

Introduction voice

Page0

This section will introduce you to what an engineering drawing is and what it may contain. We will learn why engineering drawings are important and the placement of its components. Engineering drawings are used to communicate design ideas so that they may be evaluated and then manufactured. Standards control the placement of the drawing components so that no matter who is looking at your drawing, they know where the components will be.

Page1

Design is the process of developing a product that solves a problem. For example, hammers transmit a lot of vibration to the user. It would be nice if a hammer could be designed that minimized the transmitted vibration.

There are many design strategies. That is, ways to regiment the design process to make it more effective than just off the cuff ideas. We will not be formally learning these strategies, but design is important to mention because we used engineering drawings to communicate design ideas.

Page2

Reasons for communicating a design vary. You may just want to bounce an idea off of a co-worker, your boss may want to ok your design, you may want to patent your design or get it manufactured. There are several ways to communicate a design. You may want to use a sketch just to bounce ideas. A finished design may require a technical or engineering drawing so that it can be patented or manufactured. A CAD software may also be used to create a 3D model of your design which is a very effective way to communicate your idea.

So you may be thinking, "What is the difference between a technical drawing and an engineering drawing?" A technical drawing is used to communicate an idea, design, schematic or model. An engineering drawing is a technical drawing but used to describe a part that will be made.

Page3

Standards are a set of rules that control how and what goes into an engineering drawing. There are two main standard organizations: ASME (the American Society of Mechanical Engineers) and ISO (the International Standards Organization). Standards are important because they help minimize mistakes. Mistakes made while drawing and reading the drawing, and manufacturing and inspecting the part. These rules also help with international communication.

Page4

You may, in conversation, here an engineering drawing referred to as a blue print or just as a print. Why is that? Well, before the age of wide spread computer use, engineering drawings would be created using a pencil at a drafting board. To create a copy of the drawing, a process called blue printing was used. Most of the time people would look at, and markup, the blue print and not the original drawing. This is why drawings are still referred to as prints.

Page5

Engineering drawings describe parts that will be manufactured. They describe the shape of the part and give all the dimensions and specifications needed to manufacture and inspect the part.

Page6

6a

An engineering drawing has several different areas or components. I will talk about each component in detail below. For a quick summary take a look at the figure. Around the outside of the drawing is the border and zones. There are various blocks. At the bottom of the page, there is the title block and the tolerance and projection blocks. At the top, there is the revision history block. The drawing may also contain notes. And, the drawing of the object is placed in the middle.

6b

Sheet sizes or the size of the paper the drawing is printed on is controlled by the ASMEY14.1 and ASME14.1M standards. For US customary units, the sheet sizes start at A which is a standard 8.5 x 11 sheet of paper and go to K. Sheets A through F are considered flat sheets and G through K are considered roll sheets because they are long and are usually rolled up. For metric units, the sheet sizes start at A0 and go to A3.0. Sheets A1.0 through A3.0 are considered roll sheets.

6c

The most important part of the engineering drawing is the drawing of the part. This describes the shape and size of the object. In the figure you can see two different types of drawings. The one that looks 3 dimensional is called a pictorial and the other is called an orthographic projection. They are often used in conjunction with each other to enhance readability of the drawing.

6d

Many times the object is larger than the actual sheet size that it is printed on. Therefore, it is often the case that the part is printed out at a reduced scale. That means it is smaller on the printed sheet than it is in real life. This scale must be noted in the title block.

6e

Zones are used to identify different locations on the drawing. If you want to refer to a particular location on the drawing all you have to do is give the letter-number combination. For example, Zone F6 points to the 2.75 inch dimension.

6f

Drawing notes give information about the part's manufacture that can't be represented in normal dimensions. Look at the figure above. Notice that it has 2 notes.

6g

The title block gives information about the part or assembly represented in the drawing. Information such as the part name, part number, scale, company, and who drew the part. Specific information about all that is contained in the title block is given in the book.

6h

The revision history block gives information about any changes made to the drawing. The zone of the change is noted, the revision name, a description of the revision, the revision date, and who approved the revision.

6i

The tolerance block gives the block or page tolerance. This is the default tolerance that applies to all dimensions not specifically toleranced. At this point, you probably don't know what a tolerance is. In general terms, it is the maximum amount that a dimension may vary and still pass inspection. The projection block states the projection method used to create the drawing. Basically, either the 3rd angle projection method or the 1st angle.