

Technical Writing Style

1. **Omit needless words.** The following italicized words are examples of needless words: *definitely* proved, orange *in color*, worst-case *maximum possible* error, because *of the fact that*
2. **Never begin a sentence with a word that has an "-ing" suffix.**
"Assuming a $\ll 1$ and substituting in Eq. 12, the relation becomes Eq. 14." ✗
"When a $\ll 1$, Eq. 12 can be simplified to become Eq. 14." ✓
3. **Put statements in positive form.**
"None of these integers were non-negative." ✗
"All of these integers were positive." ✓
4. **Whenever possible, give numerical values in statements and avoid ambiguous words:**
"The voltage across a forward-biased silicon diode is small." ✗
"The voltage across a forward-biased silicon diode is about 0.7 V." ✓
5. **Avoid dangling comparatives and superlatives.** The range of options in the comparison must be specified.
The voltage across the diode is *smaller*. ✗
The voltage across the diode is smaller than the voltage across resistor R1. ✓
6. **If the values of X and Y are compared, then X and Y *must* have the same units.**
For example: In this design R was chosen to be larger than C. ✗
Since R is a resistance and C is a capacitance, their dimensions are not the same, and the sentence is rubbish.
Watch out for phrases like "400 volts of ac current". Current does not have units of volts.
7. **For numbers between -1 and +1, insert a zero to the left of the decimal point in order to avoid a "naked decimal point".** For example, use 0.47, *not* .47
8. **Avoid improper addition of numbers.** For example: There are four pots of boiling water on the stove, each pot with a temperature of 100°C. If one poured all of the water into one container, then the water would *not* have a temperature of 400°C of water, but only 100°C. Note that temperature is *not* additive. In general, single digit numbers (zero through nine) are spelled out, while numbers of two or more digits (10, 20th Century, ...) use figures.
9. **When a number is at the beginning of a sentence it is *always* spelled-out.**
10. **There should always be *one blank space* between a number and a unit:**
"5 kHz", not "5kHz" There is no space between the metric prefix and the base unit.
11. **About verb tense**, many engineers believe that *all* formal technical writing should use the past tense. However, it is appropriate to use present tense for things that are true when the author writes about them and will still be true in the future when the text is read.

Technical Writing Style

1. Use the opening page to present the essential information. Avoid starting with Background, Introduction or Methodology, in order to use the most valuable part of the document—the first page—in the best way. For example:

Conventional Opening:

Report into Firewall Software

Background

The IT Assessment Group has drawn this report together to examine the alternative ways of protecting the company's data. In particular, the concept of firewall software, defined as software that can be used to protect an organization from viruses and unauthorized entry (into databases) and its use within the organization is assessed. In order to assess the alternatives available, six independent technical evaluators were briefed on the company's databases, existing procedures. This report draws on the conclusions of the six evaluators.

Essential Information:

Firewall Software

Protecting the Company's Data

Firewall software is essential to protect the company's databases from viruses or unauthorized access. By investing \$20,000 in the latest software, the company will safeguard its 30,000 customer records and accounts and protect itself against credit-card fraud — estimated to cost the industry \$2.5 billion a year.

Then, write down your sections and subsections, and review them. Drop ones that are not essential. Then work out the best order to let readers pick out the information they need.

2. Write your headings using strong verbs and specific nouns. When you have your sections and subsections, give them headings with strong, active verbs and specific nouns, which will make your writing more direct and interesting. For example:

Standard Headings

The Mechanization of Auto Assembly

1. Present Method
2. Need for Change
3. Proposed Method
4. Warehouse
5. Factory
6. Shipping Depot
7. Office
8. Cost Comparisons
9. Recommendation

Headings with Strong Verbs and Specific Nouns

Mechanizing Auto Assembly

1. How the Assembly Line Works
2. Adopting a Mechanized Assembly Line
3. Choosing the Just-in-Time Principle
4. Warehouse — Keeping Enough Stock
5. Factory — Updating the Assembly Link
6. Shipping Depot — Meeting Order Deadlines
7. Office — Checking the Paperwork Saving
8. Costs and Improved Turnaround Times
9. Adopting a Mechnized Auto Assembly

3. Match your content to the knowledge of your audience. You may assume that everybody understands common terms but you may need to explain more complex terms.

Poor Technical Writing

The 15ATS series toggle switches, in excess of 200 in total, were subject to the extreme of temperatures caused by being in close proximity to the furnace. This in turn caused heat failure as the expansion of metal caused a fault whereby the metal connection fused. The heat of the furnace has to be over 600 degrees Fahrenheit before this effect takes place.

