भारतीय मानक

Indian Standard

IS 19063 : 2024
ISO 22324 : 2022

सुरक्षा और प्रत्यास्थता — आपातकालीन प्रबंधन — रंग कूटबद्ध चेतावनी के लिए दिशानिर्देश

Security and Resilience — Emergency Management — Guidelines for Colour Coded Alert

ICS 01.070; 03.100.01

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Risk Management, Security and Resilience Sectional Committee, MSD 17

NATIONAL FOREWORD

This Indian Standard which is identical to ISO 22324 : 2022 'Security and resilience — Emergency management — Guidelines for colour-coded alert' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Publication and Risk Management, Security and Resilience Sectional Committee and approval of the Management and Systems Division Council.

The text of the ISO standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'; and

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standard for which Indian Standard also exists. The corresponding Indian Standard, which is to be substituted in its place, is listed below along with its degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 22300 Security and resilience — Vocabulary	IS/ISO 22300 : 2021 Security and Resilience — Vocabulary	Identical

Annex A and Annex B are for information only.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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Introduction

People can be faced in their daily lives with various kinds of risks. People at risk should be able to take appropriate safety actions when faced with hazards even if they do not have a full understanding of them.

Public warnings, through a combination of prior notifications and alerts, enable people at risk to take appropriate and timely actions to protect their safety. ISO 22322 provides further guidance on public warning.

Colour-coded alerts are used to notify people at risk of status changes on a safety or danger continuum in allowing them to take appropriate actions.

This document will lead to better understanding of colour-coded alerts by reducing confusion and prompting more appropriate responses in an emergency situation.

Indian Standard

SECURITY AND RESILIENCE — EMERGENCY MANAGEMENT — GUIDELINES FOR COLOUR CODED ALERT

1 Scope

This document gives guidance on the use of colour codes to inform people at risk as well as first response personnel about danger and to express the severity of a situation.

This document is applicable to all types of hazard in any location.

This document does not apply to the method for displaying colour codes, detailed ergonomic considerations related to viewing displays or safety signs covered by ISO 3864-1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 22300, *Security and resilience — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22300 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Guidance for use of colour codes

4.1 General

Red, yellow and green (and the spectrum in between in terms of hue) should be used to express the status of a hazard. Black, purple, blue and grey should be used to give supplementary information about the hazard. ISO 22322 provides further guidance on public warning.

4.2 Colour codes to express the status of hazard

4.2.1 General

The colour codes to express the status of hazard are as follows:

— Red is associated with danger and should be used to notify people at risk to take appropriate safety actions immediately.

— Yellow is associated with caution and should be used to notify people at risk to prepare to take appropriate safety actions.

— Green is associated with a safe status and should be used to notify people at risk that no action is required.

This document does not define danger, caution or safety other than the suggested meaning given in Table 1.

Experts should classify the status of hazard into danger, caution or safe.

Table 1 — Colour codes

Colour	Associated meaning	Proposed action
Red	Danger	Take appropriate safety action immediately
Yellow	Caution	Prepare to take appropriate safety action
Green	Safe	No action required

4.2.2 Typical colours for colour-coding system

If more than three colours are needed to express the level of hazard, the colours and supporting information should be based on the following:

— the number of the level of hazard should be minimized in order to limit the number of colours being used;

— hues between the red and green spectrum should be chosen;

— no more than seven colours should be used to avoid confusion;

— supporting information, which is understandable by users, should be added, including:

  — supplemental information (e.g. text, numbers, shape, symbol, size);

  — positional coding.

Figure 1 illustrates the different colours which can be used in colour-coding systems.

The colours in Figure 1 are indicative and should not be used for colour matching.

Annex B gives recommendations on colour specifications based on Munsell, CMYK and RGB systems.

