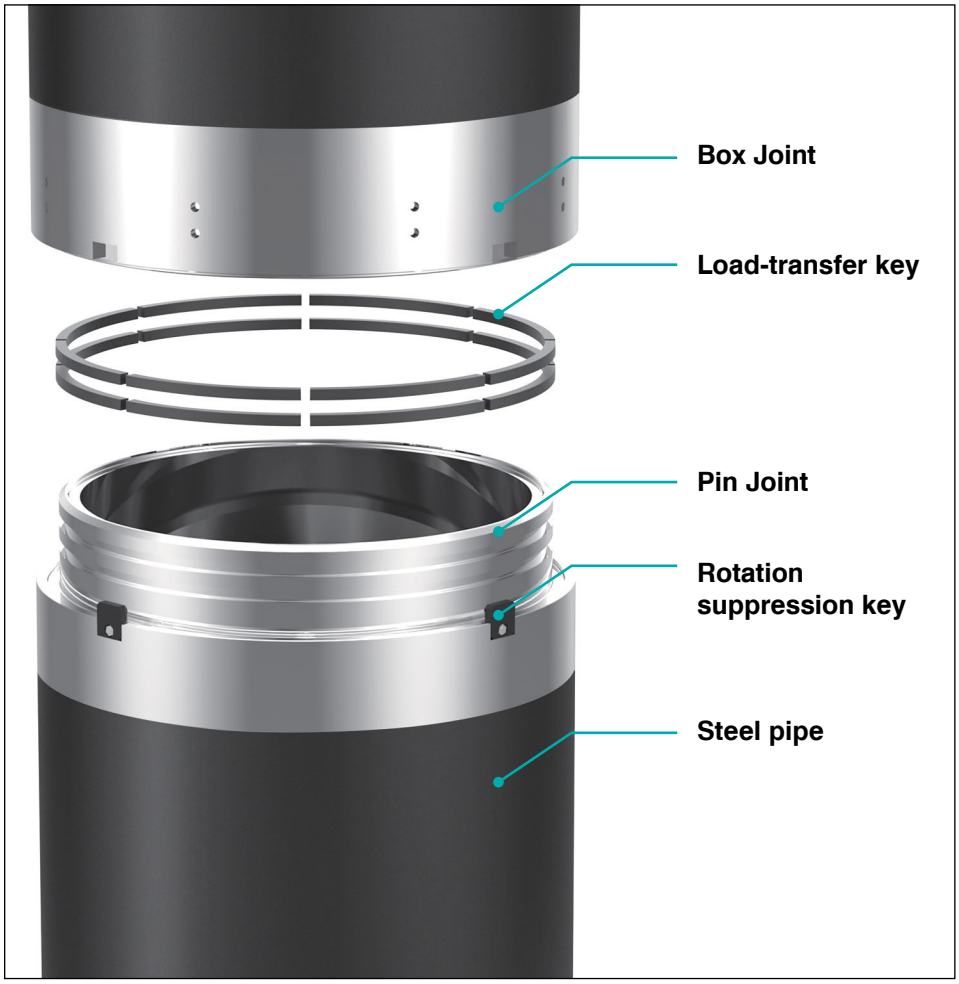
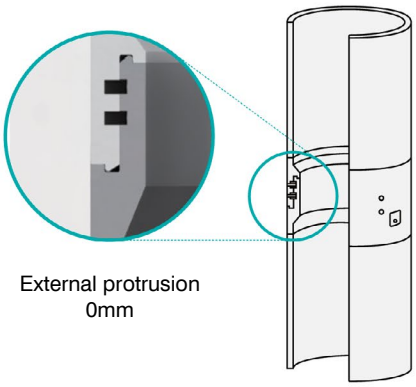
MECHANICAL SPLICE JOINT

