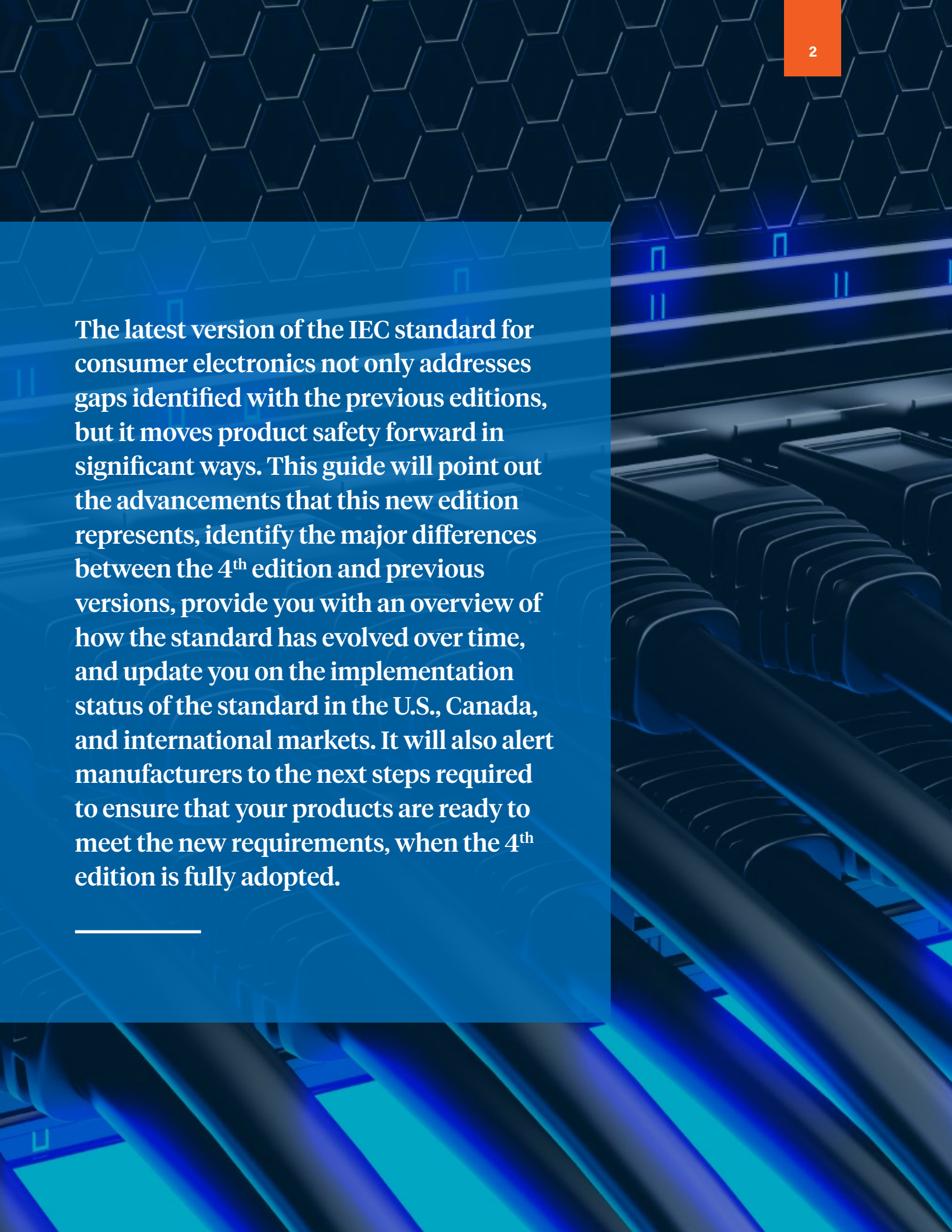
Your Guide To IEC 62368-1, Edition 4

The updated global safety standard for audio / video, information and communication-technology equipment



The latest version of the IEC standard for consumer electronics not only addresses gaps identified with the previous editions, but it moves product safety forward in significant ways. This guide will point out the advancements that this new edition represents, identify the major differences between the 4th edition and previous versions, provide you with an overview of how the standard has evolved over time, and update you on the implementation status of the standard in the U.S., Canada, and international markets. It will also alert manufacturers to the next steps required to ensure that your products are ready to meet the new requirements, when the 4th edition is fully adopted.

