

Introduction to Engineering Dimensioning – 1

Units & Scales

Goals

- Understand units and measures
- Understand concepts of scaling and types of scales

Units of Measure

- Measurement of length and angle are used in Engineering Graphics
- Length
 - English - Inches, unless otherwise stated
 - Up to 72 use inches, use a combination of feet and inches for measures over 72 inches
 - SI – millimeter, mm
- Angle (angular measurements)
 - Degrees, minutes, seconds (60° 30' 20")

Terms and definitions - Scaling

- **Scaling** a drawing is a process for making an object fit the dimensions of the display media (e.g. paper)
- Scales are tools used to scale a drawing while creating it – **a conversion factor is built into the measurement.**

More on length measurements

Three Common Types (Labels) for Scales

| Architect's Scales | | |
|--------------------|----------|---------|
| Full Size | 1" = | 0'1" |
| Quarter Size | 3" = | 1' - 0" |
| One-eighth | 1 1/2" = | 1' - 0" |
| One-twelfth | 1" = | 1' - 0" |
| | 3/4" = | 1' - 0" |
| | 1/2" = | 1' - 0" |
| | 3/8" = | 1' - 0" |
| | ... | |

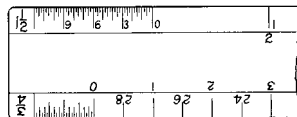
| Mechanical Engineer's Scales | | |
|------------------------------|---|----|
| 2" | = | 1" |
| 1 1/2" | = | 1" |
| 1" | = | 1" |
| 3/4" | = | 1" |
| 1/2" | = | 1" |
| 1/4" | = | 1" |
| 1/8" | = | 1" |

| Civil Engineer's Scales | | |
|-------------------------|---|-------|
| 1" | = | 10.0' |
| 1" | = | 20.0' |
| 1" | = | 30.0' |
| 1" | = | 40.0' |
| 1" | = | 50.0' |

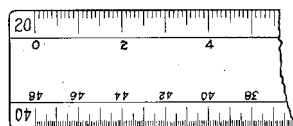
More on length measurements

Types of Scales by Presentation

Open-divided

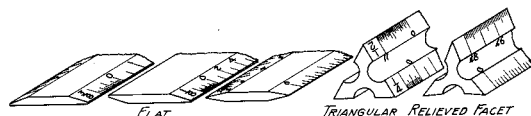


Full-divided



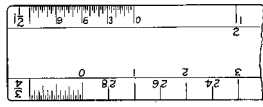
More on length measurements

Types of Scales (Tools) by Construction



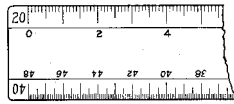
Architect's Scale –

- Major Unit = 1 foot
- Divisions = inches



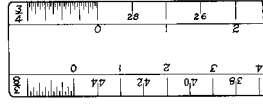
Civil Eng. Scale –

- Major Unit 1 inch = 10's of feet
- Divisions = tenths



Mech. Eng. Scale –

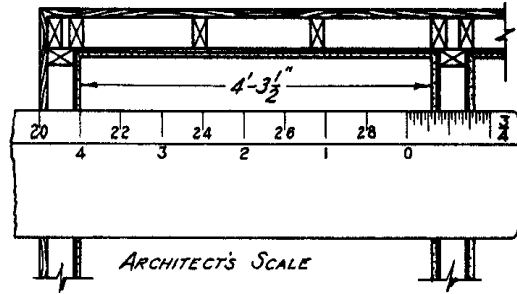
- Major Unit = 1 inch
- Divisions = fraction of an inch



Dimensioning - 1

7

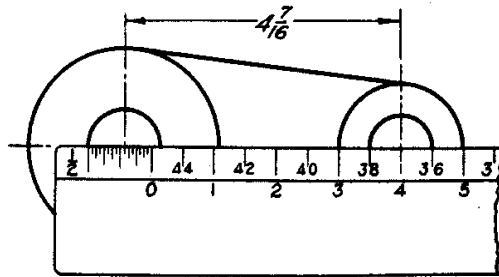
Example Use – Architect's Scale



Dimensioning - 1

8

Example Use – Mechanical Engineer's Scale



Dimensioning - 1

9

Compound Scale

