HDPE Pipe
Butt Fusion 101

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Polyethylene

HDPE: Benefits:

- ✓ corrosion resistant
- ✓ capable of leak free joints
- ✓ is lighter than many other piping materials
- ✓ Has small crack resistance
- ✓ has high flows and is less prone to internal deposit buildup than many other pipes.

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Leak Free Joints?

3 ways to get leak free joints in HDPE:

FUSION

There are three main types of HDPE pipe fusion:

- 1) Butt fusion - todays topic
- 2) Socket fusion
- 3) Electrofusion

Each of the above joining methods are similar in that each uses heat and pressure to join HDPE pipe.

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7 steps to hdpe butt fusion

1. Secure pipe in machine
2. Face the ends
3. Check alignment
4. Heat
5. Join ends
6. Hold to Fuse / Cool
7. Inspect

- Source: ASTM F2620 / PPI TR-33 North American HDPE Butt fusion standard / procedure

ASTM

PPI Plastics Pipe Institute

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HDPE Pipe Butt Fusion step 1

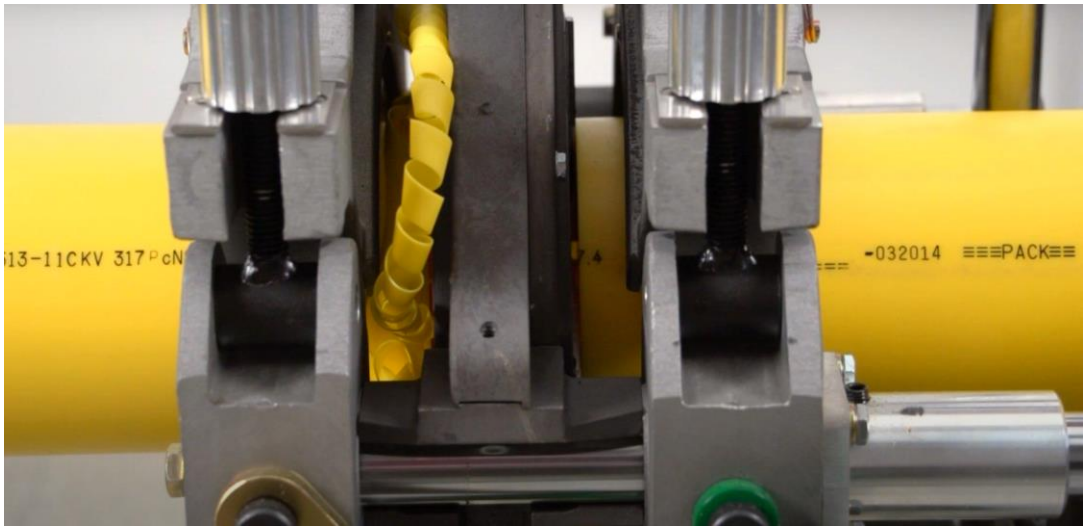
1.Secure / clamp pipe

- clean pipe to remove stones / dirt
- clamp pipe in machine jaws securely

HDPE Pipe Butt Fusion - Step 2

2. Face the pipe ends

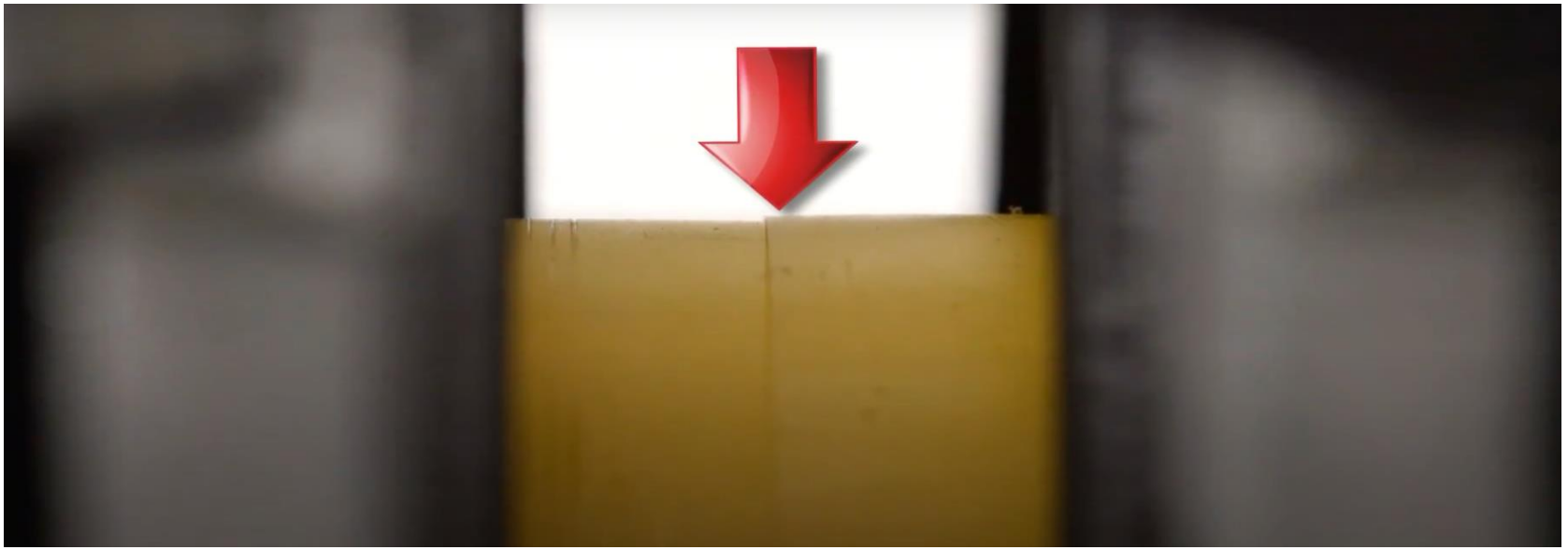
- squares the pipe ends
- removes oxidized layer of pipe



HDPE Pipe Butt Fusion - Step 3

3. Check pipe alignment

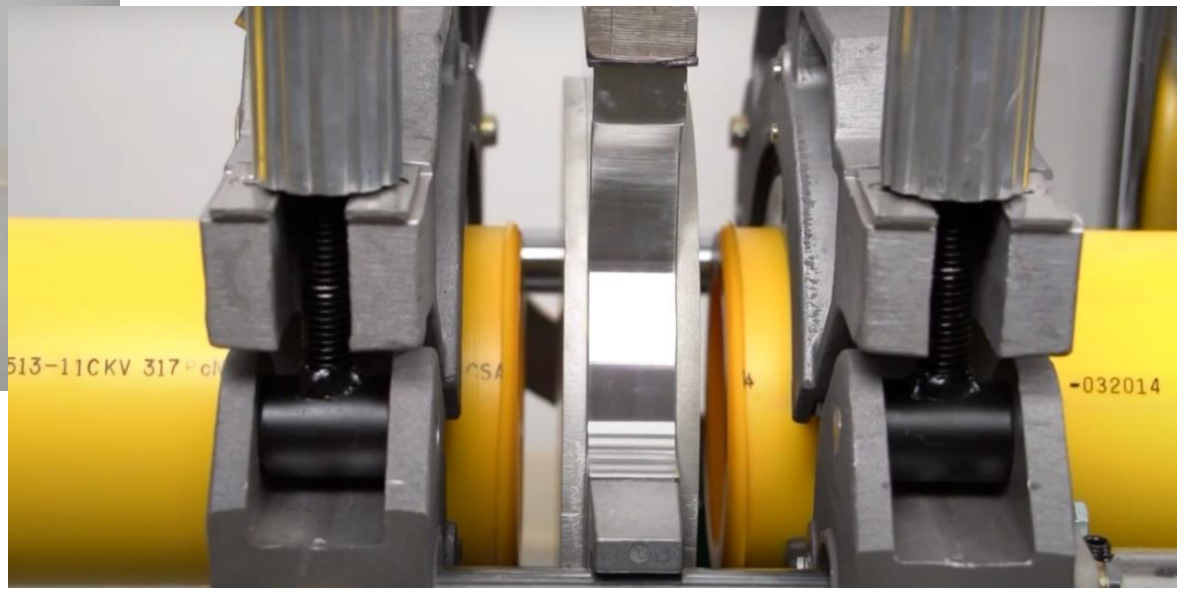
- high/low max 10% of pipe wall thickness
- do not fuse a miter into the pipe
- adjust as needed, remove shavings & clean pipe



