

Calculation of the Angle of Undercut of the Rubber at the Pocket Openings
Using the original B&SCC templates
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The angle of undercut of the rubber can be calculated using dimensions taken from the Standard Templates designed by the late Norman Clare of Clare Padmore Billiard Table Manufacturers in Liverpool and originally issued by the B&SCC. There is a pair of templates for the corner pockets and a pair of templates for the middle pockets. Either pair can be used to make the calculations.

The pairs of templates are designed to test the dimensions of the pockets. The thicker narrower template is used to test the opening of the pocket. The thinner wider template is used to test the amount of undercut at the fall of the slate and the location of the fall of the slate. When the rubbers are being fitted and shaped the cushion rails can be bolted to the table bed and the pocket opening template can be used to mark the rubbers for the correct shaping. However the undercut template can only be used after the shaping has been completed. Knowing the undercut angle in degrees allows the correct amount of undercut to be given to the rubbers when they are being fitted. In other words the guesswork is eliminated. The angle of undercut will be calculated using measurements taken from the corner pocket templates.

The template used to test the shape and size of the pocket opening is 3&1/2" (88.9mm) wide at the fall of the slate and 1&1/2in (38.1mm) high. The template used to test the under cut and location of the fall of slate is 3&6/8" (95.25mm) wide and 1&3/16" (30.15mm)high.

The difference in width of the two templates is 1/4" (6.35mm)

The difference in height of the two templates is 7/16" (7.95mm)

A right angle triangle simulating the angle of undercut can be created using these differences in template size.

Half the difference in width forms the base of the right angle triangle is 1/8inch

The difference in height forms the perpendicular height of the triangle is 5/16inch

Using simple trigonometry:

$$\tan \theta = 1/8 \div 5/16 \text{ or } (6.35 \div 2) \div 7.95 = 0.400$$

$$\tan \theta = 1/8 \times 16/5$$

$$\tan \theta = 0.400$$

$$\theta = 22^\circ$$

Hence the degree of under cut at the fall of slate is 22°

Note: Rubbers on many tables have an undercut in excess of 30° which probably makes the pocket opening generous for balls entering straight in, however rail balls tend to be trapped between the undercut rubber angle and the slate, (creating the white indentation in the bed cloth), then deflecting the ball to the opposite jaw before it either falls into the pocket or stays out. If there is no undercut then the white indentations may not form.

Recently the I.B.S.F began to use the Wiraka® templates to standardize the tables in international competition. These templates have no undercut and have marginally tighter pocket openings.

A further improvement would be to standardize the amount of rubber that turns into the pocket opening. This could be achieved by standardizing the gap between the timber rails.

For example the gap between centre pocket rails is 3.5 inches.

If it is desired to tighten these pocket openings then more rubber is needed to curve into the pocket.

From a billiard table fitter's point of view it would be better to make the gap 3.25 inches so that less rubber is needed to create the required opening.

Note: The dimensions and shape of the wooden blocks that the rubbers are glued to can influence the shape of the pocket openings, but that's another story.

