ท่อ ไทย พีพี-อาร์
THAI PP-R®
ยอดขายอันดับ 1 ในประเทศไทย

Quality Guaranteed At Least 5 Years*
Coverage Up To 1 Million USD

<< Cross Section of Thai PP-R Homogenized Pipe and Fitting

ALMOST 2 DECADES OF TOP QUALITY IN THAILAND

PP-R(80) Pipe System German Export Standard

Easy Installation, Homogenized, Never Leak





Electro Fusion Fittings

Butt Fusion Fittings

Another Quality from the Group
Beware of Imitations
TAC-M
Thai Advanced Construction Materials

www.thaippr.com
ท่อน้ำ Thai PP-R
@thaippr

INTERNATIONAL CERTIFIED OF MANUFACTURING STANDARDS

German Standard PP-R Pipes

Pipe standard	: DIN 8077-8078 by DVGW
Fitting standard	: DIN 16962-5 by AENOR
Cleanliness Standard	: BS 6920 Part II, WRAS

ISO 15874
ISO 9001:2000
ISO 14001:2000
CE for Welding Machines

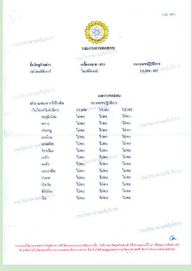
DVGW type examination certificate German export standard. Both Pipes and Fittings have been tested and certified by DVGW.

AENOR is an international standards institute that certified that the quality of all types of Thai PP-R fittings meets the Spanish and European standards.

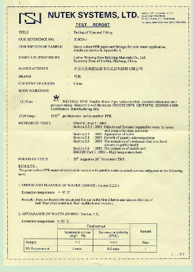
PRODUCT LIABILITY
Coverage up to 1 Million USD

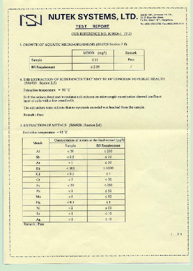
WRAS is an international standards institute from England that certified that water flowing through all types of Thai PP-R fittings meets the cleanliness and safety standards.

Cleanliness test of stagnant water in pipes in accordance with British Standard BS 6920 Part II



BS 6920 Part II by NUTEK Systems, Hongkong





12 SUPERIOR FEATURES

Quality Guaranteed At Least 5 Years* Coverage Up To 1 Million USD

Best Seller 1 In Thailand

Produced from High-Quality Green Plastic Pellets from Europe
Plastic pellets used as raw materials to produce all Thai PP-R pipes and fittings are green plastic pellets from Europe, guaranteeing quality and long lifetime.

Pipes and Fittings are Produced from the Same Factory.
Therefore, pipe and fitting are homogenized completely and confidently without leakage.

Durable, Not Fragile
Material is extremely impact resistant, strong, stiff, not fragile, and can withstand high water pressure.

Heating Time Specified on All Pipes
Prevents pipes from clogging due to too-long welding time.

Feel Confident with After-Sales Service
A team of experts are ready to provide consultation and services before and after sales with complete information about products, installation, and usage.

More Than 500 Types of Fittings
Can be installed together with all types of pipes both threaded and plain ends.

E.F. Fitting (Electro Fusion)
Innovation for large pipes D75-D315, using electricity to weld and homogenize the pipes and fittings for easier installation of large pipes within limited space.

All Pipes and Fittings Meet German and Spanish Export Standards.
Tested and certified by DVGW and AENOR.

Easy Repair When Pierced by Drill Bit or Nail
Economical, convenient, and fast.
Use a repairing stick to plug the hole. There is no need to strip off the wall and tiles to repair.

Clean and Safe According to British Standards BS 6920 Part II, WRAS, DVGW W270
Recognized by Green Peace for high cleanliness and safety, pipes and fittings can be used with high-temperature water without causing consumption hazards.

FIBER/FASER Advanced Innovation
The interior is reinforced with fiber/faser composite to reduce pipe expansion in the event of temperature change in the pipe and help increase the flow rate, withstanding the pressure up to 20 bars.

50-Year Lifetime
Under temperature and pressure according to DIN 8078 specification.

** Warranty does not include all types of valves, welding machines and cutters.*

PRODUCT SPECIFICATION AND FEATURES

PP-R (80) PIPE ECONOMY CLASS SDR 11 (PN10)

Application	: Plumbing pipes, air pipes, chilled water pipes or other piping systems
Application Temperature	: 3-60 °C*
Lifetime	: 50 years*
Working Pressure	: PN 10 or approximately 10 bars*
Certified Standards	: DIN 8077/78 & ISO 15874
Cleanliness Standards	: BS 6920 Part II
Length	: 4 meters
Appearance (Color)	: Green

Code	Outside Diameter		SDR	PN	Wall Thickness	Internal Diameter	Water Volume	Weight
	(mm)	(Inch)			(mm)	(mm)	(l/m)	(Kg/m)
101N020-011**	20	1/2"	9	12.5	2.3	15.4	0.186	0.115
101N025-011	25	3/4"	11	10	2.3	20.4	0.327	0.164
101N032-011	32	1"	11	10	2.9	26.2	0.539	0.267
101N040-011	40	1 1/4"	11	10	3.7	32.6	0.835	0.412
101N050-011	50	1 1/2"	11	10	4.6	40.8	1.308	0.638
101N063-011	63	2"	11	10	5.8	51.4	2.076	1.010
101N075-011	75	2 1/2"	11	10	6.8	61.4	2.962	1.420
101N090-011	90	3"	11	10	8.2	73.6	4.256	2.030
101N110-011	110	4"	11	10	10.0	90.0	6.364	3.010
101N125-011	125	5"	11	10	11.4	102.2	8.207	3.826
101N160-011	160	6"	11	10	14.6	130.8	13.443	6.401
101N200-011	200	8"	11	10	18.2	163.6	21.030	9.979
101N250-011	250	10"	11	10	22.7	204.6	32.891	15.500
101N315-011	315	12"	11	10	28.6	257.8	52.219	24.600

