

TEMPLATE FOR WRITING ANTEC® PAPERS INCLUDING FORMAT AND WRITING HINTS

Mark A. Spalding, The Dow Chemical Company, Midland, MI

William M. Smith and Frederick V. Phillips, University of Southern Michigan, University Center, MI

Abstract

This template can be used to write both Technical and Commercial papers for the Annual Technical (ANTEC) conference of the Society of Plastics Engineers (SPE). This template is meant to supplement the paper format guidelines presented in the Write Now brochure. The template was designed such that an author can quickly replace the text in the template with their own content. Writing hints and common mistakes are also discussed.

Introduction

It is estimated that about 30% of all papers submitted to the review process will require modifications due to improper format [1]. These modifications create additional work for the authors and the paper review committees, and in extreme cases can cause a paper to be excluded from the conference. Following the proper paper format is required so that all papers appear the same in the conference proceedings.

Most papers will have an introduction section. This section can be used to clearly state the problem and opportunity, and provide a description of prior work in the form of a critical review of the literature. The section should then lead the reader into the new research or innovations that will be presented. As an example, the next paragraph leads the reader into the major contents of this template.

The goal of this paper is to provide an easy-to-use template for writing both Technical and Commercial ANTEC papers. The template is aimed at making paper writing easy for authors while eliminating the need for mandatory modifications due to formatting errors. Many writing hints are also provided.

Using This Template

Writing hints, fonts, margin spacing, and reference formatting are contained within this template. Your paper must be written using Times New Roman font style or a similar font style using the margin spacing provided with this template and as described by the Write Now brochure.

The first level headings are the reader's first guide to your paper. The headings must be in upper and lower case

letters (title case), centered, and using a bold font size 12. Two of the first level section headings, the Abstract and Conclusions must be present. Other sections such as the Introduction, Materials, Discussion, and References will likely be used for most papers. Moreover, additional specific topic first level headings are highly desired to guide your reader through your paper. As an example, a section for Materials is presented in the next section. Second level headings must be left justified, in title case, and use bold font size 11 letters. The Literature Reviews section under Writing Hints is an example of a second level heading. A complete listing of letter styles is presented in the Write Now brochure.

To use this template, the author must remove the current text in the sections, tables, and figures, and replace with their writings. In order to preserve the margins and font sizes, it is recommended that the author remove and replace text in the sections one by one.

Materials

A description of the materials and resins is highly important to the reader, especially if the reader is planning on replicating the work. The description of the materials should be as complete as possible while not being commercial in nature. For Technical papers, avoiding commercialism is described later in this template. The next paragraph provides an example of a description for resins.

Two low density polyethylene (LDPE) resins were used for the experimental work [2], and they were manufactured by The Dow Chemical Company. Both resins had a solid density of 0.922 g/cm³. The melt indices (MI) for the resins were 0.8 and 2 dg/min (190°C, 2.16 kg). The melt density, thermal conductivity, and heat capacity at about 210°C were 0.74 g/cm³, 0.18 W/(m °C), and 1260 J/(kg °C), respectively. Shear viscosities for the resins are shown by Figures 1 and 2 and were modeled using a power law as follows:

$$\eta = \eta_o e^{-b(T-T_o)} \dot{\gamma}^{n-1} \quad (1)$$

where η is the shear viscosity (Pa-s), $\dot{\gamma}$ is the shear rate (1/s), T is the temperature (°C), n is the power law constant, and η_o , b , and T_o are model constants. The model constants for the resins are provided in Table 1.

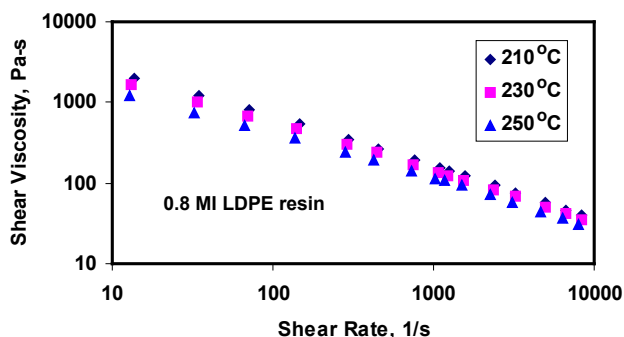
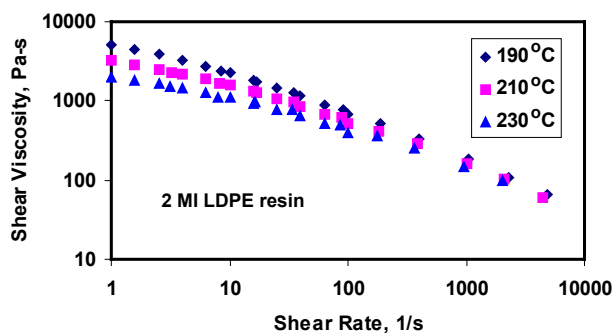


Table 1. Shear viscosity model parameters [2].

