

# M86 XL Pipe Shaver

for Taper/Taper and Quick-Lock® adhesive-bonded Pipe Joints in sizes 2 to 10 inch (50 - 250 mm)

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## Introduction

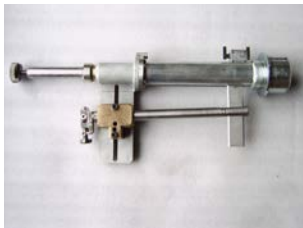
The Bondstrand® M86XL Pipe Shaver is designed to prepare a tapered or straight spigot on the cut end of a Bondstrand pipe in the size 2 to 10 inch (50 to 250 mm) allowing to fit a Bondstrand fitting with a matching tapered socket or Quick-Lock socket, as well as preparing ends for mechanical coupling e.g. Helden, Straub™, Viking Johnson™, etc.

The shaver is centred and fixed on the end of the pipe by an expanding arbor. Arbors are available for each pipe size. The arbor slips in to the pipe and the O-rings expand to grip the inside of the pipe when the tensioning bolt is tightened. The necessary arbors are not included and have to be ordered separately.

Each Bondstrand M86XL pipe shaver is supplied in a case with a 6 mm Allen® key for adjustment of tool holder, 5 mm Allen® key for adjustment of angle, Key for cutting blade and M86XL shaver instruction manual. A 19 mm spanner (not included) is required to tighten the clamping bolt. A suitable pipe vise (chain type or similar) is recommended to hold the pipe during shaving operations.

The shaver is driven by a portable power-drive type Ridgid® 700. This powerdrive is not included and has to be ordered separately.

**Note: The use of this shaving tool is restricted to Bondstrand pipe material.**



M86 XL Pipe Shaver



## EG-STATEMENT OF AGREEMENT

According to machinery directive 98/37/EG, appendix II, under a, this shaver

- \* complies with machinery directive 98/37/EG;
- \* complies with the following harmonised European Standards:  
NEN-EN 1050, NEN-EN 292-1 and NEN-EN 292-2.



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## Safety precautions

### Personal protection and safety

The following personal protection gear must be used when cutting, shaving, sanding and grinding Glassfiber Reinforced Epoxy (GRE) material:

- Safety shoes, or boots;
- Work gloves (GRE material can be very sharp and may cause cuts or splinters);
- Proper fitting and buttoned up protective clothing must be worn when operating the shaver;
- A hard hat is to be used, if the situation requires so;
- A hair net must be worn, if applicable, when shaving, cutting, grinding, etc.;
- An appropriate dust mask is to be used when cutting, shaving, grinding and sanding.

### Operational safety

For safe operation of the shaving tool, the following rules must be followed:

- Use left hand to hold the grip of power drive and the right hand to operate the power switch;
- Immediately release the power switch when the shaver seizes to avoid injury to self, or damage to tooling;
- The optional power drive torque arm must never be used for safety reasons;
- Pipe-shaver assembly must be at ergonomic height to be able to work in the proper posture;
- Ample rest should be taken to avoid physical and mental over stressing;
- Only authorized persons are to be allowed in the shaving area;
- Before starting the power drive, ensure that the shaver will run free from pipe bench, table, or support;
- Shaving area must be clearly marked as such;
- Shaving tool shall only be used to prepare spigots on Bondstrand pipe material;
- Pipe shaver shall only be operated by trained persons;
- No other type of power drive shall be used if this is working at a higher speed than the Ridgid 700;
- Maximum cutting depth to be no more than 2mm or less if circumstances require (larger diameters);
- Power drive and shaving tool must be kept in good working order to guarantee proper and safe operation. Defective parts must be exchanged, or repaired by qualified persons only.

Note: The noise level of the shaver and powerdrive is < than 70 dB (A).

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## Operating instructions

The following procedure should be carefully followed to ensure satisfactory operation of the shaver.

### A. SET THE CORRECT DIAMETER AND ANGLE

See Table 1A, 1B, or 1C (page 6-7) for required shaving angle in combination with the pipe diameter. To set the angle of the shaving arm guide block both screws have to be loosened (5 mm Allen key). The screw at the far end from the central shaft has to be removed and put in the bolt hole belonging to the required angle. Adjust the cutting blade holder for the required diameter and tighten the 2 bolts. (*photo 1*).

