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Safety Notes and Warning Messages

Practical Guides

This document is currently under revision

Bibliographic Information of the Deutsche Nationalbibliothek (The German Library)

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at http://dnb.d-nb.de.

Publisher
tcworld GmbH, Rotebühlstraße 64, 70178 Stuttgart, Germany
Phone +49 711 65704-0, Fax +49 711 65704-99
E-mail info@tekom.de, www.tekom.de

ISBN 978-3-944449-56-2 Print
ISBN 978-3-944449-66-1 eBook PDF

Layout: Elisabeth Gräfe, www.fraugraefe.de

This document is currently under revision

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5 Recommendations for Implementation

This guide contains a wide range of rules that form the framework within which safety notes and warning messages in instructions for use can be designed. Many technical editors, however, want clearer rules that they can apply directly to their work. The standards do not currently satisfy such wishes. At best, a stricter formulation of the principles can be expected for specific products in the near future.

tekom welcomes this, since adjustable rules give technical editors room for appropriate adaption and personal decision. This applies to all aspects of the safety-related information, its content, distribution (grouping, placement, sequence within documents) and also its typographical and graphic design.

The following sections nonetheless contain recommendations that represent a stricter design than recommended in the standards themselves. This is intended to satisfy the desire for ready to use "cookbook"-style rules. At the same time, the recommendations presented are open enough to allow use on different types of instructions for use and for diverse products.

5.1 Basics of Structuring and Presentation of Safety Information in Instructions

The pertinent horizontal standard ISO/IEC 82079-1 makes a clear distinction between safety notes and warning messages. For the former, it requires that they shall be "presented in a meaningful organized system". The statement appears nebulous and unclear; however, it states the essentials: both the structure and the design must have a "meaning", i.e. correspond to a purpose defined by the author. While the basic purpose of safety-related information is obvious, a specific structure is meaningful in connection with a specific product and the instructions for use applicable to this specific product.

To illustrate this, the following table compares two extremes: instructions for use for a comparably simple product and operating instructions for a production facility comprising several pieces of equipment. In both cases, conclusions for the structure of safety-related information were derived from the features of the respective documentation.

Instructions for use for a simple product	Operating instructions for a production facility comprising several pieces of equipment
Only few life phases Only a single target group	Many, also complex life phases Diverse target groups with different requirement profiles
No division of the safety notes by life phases and target groups required	Division of the safety notes by life phases and target groups meaningful/required
Few, usually obvious hazards	Some hidden hazards with high risk
Few safety notes required Presentation in a safety-related chapter meaningful	Many safety notes required Introductory safety chapter as well as several life-phase-related "safety chapters" meaningful in different parts of the instructions for use
Few, simple work steps	Complex work steps (particularly during setup and maintenance)
All the safety-related information can be arranged at the outset of the instructions in a safety chapter	Numerous warning messages required in context
Instructions for use are prepared by an organization	Inclusion of supplier documentation from numerous sub-suppliers required

Instructions for use for a simple product	Operating instructions for a production facility comprising several pieces of equipment
Consistent design for safety-related information possible	Various designs must be harmonized, overview of safety and safety measures required at the outset of the manuals

Illustration 5-1: Relationship between the type of instructions for use and the structure of safety-related information

The illustration demonstrates that the division of safety-related information in instructions for use should not be determined on the basis of rigid rules, but rather based on the necessities of the individual case.

Similarly, layout and design of instructions for use will affect the presentation of safety notes and warning messages. Above all, the paper format and the column width have a large influence on the respective design options. Pictograms and symbols can hardly be set in marginal columns on small paper formats or in layouts with several columns. In such documents Pictograms and signal words should be kept rather small so they do not excessively dominate the relatively narrow columns (table 2 in section 6.2.1 of ISO/IEC 82079-1 defines the smallest height for safety signs at 10 mm; the height of the safety alert symbol, however, may be only 4 mm or presented in 12 point font size). If colors can be used, this raises numerous additional design issues that need to be clarified in each case.

