

Tapping Guide

HOW TO TAP BLUE BRUTE[®] PIPE

M U N I C I P A L S Y S T E M S

**BLUE
BRUTE**[®]



IPEX
by aliaxis

BLUE BRUTE® PIPE TAPPING GUIDE

Do's & Don'ts

1. Use proper equipment
2. Use proper safety procedures
3. Don't over tighten machine on pipe
4. Apply approved lubricant to sharp core cutter
5. Cut and thread "slow and steady"
6. Use Teflon® tape on corporation stop
7. Tighten main stop to 37 Joules (27 ft.lbs.)
8. If saddle is used, straps should be at least 50mm (2") wide
9. Remember to tap slow & steady

Introduction

Direct Tapping is suitable for PVC DR18 and DR14 pipe in sizes sizes 6" (150 mm) through 12" (300 mm)", conforming to AWWA C900 and CSA B137.3. In certain designated areas, where special provisions have been made, the above size restrictions may be modified. Consult IPEX.

There is a right way and a wrong way to tap. The purpose of this guide is to provide a brief outline of things to do (or not do) when you tap Blue Brute PVC pipe.

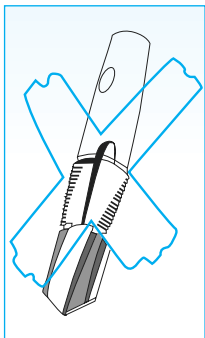
Service connections vary in size from small (supplying individual homes) to large outlets (for industrial and other uses). The largest size corporation stop which can be tapped directly into the pipe is 25mm (1"). Larger outlet sizes can be installed by using service clamps, bossed sleeves or tapped couplings. Consult IPEX Installation Guide for more information. Use the AWWA thread for all direct taps. Iron pipe thread **IS NOT** recommended. Corporation stops should be located at least 600mm (2') from the ends of the pipe. If two taps are made – one on each side of the main – they should be separated by at least 450mm (18") measured along the pipe length. Multiple taps made on the same side of the main should be staggered radially. Keep them at least 450mm (18") apart. Avoid tapping in any area showing discoloration (sunburning). Also, do not tap in a bend of the pipe.

THE RIGHT TOOLS

Typically, the tap will be made with Footage Tools Main Line tap machine, Modified Mueller B, Mueller B100, or Hays B1. In any case, the cutting tool must be a Core Cutter which fits all the above machines. Do not use auger or twist bits. A practice dry tap is a good idea. It will allow you to check clearances and adjust stop marks.

Additional Accessories Required

- Core Cutter and Tap. Parts fit Footage Tools, Mueller B and machines.
- Standard Torque Wrench: Readings from 0 to 135 Joules (0 to 100 foot pounds).
- Socket to match torque wrench, 20mm (3/4") for Mueller B and B100 machine (8-point socket).
- For more information on saddle tapping, see appropriate section.



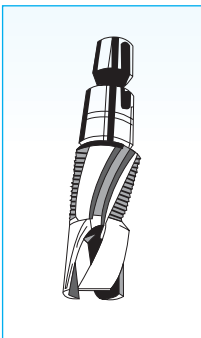
Wrong

Do not use an auger bit or twist drill for taps. Do not tap iron pipe threads in PVC pipe.



Right

Use Core Cutters designed with exits lots for cuttings. Make sure they are harp.



Right

Only AWWA threads are recommended.

CORRECT MACHINE

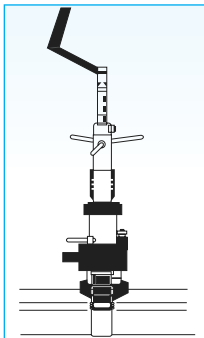
Modified Mueller B or B100 Machine

For tapping PVC pipe, two modifications to the B machine are recommended:

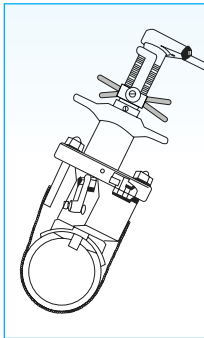
1. Insert one or two Teflon® washers between collar and feed yoke (to isolate the **feed and cutting rates**), or adapt the B100 collar (thrust bearing) to the B machine. This will require a grinding operation.
2. Cut the handles from the feed nut (to limit the feed rate). The B100 and Hays machines may be used as supplied, but removing the handles from the feed nuts is desirable.

Footage Tools Tapping Machine

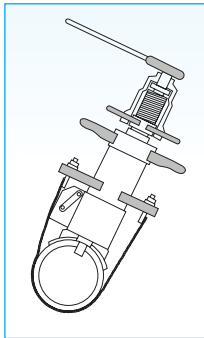
Footage Tools tapping machines are **specifically designed** for PVC pipe. No modifications are necessary. A video on how to use the machine is available from Footage Tools (Toronto, Ont.).



Right
Footage Tools
Direct Tap or
Saddle Tap
Machine



Right
Mueller B100 or
Hays B1 Machine
with strap.



Right
Modified Mueller B
Machine. Machine
should be in good
condition. There
should be no
wobble in the
boring bar.

