

Rubbers.

By using different shapes of rubber, you can make a rosette look very different.

An engineer would call the rubber a cam follower. An engine turner refers to it as the “touch”
It's the fixed point that the rosette presses against.

That's the key point. It should be fixed, solidly.

See how sturdy the rubber supports are on most old rose engines. Clamping arrangements are usually based on square or triangular bars, to avoid any twisting. You don't have to copy the old machines, but the rubber shouldn't move at all under pressure. Even slight flexing is unacceptable.

The rubber can normally be mounted in front of, or behind the mandrel. If cutter and rubber are both in front, the cutter won't dig into the work if the rubber loses contact with the rosette. If the rubber's behind, the action is less forgiving, but the pressure of the cutter against the work, helps hold the rosette against the rubber. With cutter and rubber both in front, you generally copy the shape of the rosette. With the rubber behind, you reverse the shape. Some small machines only have one rubber support at the front. To reverse the shape, you move the cutter behind centre.

With a swivel-head machine, when the pivot point is between rosette and work, you get the reverse of what you might expect.

Rubbers can be made of any rigid, durable material that won't damage your rosettes. If you're using metal, it's essential to get it really smooth, and bring it to a high polish. Plastics like PTFE, HDPE, acetal and lubricated nylon can all be used. I've not tried PTFE, but the others are easy to machine.

Early British machines used a small roller as the rubber. The modern equivalent is a ball bearing, like the ones used as guides for router cutters. I pinch the blade guides from my bandsaw.

Traditional rubbers point inward towards the centre. Mine are side-on to the rosette. This makes it much easier using the blade guides as rubbers, and if I want a really small radius, it's easy to polish-up a bit of thin silver steel in the lathe, or turn the required radius on nylon rod.

I use a banjo (toolrest holder) from an old woodturning lathe, with a sturdy brass pillar, and a hole at the right height to take the rubber. When I need a broad, flat rubber, I use the pillar itself.

I suspect the owner of a fine rose engine would be horrified at the idea, but I quite often use a bit of oil or grease to ease the rosettes over the rubber, particularly for brass on brass contact.

The shape of the rubber determines the shape produced on the work.

Rubbers for swash plates must be convex.

Rubbers for lateral rosettes can be anything, from small convex, through flat to shallow concave.

Looking at the effect on concave scoops :

A small radius copies the shape. As the radius increases, the points grow more rounded, producing a sine wave, of sorts. When the rubber is broad enough to bridge 2 points on the rosette, the shape reverses giving convex lobes. The height of the lobes depends on the radius of the rubber. As it gets larger, the lobes get shallower. This is as far as you can go with the rubber for a swash plate.

For lateral rosettes, you can carry on reducing the throw with a broad flat rubber, and even a broad, shallow concave. When the concave curve is the same radius as the rosette, it just produces a circle. A broad, flat rubber is often used with polygonal rosettes to produce convex lobes. It's usually easier than trying to copy a convex lobed rosette. If you reverse a star into a flower using a broad flat rosette, the centres of the petals will come at the same positions as the points of the star. If you reverse a star by moving the cutter beyond centre, the points of the star produce the incuts between petals.

You could use shaped rubbers, broad enough to bridge 2 points, to add shape to the humps. If you

want to produce convex lobes with sharp incuts from a concave rosette, it's best to work with a broad flat rubber to reverse the shape. It produces much sharper incuts than you'd get from a small rubber on the reverse side of the machine.

The rubber should normally be mounted at centre height. If it is above or below, it steepens one side of the lobe, and makes the other side smoother. You can continue the design to the centre of the work. You get similar effects by raising or lowering the cutter, but if the cutter's not on centre height, you can't take the pattern to the centre.