*** D20 Pipe (1/2") has thickness increased from 1.9 mm (SDR 11) to 2.3 mm (SDR 9) to prevent clogging from welding and can withstand pressure up to 12.5 bars.*

PP-R (80) PIPE HIGH PRESSURE CLASS

Application	: Plumbing pipes, hot water pipes, chilled water pipes or other piping systems
Application Temperature	: 3-95 °C*
Lifetime	: 50 years*
Working Pressure	: PN 20 or approximately 20 bars*
Certified Standards	: DIN 8077/78 & ISO 15874
Cleanliness Standards	: BS 6920 Part II
Length	: 4 meters
Appearance (Color)	: Green with 4 white stripes

SDR 6 (PN20)

Code	Outside Diameter		SDR	PN	Wall Thickness	Internal Diameter	Water Volume	Weight
	(mm)	(Inch)			(mm)	(mm)	(l/m)	(Kg/m)
101N020-006	20	1/2"	6	20	3.4	13.2	0.137	0.172
101N025-006	25	3/4"	6	20	4.2	16.6	0.217	0.266
101N032-006	32	1"	6	20	5.4	21.2	0.353	0.434
101N040-006	40	1 1/4"	6	20	6.7	26.6	0.556	0.671
101N050-006	50	1 1/2"	6	20	8.3	33.4	0.877	1.050
101N063-006	63	2"	6	20	10.5	42.0	1.386	1.650
101N075-006	75	2 1/2"	6	20	12.5	50.0	1.964	2.340
101N090-006	90	3"	6	20	15.0	60.0	2.829	3.360
101N110-006	110	4"	6	20	18.3	73.4	4.233	5.040

SDR 7.4 (PN16)

Code	Outside Diameter		SDR	PN	Wall Thickness	Internal Diameter	Water Volume	Weight
	(mm)	(Inch)			(mm)	(mm)	(l/m)	(Kg/m)
101N160-074	160	6"	7.4	16	21.9	116.2	10.609	9.100

** Please see details on lifetime, pressure and temperature from table in page 19.*

INNOVATION OF PP-R PIPE SYSTEM

PP-R(80) PIPE SDR7.4 (PN16)

Application	: Plumbing pipes, hot water pipes, chilled water pipes or other piping systems
Application Temperature	: 3 - 60 °C*
Lifetime	: 50 years*
Working Pressure	: PN16 or approximately 16 bars*
Certified Standards	: DIN 8077/78 & ISO 15874
Cleanliness Standards	: NSF61&372 ,BS 6920 Part II,WRAS
Length	: 4 meters
Appearance (Color)	: Green with 4 gray stripes

Code	Outside Diameter (mm)	Outside Diameter (Inch)	SDR	PN	Wall Thickness (mm)	Internal Diameter (mm)	Water Volume (l/m)	Weight (Kg/m)
101N020-074	20	1/2"	7.4	16	2.8	14.4	0.163	0.148
101N025-074	25	3/4"	7.4	16	3.5	18.0	0.255	0.231
101N032-074	32	1"	7.4	16	4.4	23.2	0.423	0.371
101N040-074	40	1 1/4"	7.4	16	5.5	29	0.661	0.577
101N050-074	50	1 1/2"	7.4	16	6.9	36.2	1.030	0.900
101N063-074	63	2"	7.4	16	8.6	45.8	1.648	1.415
101N075-074	75	2 1/2"	7.4	16	10.3	54.4	2.325	2.016
101N090-074	90	3"	7.4	16	12.3	65.4	3.361	2.888
101N110-074	110	4"	7.4	16	15.1	79.8	5.003	4.328
101N125-074	125	5"	7.4	16	17.1	90.8	6.478	5.569
101N160-074	160	6"	7.4	16	21.9	116.2	10.609	9.101

PP-R (80) PIPE DURABLE CLASS FIBER/ FASER COMPOSITE PIPE

Application	: Plumbing pipes, hot water pipes, chilled water pipes or other piping systems
Special Feature	: Reduce expansion by 3 times
Application Temperature	: 3 - 95 °C*
Lifetime	: 50 years*
Working Pressure	: PN 20 or approximately 20 bars*
Certified Standards	: DIN 8077/78 & ISO 15874
Cleanliness Standards	: BS 6920 Part II
Length	: 4 meters
Appearance (Color)	: Green with 4 red stripes

SDR 6 (PN20)

Code	Outside Diameter (mm)	Outside Diameter (Inch)	SDR	PN	Wall Thickness (mm)	Internal Diameter (mm)	Water Volume (l/m)	Weight (Kg/m)
102F020-006	20	1/2"	6	20	3.4	13.2	0.137	0.180
102F025-006	25	3/4"	6	20	4.2	16.6	0.217	0.278
102F032-006	32	1"	6	20	5.4	21.2	0.353	0.458
102F040-006	40	1 1/4"	6	20	6.7	26.6	0.556	0.711
102F050-006	50	1 1/2"	6	20	8.3	33.4	0.877	1.104
102F063-006	63	2"	6	20	10.5	42.0	1.386	1.758
102F075-006	75	2 1/2"	6	20	12.5	50.0	1.964	2.495
102F090-006	90	3"	6	20	15.0	60.0	2.829	3.592
102F110-006	110	4"	6	20	18.3	73.4	4.233	5.358

SDR 7.4 (PN20) MF**

Code	Outside Diameter (mm)	Outside Diameter (Inch)	SDR	PN	Wall Thickness (mm)	Internal Diameter (mm)	Water Volume (l/m)	Weight (Kg/m)
103F160-074	160	6"	7.4	20	21.9	116.2	10.609	9.490