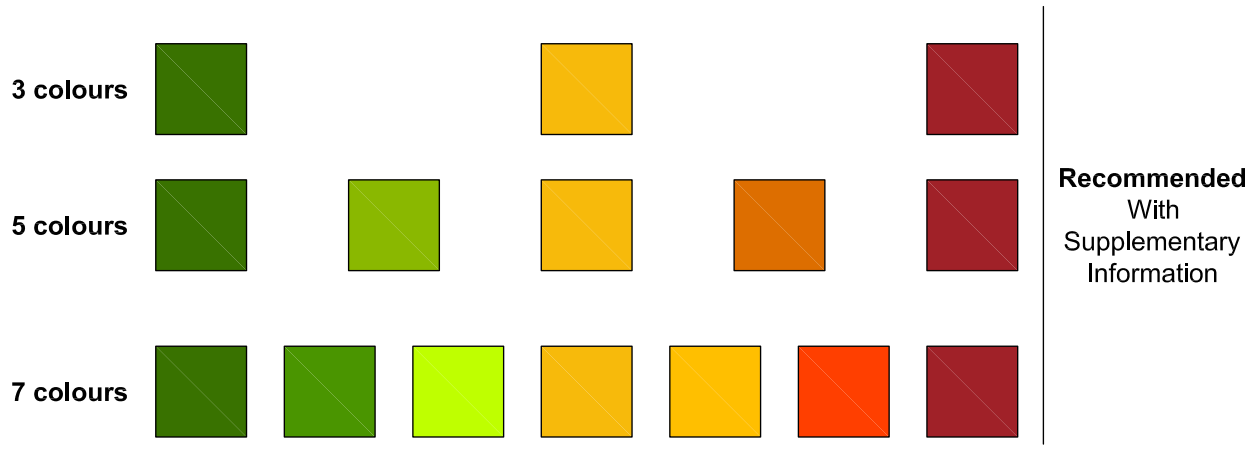


Figure 1 — Guideline for use of basic colours

4.2.3 Order and position for the red, yellow and green spectrum

The order of colours can provide positional cues so that people can easily recognize the meaning of the alert.

There are several ways to show and use the spectrum of red, yellow and green (see Figure 2). However, these colours should always be placed in a certain order where the increasing level of hazard is presented:

— from left to right, or

— from bottom to top.

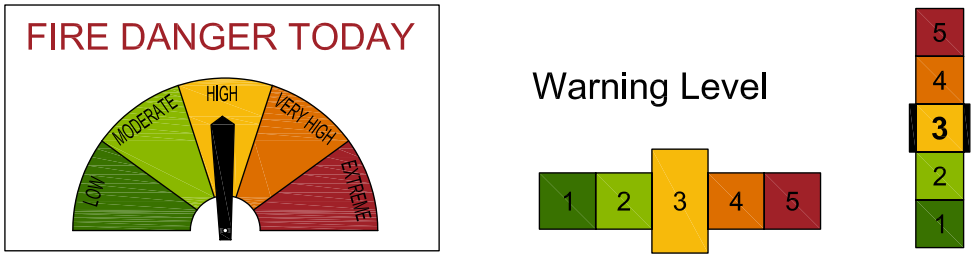


Figure 2 — Example of the order and position of colour-coding

4.3 Colour codes to give supplementary information

4.3.1 General

In addition to the red, yellow, green spectrum, the colours black, purple, blue and grey may be used to provide additional information, see Table 2.

Annex B gives recommendations on colour specifications based on Munsell, CMYK and RGB systems.

Applications using colour codes consistent with this document are demonstrated in Annex A.

Table 2 — Supplementary colour codes

Colour	Associated meaning	Additional information
Black	Fatal danger	Can be used in addition to red to give supplementary information about fatal danger.
Purple	Fatal danger	Can be used in addition to red to give supplementary information about fatal danger.
Blue	Informational purposes	Can be used to give supplementary information. However, blue should not be used to indicate any level of hazard.
Grey	No information available	Should be used to explicitly indicate that no information is available.

4.3.2 Black and purple

Black or purple should be used for fatal danger. Users may choose black or purple depending on cultural significance.

Black can be replaced with black and white checkerboard.

When expressing fatal danger on computer screens or LED displays, black can be a problem since black is a non-luminescent colour. In such cases, using black and white checkerboard is recommended. See Figure 3 for a checkerboard example.

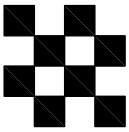


Figure 3 — Example of checkerboard

4.3.3 Blue

Blue should not be used to indicate a safe condition or any other level of hazard. Blue should be used for purely informational purposes that do not indicate levels of hazard.

4.3.4 Grey

Grey should be used to explicitly indicate no information is available.

4.4 Consideration for human factors and colour blindness

4.4.1 General

It is essential that colour-coded alerts are visible, and that appropriate attention is paid to the performance of the display device and its associated ergonomic requirements.