PLACING OF THE MACHINE

The machine should fit on the drilling site firmly, but not in a way that will set up wall stresses by distorting the pipe. Saddle O.D. must match pipe O.D.

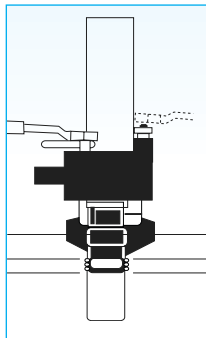
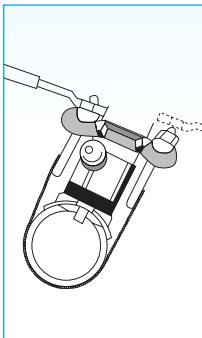
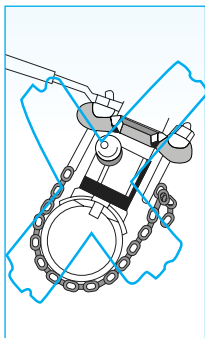
Mount the machine so both tightening nuts are accessible and tighten both sides **evenly**. If a strap is used, tighten the strap so the machine does not slip.

Tighten sufficiently to the gasket and hold the machine in place during the tapping operation. Further tightening is not necessary.

Be absolutely certain that threads on the tap match threads on the corporation stop. **Do not mix AWWA threads with iron pipe threads.**

Remember, only AWWA threads are recommended for direct taps on Blue Brute Pipe. **Cutting tool must be lubricated with an approved lubricant.** This will help reduce the heat generated when cutting.

Once the machine has been properly placed, place tapping blanket over assembly. This is a safety precaution.



Wrong

Over tightening one side may distort wall and stress pipe. Never use wrench extensions.

Right

Tighten both sides evenly.

Right

When using a strap, both sides should also be evenly tightened.

THE HOLE

Cut the hole; don't punch it. Rotate the ratchet handle one complete turn for every one-eighth turn of feed yoke, approximately 25mm (1") movement of feed nut to each one-quarter turn of ratchet handle.

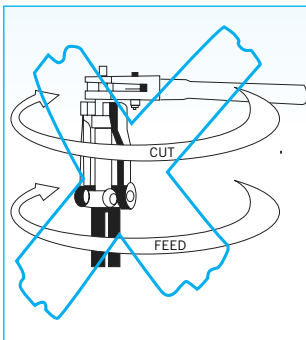
During a proper tapping operation the boring bar should rotate easily. If unusual resistance is encountered, the feed yoke is being advanced at too high a rate.

When making the threads, allow the tap to feed itself after it has a start. When withdrawing the cutter, the upward force will be about 0.6 Newtons per kilopascal (1 pound force per 1psi) line pressure.

Care should be taken to avoid damage by holding down the boring bar and releasing it slowly. The flap valve is closed and boring bar and cutter taps are removed. If flap valve is held open by the tapping tool, too much gland packing in the cap is the probable cause.

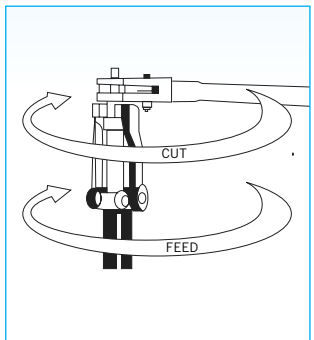
The coupon (the core of PVC retained in the cutter) is removed from the cutter using a knock-out pin. The boring bar is then replaced with an E-Z release screw plug to which a closed corporation stop is attached.

THE COUPON



Wrong

If feed rate exceeds cutting rate, the pipe may be damaged.



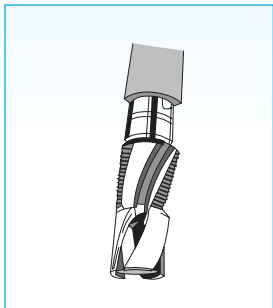
Right

Feed lightly – just enough to keep cutter engaged – “slow and steady.”

When "Coupon" is Removed

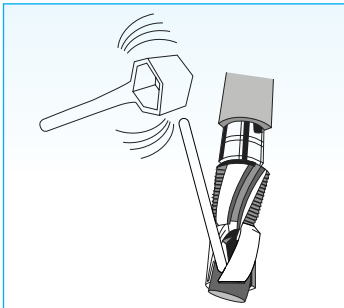
The coupon (the core of material held in the cutter head) is a good indicator of correct tapping procedure. Keep the coupons to check quality of tap.

Checking the "Coupon"



Right

Coupon retained in cutter head after tapping.



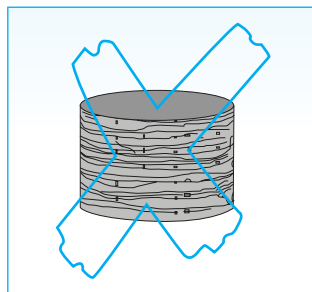
Right

Retain and examine coupons after removal.

The condition of the coupon provides a check of incorrect tapping procedure.