** Please see details on lifetime, pressure and temperature from table in page 19.*
*** MF Fiber mixed with especially thick fiber, withstanding pressure up to 20 bars.*
**** Ask the manufacture for advice every time when using pipes and fittings for transferring or exposing the interior or exterior of the pipes and fittings to chemicals.*

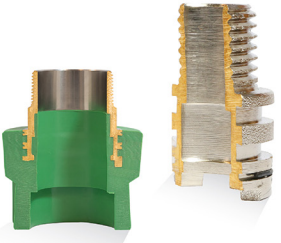
FITTINGS

There are a variety of fittings that can be installed with all types of pipes both with threaded and plain ends. Therefore, they are very convenient to use. All fittings are strong and have permissible working pressure up to 20 bars and support temperature up to 95 °C.

Threaded end nickel-coated brass fittings with sizes up to 3" (D90)

Threaded end brass fittings (special order products)

Cutter



Threaded end nickel-coated brass fittings
Produced from brass coated with nickel to prevent green rust. Stronger and more durable.

*** Warranty does not include all types of valves, welding machines and cutters.*

WELDING MACHINE

D20-32 Small (1/2"- 1")
(Small heating plate)

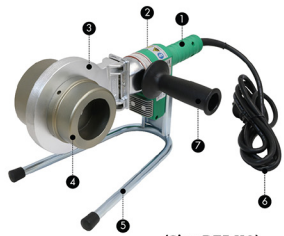
D20-32 (1/2"- 1")
(Medium heating plate)

D20-63 (1/2"- 2")
(Medium heating plate)

D75-110 (2 1/2"- 4")
(Large heating plate)

(Size D20-32 and D20-63)

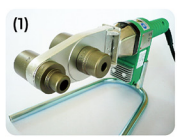
1. Handle
2. Light indicator
3. Heating plate
4. Welding head
5. Base
6. Plug
7. Holder

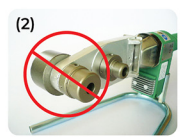


(Size D75-110)

Assembling

1. Only use Thai PP-R welding machines.
2. Assemble the welding head of the desired size firmly onto the heating plate with screw. (The size of the welding head must not come out of the heating plate for uniform heat distribution, as shown in Figure (1) and (2).)
3. Connect the power plug to the 220-volt power outlet (normal house electricity). On the side of the welding machine, there are two indicating lights. If the red indicator is lit, it indicates the machine is heating up. If the green indicator is lit, it is ready to use. The welding temperature is approximately 250-260 °C. (Do not leave the plug connected all day because it may be damaged by a power outage or power surge.)





Red Indicator
Machine is not ready.

Green Indicator
Machine is ready.

Maintenance and Storage

1. When stop using, unplug and let the machine cool.
   (Absolutely do not use water to speed up cooling because it will damage the electrical system and the heat resistor.)
2. Always clean the welding head and welding machine with a clean cloth before storing.
3. Do not use pliers or sharp tools to grip the welding head as this may damage the coating.
4. Do not throw the welding machine and welding head.
5. Replace the welding head immediately when the coating is found to be damaged, which can be observed if the plastic material melts on the welding head while welding.
6. In case of suspected damage, if under the warranty period, do not try to repair by yourself. It must be returned to the Company for inspection and repair.
7. Check the temperature of the welding machine before every use.

INSTALLATION

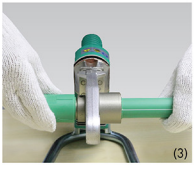
In the installation of Thai PP-R pipes, Socket Fusion method is used. The heart of this method of installation is to use the heat at 250-260 °C, which is the temperature range that causes Thai PP-R pipes and fittings to melt and be homogenized, causing no leakage. Therefore, use the company's welding machines only and using a welding machine that can adjust the temperature is not recommended.

This method of installation does not require any glue or binder. This makes the Thai PP-R pipe installation system very clean and safe, especially in the case of repairing the piping system inside the building. There will be no spark, smoke, or smell from chemicals disturbing during work and it can be used immediately when it cools.

Installation Procedure


(1)


(2)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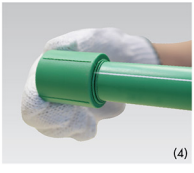

(4)

1. **Cutting pipe:** Use a cutter to cut the pipe at the desired position perpendicularly. If it is a large pipe, you can use a saw that does not cause high heat to cut and clean the pipe end.
2. **Measuring pipe distance:** When welding pipes, each size has different welding distances. Therefore, align a measuring sheet, which specifies the size of the pipe, on the pipe, then use a pencil to mark or check the welding distance of the pipe in the heating table.
3. **Welding pipe and fitting:** Clean the pipe and fitting to prevent dust or dirt. After that, insert the pipe and fitting into the welding head at the same time, pushing the fitting as far as possible. Push the pipe to the marked position. Then, heat by following the specified time of each size of pipe strictly.
4. **Connecting pipe and fitting:** After heating up to the specified time, pull out the pipe and fitting simultaneously. Then, insert the pipe into the fitting. Straightening can be done, but do not twist because it may cause the weld to separate, causing the leak. Hold the pipe and fitting until they are completely connected and release the hand. Allow to cool down according to the time specified. Then, test the water pressure.