Special consideration should be given to human limitations for distinguishing colours one at a time. Judgements about safety, relying only on colour-coding, should take account of human abilities to discriminate between different colours.

Whenever human judgement based solely on colour-coding is required, only red, yellow and green should be used. Supplementary information to the used colour should be provided whenever people at risk can be expected to include those with limited colour discrimination. Supplementary information should follow ergonomic advice for all kinds of colour blindness (see ISO/TR 22411 and ISO 9241-300).

NOTE Inability to distinguish between red and green is the most common form of colour blindness (more information can be found in ISO/IEC Guide 71).

4.4.2 Colour names

When appropriate, the colour name should be used as a supplementary way to warn people at risk.

EXAMPLE An audible “red alert” over a public address system can be used to warn people.

NOTE Some languages do not include words for all existing colours. Generally, names for black, purple, red, yellow and green are common in most languages, while names of orange and amber are not found in many languages.

4.4.3 Text colours

When appropriate, text should be used to clarify the colour that is used. Such text can be placed separately or superimposed over the colour. When superimposing text over a colour-coded alert, the text colours shown in Table 3 are recommended in order to maintain satisfactory levels of contrast.

The selection of appropriate text font should take account of ergonomic requirements.

NOTE The choice of font has a significant impact on legibility. The appropriate font depends on conditions such as, but not limited to, viewing distances, levels of illumination and colour contrasts.

Table 3 — Recommended colours for superimposed text

Colour-coded alert	Text colours
Black	White
Purple	White
Red	White
Yellow	Black
Green	White

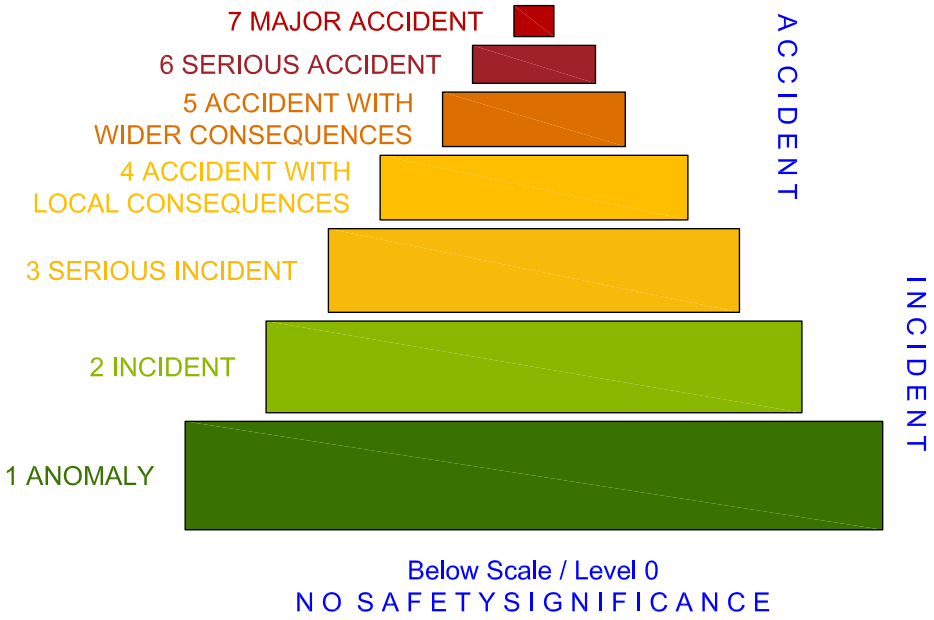
Annex A
(informative)

Examples on the use of colour codes in practice

A.1 General

This annex gives three examples of colour codes used in practice. These examples are not based on the colour codes in this document but are presented for information.