HDPE Pipe Butt Fusion - Step 4

4. Heat the pipe

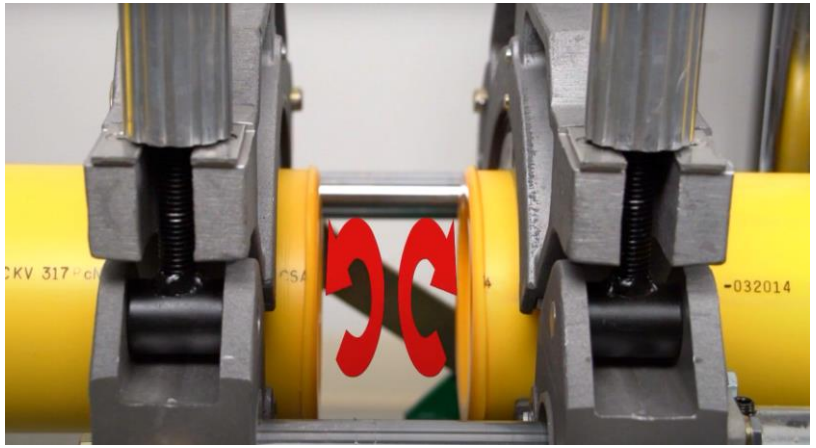
- check temperature range 400 F – 450 F
- wipe the heater clean & apply heat to pipe
- until we get the desired melt bead size

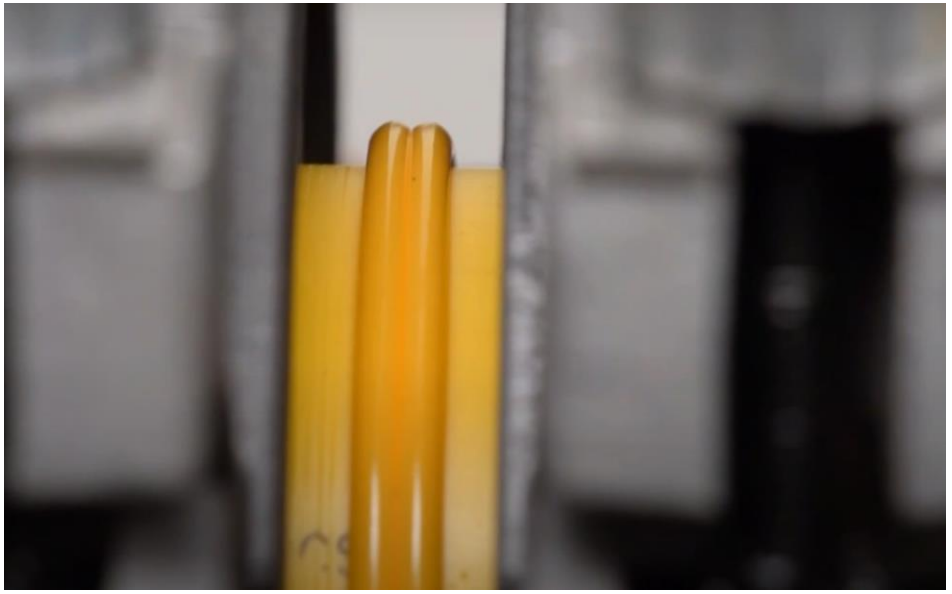


HDPE Pipe Butt Fusion - Step 5

5. Join the pipe

- at the calculated fusion pressure
- check melted pipe ends are smooth/glossy
- don't take too long to close