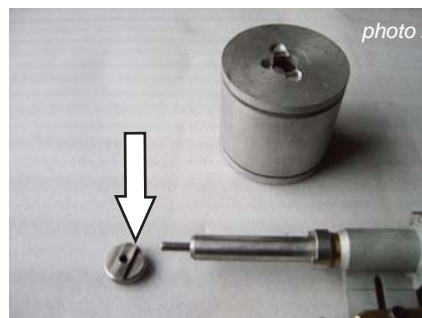
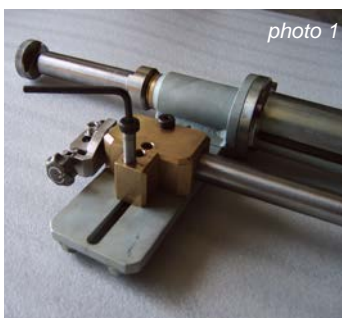
### B. FITTING THE ARBOR

- 1) The round nut (part no. 1) is removed from the tensioning bolt (*photo 2*).
- 2) The correct size arbor is mounted on the shaft.
- 3) The nut is replaced taking care that the protrusions on the nut and on the shaver shaft do engage in the slots. The nut and tensioning bolt are not tightened until the arbor has been fitted into the pipe to be shaved.

### C. THE TAPER CUTTING ANGLE

Make sure that the correct taper angle (see Table 1A, 1B, or 1C) is set on the shaver.

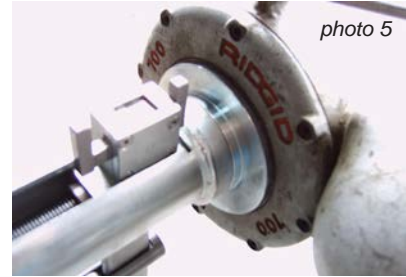
**Warning:** Incorrect angle setting will result in joint failure!



## Operating instructions c'tnd

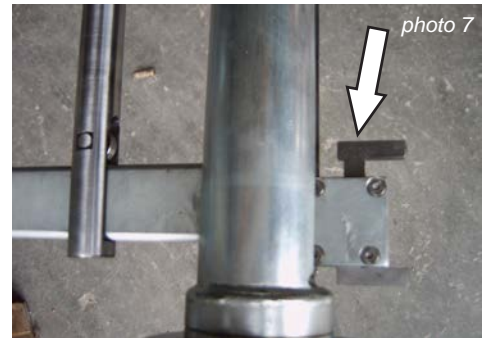
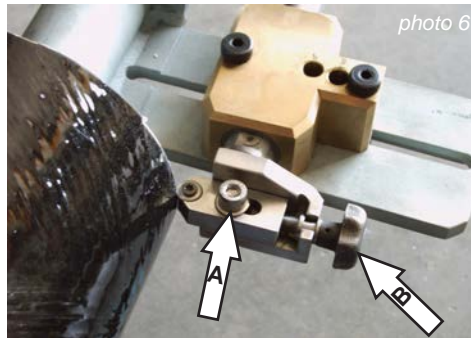
### D. FIT THE SHAVER TO THE PIPE

The shaver with the appropriate fitted arbor is slid in to the pipe so the arbor is completely in the pipe and flush with the cut pipe end (*photo 3*). The shaver is then lifted somewhat while the central tensioning bolt is firmly tightened (*photo 4*). This to ensure that the shaver is mounted as squarely as possible in to the pipe. After positioning the shaver on the pipe and tightening the tensioning bolt, the power drive (not included) is fitted onto the power drive adapter of the shaver. The spring-loaded keys will automatically engage in the keyway when rotating (*photo 5*).



### E. ADJUST THE CUTTING TOOL

Loosen the tool holder clamping bolt (*part A, photo 6*) in order to turn the adjusting screw (*part B, photo 6*) on the back of the cutting tool for changing the cutting depth. The cutting tool should be adjusted to give a cut of max. 2 mm depth. One turn of the adjusting screw on the back of the cutting tool changes the cutting depth by 1 mm. So, a maximum of 2 mm cutting depth is accomplished by two clockwise turns, reduces the pipe spigot diameter by 4 mm.



### F. ENGAGE THE CUTTING TOOL FEED

The feed is engaged by moving the feed flock locking bar towards the arbor (*photo 7*). Once engaged, rotate the shaver frame clockwise around the threaded feed tube with the power drive and the cutting tool automatically advances.

### G. RETURN THE CUTTING TOOL

First turn the cutting tool free from the pipe. Then the feed is disengaged by moving the feed flock locking bar mentioned in point F away from the main frame and the cutting bar assembly. Reset to its original position. Repeat steps E and F until the required spigot diameter is achieved as indicated in Table 1A, 1B, or 1C. The M86XL shaver automatically disengages the feed mechanism at the maximum limit of the tool holder travel. After shaving, the spigot nose diameter at the end of the pipe should be measured and have the dimension as per Table 1A, 1B, or 1C.