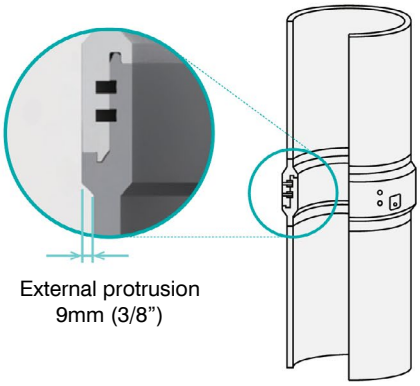
Mechanism



Flat type



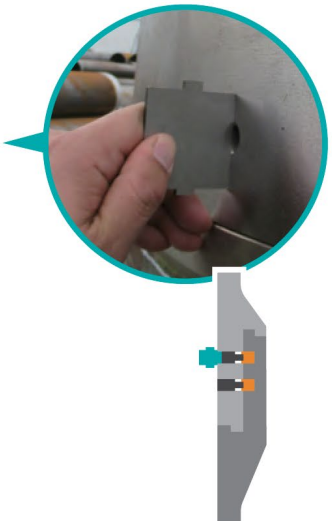
Step type



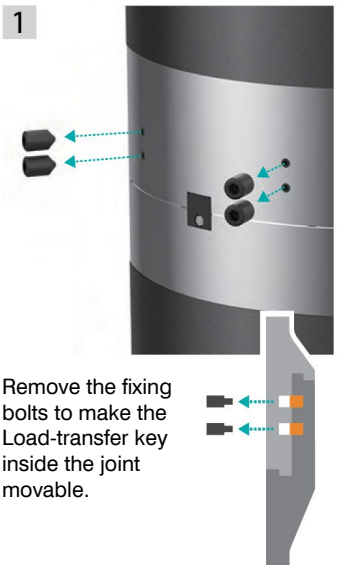
REMOVAL PROCEDURE

Remove the joint in the reverse order of the joining method.

Inspection

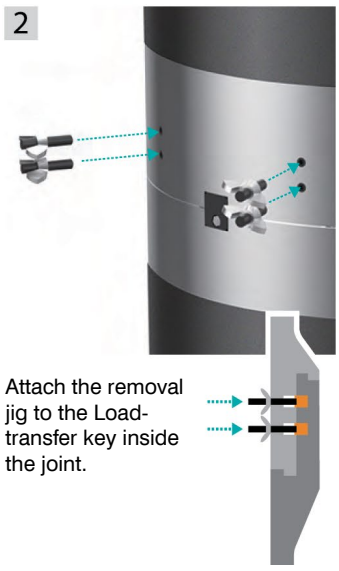


1



Remove the fixing bolts to make the Load-transfer key inside the joint movable.

2



Attach the removal jig to the Load-transfer key inside the joint.

3

Utilize the removal jig to draw the Load-transfer key inside the joint into the groove of the Box Joint. The joint will then be ready for extraction.

MECHANICAL SPLICE JOINT

Specifications

Chemical Composition (%)

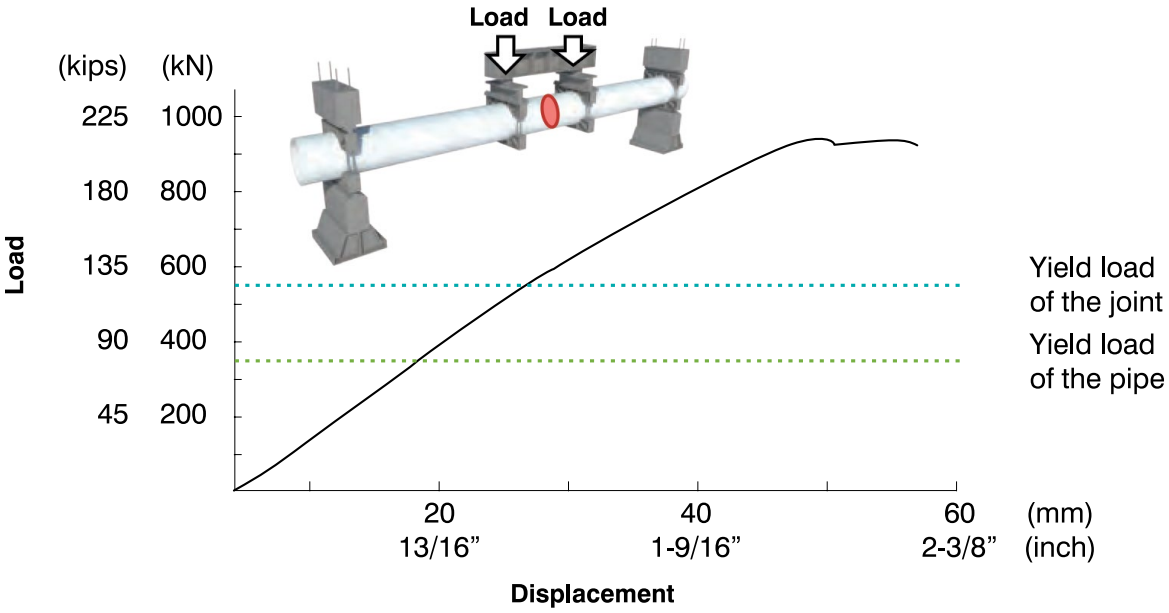
C	Si	Mn	P	S	Cr	Mo
≤0.48	0.15 - 0.35	0.30 - 0.85	≤0.03	≤0.03	0.90 - 1.50	0.15 - 0.35