This goes to show that a framework with only a few rigid rules as introduced by the standards is in fact welcome. This framework includes the following principles that technical editors should consider a guideline:

Principle	Use of the principle
Keep related items together	Present safety notes in a safety chapter (or several life-phase-related safety chapters) Place warning messages before/in the respective sequence of actions
Avoid overstimulation	If there are several safety notes in a safety chapter, do not provide each one with a warning triangle or signal word or another pictogram Do not place more than three warning messages in sequence
Consider target group(s)	Divide safety information according to life phases into several safety chapters
Emphasize safety-related information	Provide warning messages (within context) with a warning triangle and signal word Present/print pictograms and symbols in safety colors where technically feasible Use a heading to identify safety chapters as safety-related
Ensure readability	With a paper format ≥ A5 do not use fonts smaller than 10 point; with smaller, folded formats, never use fonts smaller than 8 point Only present/print safety notes and warning messages with black lettering, preferably on white background Do not print the safety chapter on color paper (yellow, red, etc.)
Use meaningful titles/ headings	Headings, especially in a safety chapter, should not be "generic" (e.g. "hazards in case of misuse"). They should instead present the facts and situations in the most specific terms possible (e.g. "regular maintenance required" or "avoid eye damage due to laser light"). Just signal words alone in warning messages do not provide sufficient information. They need to be enlarged on by technical descriptions/terms.

Illustration 5-2: Principles for designing safety-related information

ISO/IEC 82079-1 recommends using font that is larger than the rest of the text for warnings. From the perspective of ANSI Z535.6, however, this does not make sense: Text of various font sizes is not readily perceived as belonging together. In extreme cases, which have been observed in usability tests, readers skip warning messages when reading if these differ too much or are set too heavily apart from the main text. In a case where one of the guide's authors was on hand to make observations, a test person skipped a framed warning message and justified this during the subsequent interview, saying that he was accustomed to overlooking framed information in newspapers and magazines. The psychology of shapes has also clearly demonstrated that similar objects tend to be perceived as belonging together in contrast with objects that are not similar. It obviously is recommendable to transfer these findings to text design and require that warnings should not differ too greatly from other text.

The following chapters contains further details and examples.

5.2 Safety Notes

According to the definition in ISO/IEC 82079-1, safety notes shall be presented in a meaningful organized system in a section or chapter of the instructions for use. Safety notes serve to:

– explain safety measures,
– raise safety awareness and
– lay a foundation for safety-related training of users/operators.

These purposes place the safety note in a learning context. Safety notes – and thus the entire chapter/section of the instructions for use – are targeted at promoting safe behavior. The didactic effectiveness of safety notes is thus more important than their arrangement in the instructions for use. A safety chapter is not usually read during a hazardous situation or action, but long before. The safety chapter is meant to teach the user the "rules of the game" for safe use, for him to keep them in mind before he encounters situations where action is needed.

5.2.1 Structure and Content of the "Safety" Chapter

The "safety" chapter should present the safety notes in a logical order. Suitable structuring principles are:

– by target group: e.g. operators, users and maintenance staff
– by phase of life: e.g. transport, installation, use, maintenance
– by part of the product/system (in case of complex products)
– by type of hazard

Organizing the content by risk level is less suitable, because it can place the information in an otherwise confusing order, especially if numerous safety notes are required. The safety notes belonging to one and the same phase of life, however, could be organized by their significance, e.g. the highest risk first.

The introduction of ISO/IEC 82079-1 and its distinction between safety notes and warning messages raises the question about whether warning messages can be part of a safety chapter or whether warning messages are a kind of "subset" of safety notes. The general answer is no. A warning messages is normally placed in a procedural context and its purpose is limited to drawing attention to a hazard that is directly related to the action described. As outlined above, safety notes, however, are presented in a learning context.

However, one may decide to integrate a specific safety note in a safety chapter with the design of a warning message to draw special attention to it. However, this design should definitely be used sparingly.

In very comprehensive documentation, it is useful to divide the safety chapter into several sections that precede the chapters or even entire manuals for specific phases of life. Such organizational concepts are presented in illustration 5-3.