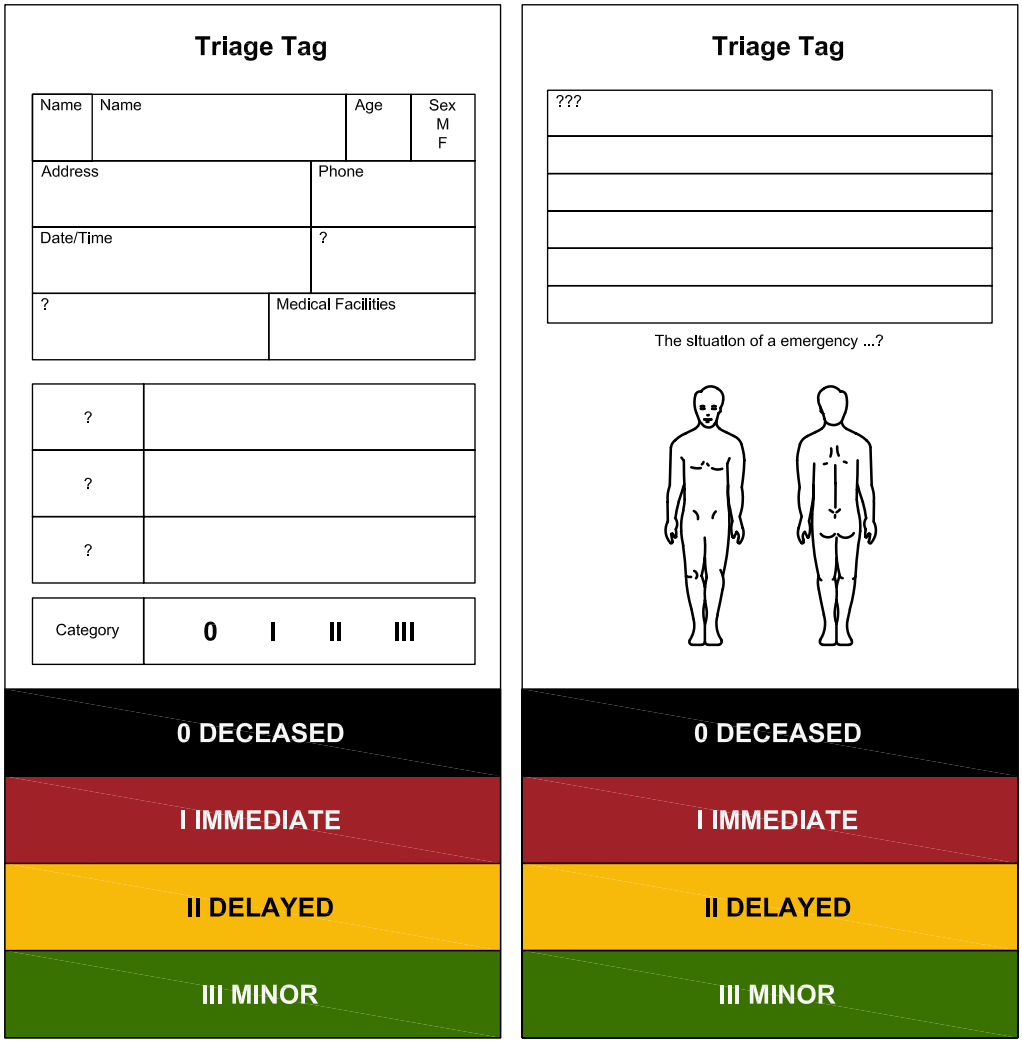
A.2 International nuclear and radiological event scale



NOTE Source: Reference [7]. Copyright retained by IAEA.

Figure A.1 — An application of the IAEA-system using seven colours including purple as a fatal colour