Cautions:

1. If the pipe is cut until it is notched, the pipe must be cut at that point. Do not change the cutting position because the pipe may be broken from the notch.
2. The welding head must be changed when Teflon is peeling because the plastic will stick to the welding head and burn, causing the welding to be incomplete, which may result in subsequent leakage.
3. Do not push the pipe further into the welding head beyond the marked position, as this will cause the end of the pipe to become blocked or clogged.
4. Do not allow silicone with oil ingredient to contact the pipe surface because it will cause swelling, shortening the service life and reducing the withstanding pressure.
5. Do not use pipes or fittings that are pale or deteriorate because they will not homogenize while welding and have lower withstanding pressure and leak.
6. At the area where the pipe and fitting are installed (Socket Fusion, Butt Fusion, Electro Fusion), do not paint or apply any other materials before welding, because the pipe and fitting will not homogenize, resulting in eventually leakage.

Time on the Pipe

To prevent installation problems, Thai PP-R pipes have the heating time specified on all pipes. The welding time on the pipes is protected under a petty patent.

Prevent pipe clogging due to too long welding time.

See additional installation procedures at ***www.thaippr.com.***

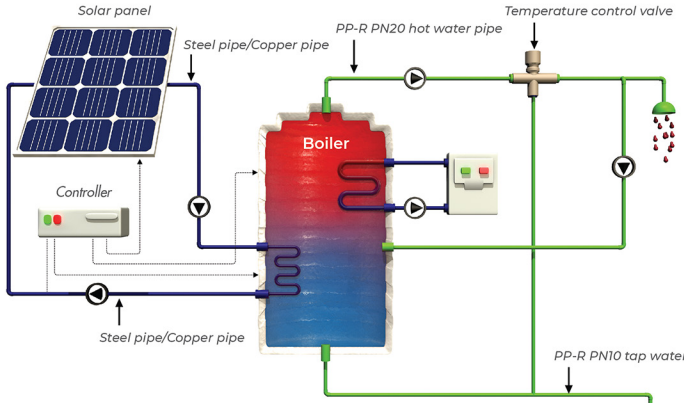
TABLE OF HEATING TIME

Size		Welding Depth	Heating Time	Pipe and Fitting Welding Time	Cooling Time Before Use
mm	Inch	mm	Second	Second	Minute
20*	1/2	14.0	5 SDR 11 PN 10 Pipe Size 20 mm Heating time only 3 seconds	4	2
25	3.4	15.0	7 SDR 11 PN 10 Pipe Size 25 mm Heating time only 5 seconds	4	2
32	1	16.5	8	6	4
40	1 1/4	18.0	12	6	4
50	1 1/2	20.0	18	6	4
63	2	24.0	24	8	6
75	2 1/2	26.0	30	8	8
90	3	29.0	40	8	8
110	4	32.5	50	10	8

Caution: *During installation, heating longer than the specified time will cause the pipe end to melt too much and may cause clogging.*

Installation of Thai PP-R Pipe with Solar Water Heater

Thai PP-R pipes can only be used with solar water heaters for water temperature not exceeding 95 °C. For the solar collector system, in which the pipes are installed through the solar panels that absorb solar energy and transfer heat to the heater, the heat accumulation may cause the temperature to exceed 100 °C. Therefore, use steel or copper pipes instead.



Piping system for solar water heater

SUPPORT INTERVALS

The support intervals of Thai PP-R pipes shall consider the installation and actual usage temperatures.

- In case of laying the main pipes and connecting the branch pipes, there must be a supporter clamping at the fitting.
- In case of changing the direction of the pipes, connecting with plain end pipes or valves, there must be a supporter clamping at a position nearest to the fitting.
- In case of laying hot water pipe, expansion loop must be installed and fixed point and sliding point shall support the expansion of pipes according to the manufacturer's recommendation.
  For horizontal pipe SDR 6, consider installing the expansion loop for pipe longer than 10 meters.
  For horizontal pipe SDR 6 Fiber or SDR 7.4 Fiber, consider installing the expansion loop for pipe longer than 40 meters.
  However, for vertical pipe, there is no need to install the expansion loop.
- In case of using Thai PP-R pipes with heating systems such as heat exchangers, boilers or solar cells, appropriate air release valve must be installed to prevent sudden increase of pressure and temperature according to the manufacturer's recommendation.

In the installation, do not bend the pipe because it may cause leakage. If installation on a curve is required, use a 45° elbow fitting.

Support Intervals for Thai PP-R SDR 11 and SDR 6 Pipes

Temperature Defference in Installation and Actual Usage Δt (K)	Pipe Size (mm)												
	20	25	32	40	50	63	75	90	110	160	200	250	315
	Support Interval (cm)												
0	85	105	125	140	165	190	205	220	250	260	270	280	305
20	60	75	90	100	120	140	150	160	180	220	230	240	250
30	60	75	90	100	120	140	150	160	180	220	230	240	250
40	60	70	80	90	110	130	140	150	170	210	220	230	245
50	60	70	80	90	110	130	140	150	170	210	220	230	245
60	55	65	75	85	100	115	125	140	160	200	210	220	230
70	50	60	70	80	95	105	115	125	140	170	180	190	200

Support Intervals for Thai PP-R SDR 6 Fiber Pipes

Temperature Defference in Installation and Actual Usage Δt (K)	Pipe Size (mm)									
	20	25	32	40	50	63	75	90	110	160
	Support Interval (cm)									
0	120	140	160	180	205	230	245	260	290	340
20	90	105	120	135	155	175	185	195	210	270
30	90	105	120	135	155	175	185	195	210	245
40	85	95	110	125	145	165	175	185	200	235
50	85	95	110	125	145	165	175	185	190	205
60	80	90	105	120	135	155	165	175	180	195
70	70	80	95	110	130	145	155	165	170	185

For tap water, use $\Delta t = 0$.

Example of Calculations

Installation of SDR 6 PN20 pipe size 25 mm is required at installation temperature of 35 °C and for hot water usage at 65 °C. What is the support interval?

$$\Delta t = T(work) - T(installation)$$
$$= (273.15 + 65) - (273.15+35)$$
$$= 30\ K$$

From the table, pipe size 25 mm has ΔT at 30 K. Therefore, the support interval is 75 centimeters, but if used with cold water at normal temperature, the support invertal must be 105 centimeters. It is clear that temperature greatly affects the support intervals. If used with high-temperature hot water, the support intervals are required to be closer than normal temperature. Therefore, the usage temperature must be considered every time for the support intervals.