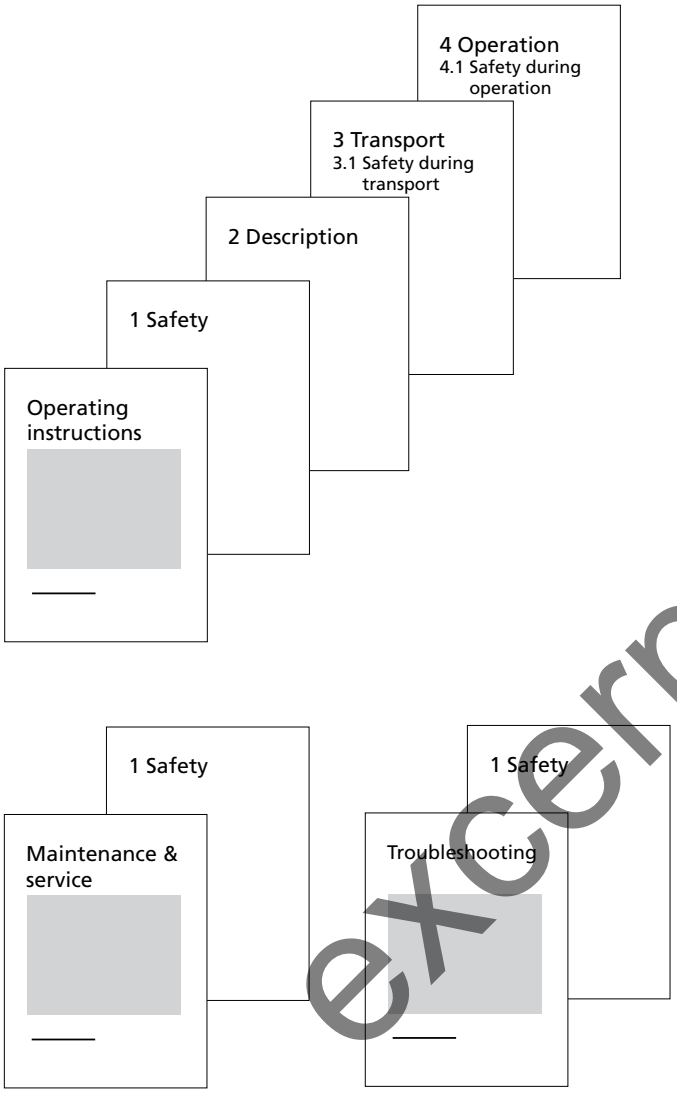

Illustration 5-3: Organizational concepts for safety-related information in comprehensive documentation

The content and structure of safety chapters should always be defined on the basis of a risk assessment (see chapter 2.2 *From Risk Assessment to Safety Note or Warning Message*).

Sample structure of the "safety" chapter for a simple device that is also meant for consumers

- Introduction about the meaning of the instructions for use and the safety notes
  - First read, then use
  - Store instructions for use, pass on if product is sold
  - Explanation of pictograms and symbols
- Area of application / purpose of product ("intended use")
  - Authorized use
  - Technical limitations (e.g. durability or specific materials, applications)
  - Hazardous misuse / prohibit improper use
  - "Prohibit" modifications

- Primary hazards (only for the phase of life “use”)
- User qualifications
  - Training or other requirements
  - Minimum age where necessary
  - Requirement to keep children away where necessary
  - Hazards for specific groups of people (e.g. people with disabilities, older people, people who wear electro-medical devices)
- Personal protective equipment that is required (if applicable)
- Safety notes related to individual phases of life
  - Transport
  - Connection, commissioning
  - Use
  - Maintenance
  - Disposal

Sample structure of the “safety” chapter for complex products, e.g. machine tools

- Introduction about the meaning of the instructions for use and the safety notes
  - First read, then use
  - Store instructions for use, pass on if product is sold
  - Explanation of the structure of the safety information contained in the instructions for use
  - If necessary, explain the structure of the entire documentation – where can you find what type of information?
  - Explanation of pictograms and symbols
- Area of application / purpose of product (“intended use”)
  - Authorized use
  - Technical limitations (e.g. durability or specific materials, applications)
  - Hazardous misuse / prohibit improper use
  - “Prohibit” modifications
- Primary hazards (only for the phase of life “use”)
  - User qualifications
  - Training or other requirements
  - Minimum age where necessary
  - Hazard for specific groups of people (people with disabilities, older people, people who wear electro-medical devices, etc.)
- Personal protective equipment that is required (if applicable)
- Protective equipment and safety measures with illustrations (if necessary, ordered by system parts or components)
  - Guards
  - Protective devices (control system safety)
  - Monitoring of safety-related parameters
  - Emergency stop equipment
  - Shut-off devices for all energy sources
  - Special protective measures (e.g. explosion protection)
  - Warning devices
  - Signs
  - Checklist for test of all guards, protective devices and safety measures
  - Additional protective devices to be installed or safety measures to be taken by the operator on-site
- Safety notes related to individual phases of life (if necessary, as a section at the beginning of the respective chapter of the instructions for use or a separate manual)

› Transport
› Connection, commissioning
› Use
› Troubleshooting
› Maintenance
› Disposal

5.2.2 Recommendations for design of safety notes

Safety notes in a safety chapter do not require any special or outstanding design. Since they are already provided in a chapter that is exclusively dedicated to safety-related information, they are sufficiently highlighted.

