

Computer Generated Graphs

The "Writing Guide for Formal Technical Reports" gives a very good description of graphing in technical reports. Following the information in this Guide will produce excellent and professional graphs. If you prepare your graphs by hand those procedures should be followed.

However, since the last revision of this Guide in 1987, computers and printers capable of graphics have become the norm. Quality graphs can now be produced more easily using a computer than by hand. In fact, most spread sheet programs allow data reduction, graph preparation, and export of the graphs to a word processor. One needs enter the data only once easing manual operations and minimizing data entry errors.

It is impossible to follow all the guidelines given in the "Writing Guide" when using computer graphing. (Just try to aligning graph paper grids to laser printer output!) But, having said that, most of the guidelines are still valid and should be used.

Figure 1 shows a graph generated in Microsoft Excel. It illustrates the type of computer generated graph we'll most likely use.

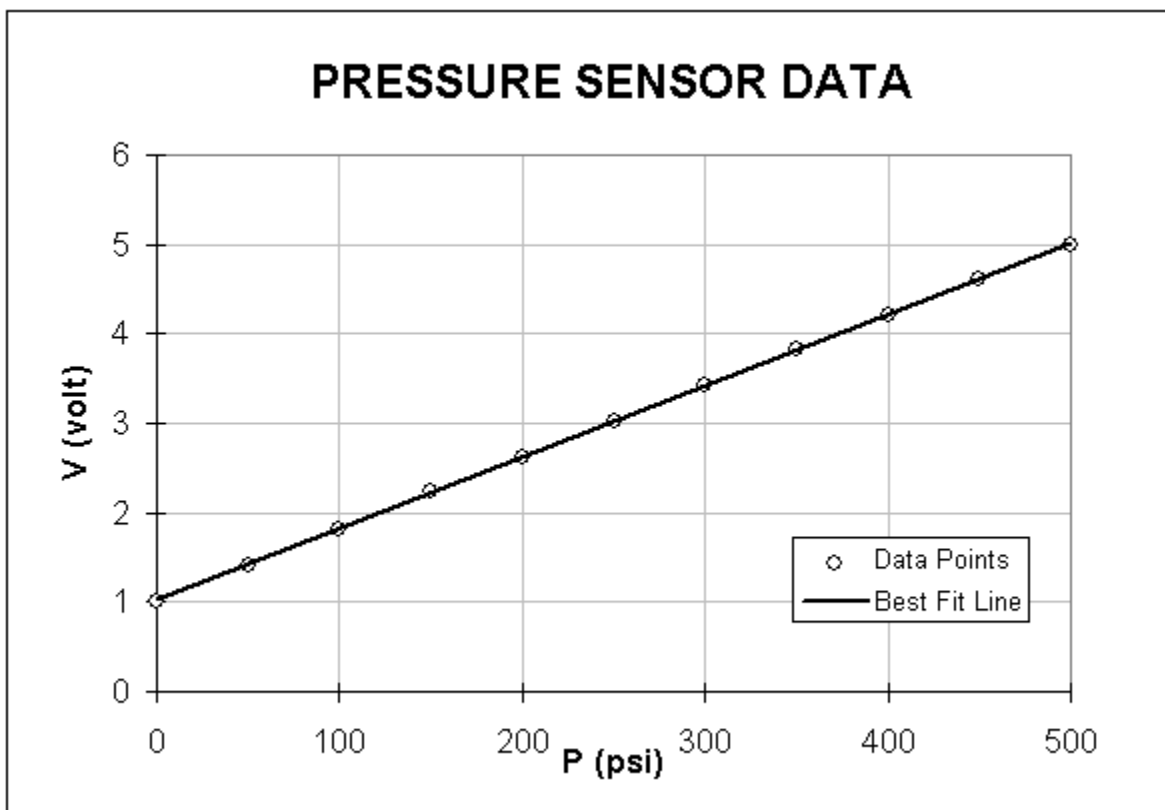


FIGURE 1

For computer generated graphs follow these guidelines:

- Graphs should be incorporated into the report by importing them into the word processor rather than on separate pages. This looks more professional for computer generated graphs. However, it is acceptable to have each graph take up a separate page.
- For our lab reports, graphs will be at least half page in size. Smaller than this and they become difficult to read. (Well, at least for my tired old eyes.)
- Grid lines will be included on graphs. Since computer graphs are printed on plane paper rather than graph paper these grid lines are needed. They should be a lighter gray than other elements of the graph but easily visible. See Figure 1 above.
- As in Figure 1, the background should be clear (white). All information should be in black and white except for the grid lines which are gray.
- The Guide states that lines should not go through data symbols but be broken at their edges. This isn't feasible with computer generated graphs so lines may go through the data symbols.
- The Guide also indicates the data and your name should be included in the lower right hand corner. This is difficult in some graphic programs so it is optional. i.e. nice but not required.
- Some spread sheets can automatically fit and display a best fit line, I know Excel can. They can also print the equation on the graph but there are a couple of problems with this. First it writes the equation using x and y. x and y have no meaning on a plot of voltage versus pressure (or other engineering units). If a best fit equation is included on a graph be sure to edit it to reflect the properties being plotted. *This is true throughout the report.* Secondly, the number of significant digits should reflect the accuracy of the data. Many programs include five or six significant digits which is usually unreasonable.

Be careful when using a spread sheet that the type of graph selected is what you want. Most programs will plot the data selected against cell numbers **as the default**. If you want to plot one data set (column A) against another data set (column B), which is common for lab work, you must select an x-y plot.

There are several points mentioned in the Guide which should be emphasized.

- As the guide indicates, do not use color. For a technical report it is more important that no information is lost in copying than to have flashy colors. This is for technical reports, sales and promotional literature are different.
- Graphs shouldn't intrude on the margins any more than text does.
- Test data is indicated with data symbols at each data point and may or may not be connected with lines. Analytical curves (plots of equations) should in general not have data symbols.