

Measuring the diameters of diaphragm springs

Why should diameters be measured in flat position?

We recommend the diameters of diaphragm springs be specified and measured in flat position for the following reasons:

1. Effect of edges:

Blanked edges: If you measure a diaphragm spring with blanked edges in free condition, you measure across the burr edge (see sketch). The burr edge is formed by the punch exit, the shape of which depends on the condition of the tool used (clearance, wear), the milling texture and the hardness of the material. These factors require approximately twice the diameter

tolerance as when measured in flat position. In flat position, the punch entry is measured which has a precisely defined geometry.

Turned edges with a radius: Here, the variation of the edge radius affects the measurement result, whereas in flat position the dimension is provided by the precisely observed turned diameter.

2. Effect of free height

The free height of a diaphragm spring plays a large part in determining

diameters, the inner diameter in particular. This applies especially to slotted springs with long fingers. Free height is usually for reference only, as in most cases it is not a functional dimension. It is also smaller for a preset spring than for a non-preset spring. These non-definable influences can be eliminated by carrying out measurement in flat position.

The spring to be measured is placed in a press in flat position using a special fixture that allows measurement using (e.g.) a vernier.