Today often, all or most of the notes and messages in a safety chapter designed in the style typical for warning messages. Some obviously feel compelled to follow the so called SAFE-rule. According to it, each warning message must contain a signal word (S), the type of the hazard (A), the possible consequences (F) and the options for escape from or avoidance of the hazard (E). The result is a flood of symbols and pictograms in the safety chapter. Often there are five or more of them on each page. Such a design can be exhausting and even confusing.

The typical design of warning messages, including a hazard alert symbol (yellow triangle with exclamation mark) and a signal word should be limited to warnings appearing in an action sequence, preventing overstimulation or even "warning pollution". If information contained in a safety chapter is designed like a warning message at all, then this should be limited to only a few instances – less is more.

Otherwise, all common technical documentation formats can be used in safety chapters to present safety-related information:

– Continuous text
– Numbered and unnumbered lists
– Tables
– Diagrams
– Graphics and images
– Subheadings
– Marginal notes
– …

The design should emphasize the structure of the chapter and organize it. It can also facilitate access to any particular part of the text and make it easier to identify a specific portion of the information.

The more interesting a safety chapter is designed, the more likely it is that it will be read. Particularly, graphics, tables and overviews will draw interest. However, diagrams, graphics and images (like in other parts of the instructions for use) should always fulfill a pre-defined purpose and not merely serve to make the text more interesting, let alone serve as a type of decoration.

5.3 Warning Messages in Context

According to the definition in ISO/IEC 82079-1, warning messages serve to warn users of hazards and guide them in avoiding them. To this end, they are usually provided where the tasks or actions associated with the hazard(s) are described. While ISO/IEC 82079-1 does not further differentiate the placement of warning messages in context, ANSI Z535.6 draws a distinction between two options:

– Warning message may be placed *before* the description of a sequence of action (section safety messages)

– Warning message may be placed *within* the sequence of actions, i.e. between two steps or even *integrated into a step* (“embedded safety messages”)

ANSI allows different designs for these two types of warning messages. For example, “embedded safety messages” may begin in the middle of a text line and they do not necessarily have to be preceded by the hazard alert symbol.

When applying the standard, you are thus forced to make a decision: If you want to use all categories specified by to ANSI Z535.6, you cannot apply ISO/IEC 82079-1 dogmatically. The majority of the requirements for design, however, are entirely compatible.

5.3.1 Structure, Content and Placement of Warning Messages

Both ISO/IEC 82079-1 and ANSI Z535.6 associate five elements with warning messages that are combined in a more or less strict structure:

1. Emphasize the warning by means of the hazard alert symbol
2. Use a signal word that specifies the risk level – DANGER, WARNING, CAUTION (high, moderate, low risk)
3. Give the type and source of the hazard, also a description of the causes if necessary
4. State the possible consequences for people, pets, material assets and the environment if the hazard actually occurs or the warning message is ignored
5. State the options for avoiding the hazard

At the same time, the structure above is in the recommended order, although this order is not necessarily required by the international or the US standard. The following example illustrates the basic structure. It specifies the type of hazard and the possible consequences in a joint sentence. Many people do not agree with this. However, there are no objections to it in the standard. In the example, the simplest design possible has been selected. The graphic design is covered in chapter 5.3.2 *Recommendations for Design of Warning Messages*.

⚠ WARNING

- Corrosive liquids can damage mucous membranes and cause skin irritations.
  Do not use acidic cleaners.

Illustration 5-4: Example of a typical warning message structure

Placement of warning messages

According to ISO/IEC 82079-1, warning messages must be “given in the context in which a danger may occur” (section 5.5.3). Essentially this means that a warning message can be placed anywhere in the instructions for use. Style sheets and DTDs should take this into consideration. Warning messages today are frequently provided in the following parts or sections of the instructions for use:

– *Before* the description of a sequence of actions (ANSI Z535.6: section safety message)
– *Within* the description of a sequence of actions (ANSI Z535.6: embedded safety message)
– In a table cell that refers to a hazardous situation (ANSI Z535.6: embedded safety message)
– In/together with an illustration that refers to a hazardous situation (ANSI Z535.6: embedded safety message)
– In a continuous text as a separate section (e.g. in the safety chapter)
– In a list or as a list item (ANSI Z535.6: embedded safety message)

Warning messages are normally associated with a sequence of actions. Placing the warning message *before* the description makes sense if

– the course of action only involves a few steps, e.g. no more than three to five
– the hazard is present during the entire course of action
– the hazard occurs at the very beginning

Placing the warning message *within* the description makes sense if

– the course of action includes many steps
– the hazard only occurs later in the course of action, e.g. only in the fifth step or later
– several different hazards can occur during the course of action

The differences in placement also call for adjustments in design (see the following chapter 5.3.2 *Recommendations for Design of Warning Messages*).