### H. RETRACT THE CUTTING TOOL

As in point G.

### I. REMOVE POWER DRIVE

### J. RELEASE CENTRAL TENSIONING BOLT

The shaver can now be removed from the pipe. Care should be taken to pull the shaver straight out of the pipe in order not to damage the thin front edge of the spigot.

### K. MAINTENANCE

This shaver is designed to be a maintenance-free unit. The following measures should be followed:

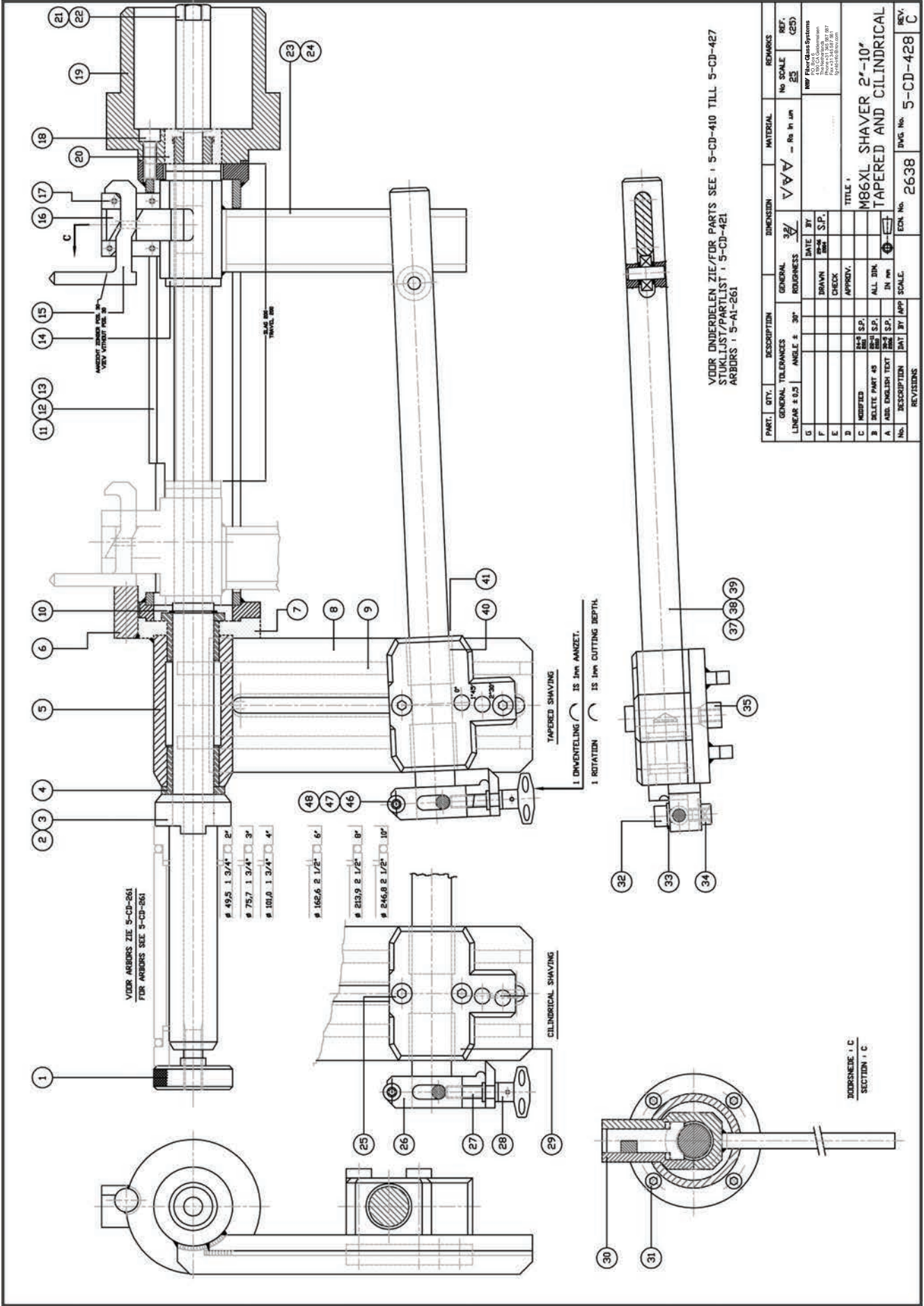
1. Clean the shaver on a daily basis. Pay special attention to the threaded feed tube and its associated components;
2. Check cutting blade twice a day (minimum). A dull cutting edge results in unnecessary strain on the automatic feed components. The cutting edge can be loosened using a crosshead type screwdriver and turned to provide a new sharp edge. This can be done until the complete blade is dull. Cutting blades are available from NOV Fiber Glass Systems.