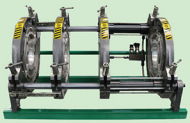
BUTT FUSION (B.F.) FITTINGS

Butt Welding: Size 125 -315 mm (PN10)

Elbow 45 | Elbow 90 | Tee | Reducing Tee | Reducing Socket | Flange Adapter | Cap

Butt Fusion (B.F.) Welding Machine

Machine & Stand



Aluminum Clamp Sets

Heating Machine/ Electric Milling Cutter

** Use Butt Fusion Welding Machine of the Company Only.*

ELECTRO FUSION (E.F.) FITTINGS

Socket Welding: Size 75 – 315 mm (PN10, PN16, PN20)

Socket | Elbow 45 | Elbow 90 | Tee | Reducing Tee | Reducing Socket | Flange Adaptor

** Use Electro Fusion Welding Machine of the Company Only.*

Electro Fusion (E.F.) Welding Machine

Machine

Caution

1. Do not throw machine and equipment.
2. Do not allow the machine to expose or soak in water.
3. The size of electrical cable must not be less than 2.5 mm.
4. Breaker must not be less than 1P 16A.

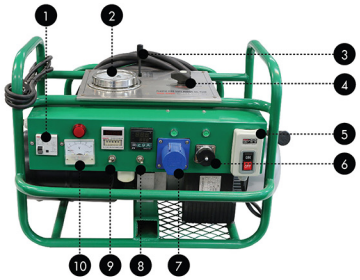
Installation with E.F. Fitting

Work installed with Butt Fusion

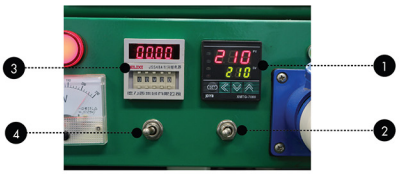
* Image before applying UV protective coatings.

Components of Butt Fusion (B.F.) Welding Machine

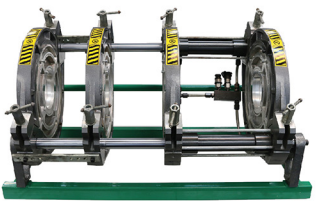
Machine & Stand



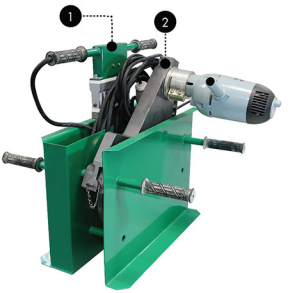
1. Breaker
2. Pressure Screen
   Blue numbers (bar) / Black numbers (Mpa)
3. Moving Button for Hydraulic Aluminum Clamp Sets
4. Pressure Adjustment Button
5. Hydraulic Pump Switch
6. Electric Milling Cutter Plug
7. Heating Plate Plug
8. Temperature Setting Set
9. Timer
10. Voltage Meter



1. Temperature Setting Set
2. Temperature Setting Set Switch
3. Timer
4. Timer Switch



Aluminum Clamp Sets



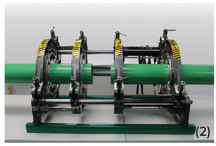
1. Heating Machine
2. Electric Milling Cutter

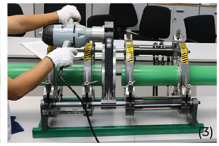
Chilled Water System

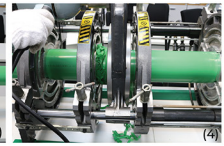
When chilled water piping is installed, it is necessary to consider implementing a Compression Loop and designating both fixed support points (Fixed Points) and sliding support points (Sliding Points) to accommodate pipe contraction, in accordance with the manufacturer's recommendations. Alternatively, a Flexible Joint, which supports expansion or contraction, may be used, also in accordance with the manufacturer's recommendations.

In cases where PP-R pipes or fittings are connected to machinery or equipment that experiences vibrations, temperature changes, or pressure fluctuations, it is recommended to always install a Flexible Joint to prevent damage to the pipes and fittings.

Butt Fusion (B.F.) System Installation (Do not use fiber pipe for butt fusion)







Caution

1. Avoid installing in windy conditions or finding shelter for the welding machine.
2. Avoid installing in the presence of more dust than normal.
3. Check the cleanliness of the heating plate, pipe cross-section and fittings before heating every time.

1. Use the Company's welding machine only.
2. Cut the pipe to the desired length. The pipe cross-section must be perpendicular. Then, assemble the aluminum clamp set according to the size of the pipe to be welded, spacing enough on both sides of the pipe that will be cut and tighten the bolts to secure the aluminum clamp set at all 8 points.
3. Find a drag force (the pressure that must compensate for the falling power of the machine or the force used to drag the pipe, must find a new value every time when start welding) to be combined with P1 and P5.
4. Move the aluminum clamp set to allow enough space for the electric milling cutter to cut the end of the pipe or the fitting on both sides, about 0.2 - 0.5 mm, to cut the uneven and oxidized parts to check the perpendicularity of the two ends. When the two ends are connected together, the distance must not exceed 0.3 mm and the level of the two ends of the pipes should not be more than 0.5 mm. When perpendicular, pull the pipe before turning off the electric milling cutter to get a smooth surface and perpendicular. After that, remove the electric milling cutter. Clean until without dust and pipe debris.
5. Clean the heating plate with a clean cloth and set the heating plate temperature to 210 °C.
6. Place the heating plate between both ends of the pipes, which have already been cut. Heat the first phase with the pressure P1 + drag force until the bead height rises as specified. Then, reduce the pressure to P2 and continue to heat for a specified time T2. (Set the time and press the start button. When complete, there will be an alarming sound.)
7. Remove the heating plate and connect the pipes together within the time T3.
8. Push the pipes together at the specified pressure and time according to T4 and P5 + drag force. Turn off the hydraulic pump and let the weld cool down by the time T5. Be careful not to cause movement or bumps at the welding area. Wait until it has cooled down before the aluminum clamp set can be disconnected to weld to the next point.