5.3.2 Recommendations for Design of Warning Messages

For many years technical editors have been focusing on the design of warning messages. By many it is seen as the crucial criterion for their effectiveness. This is a misconception, however. The design is not the critical element. It should definitely not take precedence over the more important questions of completeness of content, comprehensibility, and meaningful placement.

The few design rules are therefore considered subordinate to other criteria in the section below. The design should achieve the following objectives:

– Warning messages must be emphasized so that they are not overlooked or ignored.
– The harmony of layout and typography should be supported, not interfered with or obliterated (for example, ANSI Z535.6 in a note to section 9.4 states: “the formatting should not unnecessarily interfere with the user reading the information”).
– Organize/arrange information

Hazard alert symbol (triangle with exclamation mark)

According to ISO/IEC 82079-1 (section 6.8.6), the hazard alert symbol and one of the three signal words DANGER, WARNING or CAUTION belong together (to select the correct signal word, see chapter 4.2.2 Comparison of EN 82079-1 and ANSI Z535.6). According to ANSI Z535.6, this is only the case if a “signal word panel” is used. In this case, the hazard alert symbol and the signal word are placed together in a square frame. The frame may also be a colored area in which the hazard alert symbol and the signal word are placed. The color may also be the same as the background color (e.g. white). In this case, the hazard alert symbol must be approximately as large as the font and both must be centered in the frame. However, if no frame is used, the signal word can be used without a hazard alert symbol and the hazard alert symbol can be used without a signal word. To achieve maximum compatibility of ISO/IEC and ANSI, the requirements in ISO/IEC 82079-1, section 6.8.6 should not be applied dogmatically. Embedded safety messages do not require a hazard alert symbol.

Consequently, there are only two basic options for a design suitable for international use:

– Hazard alert symbol and signal word *without a square frame* (1):
  ⚠ WARNING
– Signal word panel, i.e. hazard alert symbol in font size together with signal word centered *in a square frame* (2):

  ⚠ WARNING

Illustration 5-5: Design of warning messages as a signal word panel

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Solution 1 allows placing the hazard alert symbol above or left of the signal word, but not to the right or below it. It may also be significantly larger than the font.

WARNING

Text Text Text Text Text Text Text Text Text Text
Text Text Text Text Text Text Text Text Text Text
Text Text Text Text Text Text Text Text Text Text

WARNING

Text Text Text Text Text Text Text Text Text Text
Text Text Text Text Text Text Text Text Text Text
Text Text Text Text Text Text Text Text Text Text

Illustration 5-6: Signal word WARNING next to or below the hazard alert symbol

Additional elements, such as lines, frames and shadows may be used.

WARNING

Text Text Text Text Text Text Text Text Text Text
Text Text Text Text Text Text Text Text Text Text
Text Text Text Text Text Text Text Text Text Text

WARNING

Text Text Text Text Text Text Text Text Text Text
Text Text Text Text Text Text Text Text Text Text
Text Text Text Text Text Text Text Text Text Text

WARNING

Text Text Text Text Text Text Text Text Text Text
Text Text Text Text Text Text Text Text Text Text
Text Text Text Text Text Text Text Text Text Text

Illustration 5-7: Design of warning messages with additional lines, frames and shadows

Solution 2 is strictly regulated. The only choices are the font type (must be sans serif, however) and whether to use the safety colors. In contrast with the popular assumption, ANSI Z535.6 does not require use of colors:

Color signal word panel

Color signal word panel with frame

Black and white signal word panel

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Black and white signal word panel

Gray signal word panel

There are only two options for placement of the signal word panel:

DANGER	Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text

Signal word panel left next to the warning message

DANGER
Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text

DANGER
Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text Text

Signal word panel above the warning message

Illustration 5-8: Different design options for signal word panels and messages

5.3.3 Additional Symbols and Pictograms (Warnings, Mandatory Actions, Prohibitions)

Additional symbols or pictograms can be used with each hazard alert symbol and signal word design variant. They can either illustrate the hazard (warning sign) or the corrective measure (mandatory action or prohibition sign). One or more symbols and/or pictograms may be used.

