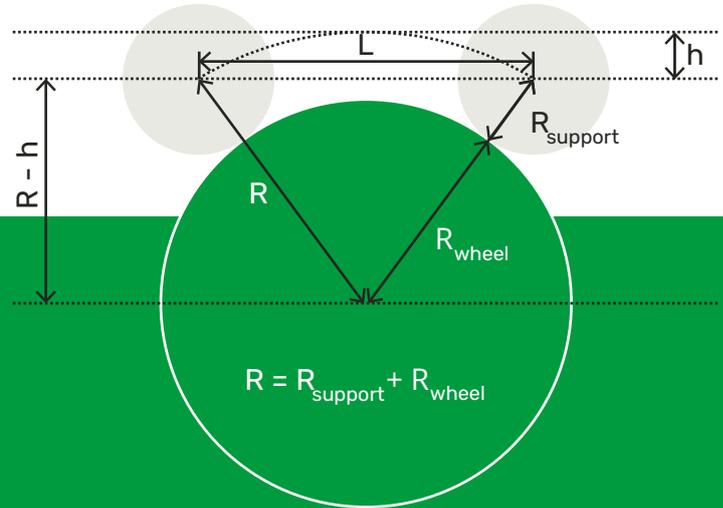


VERSINE MEASURING PRINCIPLE

The diameter measurement of the MiniProf Wheel 400 is based on the commonly used versine measuring principle, assuming an ideal wheel with no deformations and perfect surface conditions.



$$R_{\text{wheel}} = \frac{(\frac{1}{2}L)^2 + h^2}{2h} - R_{\text{support}}$$

Based on a 100% perfect wheel, the MiniProf 400 provides theoretical diameter accuracy depending on the size of the wheel being measured, as outlined in the schedule to the right.

Wheel diameter	MiniProf Wheel 400
800 mm	30 μm
1000 mm	50 μm
1200 mm	80 μm

The versine measuring principle is used by Greenwood Engineering and most manufacturers of similar full-contact and non-contact handheld measuring systems. Regardless of the manufacturer, it is crucial to understand that even minor defects or surface irregularities on the measured wheel flanges can cause significant inaccuracies in the diameter readings.

For instance, a small 0.1 mm dent on the flange of a 1000 mm wheel could lead to a diameter deviation of up to 2.2 mm. Please refer to the error amplification factor as illustrated below:

Error amplification (times)

ERROR AMPLIFICATION AS FUNCTION OF WHEEL DIAMETER