Introduction to IEC 62368-1, Ed. 4

When IEC 62368-1, the global safety standard for consumer electronics (audio/video) apparatus and information technology equipment, was first published in 2010, it represented a significant departure from the two now-legacy standards it replaced: IEC 60950-1 and IEC 60065. This departure lay in the standard's hazard-based approach to safety rather than the product-based approach of legacy standards.

Among its many benefits, the hazard-based safety approach both addressed and anticipated the increasing complexity of products containing new technology; and in this sense, the new standard was technology-independent and "future-proof". IEC 62368-1 stood as a new, globally harmonized standard able to encompass new and emerging products in the technological sphere. It aimed to safeguard both the users who operate the devices within its scope, and the environments in which those devices were used.

This latest edition of the standard takes product safety a step further, by increasing the scope and number of products it covers, and by facilitating a smoother adoption process, especially for research and design engineers who require clarity about various requirements' intent.

Three areas of advancement

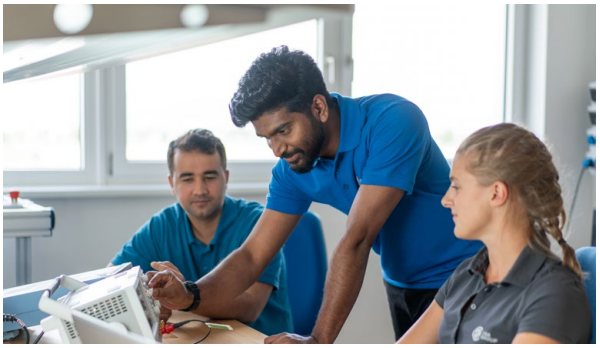
Three aspects of the design of the 4th edition represent advancement over the previous editions:

Scope and applicability—The 4th edition broadens its scope to encompass a broader range of products, such as the use of liquid cooling in data-related server centres.

Technological neutrality—The 4th edition continues the technology-neutral approach, and has been designed to accommodate rapid technological advancement. This allows the standard to remain relevant in the face of constantly evolving technology and innovation.

Risk assessment and hazard control—The 4th edition's detailed risk assessment process takes into account potential hazards arising from new and emerging technologies, and covers an increased number of products. As with the previous versions, the risk-based approach enhances safety measures and ensures that manufacturers identify and address risks proactively.

Product groups affected



The 4th edition of IEC 63468-1 covers a broad range of products that number in the hundreds, if not thousands. (This edition and its predecessors tend to serve as catch-all standards for products that don't fit clearly under other standards.) The 4th edition covers the following types of equipment:

- Communication
- Audio / Video
- Information technology
- Business and office machines

The 4th edition governs four categories of IT and AV equipment:

- Components and sub-assemblies intended to be incorporated into equipment such as business and office machines
- External / Internal power-supply units intended for use with other equipment within IEC 62368-1
- Large equipment for use in restricted-access areas
- Equipment used in outdoor locations

This edition also covers accessories intended to be used with equipment covered by IEC 62368-1, such as wireless cellphone chargers.

Examples of products

Banking equipment — Monetary processing machines, including ATM (cash-dispensing) machines, and point-of-sale terminals

Consumer electronic equipment (including professional audio, video and musical instrument equipment and accessories) — receivers and amplifiers, video cameras, video monitors and video projectors, electronic musical instruments, music tuners, tone generators and sound modules, drum machines and rhythm generators, electronic audio speakers and monitors (indoor and outdoor), video games, jukeboxes, record and optical disc players, antenna signal converters, network surveillance cameras, multimedia equipment, and electronic flash equipment

Data and text-processing machines (and related equipment) — personal computers, tablets, smartphones, wearable devices, computer modems and routers, calculators, printers (including 3D printers), scanners, photocopiers, fax machines, and visual display units

A brief history: IEC 62368-1, editions 1 through 4

When IEC 62368-1 was first published in 2010, a number of issues with the 1st edition, such as the complexity of having to interpret tables for clearance, creepage, etc., led to its not being widely accepted by industry. TC108, the Technical Committee tasked with developing this new standard, continued to revise and improve the standard and, in 2014, IEC 62368-2014, the 2nd edition, was published.