Standardized pictograms and symbols should preferably be used. The most important source for warning, mandatory action, or prohibition signs is ISO 7010 (also a European standard). The collection is sorted by the application environment and continuously expanded. With part 3 of the ISO 3864 standard series, the standards experts encourage the development of new pictograms. This part of the standard contains detailed recommendations and templates. The US equivalent to this standard is ANSI Z535.3. There still currently exists no compilation of all US warning signs in a common standard or database. The pictograms are – as was the case under ISO – scattered across individual standards, which complicates research.

Additional, symbols and pictograms can be placed as needed, but they should not be placed directly before or after the signal word. Also, they may not be used as a substitute for the hazard alert symbol, since ISO/IEC 82079-1 requires that the hazard alert symbol be placed before the signal word.

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If the instructions for use are to be used in the USA also, US pictograms should be used. They significantly differ from the ISO pictograms and are generally inserted into a square field without a triangular or circular outline. This makes it possible to present the actual pictogram content larger than if a triangle is drawn around it. ANSI, however, also accepts the ISO format with a surrounding shape (triangle, circle). Two versions are thus required when managing additional pictograms (USA and international). However, if automated document generation from a common data resource is used, the expenses should be manageable. Integrating pictograms – also ANSI pictograms – into the ISO shapes is popular, widespread and generally makes sense. However, if you draw a triangle around the pictogram, the content size is often reduced to such an extent that it is no longer clearly visible. This is where writers should strike a balance between the individual case and consistency of presentation.

⚠ DANGER

This is a warning message text that specifies the hazard.

This is a warning message text that specifies the consequences.

⇨ This is a warning message text that specifies the remedy.

Illustration 5-9: Warning message with additional pictogram

	**⚠ DANGER**
	This is a warning message text that specifies the hazard. This is a warning message text that specifies the consequences. This is a warning message text that specifies the remedy.

Illustration 5-10: Warning message with additional pictogram

⚠ DANGER

This is a warning message text that specifies the hazard.

This is a warning message text that specifies the consequences.

⇨ This is a warning message text that specifies the remedy.

Illustration 5-11: Warning message with additional US pictogram, version for the USA

	**⚠ DANGER**
	This is a warning message text that specifies the hazard. This is a warning message text that specifies the consequences. This is a warning message text that specifies the remedy.

Illustration 5-12: Warning message with additional ISO pictogram, international version

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Special formatting of the text

The different information elements in the warning message may have different formats. Frequently, the hazard description and/or the remedy are emphasized by different formatting. Such distinctions should be used sparingly, since they tend to distract rather than emphasize the essential information.

⚠ DANGER	
	**This is a warning message text that specifies the hazard.** This is a warning message text that specifies the consequences. This is a warning message text that specifies the remedy.

Illustration 5-13: Warning message with emphasized hazard

⚠ DANGER	
	This is a warning message text that specifies the hazard. This is a warning message text that specifies the consequences. ⇨ This is a warning message text that specifies the remedy.

Illustration 5-14: Warning message with emphasized corrective measure

⚠ DANGER

This is a warning message text that specifies the hazard.

This is a warning message text that specifies the consequences.

⇨ *This is a warning message text that specifies the remedy.*

Illustration 5-15: Warning message taking emphasis of details to the limit (or beyond)

Additional rules that must be observed for the design to comply with both ISO/IEC 82079-1 and ANSI Z535.4:

Rule	Example
Use hazard alert symbol according to IEC/ISO	⚠
Type signal word in sans serif in capital letters	~~WARNING~~ WARNING
Do not put an exclamation point after the signal word	~~DANGER~~!
Always use a signal word with the hazard alert symbol	⚠ WARNING
If colors are used, use the standardized signal colors (using colors is voluntary)	Yellow/black hazard alert symbol DANGER red, lettering white ⚠ DANGER WARNING orange-red, lettering black ⚠ WARNING CAUTION yellow, lettering black ⚠ CAUTION NOTICE blue, lettering white NOTICE
Do not use the hazard alert signal for warnings against property and environmental damage	

Illustration 5-16: Rules for IEC and ANSI-compliant design of warning messages

Design of the warning message depending on its placement

As displayed in chapter 5.3.1 *Structure, Content and Placement of Warning Messages*, warning messages may occur virtually anywhere in the instructions for use. Therefore, various designs are indeed required within the instructions for use. However, there should not be a bewildering array of different designs. Two different designs usually suffice: one for general use between paragraphs of the main text and another for placing warning messages in sequences of action, lists or table cells.

