ORTHOGRAPHIC PROJECTION

Orthographic projection is used to show at least three views of an object in two dimensions. The views usually shown in orthographic projection are: *front view* (*elevation*), *side view* (either *right* or *left side*), and *plan view* (*top*). These views are displayed in two dimensions. The front view shows length/width and height. The side view or elevation shows width/length and width. The three principal views of a drawing that represents objects in two dimensions, are together known as orthographic drawing.

However, other views such as auxiliary and sectional views can be drawn for complex objects. This is because the three principal views are unable to expose the detail of the complex object.

The paper or board on which orthographic drawings are made is called a *plane*. Any projection made by lines of sight perpendicular to the projection plane is called orthographic projection. In other words, an orthographic drawing is the drawing of the image that implies that the observer is stood at a distance and looks at the object at an angle of 90°.

Projection Planes

The front and back views of a simple rectangular box is usually identical. The same thing goes for the right side and left side views. In the projection of simple regular objects, only three views are required. When orthographic views of an object are drawn on paper, they are drawn in relation to the three planes of reference which carry the principal views i.e. front view, plan (top view) and side view.

Angles of Projection

Orthographic projection is drawn in two methods called *angles of projection*. These angles of projection are:

- First angle projection, and
- Third angle projection.

First angle projection is the British system or orthographic projection while the third angle is the American and Canadian system of orthographic projection. The two methods are universally accepted in drawing.

Dimensions Orthographic Views

Dimensioning involves using lines called dimension and extension lines to depict the size of a drawing. Regular shapes like rectangles, squares, triangles, cylinders, and prisms have lengths, widths and heights. For them to be drawn and produced, their dimensions have to be indicated.

The following points should be noted on dimensioning of a drawing.

- All dimensions on a drawing should be of the same unit.
- Dimension should be placed outside the outline of a view, except when dimensioning a circle.
- Extension lines are used to indicate lengths, to be dimensioned. Extension lines are thin and continuous and are drawn from the end of the lengths to be dimensioned.
- Dimension lines which usually carry arrowheads on both ends, are placed between the extension lines.
- Dimensions are written above horizontal dimension lines, and on the left of vertical ones.
- Extension and dimension lines do not cross each other.
- Centre lines and outlines are not used as dimension or extension lines.
- Dimensions indicated on one view should not be repeated on other views.
- The dimension line for an angle is a circular axis whose centre is on the point of the angle.
- Larger dimensions should be place outside smaller ones.

Uses of Orthographic Projection

1. Orthographic projection is a blue print for the construction of objects in the workshop.
2. It acts as a guide to the person who is to do the construction.
3. It shows the true shape and size of an object.