	0.8 MI Resin	2 MI Resin
η_o	9720	7361
$B, 1/^\circ\text{C}$	0.00913	0.0157
$T_o, ^\circ\text{C}$	210	190
N	0.41	0.48

Writing Hints

An ANTEC paper is not difficult to write if the author understands the goals of the paper and the prior research. The number of goals or ideas should be limited to no more than three. For example, this paper has only two goals: 1) a template for ANTEC papers, and 2) key writing hints. Papers that have more than three goals often have a scope that is not narrow enough for a typical 5 page paper and a 30 minute presentation.

A critical literature review and proper use of tables and figures will strengthen the paper, providing a complete description of prior work and a comparison to the present work. Hints for writing literature reviews, making tables and figures, and how to avoid common mistakes are presented in the next sections. Many additional writing hints are provided in the Write Now brochure.

Literature Reviews

The best papers written and presented at ANTEC have a relatively deep review of past research on the topic. In most cases the authors are aware of the past research, but if the topic is new to the author then often an adequate review of the literature is difficult. Many prior papers on a subject, however, can be easily obtained by going to the SPE website and then going to the “Online Technical Library” area. In this area, all SPE members can run a search on a topic, key word, or author, and then download the papers for review. Although the search is limited to the electronic libraries owned by SPE, it does provide a quick assessment of prior research.

Figures and Tables

In most cases, data and information are best conveyed to a reader via tables and figures. In all cases, tables and figures should be called out in the text and explained. Do not assume that the reader is going to extract the same information that you are teaching. That is, a complete explanation of the trends, usage, and discrepancies should be presented in the text and sometimes in the table title or figure title.

For figures, the data points and trend lines should be clear and easy to read. The use of color coding for the data is a great method to identify trend lines and data points, but remember that the paper will likely be printed with a standard black ink printer. Thus, the trend lines and data points should be identifiable using black ink on white paper. Yellow trend lines and data points are difficult to view on most media and should be avoided.

Tables and figures can be included in either the text or at the end of the paper after the references and appendices. Including the tables and figures in the text is preferred since it allows the reader to quickly assess the data with descriptions in the text. If the tables and figures are included in the text, they should be added after the paragraph that they are introduced or as soon after a page or column break. The figures and tables must fit in the boundaries with the text, preserving all margins including the center margin. Larger figures and tables must be included at the end of the paper.

Paper Length

As previously stated, the best papers at ANTEC have a maximum of only three goals or subtopics. Typically, these goals can be described and analyzed in 4 to 5 pages. As a guideline, authors should target the paper length to 5 pages. If the topic, however, requires additional pages to document the subject, then the paper can be extended to up to 8 pages. The file size of the document must be less than 5 Mb.

Common Mistakes

As previously stated, about 30% of the papers submitted must be modified by the author to correct simple format problems. Several of the most common mistakes are discussed in this section.

Common format problems include improper margin dimensions, the use of page numbers, improper font styles and sizes, and improper margin justifications. Page numbers are not allowed since they are assigned by the publisher. In all cases, page numbers assigned by authors will require a modification by the author to remove them. The margins and column justification are preset with this template and should not be altered. The columns are both right and left justified. Font styles and sizes are also illustrated in the template for the first and second level headings.

Only common acronyms and abbreviations should be used in your paper. The reader will lose interest in your paper if he is forced to translate complicated abbreviations each time they are encountered. When a common abbreviation is used, the term should be spelled out the first time it is used followed by the abbreviation in parentheses. There are numerous examples of abbreviations in this template.

The use of slang terms are not a good practice since their use takes away from the professionalism of the paper and since they can be very misleading to non-US citizen readers. As an example, the temperature of the first barrel zone was dropped to 230°C. The word dropped is a slang word in this context. The proper way of writing this sentence would be as follows: the temperature of the first barrel zone was decreased to 230°C.

The use of System International (SI) units is required for all data reported in the paper. A list of the common SI units is given in the Write Now brochure. If it is important to report the value using a US customary unit, report the data with SI units and then with the US customary unit in parentheses. For example, the extruder was discharging at a pressure of 10 MPa (1450 psi). Overuse of US customary units, however, can be distracting to the reader and they should be used only when necessary.