Placement	Design recommendation and reason	Example
Before a sequence of actions or in a text with several paragraphs	Hazard alert symbol and signal word should be at least two font sizes larger than the basic font or use a design with signal word panel Clear indication of the beginning and end of the warning message, e.g. through spacing, lines, frame or gray fields *Sufficient space available, maximum attention should be drawn* *Conforms with "section safety messages" in ANSI Z535.6*	Paragraph with describing text, Paragraph with describing text, Paragraph with describing text, Paragraph with describing text. **WARNING** Text, Text, Text, Text, Text, Text. Text, Text, Text, Text, Text, Text. Text, Text, Text, Text, Text, Text. Paragraph with describing text, Paragraph with describing text, Paragraph with describing text, Paragraph with describing text.
In a sequence of actions, a list or a table cell	Hazard alert symbol and signal word should be the size of the basic font, do not bold the signal word, start warning message on a new line, indent under text of the list and ensure only a little vertical space to the previous/next list item Do not use signal word panels *The warning message is to be noticed, but at the same time should remain part of the sequence or list. It should also be possible to place warning messages in narrow table columns, e.g. in the "remedy" column of a "troubleshooting" table* *Conforms with "embedded safety messages" according to ANSI Z535.6*	Paragraph with introductory text, Paragraph with introductory text, Paragraph with introductory text: 1. Description of the first step. 2. Description of the second step. ⚠ WARNING Text Text Text Text Text Text Text Text Text Text Text. 3. Description of the third step.

Illustration 5-17: Recommendations for formatting of warning messages depending on their placement

5.3.4 Translation of Signal Words

The signal words have been translated by ANSI and ISO. The standards ANSI Z535.4 and ISO 3864-2 have informative annexes in which the translations are provided in the most important languages. Unfortunately, they are not free of errors and there are some inconsistencies with the translations of IEC 82079-1. The following illustration shows the current status. If translations appear in the versions of ISO/IEC 82079-1 that deviate from ISO 3864-2, you should use those from ISO/IEC 82079-1, since ISO 3864-2 is not a European standard and the translations of the signal words only appear in an informative annex. In contrast, they are part of the main text of ISO/IEC 82079-1 in section 6.8.6.

Language	DANGER	WARNING	CAUTION
Chinese	危険	警告	注意
Danish	FARE	ADVARSEL	FORSIGTIG
Dutch	GEVAAR	WAARSCHUWING	VOORZICHTIG
German	GEFAHR	WARNUNG	VORSICHT
Finnish	VAARA	VAROITUS	HUOMIO
French	DANGER	MISE EN GARDE ISO/IEC 3864-2 specifies: ATTENTION	ATTENTION
Greek	ΚΙΝΔΥΝΟ	ΠΡΟΕΙΔΟΠΟΙΗΣΗ	ΝΡΟΣΟΧΗ
Italian	PERICOLO	AVVERTENZA	ATTENZIONE
Japanese	危険	警告	注意
Korean	위험	경고	주의
Norwegian	FARE	ADVARSEL	FORSIKTIG
Portugese	PERIGO	ATENÇAO	CUIDADO
Russian	ОПАСНОСТЬ	ПРЕДУПРЕЖДЕНИЕ	ВНИМАНИЕ
Swedish	FARA	VARNING	OBSERVERA
Spanish	PELIGRO	ADVERTENCIA	ATENCION
Turkish	TEHLIKE	UYARI	DIKKAT

Illustration 5-18: Translation of the most important signal words according to ANSI and ISO

The signal words NOTICE and SAFETY INSTRUCTION

The signal words NOTICE and SAFETY INSTRUCTION currently exist only in ANSI Z535.6, but not in ISO/IEC 82079-1. However, NOTICE may also be used in Europe and internationally for marking messages concerning property and environmental damage, since no rule concerning this is included in ISO and European standards. This signal word, however, must not be combined with the safety alert symbol, since it is reserved for personal injuries. However, if there is danger of serious environmental damage (e.g. leakage of radioactive, carcinogenic or highly toxic substances), the signal word WARNING with a safety alert symbol may be used or will even have to be used; in such cases, the environmental damage would almost certainly result in personal injuries.