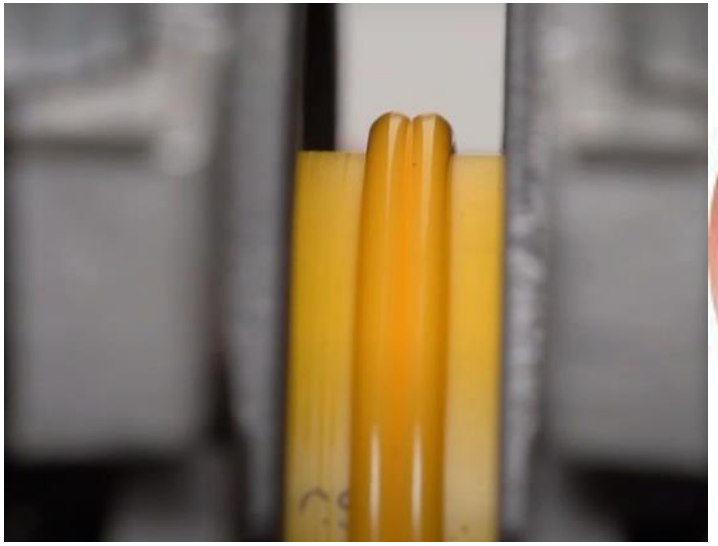




HDPE Pipe Butt Fusion - Step 6

6. Hold pipes

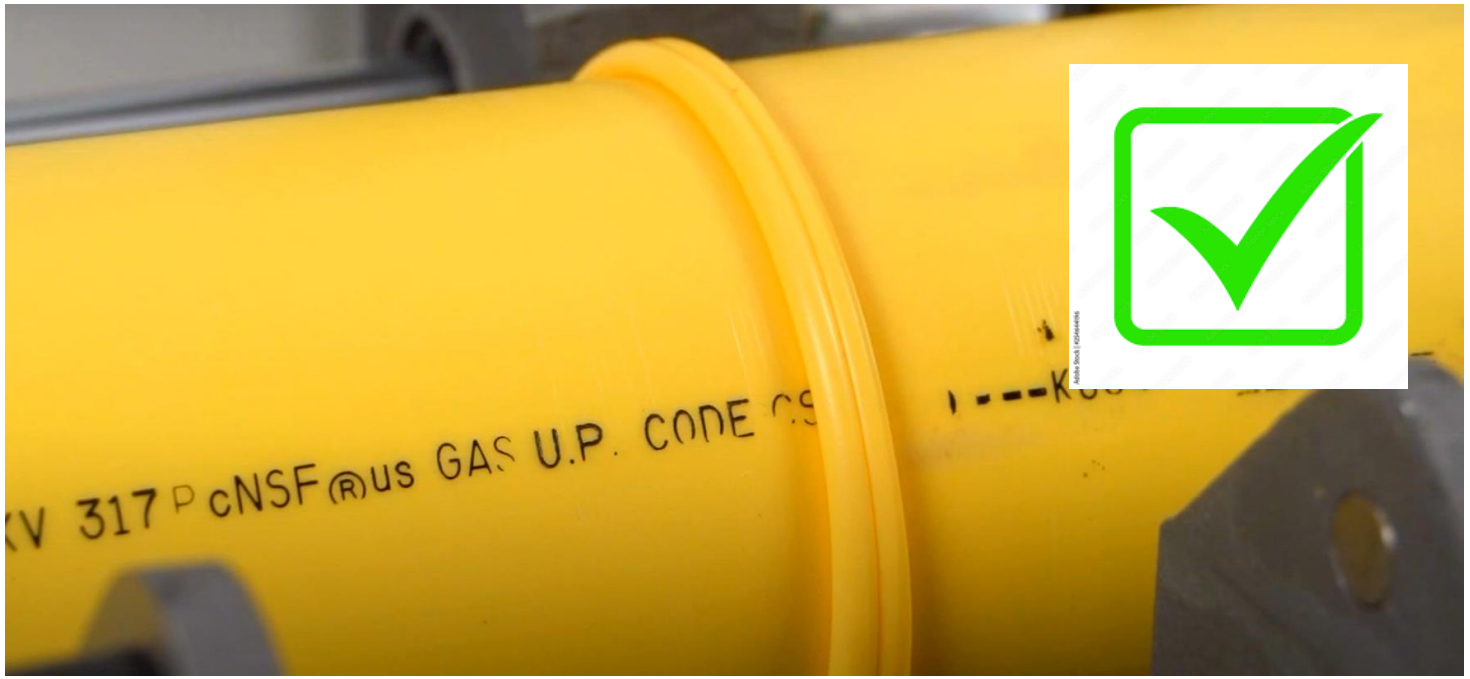
- at the calculated fusion pressure
- for the calculated time
- the fusion happens during this time