A Few Words About Commercialism

Commercialism is defined as the use of the presentation or paper to promote a device, product, or company. For Technical papers, commercialism is not allowed at ANTEC.

As researchers and innovators, we write about things that we know best and things that are important to our jobs and company. These topics include new equipment, new products, and new processes. Many of these are protected

under patent laws or described using trademarks. As authors we are obligated to describe our equipment and processes such that another researcher can replicate our results. But these descriptions must be written as having a scientific purpose and must not be commercial in nature. There are several ways of presenting this kind of technical work without being commercial.

As an equipment example, it is highly important to describe and identify the device. The name of the device or trade name can appear in the title and can appear once or twice in the text of the paper. After the trade name is identified, the author should then describe the item in more generic terms to remove the commercial aspect from the paper. In the remainder of the paper, the device is referenced using the generic term. Moreover, the data that follows in the paper must then be of a technical nature that has a teaching value to the reader. An example is as follows:

“This report describes results from three sets of experiments conducted for a screw with an Energy Transfer (ET) section and for a conventional screw without a specialized mixing section [3,4]. The ET section or screw is referred to as the mixing section or mixing screw for the remainder of this paper. Other high-performance mixing screws are available and work on essentially the same principle.”

For resins, the author should identify the characteristics that are important to the technical aspects of the paper, removing trade names if possible. The author can identify the manufacture of the resin. This amount of information should allow a different researcher to replicate the results. An example is as follows:

“The resin was an acrylonitrile butadiene styrene (ABS) polymer with a melt flow rate (MFR) of 3.5 dg/min (230°C, 3.8 kg), and it was manufactured by The Dow Chemical Company.”

In the remainder of the paper the resin would be referred to as only ABS resin. The trademark name of the resin for this case would never appear in the paper.

If several resins or screw designs are compared, then the author may elect to label them such that the commercial aspects are removed. As an example if several polycarbonate (PC) resins are described, use the characteristic that differentiates the resins such as the MFR as shown by Table 2. The trademark name for the resin would not be used in the table or paper, eliminating all commercial aspects while still conveying the technical aspects of the research.

Table 2. Extrusion results for the 6 and 23 MFR polycarbonate resins at a screw speed of 60 rpm.

MFR, dg/min	Rate, kg/h	Specific Energy, J/g
6	75.0	709
23	79.8	462

Remember that a great paper teaches the reader about a technology, and the best way to teach is to provide the facts and a detailed analysis and how it can be used. Commercialism detracts from the teaching qualities of a Technical paper and compromises your integrity with the reader.

Commercial Papers

Authors should follow the same guides as discussed above for writing a high-quality Commercial paper with several exceptions. The use of trade names and trademarks are relaxed such that the author can use them as much as needed. Overuse of trade names, however, can be tiresome to the reader. If the trade name can be placed into a generic term, the paper often becomes easier to read.

For Commercial papers, it is acceptable to not include details that would normally be needed to reproduce the data. These details are typically proprietary information and thus by presenting these details the author's organization could lose its competitive advantage. Although these details are not provided, the paper should still teach the reader the advantages of the product or process.

Case studies are an excellent method to show the advantages and value of a new product or process. Using examples provides the reader with information on the effectiveness of the product or technology. For example, a case study that compares the effect of a new additive in a resin to the resin without the additive would be very beneficial to the reader. Moreover, the author could compare the new additive to generic chemicals that are used for a similar purpose. The author should never compare the new additive to another company's product. Instead, use the generic chemical name for the competitive product.

Discussion

Writing and presenting an ANTEC paper can be a very enjoyable and rewarding experience, especially if careful thought is made during the writing process. The hints provided here are simple to use and will help you write a high-quality paper. Moreover, the template will allow you to create a paper that is free of format errors, eliminating the need to modify the paper at a later date.

Conclusions

This ANTEC paper template is an easy-to-use method of preparing papers with the proper format. If the template is used as presented along with the many writing hints, authors should be able to submit high-quality papers to the ANTEC website, eliminating the need for modifications at a later date. This template is meant to supplement the paper format guidelines presented in the Write Now brochure.

References

1. J. Davenport, Materials Transformation Center, personal communication.
2. M.A. Spalding, G.A. Campbell, F. Carlson, and K. Nazrisdoust, *SPE-ANTEC Tech. Papers*, **52**, 792 (2006).
3. C.I. Chung and R.A. Barr, U.S. Patent 4,405,239 (1983).
4. S.A. Somers, M.A. Spalding, J. Dooley, and K.S. Hyun, *SPE-ANTEC Tech. Papers*, **41**, 222 (1995).