Concise and Easy to Read

Over 200 automatic toggle switches fused when the keypad melted as the furnace temperature rose to over 600 degrees Fahrenheit.

4. Keep information specific rather than general.

General

- heavy precipitation during the period
- excessive heat
- select the appropriate key

Specific

- four inches of rain in 48 hours
- 120 degrees Fahrenheit
- click Alt-B

When you give details, moving from general to specific improves your technical documents. For example, if a manager wants to know why production stopped for an hour on the assembly line, you have to give specific information. How specific your writing should be depends on the reader and your reason for writing. For example, if you are writing for nontechnical manager who wants to know why there's a problem and how you fixed it, the specific information below is enough. If you are trying to identify the reason for the belt stopping for a technical manager who needs to act to stop the fault reoccurring, you would need to go into excessive technical details of the specific failure (as shown below).

Too General

Problems arose in a number of areas of the stock transportation device that required intervention by an appropriately qualified member of staff so remedial action could be taken.

Specific

As the temperature rose to 120 degrees Fahrenheit, the coolant for the metal rollers overheated causing the conveyor belt to jam. To keep the belt working, a mechanical engineer had to reset the timer and rollers on the conveyor belt, replace the coolant and slow the belt by 25% to 200 feet an hour.

Excessive Detail

Monitoring the temperature saw a rise from 80.5 degrees Fahrenheit to 124.5 degrees Fahrenheit causing problems in the coolant's temperature. As the coolant's optimum operating temperature is 80 degrees Fahrenheit, the result was an expansion of the coolant beyond its maximum operating temperature level of 105 degrees Fahrenheit. This in turn led to a failure of the conveyor belt that was rectified by the mechanical engineer assessing the exact cooling coefficients needed with a possible ambient temperature above the manufacturer's recommended levels.

Three reduced settings were considered, namely reducing the belt speed by 10%, 20% and 25%. These would lead to a reduction in the in-line assembly velocity of 80 feet, 160 feet and 200 feet an hour respectively.

The optimum setting was 25.32% of the previous 800 feet an hour rate. However, before this was set, the engineer had to replace the 3.5 gallons of coolant used and reset 42 of the 360 rollers on the belt.

5. Write in plain English. You have to control sentence length, use active verbs, cut down on unnecessary jargon, and make your writing specific and tight. For example:

Original

From any page of a site, links can be found which point to other pages in the same site or to other sites, wherever they may be.

Specifically, these links are addresses which are called URLs. However, what is interesting for the visitor is not the address itself, but what can be found there, and so generally the address is not displayed.

Instead, what you find there is highlighted in the text (by underlining it and displaying it in another color, often blue).

Plain English

You can link any page to other pages on the same site or different sites. These URL addresses, usually hidden from view, guide the user to the right page. The user can then click on any underlined text, often shown in blue, and more information pops up.

6. Use active verbs rather than passive verbs. Active verbs make your writing simpler, less awkward, clearer and more precise. For example:

Passive Verbs

The QMS Magicolor 2 Printer **is equipped** with two interfaces, one **is known** as the parallel interface, the other **is known** as the Ethernet interface. Whatever interface connection **is needed**, you will find that MS Windows 98 has already **been preinstalled** and your software applications **are based** on this platform.
(50 words)

Active Verbs

The QMS Magicolor 2 Printer has Parallel and Ethernet interfaces. Whatever interface you need, you will find your software applications will work on the preinstalled MS Windows 98.
(28 words)

7. Keep your average sentence between 10 to 20 words.

Long Sentence

A highlight of the web site is the development of two types of electronic advisory systems—Expert and Technical where both of the systems inform the user about standards by either asking a series of questions which determine whether, how, and which specific parts of the standard apply to the user's activities, or addressing complex standards by placing in one location a large amount of information about the standard. **(One Sentence—70 words)**

Shorter Sentences

The web site offers both expert and technical advice sections. These explain standards by asking questions to find out if and how the standards apply to the user. They also address complex standards by placing all the relevant information in one place. **(Three sentences—42 words)**

8. Edit wordy phrases. Unnecessary words and phrases obscure meaning. You have to make every word count in technical documents.