**Part List for M86 XL Pipe Shaver (Drawing Ref: 5-CD-428)**

<b>Part #</b>	<b>Qty</b>	<b>Description</b>	<b>Dimension</b>
1	1	Nut	Ø 50x20
2	1	Shaft	Ø 30.4 x 579
3	1	Ring	Ø 48 x 25
4	2	Bearing bushing	Ø 40 x 30
5	1	Case	Ø 50 x 96
6	1	Bar	Ø 15 x 33
7	1	Flange	Ø 85 x 13
8	1	Plate	10 x 85 x 205
9	1	Strip	8 x 20 x 225
10	1	Press spring	Ø 26-DIN 471
11	1	Pipe	Ø 60x5 length 270mm
12	1	Flange	Ø 85x12
13	1	Flange	Ø 70x4
14	2	Guiding bush	St.7366-30-24 x 022
15	1	Wedge	7.5 x 32 x 66
16	1	Thread block	20 x 24 x 50
17	4	Screw (countersink)	M4 x 16 DIN 7991
18	4	Screw (cylinder)	M8 x 25 DIN 912
19	1	Bush	Ø 110 x 99
20	1	Bearing nut	Ø 36 x 22
21	1	Bar	Ø 12 x 704
22	1	Nut	Ø 22 x 49
23	1	Case	36 x 68 x 79
24	1	Strip	10 x 40 x 155

<b>Part #</b>	<b>Qty</b>	<b>Description</b>	<b>Dimension</b>
25	2	Screw	M8 x 10h8 x 40 UPS
26	1	Toolbit holder	230-35-0202-N112-1
27	1	Spindle	Ø 12 x 43
28	2	Knob	DIN 6336-GG-32-M6-E
29	1	Block	36 x 80 x 85
30	1	Cover	10.5 x 40 x 58
31	4	Screw (cylinder)	M6 x 20 DIN 912
32	1	Screw (cylinder)	M8 x 30
33	1	Washer	M8 DIN 125A
34	1	Nut	13 x 13 x 8
35	1	Strip	13 x 16 x 80
36	-	-	-
37	1	Head	30 x 32.5 x 52.5
38	2	Stylus	Ø 6 x 30
39	1	Bar	W25h6 x 370
40	2	Ring	IR-25 x 29 x 30
41	2	Screw	M5 x 8
42	1	Bearing	SKF Nø 608-2RSI
43	1	Cylinder pin	Ø 8 x 25
44	1	Washer	Ø 8 x Ø 14 x 1.2
45	-	-	-
46	1	Toolbit	Sandvik
47	1	Insert	Sandvik
48	1	Screw	Sandvik

# Shaver & Assembly Drawing (Drawing Ref: 5-CD-428)



# Shaving Joint Dimensions

Table 1A: For Taper joints Series 2400

Nom. Pipe Size	Taper angle	Nose thickness		Spigot dia at nose		Nose thickness		Spigot dia at nose		
		A	B	A	B	A	B	A	B	
<b>mm    degr.</b>		<b>2410</b>			<b>2412</b>			<b>2414</b>		
50	1.75	1.0	55.2	1.0	55.2	1.0	55.2	1.0	55.2	
75	1.75	1.0	83.8	1.0	83.8	1.0	83.8	1.0	83.8	
100	1.75	1.0	107.2	1.0	107.2	1.0	107.2	1.0	107.2	
150	2.50	1.0	161.0	1.0	161.0	1.0	161.0	1.0	161.0	
200	2.50	1.0	210.8	1.0	210.8	1.0	210.8	1.0	210.8	
250	2.50	1.0	264.9	1.0	264.9	1.0	264.9	1.0	264.9	
<b>mm    degr.</b>		<b>2416</b>			<b>2420</b>			<b>2425</b>		
50	1.75	1.0	55.2	1.0	55.2	1.0	55.2	1.0	55.2	
75	1.75	1.0	83.8	1.0	83.8	1.0	83.8	1.0	83.8	
100	1.75	1.0	107.2	1.0	107.2	1.0	107.2	1.0	107.2	
150	2.50	1.0	161.0	1.0	161.0	1.0	161.0	1.0	161.0	
200	2.50	1.0	210.8	1.0	210.8	1.0	210.8	1.0	210.8	
250	2.50	1.0	264.9	1.0	264.9	1.5	265.9	1.5	265.9	
<b>mm    degr.</b>		<b>2432</b>			<b>2440</b>			<b>2450</b>		
50	1.75	1.0	55.2	1.0	55.2	1.0	55.2	1.0	55.2	
75	1.75	1.0	83.8	1.0	83.8	1.5	84.4	1.5	84.4	
100	1.75	1.0	107.2	1.5	108.2	2.0	109.2	2.0	109.2	
150	2.50	1.0	161.0	1.5	162.0	2.0	163.0	2.0	163.0	
200	2.50	1.0	210.8	1.5	211.8	2.5	213.8	2.5	213.8	
250	2.50	1.5	265.9	2.5	267.9	3.0	268.9	3.0	268.9	

