Dimensioning Rules

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 given in two different ways dual dimensioning excluded and no dimensions should be given except those needed to produce or inspect the part.

3. Dimensions should be given between points or surfaces that have a functional relation to each other or that control the location of mating parts.

4. Dimensions should be given to finished surfaces or important center lines, in preference to rough surfaces, wherever possible.

5. Dimensions should be so given that it will not be necessary for the machinist to calculate, scale, or assume any dimension.

6. Dimensions should be attached to the view where the shape is best shown (contour rule).

7. Dimensions should be placed in the views where the features dimensioned are shown true shape.

8. Dimensioning to hidden lines should be avoided wherever possible.

9. Dimensions should not be placed on a view unless clarity is promoted and long extension lines are avoided.

10. Dimensions applying to two adjacent views should be placed between views, unless clarity is promoted by placing some of them outside.

11. The longer dimensions should be placed outside all intermediate dimensions so that dimension lines will not cross extension lines.

12. In machine drawing, all unit marks should be omitted, except when necessary for clarity; for example, 1 " VALVE or 1 mm DRILL.

13. Production personnel should not be expected to assume that a feature is centered (as a hole on a plate), but a location dimension should be given from one side. However, if a hole is to be centered on a symmetrical rough casting, mark the center line and omit the locating dimension from the center line.

14. A dimension should be attached to only one view, not to extension lines connecting two views.

15. Detail dimensions should "line up" in chain fashion.

16. A complete chain of detail dimensions should be avoided; it is better to omit one; otherwise refer should be added to one detail dimension or the overall dimension by enclosing within 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. The line can be broken if necessary.

18. Dimension lines should be spaced uniformly throughout the drawing. They should be at least 10 mm (.38") from the object outline and 6 mm (.25") apart.

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, if avoidable.

22. Dimension lines and extension lines should not cross, if avoidable. (Extension lines may cross each other.)

23. When extension lines cross extension lines or visible 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, not curved,and pointing to the center of circular views of holes wherever possible.

27. Leaders should slope at 45°, or 30°, or 60° with horizontal but may be made at any convenient angle except vertical or horizontal.

28. Leaders should extend from the beginning or from the end of a note, the horizontal "shoulder" extending from 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 about 3 mm (.13") high for whole numbers and 6 mm (.25") high for fractions.

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 reserved for the dimension figures.

33. Dimension figures for angles should generally be lettered horizontally.

34. Fraction bars should never be inclined except in confined areas, such as in tables.

35. The numerator and denominator of a fraction should never touch the fraction bar.

36. Notes should always be lettered horizontally on the sheet.

37. Notes should be brief and clear, and the wording should be standard in form.

38. Finish marks should be placed on the edge views of all finished surfaces, including hidden edges and the contour and circular views of cylindrical surfaces.

39. Finish marks should be omitted on holes or other features where a note specifies a machining operation.

40. Finish marks should be omitted on parts made from rolled stock.

41. If a part is finished all over, all finish marks should be omitted, and the general note FINISH ALL OVER or FAO should be used.

42. A cylinder is dimensioned by giving both its diameter and length in the rectangular view, except when notes are used for holes. A diagonal diameter in the circular view may be used in cases where clarity is gained thereby.

43. Holes to be bored, drilled, reamed, and so on are size-dimensioned by notes in which the leaders preferably point toward the center of the circular views of the holes. Indications of manufacturing processes may be omitted from notes.

44. Drill sizes are preferably expressed in decimals. For drills designated by number or letter, the decimal size must also be given.

45. In general, a circle is dimensioned by its diameter, an arc by its radius.

46. Diagonal diameters should be avoided, except for very large holes and for circles of centers. They may be used on positive cylinders when clarity is gained thereby.

47. A diameter dimension value should always be preceded by the symbol 0.

48. A radius dimension should always be preceded by the letter R. The radial dimension line should have only one arrowhead, and it should pass through or point through the arc center and touch the arc.

49. Cylinders should be located by their center lines.

50. Cylinders should be located in the circular views, if possible.

51. Cylinders should be located by coordinate dimensions in preference to angular dimensions where accuracy is important.

52. When there are several rough, non-critical features obviously the same size (fillets, rounds, ribs, etc.), it is necessary to give only typical (abbreviation TYP) dimensions or to use a note.

53. When a dimension is not to scale, it should be underscored with a heavy straight line or marked NTS or NOT TO SCALE.

54. Mating dimensions should be given correspondingly on drawings of mating parts.

55. Pattern dimensions should be given in two-place decimals or in common whole numbers and fractions to the nearest 1/16 ".

56. Decimal dimensions should be used for all machining dimensions.

57. Cumulative tolerances should be avoided, especially in limit dimensioning, described in §13.9.