AUTOCAD 2024 — SCALING & UNITS | Quick Reference Card

Architectural • Engineering • Civil • Metric

UNIT CONVENTIONS

Discipline	1 Unit =	Format
Architectural	1"	ft-in-frac
Engineering	1"	ft-dec-in
Civil/Survey	1 ft	decimal ft
Metric Mech.	1 mm	decimal mm
Metric Civil	1 m	decimal m

INSUNITS VALUES

Val	Unit — Set When
0	Unitless (no auto-scale)
1	Inches (arch / mech)
2	Feet (civil 1u=1ft)
4	Millimeters (metric)
6	Meters (large metric)

METRIC ↔ IMPERIAL CONVERSIONS

From → To	Multiply By
in → mm	25.4 (exact)
mm → in	0.039370
ft → mm	304.8
mm → ft	0.003281
ft → m	0.3048
m → ft	3.28084
in → m	0.0254
m → in	39.3701

■ CORE: 1 inch = 25.4 mm (exact)

mm→inch insert: scale x 0.03937

inch→mm insert: scale x 25.4

MEASUREMENT: 0=Imperial 1=Metric

Set INSUNITS before drawing anything

ARCHITECTURAL SCALE FACTORS (1 unit = 1 inch)

Drawing Scale	SF	VP XP Zoom	LTSCALE	Txt 1/8"
3" = 1'-0"	4	0.25000	4	0.50"
1-1/2" = 1'-0"	8	0.12500	8	1.00"
1" = 1'-0"	12	0.08333	12	1.50"
3/4" = 1'-0"	16	0.06250	16	2.00"
1/2" = 1'-0"	24	0.04167	24	3.00"
3/8" = 1'-0"	32	0.03125	32	4.00"
1/4" = 1'-0"	48	0.02083	48	6.00"
3/16" = 1'-0"	64	0.01563	64	8.00"
1/8" = 1'-0"	96	0.01042	96	12.0"
3/32" = 1'-0"	128	0.00781	128	16.0"
1/16" = 1'-0"	192	0.00521	192	24.0"

```
SF = 12 / (plot-inches-per-foot)
Example: 1/4"=1' → 12/0.25 = SF 48
VP Zoom = 1/48xp
Model text ht = 0.125" x 48 = 6"
```

IMPERIAL UNIT FORMATS COMPARED

Same Value	Architectural	Engineering
18 units	1'-6"	1'-6.0000"
18.5 units	1'-6 1/2"	1'-6.5000"
100 units	8'-4"	8'-4.0000"

CIVIL / ENGINEERING SCALE FACTORS (1 unit = 1 foot)

Drawing Scale	SF	VP XP Zoom	LTSCALE
1" = 10'	10	0.10000	10
1" = 20'	20	0.05000	20
1" = 30'	30	0.03333	30
1" = 40'	40	0.02500	40
1" = 50'	50	0.02000	50
1" = 60'	60	0.01667	60
1" = 100'	100	0.01000	100
1" = 200'	200	0.00500	200
1" = 500'	500	0.00200	500

```
Civil SF = feet-per-inch (1u=1ft)
1"=50' → SF=50 | XP=1/50xp
NOTE: if 1u=1": SF = ft x 12
1"=50' w/ 1u=1" → SF = 600
```

METRIC SCALE FACTORS (1 unit = 1 mm)

Scale	SF	VP XP Zoom	LTSCALE
1:1	1	1.00000	1
1:2	2	0.50000	2
1:5	5	0.20000	5
1:10	10	0.10000	10
1:20	20	0.05000	20
1:50	50	0.02000	50
1:100	100	0.01000	100
1:200	200	0.00500	200
1:500	500	0.00200	500
1:1000	1000	0.00100	1000

```
Metric SF = ratio denominator
1:100 → SF=100 | XP=1/100xp
```

MASTER FORMULAS

```
Scale Factor = Real size / Drawing size
VP Zoom XP = 1 / Scale Factor
Model Text Ht = Plotted Ht x Scale Factor
LTSCALE = Scale Factor
DIMSCALE = Scale Factor (non-annot.)
Arch SF = 12 / (plot in / ft)
mm→in import = insert x 0.03937
in→mm import = insert x 25.4
```

MODEL SPACE TEXT HEIGHT

Plot Ht	SF=24	SF=48	SF=96	SF=100
3/32"	2.25"	4.50"	9.0"	9.375"
1/8"	3.00"	6.00"	12.0"	12.5"
3/16"	4.50"	9.00"	18.0"	18.75"
1/4"	6.00"	12.00"	24.0"	25.0"

STANDARD SHEET SIZES

Size	Dimensions	Use
ANSI A	8.5" x 11"	Letter
ANSI B	11" x 17"	Tabloid
ANSI D	22" x 34"	Eng std
Arch D	24" x 36"	Residential
Arch E	36" x 48"	Commercial
ISO A1	594x841mm	Metric
ISO A0	841x1189mm	Metric lg

SYSTEM VARIABLES

Variable	Controls / Typical Value
UNITS	Unit display dialog (UN)
INSUNITS	Auto-scale on INSERT
MEASUREMENT	0=Imperial 1=Metric
LTSCALE	Linetype scale = SF
PSLTSCALE	1=auto VP linetype
DIMSCALE	Dim overall size = SF
CANNOSCALE	Active annotation scale
HPSCALE	Hatch pattern scale