Mechanical Properties

Component	Yield point	Tensile strength	Elongation
Pin joint Box joint	≥705MPa ≥102ksi	880 - 1030MPa 128 - 149ksi	≥ 13%
Load-transfer key	≥755MPa ≥109ksi	980 - 1030MPa 142 - 164ksi	≥ 11%

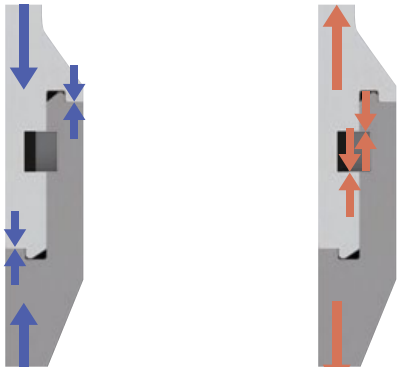
Four-Point Bending Test Data

Joint size: 00400mm x t14mm (OD16” x t0.5”)

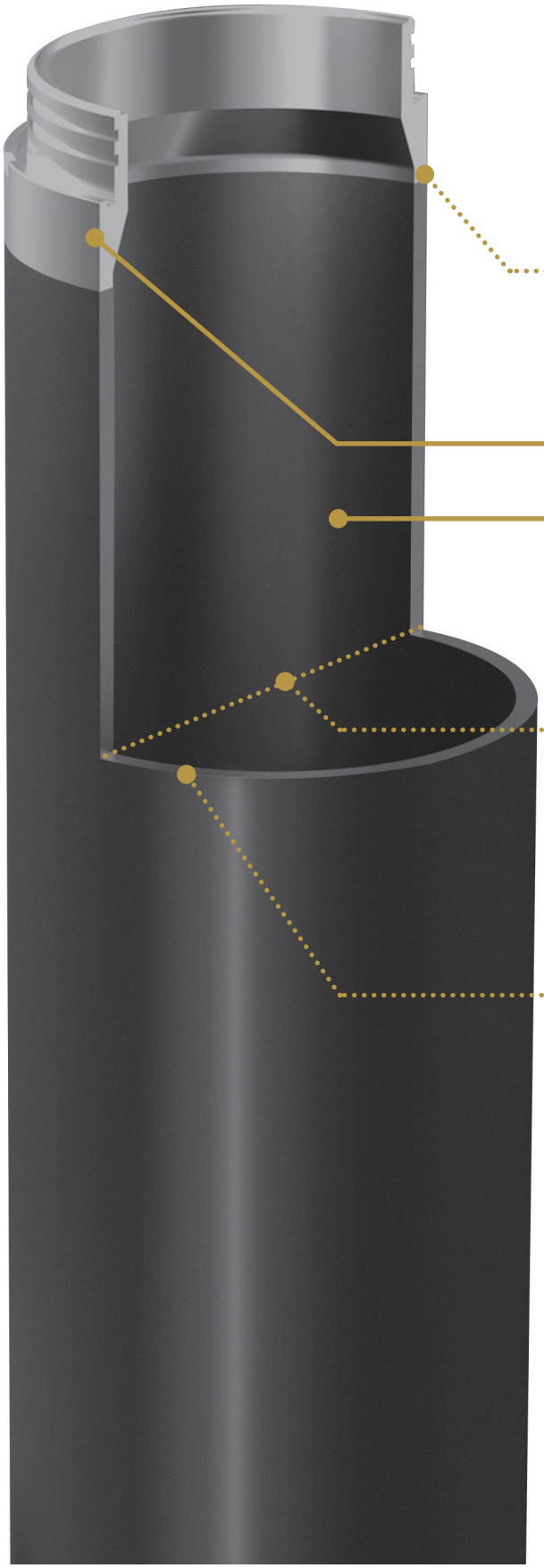


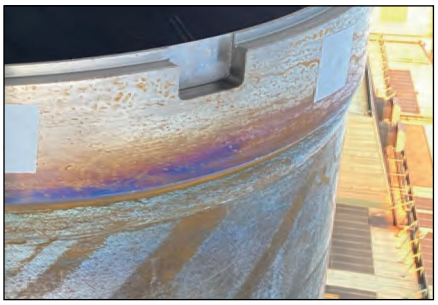
Load-Transfer Mechanism

compression force tension force



MECHANICAL SPLICE JOINT





Shop Welding

Laqnican Joint is a robotically welded to steel pipe piles at factory for quality control.

Laqnican Joint

Steel Pipe

The following tables show the standards, sizes, and strengths of steel pipes to which Laqnican Joint can be applied.

Applicable outer diameter and thickness of steel pipe for each type of Laqnican Joint

Outer Diameter

	mm in
Flat type	**400 -1600** 16 - 64
Step type	**400 -1500** 16 - 60

Thickness

	EN10025			ASTM A252		
	S235	S275	S355	Grade 2	Grade 3	
					45 ksi	50 ksi
	mm in	mm in	mm in	mm in	mm in	mm in
Flat type	**42** 1.625	**35** 1.375	**27** 1.0625	**41** 1.5625	**31** 1.25	**28** 1.125
Step type	**33** 1.3125	**28** 1.125	**22** 0.875	**32** 1.25	**25** 1.0	**22** 0.875

*Smaller diameter sizes may have a reduced applicable plate thickness, so please make an inquiry.

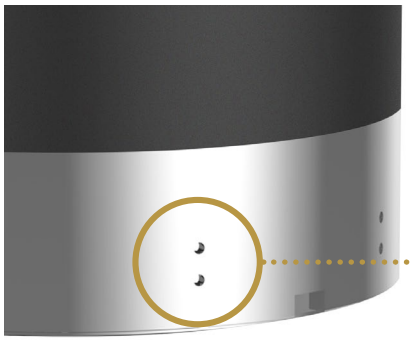
MECHANICAL SPLICE JOINT

Protective Cap

The protective cap is available as an optional part to protect the pile head from direct hammer impact when driving piles with a impact or vibro hammer.