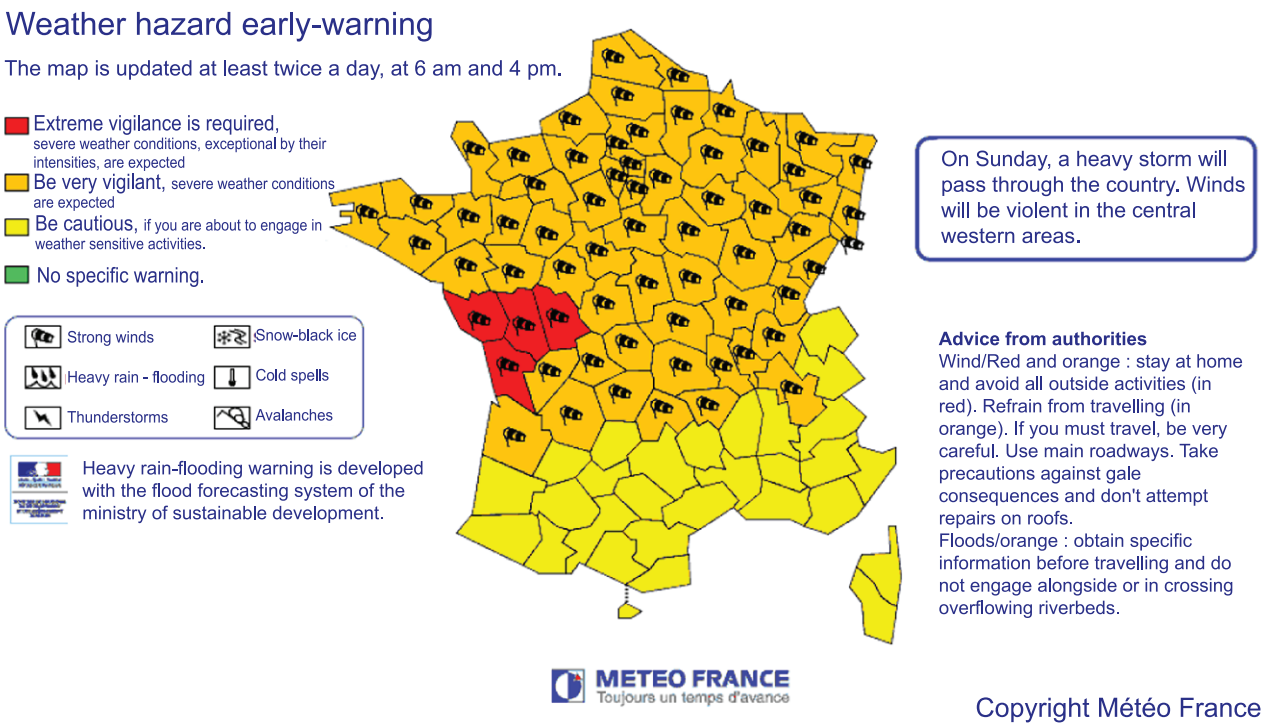
A.3 Triage tags



NOTE Created following the guidelines of the Japanese Ministry of Health, Labour and Welfare.

Figure A.2 — An example of Japanese triage tag

A.4 Meteorological map



NOTE Copyright retained by METEO FRANCE.

Figure A.3 — An application of the French system using four colours with supplementary information

Annex B
(informative)

Recommendations for colour selection

Colorimetric recommendations for selecting appropriate hues for colour-coded alerts are presented in Table B.1. Two sets of values are provided: a saturated colour set and an unsaturated colour set (for printed matter).

Colorimetric recommendations for purple, blue and grey are presented in Table B.2. Two sets of values are provided: a saturated colour set and an unsaturated colour set (for printed matter).

Table B.1 — Recommendations for colours in three different colour specification systems

Categories	Colour name	Tone	Munsell	CMYK	RGB
3	Red	Saturated	7.5R 4/15[a]	C26+M100+Y89	199/22/30
		Unsaturated	2.5R 6/10	C0+M60+Y20	239/133/157
	Yellow	Saturated	2.5Y 8/14[a]	C8+M18+Y92	244/207/0
		Unsaturated	5Y 8.5/8	C6+M7+Y58	247/231/131
	Green	Saturated	2.5G 4/10[a]	C86+M43+Y100	0/160/60
		Unsaturated	2.5G 6/8	C55+M12+Y50	124/184/146
4	Red	Saturated	7.5R 4/15[a]	C26+M100+Y89	199/22/30
		Unsaturated	2.5R 6/10	C0+M60+Y20	239/133/157
	—	Saturated	2.5YR 6/14	C7+M56+Y94	240/140/17
		Unsaturated	7.5YR 8/10	C0+M21+Y60	255/210/121
	—	Saturated	7.5GY 6/12	C58+M5+Y97	110/185/53
		Unsaturated	10GY 8/8	C24+M0+Y33	174/235/167
	Green	Saturated	2.5G 4/10[a]	C86+M43+Y100	0/160/60
		Unsaturated	2.5G 6/8	C55+M12+Y50	124/184/146
5	Red	Saturated	7.5R 4/15[a]	C26+M100+Y89	199/22/30
		Unsaturated	2.5R 6/10	C0+M60+Y20	239/133/157
	—	Saturated	2.5YR 6/14	C7+M56+Y94	240/140/17
		Unsaturated	7.5YR 8/10	C0+M21+Y60	255/210/121
	Yellow	Saturated	2.5Y 8/14[a]	C8+M18+Y92	244/207/0
		Unsaturated	5Y 8.5/8	C6+M7+Y58	247/231/131
	—	Saturated	7.5GY 6/12	C58+M5+Y97	110/185/53
		Unsaturated	10GY 8/8	C24+M0+Y33	174/235/167
	Green	Saturated	2.5G 4/10[a]	C86+M43+Y100	0/160/60
		Unsaturated	2.5G 6/8	C55+M12+Y50	124/184/146

[a] Following ISO 3864-4.

