



Designing Scientific Posters

What makes an effective poster presentation?

How to Get Started:

Make a sketch—

Work with a grid: sketch out your ideas or (even better) create your sections, cut them out and then move them around on your grid. Make sure the text and ideas flow well. Experiment.

Gather graphics —

Images, Charts, Graphs

Where to get images: Scan, photograph, import digital files (clip art, etc.), or make it yourself in other programs (such as Illustrator or Excel). Avoid web images which generally have low resolution.

Resolution: Make your images at least 300 dpi in the size you need them to be when they are printed. Low resolution images will look jagged or pixilated. (Images take from the internet are mostly low resolution.)

Image file type: Most file types work for printed documents; but beware of unnecessarily large images especially when you work with programs like PowerPoint.

Image Types: Vector images are scalable (e.g. created in PowerPoint or Illustrator). Raster or bitmap images are not scalable (e.g. created in e.g. Photoshop).

Posters as scientific presentations

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Posters are used to present your work to an audience that is walking through an exhibit. The presenter usually stands by their poster ready to engage in discussion with the roaming audience. Thus your poster must engage an audience who is both standing up and facing the distractions (noise and congestion) of a crowd.

Cooling Effects of Dirt Purge Holes on the Tips of Gas Turbine Blades

Eric Couch, Jesse Christophel, Erik Hohlfeld, and Karen Thole

Gas turbine engines run better at higher combustion temperatures

At higher combustion temperatures, these engines generate more power and use less fuel. However, these temperatures are restricted by melting temperatures of the turbine blades downstream of the combustor (see Figure 1).

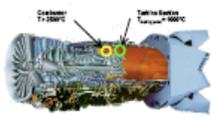


Figure 1. Pratt & Whitney F119 gas turbine engine.

Dirt purge holes on turbine blade tips allow for higher combustion temperatures

Harmful hot gases from the combustor leak across the gap between the blade tip and the shroud (see Figure 2). Dirt purge holes expel foreign particles from the blade tip so that film cooling holes are not blocked.

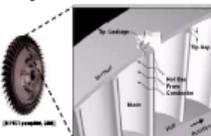


Figure 2. Flow at the tip region of a turbine blade.

The project goal was to find the film cooling effects of these dirt purge holes

To find the effects, we performed wind tunnel experiments with coated turbine blades. The wind tunnel was low speed and low temperature, and the blades, shown in Figure 3, were cooled at 12 times their normal size. To measure temperatures on the blade tip, we used an Infrared camera. Tip gap size and amount of coolant flow from the dirt purge holes were both varied.



Figure 3. Large-scale turbine blade in wind tunnel.

Temperature measurements were converted to dimensionless cooling effectiveness

$$E = \frac{T_{tip} - T_{air}}{T_{tip} - T_c}$$

where T_{tip} = temperature of the tip surface, T_{air} = ambient air temperature, and T_c = coolant temperature.

Cooling increased with blowing ratio

The effectiveness contours of Figure 4 show that cooling increased with blowing ratio.

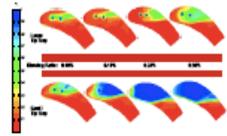


Figure 4. Measurements of film cooling effectiveness.

Tip size dramatically affected cooling

In Figure 5, the lateral averages of effectiveness plotted against the axial chord length show that tip size dramatically affected the cooling.

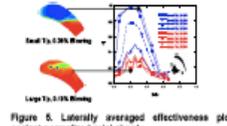


Figure 5. Laterally averaged effectiveness plotted against normalized axial chord.

In summary, dirt purge holes provide cooling to the tip surface

While intended to remove dirt from the blade, dirt purge holes also provide cooling to the tip surface. This cooling is enhanced with a small tip gap on the dirt purge floods the tip region near the leading edge with cool air.

Acknowledgments

The sponsor for this project was Pratt & Whitney.

See more sample posters at <http://www.writing.eng.vt.edu/posters.htm>

So, keep these things in mind as you create your poster:

1. The title should quickly orient the audience. (*Know who your audience is likely to be: e.g. fellow students, senior faculty, etc.*) They should quickly be able to assess your subject and purpose.

2. Key sections should be easy to locate: e.g. Objectives, Methods/Materials, Final Results, Discussion, Conclusion, etc. These sections should be designed so that they can be quickly read/comprehended.

Add Text—

Typefaces: Use serifs (with little feet) for text and sans serif (without little feet) for headlines. Don't use too many different sizes or typefaces—generally no more than two. Keep your style consistent and simple.

Type Size: It should be BIG. Text should be at least 18 point. Headings should be between 72 and 144 points (72 points = 1 inch). In general, make your subtitles 50% of the title size, and the text 50% of subtitle size.

Emphasis: Use bold or italic. (Don't underline because it makes text hard to read.) Generally, avoid fancy effects for the sake of readability—such as 'shadowed' or 'outlined' text.

Color: Make sure your colors attract and do not distract. Make sure your colors compliment and add meaning to your presentation.

Give Credit to your sources and helpers. (This may be in smaller type.)

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Above all else

Be sure to read the directions for printing posters at Cornell and define your final size (in page setup) before you begin to design.

3. Clarity and Readability (and Flow) are Key to an effective poster.
4. Posters should tell a story as well as give an overview of your work and invite discussion. Your poster should make sense whether you are standing by to explain or not.
5. Generally the flow of your poster should be the way we read in English—from top left to bottom right. You may want to use arrows, numbers, or letters to make the sequencing of your poster clear.
6. Do not crowd your poster with too much text. White space helps your audience take in what's important quickly.
7. Select scalable type and make sure your images look good at a larger size. They will not scale well if their resolution is too low.
8. Run the "spell check." Note that the red underlining that Microsoft products use to flag spelling errors may print.

Good Resources

- Scientific Literature and Writing Poster Presentations <http://people.eku.edu/ritchisong/RITCHISO//posterpres.html>
- Design of Scientific Posters <http://www.writing.eng.vt.edu/posters.html>
This site is especially useful because it contains PowerPoint Templates as well as poster samples
- Advice on Designing Scientific Posters, Colin Purrington, Swarthmore College <http://www.swarthmore.edu/NatSci/cpurrrin1/posteradvice.htm>
You'll enjoy reading Purrington's advice. He's both funny and sensible.
- Virtual Conference: Video Poster California State University, Fullerton http://fdc.fullerton.edu/research/posters/Posters_08_2001/presenters.htm
Even though this dates from 2001 (and poster styles can change), this faculty show is very worth viewing. Click to enlarge the posters.
- Poster Presentations, University of Buffalo Libraries <http://ublib.buffalo.edu/libraries/asl/guides/bio/posters.html>
I recommend this site primarily for its extensive bibliography on the topic of poster presentation.
- Sample Posters with faculty commentary at http://www.dartmouth.edu/~wisp/PosterShow/poster_pg4.html