As more countries adopted the 2nd edition, manufacturers and safety agencies came to apply it on a regular basis. Opportunities for further improvement were soon identified and, in 2018, IEC 62368-1:2018 (3rd edition) was published.

Several countries were quick to adopt the 3rd edition, but that version, too, ran into obstacles — most notably that the European Union chose not to harmonize it.

Following much consideration and consultation with industry representatives, TC108 determined that it would proceed with a 4th edition of IEC 62368-1.

IEC 62368-1, Ed. 4 was published on May 26, 2023, and is in various stages of adoption in markets around the world.

Transitioning to IEC 62368-1:2023 (4.0)

2010

IEC 62368-1, 1st edition

Introduced with the intention of countering:

- Widening of user profiles (Adults, Children, Skill)
- Narrowing of the proliferation of ITE vs AV vs CE
- Evolution of new technology (wearable, wireless, charging, etc.)

2014

IEC 62368-1, 2nd edition

- Improved technical consideration and usability
- Adopted by CENELEC with DoW of 2020-12-20 for EN62368-1:2014
- Widely adopted and accepted

2018

IEC 62368-1, 3rd edition

- Refined 2nd edition with evolving technology (wireless charging, insulated liquid, outdoor, batteries, etc.)
- Adopting by US/CAN (enforcing 2024-07-06), mandatory by UAE (2021-12-21), Saudi Arabia (2023-01-01)
- Adopted by Korean **KC 62368-1** (Mandatory by 2023-01); Japan (DENAN LAW adopted J62368-1(2023); J62368(2020) validity up to 2026-04-30)
- Adopted by Taiwan **CNS 15598-1:2020** (Enforcement by 2024-01; application starting 2023-01)
- China **GB4943.1-2022** was adopted on 2022-07-19. (Enforcement date 2023-08-01)

2020

EN IEC 62368-1, 2020

- The acceptance of the 3rd edition hit a barrier and was not harmonized in Europe
- Use the non-Presumption of Conformity method for CE DoW 2024-07-06
- 3rd edition is **not included** in EU blue guide

Now

IEC 62368-1, 4th edition

Published in 26th May 2023

- As of 15th June 2023, HAS consultant concluded the EN version is 'lack of compliance' and redrafting is required.
- As of 8th August 2023, TC108X has voted option 1 to proceed with EN IEC 62368-1:2023 without the link to legislation.
- US/CAN version: Assuming the same development pattern as 3rd ed., forecast to publish within 12 months. Subject to ANSI and SCC adoption.
- Changes are mainly new clauses, editorials, and clarification.

What's new in the 4th edition

IEC 62368-1, Ed. 4 introduces new clauses, makes editorial changes, and adds points of clarification.

Editorial changes

Clause 4.1.1
Significantly, the "Note" in the first three editions of IEC 62368-1, which allowed components with sub-assemblies certified under IEC 60950-1 and IEC 60065, has been deleted.

Manufacturers with products or components certified under these legacy standards will need to have them re-tested and re-certified.

Clause 5.4.2.3.2.4 and Table 13
The extensive reworking of Table 13 may affect constructions that tested compliant under previous versions of the standard. Reconsidering the application test parameters and limits may be required.

This clause includes new definitions for "Network Environment 0" and "Network Environment 1", based on IEC / TR 62102.

IEC 61000-4-5 Installation Classes 0 and 1 (surge protection) have been adopted as a consideration.

Clause 6
For "Control of Fire Spread", "potential ignition source (PIS)" will be used primarily to "reduce the likelihood of ignition".

