Mirror Making Strokes

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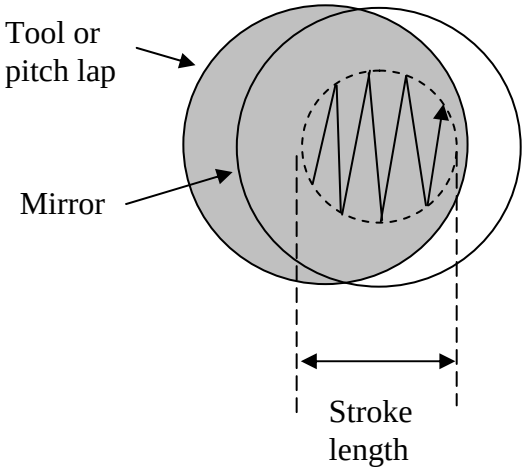
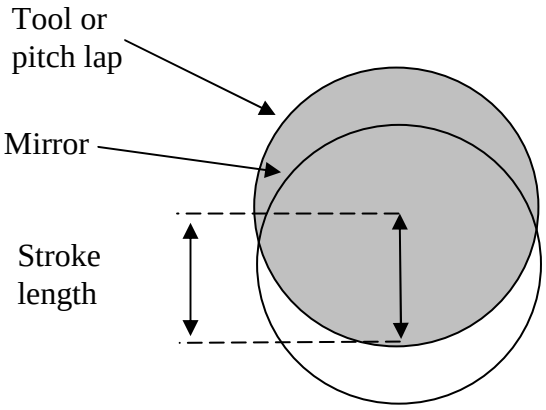
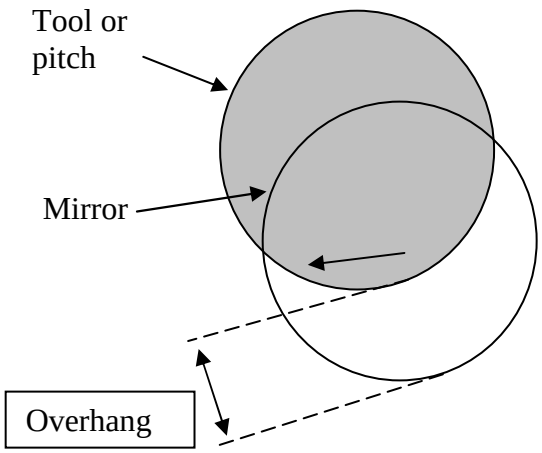
The principle mirror making strokes, starting with full sized tool or lap are described below. It is important to realise that these strokes can be used both in grinding (with a tile and cement tool or similar) and polishing (with a pitch lap). Also the position of the tool (or lap) and mirror can be reversed. Grinding or polishing with the mirror on top is referred to as MOT, with the mirror underneath and the tool (or lap) on top is referred to as TOT. The strokes are described below with the mirror on top, MOT.



The 'W' Stroke. The centre of the mirror draws an imaginary 'w' during its movement. The stroke length can vary, typically it can be 1/3 D (where D is the diameter of the mirror), so for a 12 inch mirror a 1/3 W Stroke would be 4 inches in length. The maximum overhang of the mirror over the lap would be 2 inches.



The Centre through Centre stroke. The centre of the mirror draws an imaginary straight line passing through the centre of the tool or pitch lap. The stroke length can vary depending on the action required. As with the w stroke the stroke length is given as a fraction of the mirrors diameter.



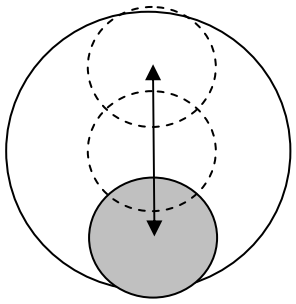
The Chordal Stroke. The centre of the mirror draws an imaginary chord along the tool or pitch lap. The important factor here is the overhang which is usually given as a percentage of the mirrors diameter. With a 12 inch mirror a 40% overhang will be 4.8 inches. The stroke length will be determined by the degree of overhang.

Using the strokes.

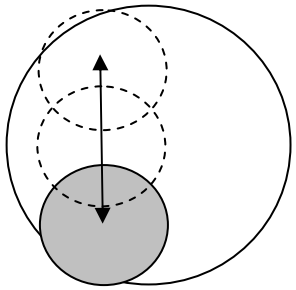
The 'W' stroke.	Used during smoothing at the grinding stage, and during polishing with a pitch lap, to maintain good contact and keep the mirror and tool spherical
The Centre through Centre stroke.	Can be used during polishing with a long stroke to deepen the centre working MOT. Working MOT with a short stroke it will reduce a turned edge
The Chordal Stroke.	A more extreme method of deepening the centre of the mirror when working MOT.

Sub Diameter Tools and Laps.

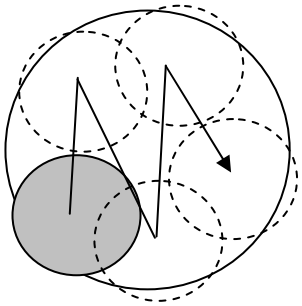
Sub diameter tools and laps are very useful to the telescope mirror maker, with such tools or laps the mirror is always worked face up with the tool or lap on top of it. This has the advantage that the mirror can be supported from underneath thereby reducing the chances of the mirror flexing which can result in astigmatism in the finished mirror. The diameter of sub diameter tools or laps can vary depending upon the intended function; here we shall limit our discussion to tools and laps of 50% the diameter of the mirror being worked. The strokes that can be employed with these tools and laps include the following;



Centre through centre stroke. Using a 50% diameter tool or lap which ends with a slight overhang on each stroke. Use for example, to rough in a curve on a mirror blank. Usually results in a non spherical curve which is deeper in the centre.



Off Centre stroke. The distance off centre may be given as a percentage of the mirrors diameter. A 50% offset stroke may be used for grinding the back of the mirror flat, or after a centre through centre stroke to bring the mirrors profile closer to a sphere.



'W' stroke. The lap is moved in a 'w' pattern across the mirror with slight overhang. The stroke is used to parabolise a spherical mirror, gradually deepening the centre. A 50% diameter pitch lap is used.

It is not necessary to stick exactly to the description of the stroke whilst working; indeed it is probably not possible to do this in practice. A certain degree of randomness in the action is an advantage for it blends in the action of the previous stroke. In this sense hand work has an advantage over machine work which does accurately reproduce the stroke constantly and this can result in the formation of zones on the surface of the glass.