Key Loosening Prevention

Optional parts are also available to prevent keys from loosening or falling off due to impact from blows or vibrations when driving piles.



Optional parts to prevent loosening of Load-transfer key

Optional parts to prevent loosening of Rotation-suppression key

MECHANICAL SPLICE JOINT

Comparison

The joining time of Laqnican Joint is approximately 5 minutes, regardless of the OD and thickness of the steel pipe pile. By replacing on-site welding, cost reductions can be expected due to shorter construction time.

Item to Compare	Laqnican Joint	Welding
Influence by weather condition	Operational regardless of weather	No operation during rain and snow Shutting-cut device is required if the wind velocity is higher than 10m/s.
Main tools applied	Hexagonal wrench	Welding machine, Generator
Joining time 1000mm x t22 (40” t7/8”)	5 minutes	105 minutes
Level of difficulty in joining operation	No requirement for expert skill	Requirement for expert skill (Skill test/ qualification)
QC methods	Control of fastening depth of fixing bolts by the use of depth gauge	RT inspection / UT inspection / PT inspection / Visual inspection
Time required for quality control	3 to 5 minutes	RT: 88 min (entire welding line) UT: 35 min (entire welding line) PT: 22 min (entire welding line) 30 minutes additionally required Until lowering of welding heat. *OD 1000mmxt12 (40”xt1/2”)

Laqnican Joint Movie

HDM
STEEL PIPE

Fields
COMPANIES