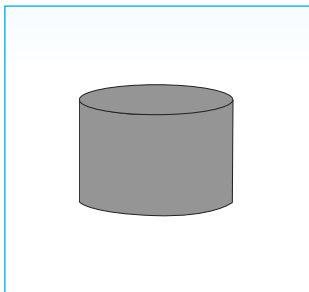
At the first sign of a "crown" or striations on the coupons, the tapping procedure or the condition of the tools should be reexamined and corrected before more taps are attempted.

INSERTING THE STOP



Wrong

Rough striations around the coupon circumference indicates a dull cutter or improper procedures.



Right

Clean edge means good cutting action.

INSERTING THE STOP

Inserting the Corporation Stop

For direct tapping, the maximum size of stop is 25mm (1"). Remember to wrap Teflon® tape around the threads.

Approximately three threads will show when stop is properly seated.

Replace top on machine. Open "equalizing" valve, and push boring bar down by hand. Hook feed yoke on boring bar and rotate ratchet handle while applying finger pressure to the feed nut. **Do not force the first few threads.** Once the first three threads are engaged, remove feed yoke and tighten the corporation stop with a torque wrench to 37 Joules (27 ft.lbs.).

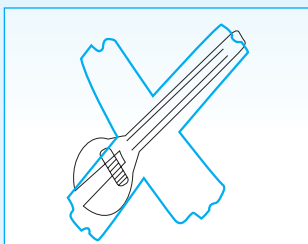
The tap is now complete. The torque wrench is snapped counter-clockwise to release the top from the E-Z Release screw plug. The tapping machine is removed from the pipe in the normal manner.

Should the stop show leakage at the threads, cuttings have been caught in the threads. If tightening to 47 Joules (35 ft.lbs.) does not stop leakage, the stop must be removed, the threads cleaned, and the stop reinstalled to 37 Joules (27 ft.lbs.) torque.



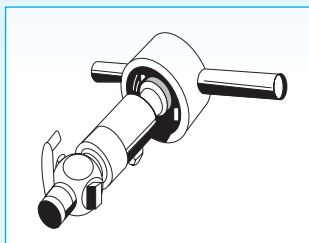
Wrong

a. Do not use any form of liquid pipe dope. Use only Teflon® thread tape wrapped around corporation thread.



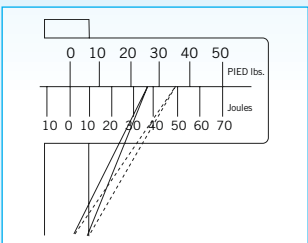
Wrong

b. Do not use ordinary adjustable wrench. Use torque wrench.



Right

a. Wrap threads clockwise with two wraps of Teflon® tape.



Right

b. Tighten stop with torque wrench to minimum 37 Joules (27 ft.lbs.), maximum 47 Joules (35 ft.lbs.).

DRY TAPS

When tapping dry, the same cutting tools are recommended; procedures are similar to those for wet tapping.

Once the tapping operation is complete, the machine can be removed and the tapped hole cleared of all cuttings before inserting the stop by hand. Wrapping with Teflon® tape is recommended.

Do not cross-thread the stop. Tighten the stop to the point where approximately three threads are showing.

The stop should be tightened to 37 Joules (27 ft.lbs.) with a torque wrench.

SADDLE TAPS

Saddles to make taps in Blue Brute pipe are available for any size or class of pipe. A service saddle or clamp can be used to make connections up to a maximum size of 50mm (2"). Above this size, a tapping sleeve and valve is required. Saddles recommended for use for PVC Pressure Pipes must provide:

- a full circle of support around the pipe
- at least 50mm (2") wide straps around the entire pipe circumference
- a body that is accurately contoured to the outside diameter of the pipe
- no distorted bearing points after it has been tightened.

Evenly tighten the saddle to the pipe. Apply Teflon® and screw the inlet side of the main stop into the saddle threads.

Open the main stop.

Using the appropriate adapter and gasket, attach the drilling machine to the main stop outlet threads. Use a machine with an operator-controlled feed rate. The use of a core drill is essential. Follow the machine manufacturer's instructions.

Lower the boring bar to the main and rotate the cutter while exerting finger-pull on the feed handle.

Withdraw the cutter; close the main stop and remove the drilling machine.

The connecting copper service pipe can be bent into a "gooseneck" from the corporation stop to allow for expansion/contraction and soil settlement. It also reduces the stress on the stop itself and allows easier assembly. IPEX's "Pipe with a Stripe" PE tubing need not be goosenecked.

- Installing an upward gooseneck causes the service pipe to rise above the grade line and invites frozen services.
- Making the tap at the side of the main and goose necking the service pipe horizontally will reduce frozen services.

COMMON SENSE

The Common Sense of Tapping (with any pipe)

1. Follow procedures in compliance with any or all occupational health and safety regulations in your area.
2. Use proper equipment including safety goggles and heavy protection blanket. The blanket should be about 1.2m x 1.8m (4' x 6') in size and should have a hole in the centre to permit installation of the tapping machine.
3. Don't over tighten machine on pipe.
4. Apply approved lubricant to sharp core cutter.
5. Cut and thread "slow and steady."
6. Use Teflon® tape on corporation stop.
7. Remember to tap slow and steady.



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