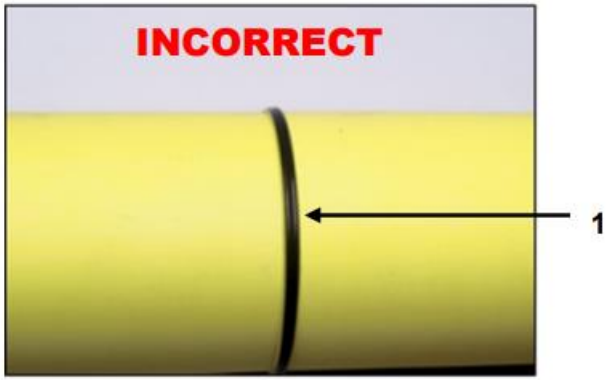
HDPE Pipe Butt Fusion - Step 7

7. Inspect visually

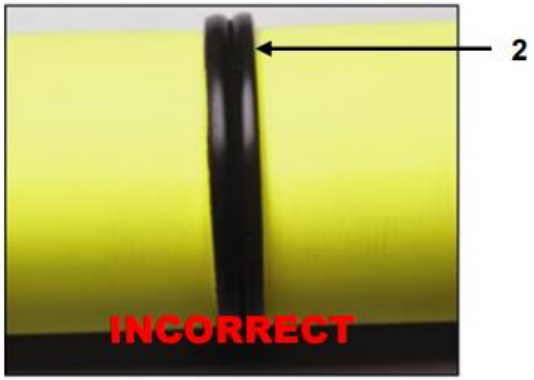
- unclamp and inspect
- see visual cues



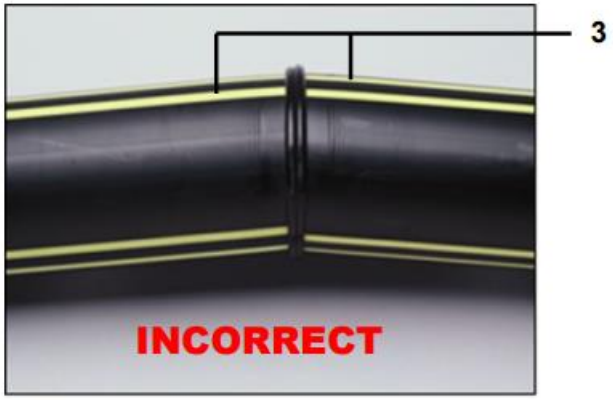
Visual inspection tips



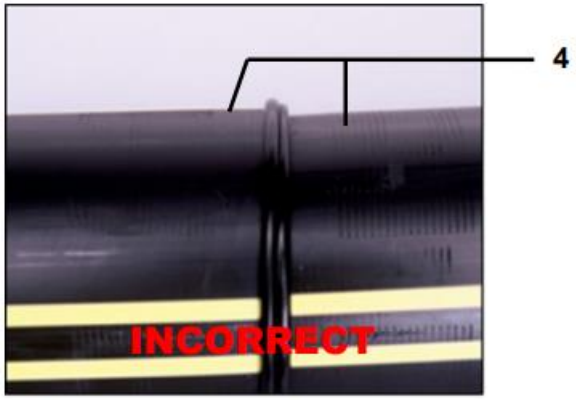
1. Insufficient heat time; melt bead too small



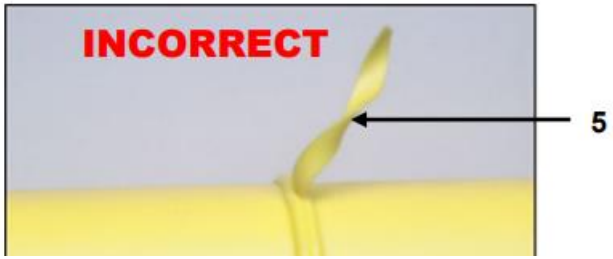
2. Excessive heat time or pressure applies during heating; melt bead too large

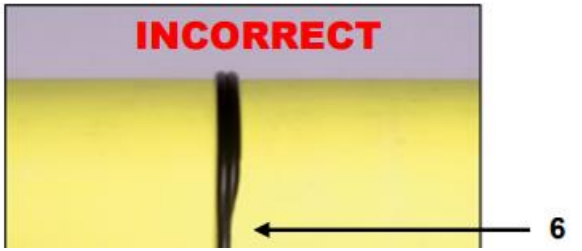


3. Pipe angled into fusion unit



4. Improper “High-Low” alignment






"That's all Folks!"