

Tolerances

Listed below are reasonable tolerances for students working in our lab. The ability to work to close tolerances is a skill that can be acquired with time, but some people seem to have a natural ability for it and others do not. Your results may vary. Tolerances must reflect a balance between what is required for correct function of the device being made, and what is possible in our shop. Function must always take first place, but a design that requires unreasonable tolerances is a poor design. Specifying tolerances that are too close is just as poor a practice as specifying them too loose since it adds needlessly to costs. Much closer tolerances are possible for work done by the Tech Shop, perhaps by a factor of 10.

OPERATION	TYPICAL TOLERANCE (inch)	POSSIBLE TOLERANCE (inch)
turning on lathe diameter	+/- .005	+/- .001
turning on lathe length	+/- .015	+/- .005
drilling, all machines diameter	+/- .008 per inch diam.	+/- .002
reaming, all machines diameter	+/- .001	+/- .0005
drilling, drill press layout/center punch hole location	+/- .030	+/- .015
drilling, milling machine hole location	+/- .005	+/- .001
milling flat surfaces	+/- .005	+/- .001
boring in lathe or mill diameter	+/- .005	+/- .001
band saw, dimensions	+/- .030	+/- .015
welding, dimensions on weldments	+/- .13	+/- .06
castings	+/- .13	+/- .03
tube bends, angle	+/- 5°	+/- 3°
radius	+/- .25	+/- .06
location	+/- .25	+/- .06