Butt Welding Table

Size	Model	Thickness	Welding Temperature	Heating		Absorption			Transfer Time	Pressure Rising Time	Cooling	
				Pressure	Bead Height	Pressure	Time	Time			Pressure	Time
mm	SDR	mm	(°C)	P1(bar)+Drag Force	mm	P2(bar)	T2(sec)	T2(min)	T3 max(sec)	T4(sec)	P5(bar)+Drag Force	T5(min)
90	11	8.2	210 ±5	4+Drag Force	1.0	0	178	2M 58s	6	8	4+Drag Force	15
110	11	10.0	210 ±5	6+Drag Force	1.0	0	217	3M 37s	7	9	6+Drag Force	17
125	11	11.4	210 ±5	7+Drag Force	1.0	1	237	3M 57s	7	11	7+Drag Force	19
160	11	14.6	210 ±5	11+Drag Force	1.0	1	277	4M 37s	8	13	11+Drag Force	24
200	11	18.2	210 ±5	17+Drag Force	1.0	1	320	5M 20s	9	16	17+Drag Force	29
250	11	22.7	210 ±5	27+Drag Force	1.5	2	367	6M 7s	10	20	27+Drag Force	35
315	11	28.6	210 ±5	43+Drag Force	2.0	3	419	6M 59s	12	24	43+Drag Force	43
90	6	15.0	210 ±5	6+Drag Force	1.0	0	285	4M 45s	8	15	6+Drag Force	25
110	6	18.3	210 ±5	9+Drag Force	1.0	1	321	5M 21s	9	16	9+Drag Force	29
125	6	20.8	210 ±5	11+Drag Force	1.5	1	348	5M 48s	10	18	11+Drag Force	33
160	7.4	21.9	210 ±5	16+Drag Force	1.5	1	359	5M 59s	10	19	16+Drag Force	34

**These parameters are for the Company's butt welding machine only.*

Scan here to watch a video of Butt Fusion (B.F) Fitting system installation.

Installation with Electro Fusion (E.F.) Fitting

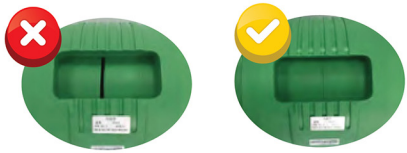
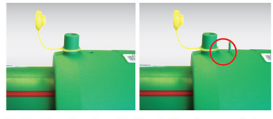


Image examples of pipe end cut at 90 degrees (for complete installation)

1. Cut the end of the pipe perpendicularly at 90 degrees, smoothing the end without pipe debris resulting from cutting.
2. Determine the welding distance by measuring from the fitting distance used.
3. Sand the slippery surface of the pipe with sandpaper number 1 (for polishing wood) by sanding it from the designated position by another 1 cm.
4. Clean the inside and outside of the pipe surface with a clean, dry cloth that is free of dust or dirt.
5. Assemble dry, clean pipes together with E.F. fitting. Use hammer to hammer around to the specified point. Be careful not to break the power cord. When welding, make sure that the pipes and fitting do not move from the specified depth. If there is an error, it may result in a short circuit and causing a fire.
6. Plug the jack of the E.F. welding machine into the fitting using a hand to squeeze to release the lock before connecting to the fitting.
7. Bring the barcode reader head to read the barcode of the fitting. It will show fusion time and cooling time automatically on the display. Then, press the OK button to start welding.
8. Allow the fitting to cool down according to the cooling time specified in the table before testing the pressure.



Indicator showing that welding is complete.

Cooling time for E.F. Fittings					
	D63	D75-110	D125-160	D200-250	D315
Cooling Time	5 min	10 min	15 min	20 min	30 min

Note : The cooling time of the E.F. reducer and E.F. reducing tee are based on the big side.

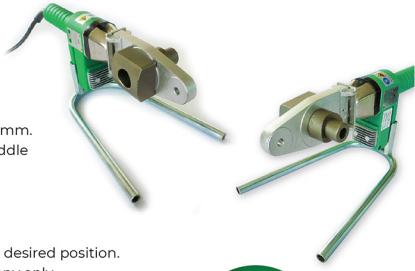
9. Remove the jack from the fitting by squeezing the jack pin to release the lock. Completely close the cap at the fitting.
10. Do not install during rain or high humidity weather. Also, do not connect the pipe to the fitting without welding and should not immediately tear off the plastic bag while the welding is not done as this will cause moisture to accumulate, resulting in incorrect assembly.
11. When welding from 2 points or more, if the distance is less than 1 meter per spot, the first spot must be welded first, waiting for it to cool down according to the cooling time table and then proceeding to assemble the next spot because the heat will cause the pipe to stretch while welding.

In the case of connecting butt fusion fitting with electro fusion (E.F.) fitting, sand the butt fusion fitting the same way as sanding the pipe surface (paragraph 3).

**Do not use bushing with electro fusion welding.*

Scan here to watch a video of Electro Fusion (E.F) Fitting system installation.

Saddle Fitting Installation



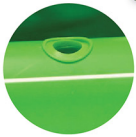
In case of adding a branch pipe from the main pipe, saddle fitting can be used, which has 3 sizes to choose from: 25 mm, 32 mm and 40 mm. (Should choose to use the saddle fitting to connect correctly to the saddle welding head.)