Also, any components and current-carrying parts in a PS3 circuit are considered to be resistive PISs without testing.

Clauses 6.4.4, 6.4.5 and 6.4.6
"Potential Ignition Source (PIS)" has been removed. While the Annex Q reference for PS2 has also been removed, its deletion will require that the PS2 compliance be revisited.

Please note that the use of a limited power source (LPS) does not equal or imply PS2 compliance. Re-evaluation or engineering judgment is required.

Annex M.4.1
This clause is applicable to all types of secondary lithium batteries, regardless of their portability. The word "portable" has been removed.

New requirements

Clause 4.1.8, G.15.1
Refrigerant-containing equipment certified under IEC 60335-2-4 and/or IEC 61010-2-011 is now allowed. This, plus the removal of the limits on 1-liter liquid handling systems, could have some impact on manufacturers who make or use such systems. Previous test results will need to be reviewed and reconsidered.

Clause 5.5.2.2
The changes will provide a certain level of relief for pluggable equipment type B, as 5 seconds are now allowed for capacitor discharge compliance after the disconnection of a connector, whereas the previous editions allowed only 2 seconds.

Clause 9.3.1 and Table 37
TS2 limits = TS1 limits for wearable devices. This could have a significant impact on the thermal design of wearable devices that will be or have already been certified under 62368-1.

Clause F.3.5.3
A suitable instructional safeguard shall be provided — on the equipment and/or on the service instructions — to alert a skilled person to a possible hazard, such as an ignition source (IS).

The instructional safeguard shall include the appropriate hazard warning symbol as well as a written alert, such as DOUBLE POLE / NEUTRAL FUSING or something similar.

Annex P
"Effective Openings" for Fire Enclosures — A new figure has been added to illustrate the allowable sizes of openings.

As the thickness of (wall) enclosure increases, the "effective" opening size decreases" and as the slope of wall (enclosure) increases, the "effective" opening size decreases.

Annex S.6
The test for grille-covering material, cloth and reticulated foam, which uses a fuel tablet, is a new option for 6.3.

Multiple clauses related to constructions

Multiple clauses have been revised with respect to side / bottom openings and how they are defined and applied.

As noted above, Annex P includes additional requirements to limit the size of openings related to the thickness of an enclosure.

Other

Other clauses contain minor or major changes that may or may not affect currently certified products.

Implementing the 4th edition across global markets

IEC 62368-1, Eds. 1 through 4 emphasize harmonization with regional and international safety standards. This alignment streamlines global compliance efforts and allows for a more cohesive approach to safety across various markets, thereby facilitating international trade of electronic devices.

Nevertheless, countries will adopt the new standard at their own pace, and manufacturers will need to keep up-to-date with the standards that apply in each market at any given time. And, of course, not all countries adopted IEC 62368-1, Ed. 3; some still have Ed. 2 in force, while others have only recently adopted Ed. 3.

North American market: Canada / US

Effective December 20, 2020, North America (Canada / U.S.) requires new products to be certified to CSA/UL 62368-1. The two active versions are CAN/CSA C22.2 No. 62368-1-14 / UL 62368-1 (2nd Edition) and CAN/CSA C22.2 No. 62368-1-19 / UL 62368-1 (3rd Edition).

European market

Manufacturers looking to sell products in the EU will have to ensure that those products also comply with the standards identified in the EU legislation directive — either by a "presumption of conformity" method (i.e., standards harmonized with CENELEC), or a "non-presumption of conformity" method (i.e., standards not harmonized with CENELEC). The adoption of this EU standard may take 12 to 24 months, and is subject to a review and recommendation to CENELEC by a designated HAS (harmonized standard) consultant.