Table B.1 *(continued)*

Categories	Colour name	Tone	Munsell	CMYK	RGB
6	Red	Saturated	7.5R 4/15[a]	C26+M100+Y89	199/22/30
		Unsaturated	2.5R 6/10	C0+M60+Y20	239/133/157
	—	Saturated	10R 5/6	C0+M77+Y100	213/80/30
		Unsaturated	10R 7/10	C0+M54+Y58	231/133/95
	—	Saturated	7.5YR 7/16	C0+M38+Y100	236/164/4
		Unsaturated	7.5R 8/8	C0+M29+Y62	238/186/106
	—	Saturated	5GY 7/12	C41+M0+Y89	169/199/72
		Unsaturated	2.5GY 8/8	C12+M0+Y67	223/225/113
	—	Saturated	10GY 5/12	C68+M0+Y100	105/160/60
		Unsaturated	7.5GY 7/8	C50+M0+Y40	114/215/183
	Green	Saturated	2.5G 4/10[a]	C86+M43+Y100	0/160/60
		Unsaturated	2.5G 6/8	C55+M12+Y50	124/184/146
7	Red	Saturated	7.5R 4/15[a]	C26+M100+Y89	199/22/30
		Unsaturated	2.5R 6/10	C0+M60+Y20	239/133/157
	—	Saturated	10R 5/6	C0+M77+Y100	213/80/30
		Unsaturated	10R 7/10	C0+M54+Y58	231/133/95
	—	Saturated	7.5YR 7/16	C0+M38+Y100	236/164/4
		Unsaturated	7.5R 8/8	C0+M29+Y62	238/186/106
	Yellow	Saturated	2.5Y 8/14[a]	C8+M18+Y92	244/207/0
		Unsaturated	5Y 8.5/8	C6+M7+Y58	247/231/131
	—	Saturated	5GY 7/12	C41+M0+Y89	169/199/72
		Unsaturated	2.5GY 8/8	C12+M0+Y67	223/225/113
	—	Saturated	10GY 5/12	C68+M0+Y100	105/160/60
		Unsaturated	7.5GY 7/8	C50+M0+Y40	114/215/183
	Green	Saturated	2.5G 4/10[a]	C86+M43+Y100	0/160/60
		Unsaturated	2.5G 6/8	C55+M12+Y50	124/184/146

[a] Following ISO 3864-4.

Table B.2 — Recommendations for purple, blue and grey in two different colour sets

Colour name	Tone	Munsell	CMYK	RGB
Purple	Saturated	2.5P 3/10	C78+M100+Y20	96/29/127
	Unsaturated	5P 5/8	C47+M50+Y0	154/129/197
Blue	Saturated	5PB 3/10[a]	C91+M81+Y30	41/70/128
	Unsaturated	2.5PB 6/10	C54+M29+Y0	130/168/223
Grey	Saturated	5PB 4/1	C26+M100+Y89	99/101/103
	Unsaturated	5PB 6/1	C49+M40+Y32	147/146/156

[a] Following ISO 3864-4.

Bibliography

[1] ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

[2] ISO 3864-4, *Graphical symbols — Safety colours and safety signs — Part 4: Colorimetric and photometric properties of safety sign materials*

[3] ISO 9241-300, *Ergonomics of human-system interaction — Part 300: Introduction to electronic visual display requirements*

[4] ISO 22322, *Security and resilience — Emergency management — Guidelines for public warning*

[5] ISO/TR 22411, *Ergonomics data for use in the application of ISO/IEC Guide 71:2014*

[6] ISO/IEC Guide 71, *Guide for addressing accessibility in standards*

[7] International Atomic Energy Agency (IAEA). *The International Nuclear and Radiological Event Scale User's Manual*. 2008 Edition. IAEA, Vienna, 2009

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