1. **Drill a hole on the main pipe** at the desired position. Use the saddle drill bit of the company only. (Do not use a drill bit or other brand of saddle drill bit to prevent the drilled hole from being too big or too small.)

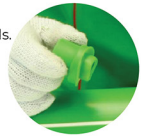
2. **Heat the pipe** by pressing the saddle welding head onto the pipe until the edge is 1 mm high. While heating the area, PP-R plastic will protrude into layers (as in the image).

3. **Heat the saddle fitting** along with the pipe by pressing on the saddle welding head until the edges are raised to 1 mm (as in the image), then continue to heat for another 12 seconds. When finished, remove the welding machine.

4. **Attach the saddle fitting** to the pipe to create a curved surface at the correct angle by holding down firmly for 5 seconds.



Protruding layers of pipe after heating



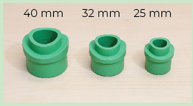
Protruding layers of saddle fitting after heating

**Saddle fitting cannot be used to replace tee fitting. Use for making a branched pipe only.*

Installing Equipment

Saddle drill bit

Saddle welding head

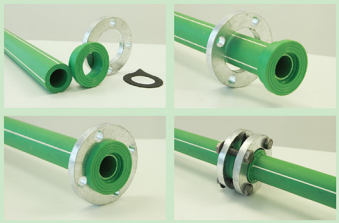


Saddle fitting

Scan here to watch a video of saddle fitting installation.

Flange Connecting Process

1. Put the flange into the pipe first. (If connecting the flange adaptor first, the flange cannot be put into the pipe.)
2. Connect the flange adaptor to the pipe and slide the flange onto the flange adaptor.
3. After that, insert the gasket and tighten the bolts together as normal.

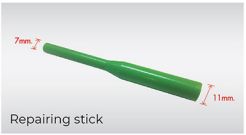


Scan here to watch a video of flange installation.

Leak Repair

Due to its homogenized welding property, Thai PP-R pipe makes repairs easy with the following work procedures :

1. When pierced by a nail or leak occurs, consider the size of the leak. Each of the repairing stick will have two sizes in the same stick: 7mm and 11 mm. Select to use as appropriate for the hole size.
2. Enlarge the hole to 5 mm for the 7 mm side of the repairing stick and to 9 mm for the 11 mm side of the repairing stick.
3. Specify the depth of the repairing stick and the welding head of the repairing stick according to the thickness of the pipe as shown in the table so that it will not go too deep beyond the pipe surface, obstructing the water path.
4. Different pipe sizes take different amounts of heating time, but the repairing stick will take 5 seconds to heat, so the pipe must be heated first with a welding head. Then, when there are 5 seconds left, put the repairing stick into the welding head of the repairing stick to heat as shown in the table.



Repairing stick


Welding head
of repairing stick

Size	Depth of Repairing Stick and Welding Head of Repairing Stick = Pipe Thickness (mm)		Pipe Heating Time before Inserting Repairing Stick	Second Starting Heating Repairing Stick Simultaneously with Pipe	Cooling Time before Using Water
mm	SDR 11	SDR 6	Second		Minute
20	2.3	3.4	5	Simultaneously with pipe	2
25	2.3	4.2	7	2	2
32	2.9	5.4	8	3	4
40	3.7	6.7	12	7	4
50	4.6	8.3	18	13	4
63	5.8	10.5	24	19	6
75	6.8	12.5	30	25	6
90	8.2	15.0	40	35	8
110	10.0	18.3	50	45	8

5. Plug the heated repairing stick into the leaking hole at the specified depth. Then, let it cool down.
6. Cut the remaining end of the repairing stick, leaving the length a little longer than the pipe surface. The rest of the repairing stick can be stored for future use. Then, let the repaired hole cool according to the time before using water.

Repairing Stick Welding Method


Repairing stick welding


Allow to cool with hand supporting.


Cut the remaining stick off.

How to Repair Leak (Caused by Nail)


Open the wall with sufficient space.


Enlarge the leaking hole with a drill.


Leaking hole that has been enlarged.


Welding of leaking hole.


Repairing stick welded to leaking hole.


Repaired pipe.

Storage of Pipe and Fitting

Thai PP-R pipes and fittings should not be placed outdoors or exposed to the sun all the time. The pipes should be stored in a covered shed under a UV-protection package to maintain product quality.

Before and After Sales Services from Experts Increase Confidence

- Ready to provide consultation on complete product and usage information.
- Free training/seminar on installation method!
- Maintain and access the site quickly and effectively.
- Dare to guarantee products for at least 5 years and have product liability (up to 1 million USD coverage).




In case of outdoor piping, UV-protective coating should be applied to protect the outer surface of the pipe. The company has sent samples of Thai PP-R pipes to paint manufacturers to conduct inspection and provide recommendations as follows:

Surface preparation ▶ **Primer** ▶ **Topcoat 1** ▶ **Topcoat 2**

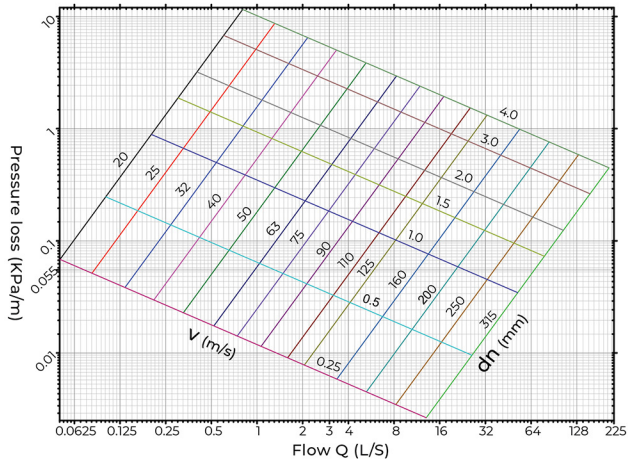
1. Prepare the surface by sanding with sandpaper number 320 over the surface. Clean until without dust or dirt.
2. Coat with Nax 2K Plastic Primer 1 part with Nax 2K Plastic Activator 1 part by volume. Stir the primer and plastic activator until they are well mixed before use. Do not mix with thinner. Use all of the paint within 24 hours. Allow to dry for 30 minutes before the next step of coating.
3. Apply topcoat 1 using Nippon Heavy Ex-Guard 4 parts with 1 part by volume of plastic activator. Stir the paint and plastic activator until they are well mixed before use. Electric stirrer may be used continuously for 15-20 minutes. Mix about 5-10% of Nippon Heavy Ex-Guard Thinner # 77 when painting with a roller or paint brush. Use all of the paint within 6 hours. Allow to dry for 1 day (more than 16 hours) before painting the next layer.
4. Apply topcoat 2 using Nippon Heavy Ex-Guard 4 parts with 1 part by volume of plastic activator. Stir the paint and plastic activator until they are well mexed before use. Electric stirrer may be used continuously for 15-20 minutes. Mix about 5-10% of Nippon Heavy Ex-Guard Thinner # 77 when painting with a roller or paint brush. Use all of the paint within 6 hours. Allow to dry for 1 day (more than 16 hours).

The lifetime of the paint will be around 3-5 years depending on the surface preparation, paint thickness, conditions and environment in that area.

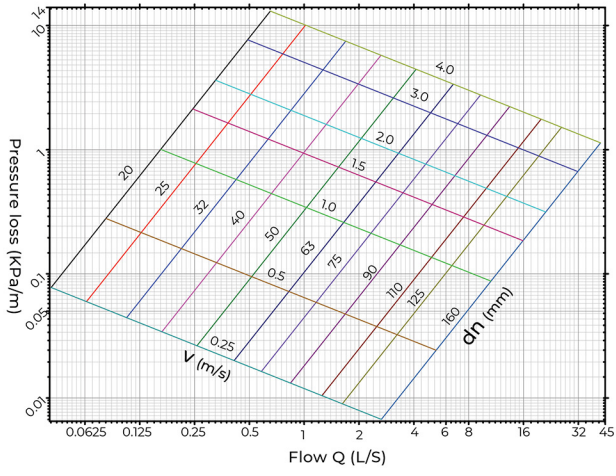
For further information, call 0 2896 4061-5

PRESSURE LOSS DIAGRAM

SDR 11 (PN 10) pipe



SDR 6 (PN 20) pipe



Lifetime Based on Pressure and Temperature

Temperature, In ◦C	Years of service	Allowable working pressure for pipes made from PP-R 80 (bar)			
		SDR 11 (SF = 1.5)	SDR 7.4 (SF = 1.5)	SDR 6 (SF = 1.5)	Fiber Composite Pipe SDR 6 (SF = 1.5)
10	1	17.6	27.8	35.0	
	5	16.6	26.4	33.2	
	10	16.1	25.5	32.1	32.4
	25	15.6	24.7	31.1	31.3
	50	15.2	24.0	30.3	30.5
	100	14.8	23.4	29.5	
20	1	15.0	23.8	30.0	
	5	14.1	22.3	28.1	
	10	13.7	21.7	27.3	28.0
	25	13.3	21.1	26.5	26.7
	50	12.9	20.4	25.7	25.8
	100	12.5	19.8	24.9	
30	1	12.8	20.2	25.5	
	5	12.0	19.0	23.9	
	10	11.6	18.3	23.1	23.2
	25	11.2	17.7	22.3	22.4
	50	10.9	17.3	21.8	21.8
	100	10.6	16.9	21.2	
40	1	10.8	17.1	21.5	
	5	10.1	16.0	20.2	
	10	9.8	15.6	19.6	19.8
	25	9.4	15.0	18.8	19.2
	50	9.2	14.5	18.3	18.5
	100	8.9	14.1	17.8	
50	1	9.2	14.5	18.3	
	5	8.5	13.5	17.0	
	10	8.2	13.1	16.5	16.8
	25	8.0	12.6	15.9	16.0
	50	7.7	12.2	15.4	15.5
	100	7.4	11.8	14.9	
60	1	7.7	12.2	15.4	
	5	7.2	11.4	14.3	
	10	6.9	11.0	13.8	14.2
	25	6.7	10.5	13.3	13.5
	50	6.4	10.1	12.7	13.1
70	1	6.5	10.3	13.0	
	5	6.0	9.5	11.9	
	10	5.9	9.3	11.7	11.8
	25	5.1	8.0	10.1	10.2
	50	4.3	6.7	8.5	8.7
80	1	5.5	8.6	10.9	
	5	4.8	7.6	9.6	
	10	4.0	6.3	8.0	8.3
	25	3.2	5.1	6.4	6.4
95	1	3.9	6.1	7.7	
	5	2.5	4.0	5.0	
	10				
	(10)*	(2.1)*	(3.4)*	(4.2)*	

*Remark : *The bracketed values apply where testing can be shown to have been carried out for longer than one year at 110 ◦C*
Refer to information according to DIN 8077, except data table Fiber Composite Pipe.

Point Yamu by COMO, Phuket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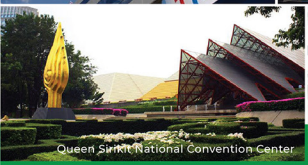
Queen Sirikit National Convention Center


CP Pinthong


Bangkok Arena (Bangkok Futsal Arena)


Lumpinee Boxing Stadium

Thai PP-R Co., Ltd.

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