Today, the word NOTICE is often translated by an equivalent of ATTENTION. This can, however, result in conflicts in languages with Latin roots, since in most of these languages, the signal word CAUTION has been translated with an equivalent of attention (“Attenzione” in Italian, “Attention” in French). In Portuguese, the word WARNING is translated “Atençao” (attention). An equivalent of “important” could therefore be used as an alternative translation for NOTICE. Other translations may also be used in

Latin-root languages, e.g. “AVIS” in French, “AVISO” in Portuguese and “AVVISO” in Italian.

The relatively new signal word SAFETY INSTRUCTION is less suitable for use in printed instructions than for labels on the product. The text is to be adjusted to the situation on hand and may then include messages like “BEHAVIOR IN CASE OF FIRE” or “FASTEN SEATBELT” etc.

Recommendations for wording in safety notes and warning messages

Safety notes and warning messages must be written in a way that ensures optimum comprehension. Words and sentence structures that are understood by as many people as possible should be used. The likely language skills of the weakest target group of the product should be used as a benchmark. Conclusions concerning the suitability of terminology and the necessity of explanations for or paraphrasing of technical terms can usually be drawn from the qualifications of the target group.

Independent of such target-group-related decisions, the following principles may be followed when writing safety-related text:

Principle		Reason	Example
1	*Preferably use simple tenses, only use complex tenses if this serves a specific purpose*	Complex tenses are more elaborate and frequently form “sentence brackets” that contain too many details force between an auxiliary or modal verb and the main verb	*Passive modal construction:* The door cannot be opened until the lock has been disengaged. *Better:* The lock is disengaged. Now open the door.
2	*Do not use passive voice for instructions (corrective measures)*	As a complex tense passive voice is unnecessarily complicated. Avoid using passive voice and specify the action directly	*Instruction written in passive voice:* The electrical system must not be repaired by unqualified personnel. *Better:* Only qualified electricians may repair the electrical system. Only have qualified electricians repair the electrical system.
3	*Write complete sentences. Only use telegram-type style where there is lack of space (e.g. on warning labels) and if misunderstandings can be ruled out*	Incomplete sentences can be interpreted and frequently result in misunderstandings with translators	*Incomplete phrase:* Toxic fumes! Serious damage to health! *Better:* Toxic fumes cause serious breathing difficulties and poisoning.
4	*Keep abstraction to a minimum, use specific (vivid) terms*	Readers cannot visualize excessively abstract terms. It requires the reader to rethink and interpret what is being said	*Abstract term:* To load the machine, do not use *climbing aids*. *Better:* To load the machine, do not climb on a *crate*, *chair* or similar. (Also see the examples for principles 3 and 7)

Principle		Reason	Example
5	*Avoid generalizations*	Generalizations are used for standardization, but often result in vague statements that do not achieve the intended effect	*Generalization:* Do not use unsafe methods. If necessary, wear suitable personal protective equipment. *Better:* Observe the following: Do not work with wet *hands*. Do not work with the machine if your concentration is impaired by medication, alcohol or drugs. When grinding, wear protective goggles and a dust mask.
6	*Avoid complex "legalese" formulations*	Safety notes and warning messages are intended for product users, not for lawyers and attorneys. Long sentences with many details are often hard to understand	*Legalese wording:* During all work involving operation, production adjustment, retooling or adjustment of the machine and its safety-related equipment as well as during inspection, maintenance and repair, observe the activation and deactivation procedures set forth in the operating instructions and the notes for safe maintenance work. *Better:* Switch off and lock out the machine as described in these operating instructions. This is required before: – adjusting production – retooling – making settings – inspection, maintenance, and repair
7	*Leave out adjectives and adverbs if they are not essential for comprehension*	Adjectives and adverbs like an ornament may unnecessarily distract from the core statement	*Unnecessary adjectives/adverbs:* Rotating *very sharp* blades can cut off body parts. *Better:* Rotating blades can cut off fingers and hands. *(The unnecessary abstract term "body parts" was also replaced by more specific words.)*
8	*Clearly declare temporal and causal relationships*	The unclear declaration of conditions and relationships can contribute to false decisions and may promote translation errors.	*Unclear declaration:* Press this lever forward and the screw unit lowers. *Express the temporal relationship more effectively:* As long as you push this lever forward, the screw unit will lower. *Express the causal relationship more effectively:* If you push this lever during operation, the screw unit will lower.

Illustration 5-19: Principles for wording of safety notes and warning messages