



Metric Reference Tool Mk.2



UF_Icarus

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Summary

A real-world reference card to judge metric distances while designing models.



0.55 hrs



3 pcs



0.30 mm
0.20 mm



0.40 mm



PLA



9 g



Prusa
MK3/S/S+

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— Measurements —

Card Dimensions: 100mm x 50mm x 2mm (+0.3mm for SF_ and +1.0mm for TF_)

Gap Measurements: 1mm, 2mm, 3mm, 4mm, 5mm, 10mm, 20mm

Hole Measurements (Ø): 1mm, 2mm, 3mm, 4mm, 5mm, 10mm, 20mm

Slot Measurements: 60mm, 70mm, 80mm

Exterior Edge Measurements: 30mm, 40mm, 50mm, ~65mm, 100mm

— Model Variants —

“Short Feature” (SF_) indicates a 0.3mm top layer for multi-color printing with layer color changes. Use this if your top-layer color is very opaque. Main card body is 2mm tall. Total height is 2.3mm.

“Tall Feature” (TF_) indicates a 1.0mm raised surface for multi-color printing through layer color changes if you have less opaque filament, or if you want to print in one color. Main card body is 2mm tall. Total height is 3.0mm.

— Notes For Printing —

- **Make sure you're printer is well-tuned and you don't get elephant foot artifacts** on your prints; this will make using the card to actually measure things more difficult.
- **Make sure you're using a dimensionally-stable filament** or make the proper adjustments for shrinkage. The round holes in this print will be a problem area if your extruded filament shrinks when it cools; it will cause the holes to be smaller than they should be.
- Filament test swatches are useful for judging **opacity** of single layer extrusions.
- **Top-Layer ironing will likely improve the finish** quality of the print, if you have the time.

— Background —

Back in ye 'olden times of 2018 when I got my first 3D printer, I found myself struggling to get an idea of real-world sizes drawing in CAD programs. **Growing up in the United States and using freedom-units all of my life, applying the metric system was awkward**; I could draw you a 1-inch circle, but would have no idea how to approximate a 25mm circle.

I gave up trying to draw my first model, whatever it might have been, and instead prioritized making this card as my first ever design. With it, I could glance down at it and judge appropriate distances between different features of my drawings and how they would appear in a physical space. I also have found it incredibly useful for scaling artistic models to print to see how tall they'll be.

This model has been indispensable for me. Having referenced it for over 6 years at this point, I've gotten a great handle on visualizing dimensions in the metric system.

As I am finishing moving over from other 3D printing repo sites that I am dissatisfied with, I decided it was time to make some improvements and redo my first-ever model.

Version 2 has been improved by cramming in more meaningful ways to measure distances into the same card and removing some less-important measurements.

Model files



sf_metric_reference_tool_mk2.stl

☐ 0.3mm top features.



tf_metric_reference_tool_mk2.stl

☐ 1.0mm top features.

Print files



sf_mrtv2colors_03mm_pla_mk3s_33m.gcode

% PLA (0.40 mm # 0.30 mm ⌚ 0.55 hrs ⚖ 9 g ! Prusa MK3/S/S+

☐ Solid part with color change for top layer. 2mm main body, 2.3mm total height.



tf_mrtv2colors_02mm_pla_mk3s_48m.gcode

% PLA (0.40 mm # 0.20 mm ⌚ 0.80 hrs ⚖ 10 g ! Prusa MK3/S/S+

☐ Solid part with color change. 2mm main body, 3mm total height.



tf_mrtv2single_02mm_pla_mk3s_48m.gcode

% PLA (0.40 mm # 0.20 mm ⌚ 0.80 hrs ⚖ 10 g ! Prusa MK3/S/S+

☐ Solid part, no color changes. 2mm main body, 3mm total height.

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