

Do's & Don'ts of Dimensioning

Major Idea: Describe the size and shape of the object in the clearest manner possible!

Therefore, unless otherwise directed, and all other things being equal, follow this advice:

1. Each dimension should be given clearly, so that it can be interpreted in only one way.
2. Dimensions should not be duplicated or the same information be given in two different ways, and no dimensions should be given except those needed to produce or inspect the part.
3. Dimensions should be given between points or surfaces which have a functional relationship to each other or which control the location of mating parts.
4. Dimensions should be given to finished surfaces or between important center lines (not to rough surfaces) wherever possible.
5. Dimensions should be so given that it will not be necessary for any worker to calculate, scale, or assume any dimension.

6. Dimensions should be attached to the view where that shape is best shown (contour rule).
7. Dimensions should be attached to the view where the features being dimensioned are shown true size.
8. Avoid dimensioning to hidden lines whenever possible.
9. Dimensions should not be placed upon a view (unless clearness is promoted thereby).
10. Dimensions applying to two adjacent views should be placed between views, unless clearness is promoted by placing them outside.
11. Longer dimensions should be placed outside all intermediate dimensions, so that dimension lines will not cross extension lines.
12. In machine drawings, omit all inch marks, except where necessary for clearness (e.g.: 1" VALVE).
13. Do not expect the worker to assume a feature is centered (e.g.: a hole on a plate), but give a location dimension from one side. However, if a hole is to be centered on a symmetrical rough casting, mark the center line C and omit the locating dimension from the center line.

14. A dimension should be attached to only one view (i.e.: extension lines do not connect two views).
15. The dimension lines of "chained" dimensions should "line up".
16. Avoid a complete chain of detail dimensions. Either omit the least significant dimension or indicate that either a detail dimension or the overall dimension is to be a reference dimension (ie: place the referenced dimension in parentheses).
17. A dimension line should never be drawn through a dimension figure. A figure should never be lettered over any line of the drawing.
18. Dimension lines should be spaced uniformly throughout the drawing. They should be at least .50" [12mm] from the object outline and .40" [10mm] apart. ["50-40-40 Rule"]
19. No line of the drawing should be used as a dimension line or coincide with a dimension line.
20. A dimension line should never be joined end-to-end (chain fashion) with any line of the drawing.
21. Dimension lines should not cross each other, if avoidable.

22. Dimension lines and extension lines should not cross, if avoidable. However, extension lines may cross each other.
23. When extension lines cross other extension lines or visible object lines, no break in either line should be made.
24. A center line may be extended and used as an extension line, in which case it is still drawn like a center line.
25. Center lines should generally not extend from view to view.
26. Leaders for notes should be straight lines (not curved), drawn at an angle, and aimed towards the center (but stopping at the edge of the circle) in the circular views of holes whenever possible.
27. Leaders should slope at 45° , 30° , or 60° from the horizontal but may be made at any angle except vertical or horizontal.
28. Leaders should extend from the first letter or the last letter of a note. The shoulder of the leader is .12" [3mm] long, is always horizontal and it extends from the mid-height of the lettering.

29. Dimension figures should be approximately centered between the arrowheads, except that in a "stack" of dimensions, the figures should be "staggered".
30. Dimension figures should be .12" high
31. Dimension figures should never be crowded or in any way made difficult to read.
32. Dimension figures should not be lettered over lines or sectioned areas unless necessary, in which case a clear space should be left for the dimension figures.
33. Dimension figures for angles should generally be lettered horizontally.
34. Group similar/related dimensions using common datums, views, styles, etc.
35. Notes should always be lettered horizontally on the sheet.
36. Notes should be brief and clear, and the wording should be standard in form (e.g.: keyways, knurls, etc.).
37. Finish marks should be placed on all edge views of all finished surfaces, including hidden edges and the contour and circular views of cylindrical surfaces.

38. Finish marks should be omitted on holes or other features where a note specifies a machining operation.
39. Finish marks should be omitted on parts made from rolled stock.
40. If a part is finished all over, omit all finish marks and use the general note: **FAO** or **FINISH ALL OVER**.
41. A solid cylinder is dimensioned by giving both its diameter and length in the rectangular view. However, a diagonal diameter in the circular view (aka: end view) may be used in cases where clarity is gained thereby.
42. Holes to be bored, drilled, reamed, etc., are size-dimensioned by notes with leaders preferably pointing toward the circular views of the holes. Indications of shop processes may be omitted from notes.
43. Drill sizes are preferably expressed in decimals. For drills designated by number or letter, the decimal size must also be given.
44. In general, a circle is dimensioned by its diameter, and an arc by its radius.
45. Avoid diagonal diameter dimension lines, except for very large holes and for circular center lines. They may

be used on "solid" cylinders ("positive" cylinders) only when clearness is gained thereby.

46. The diameter symbol \varnothing should always precede a diameter dimension.
47. The letter R should always precede the radius dimension. The radial dimension line (like a leader) either radiates from or is aimed towards the center of the arc. The leader has only one arrowhead, and it will always touch the arc.
48. Cylinders should be located by their center lines.
49. Cylinders should be located in the circular views (aka: end views), if possible.
50. Cylinders (positive or negative) should be located by coordinate dimensions in preference to angular dimensions where accuracy is important.
51. When there are several rough non-critical features obviously the same size (fillets, rounds, ribs, etc.), it is necessary to give only typical dimensions, or to use a note.
52. When a dimension is not-to-scale, it should be underscored with a thick straight line unless it is clearly indicated by break lines.

53. Mating dimensions should be given correspondingly on drawings of mating parts.
54. Pattern dimensions should be given in whole numbers and 2-place decimals.
55. English (decimal-inch) or metric (millimeter) dimensions should be used on machine drawings (i.e.: do not use fractions).
56. Avoid cumulative tolerances, especially in limit dimensioning.