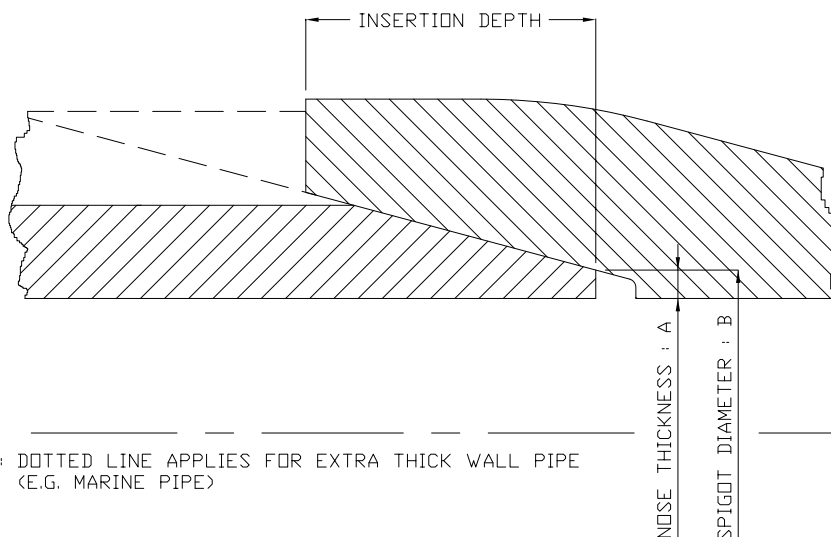
**Note:**

1. All dimensions are in mm
2. For insertion depth refer to pipe/fitting datasheets

Table 1B: For Taper/Taper joints Series 2000M / 7000M

Nom. pipe size (mm)	Taper angle (deg.)	Nose Thickness A	Nom. Insert Depth B	Spigot Diameter at Nose C
200	2.5	3.1	65	215.2
250	2.5	4.1	80	271.2

TAPER - TAPER JOINT

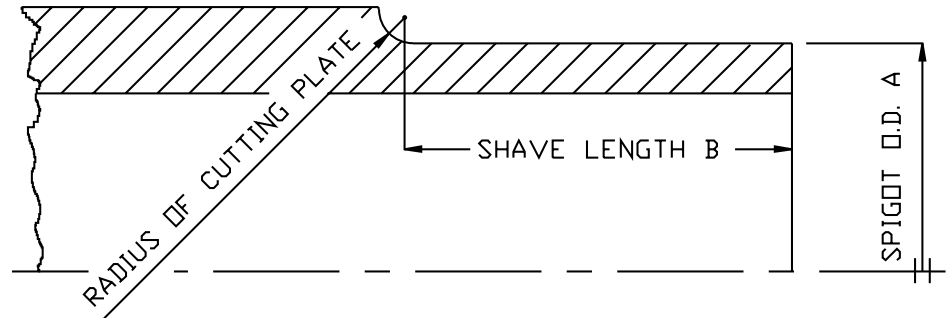


NOTE : DOTTED LINE APPLIES FOR EXTRA THICK WALL PIPE (E.G. MARINE PIPE)

## Shaving Joint Dimensions

Table 1C: For Quick-Lock (straight taper) joints

Pipe diameter mm	Shave angle degr.	Spigot diameter		Shaved length	
		minimum mm	maximum mm	minimum mm	maximum mm
50	0	59.2	59.6	49	52
75	0	87.6	88.0	49	52
100	0	112.5	112.9	49	52
125	0	139.5	139.9	59	62
150	0	166.2	166.6	59	62
200	0	217.1	217.5	65	68
250	0	271.3	271.7	71	74



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