Wordy

To understand and interpret an applet, the browser must have a Java virtual machine at its disposal. This is the case, in particular with Netscape Navigator and Internet Explorer, as well as Sun's HotJava. However, we have already mentioned several times that many Web surfers are attached to older browsers with which they feel comfortable. This being the case, if you use Java you will limit the number of visitors who will be able to wonder at what your applets do. In addition, browsers have a configuration option which allows (for security reasons, for example) the Java virtual machine to be turned off. Cautious people make frequent use of this option. **(111 words)**

Concise

Browsers such as Netscape Navigator, Internet Explorer and Sun's HotJava can only use applets with Java virtual machines. If Web surfers use older browsers, which do not understand Java, or switch the Java option off for security reasons, you will have fewer visitors to your site. **(46 words)**

9. Use simple words rather than complex ones.

Complex Words

As we noted in the **preceding** section, if you **purchased additional** printer **options**, such as a second printer tray, it is a **requirement** you **verify** its correct installation.

Simple Words

As we noted in the previous section, if you bought extra printer equipment, such as a second printer tray, you must check that you installed it correctly.

10. Avoid jargon.

Jargon-ridden

Most refractory coatings to date exhibit a lack of reliability when subject to the impingement of entrained particulate matter in the propellant stream under extended firing durations.

Jargon-free

The exhaust gas eventually chews the coating of existing ceramics.

Jargon depends on your audience, however, jargon is more than a specialist term. For example:

Profession	Example
Computers	batch processing, JPEG and macros
Law	affidavit, easement and surety
Mathematics	duodecimal, rhomboid and standard deviation
Medicine	angina, cerebral palsy and tonsillectomy

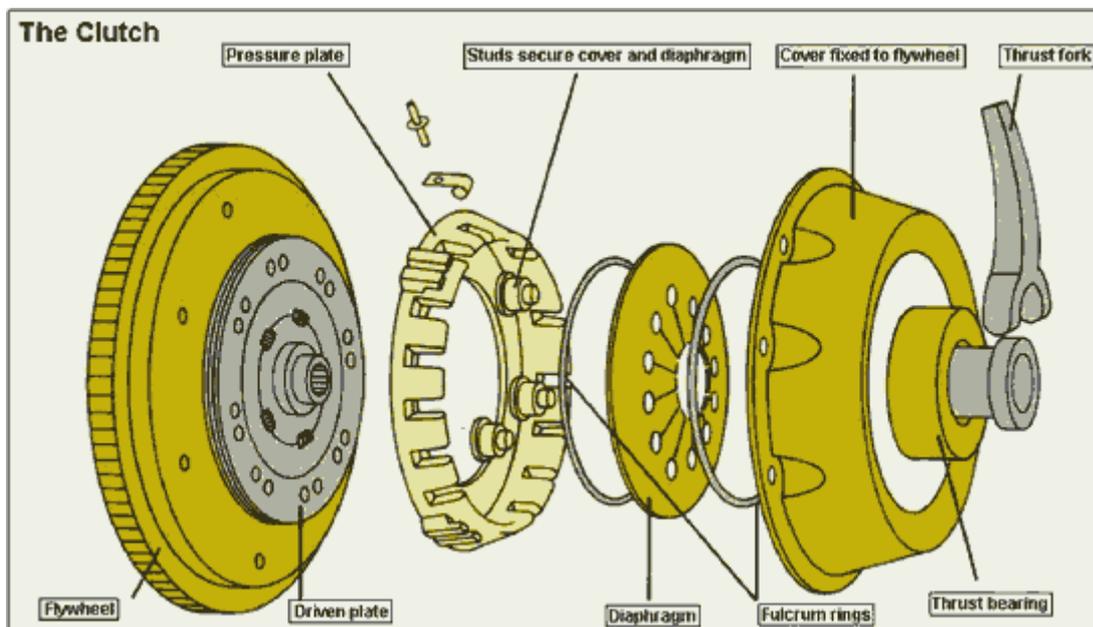
Each of these professions needs these specialist terms. They specifically describe something, even if the word is not in the average person's vocabulary. So, use such terms freely, offering explanations if you expect your readers to have problems understanding. For example, a doctor might explain the need for a tonsillectomy to a patient by saying, 'You'll need to go into hospital for an overnight operation to remove your tonsils.' But to use such an explanation in a report to his or her peers would be unnecessary.

11. Keep technical terms to a minimum.

12. Use examples and illustrations and analogies to explain difficult information or new ideas. For example:

- The operating system of your computer is like the bridge on a ship, the control center for everything that happens on your machine.

13. Use diagrams, flowcharts and graphs. A good diagram, flowchart or graph can present information very quickly. For example, the diagram showing a car's clutch below makes any explanation or technical description easier to understand.



Adapted from: <http://www.technical-writing-course.com>