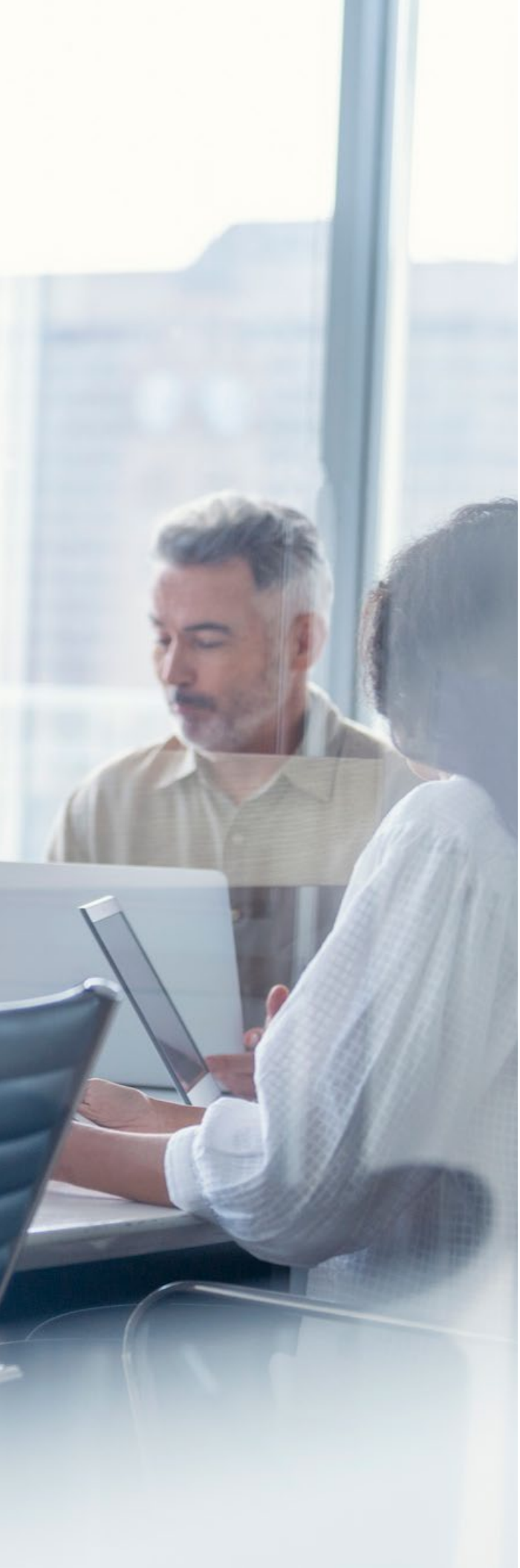
Asian markets

China has adopted the IEC 62368-1, 3rd edition. On July 19, 2022, it published GB4943.1:2022 — replacing both GB8898-2011 and GB4943.1-2011 — with an enforcement date of August 1, 2023.

Japan has adopted the IEC 623368-1, 3rd edition. It published J62368-1(2023) on May 1, 2023, with an effective date of April 30, 2026.

Korea has adopted the IEC 62368-1, 3rd edition. It published KC 62368-1 on August 27, 2021, with a formal transition date of December 31, 2021. All new applications from January 2023 forward shall be based on KC 62368-1.

Taiwan has adopted IEC 62368-1, 3rd edition, and published CNS 15598-1:2020 on June 30, 2020. The formal transition date is January 1, 2024. All new applications from that date forward shall be based on the new standard.



Next steps: a comprehensive gap analysis

Navigating the ways in which a new or updated standard will affect a manufacturers' products in different regions of the world can be daunting — especially when certain countries may still be using the next-to-last version of the standard rather than the current one.

Manufacturers looking to get ahead of the curve with the new standard will want to undertake a gap analysis of each product as soon as possible, and identify required changes, from one market to the next. CSA Group can help with that.

Why work with CSA Group?

With over a century of experience in standards development, testing, and certification, CSA Group and its team of experts can help guide manufacturers through the uncertain and challenging landscape of standards compliance in a global marketplace. With more than 30 labs in 13 countries, CSA Group keeps on top of standards-related developments as they happen, around the world.

When you work with CSA Group, you will interact directly with the certifier assigned to your project. This gives you direct access to a wealth of technical expertise in the standards that affect to your business.

Our direct-contact approach helps your compliance testing run efficiently. In the unfortunate event of a failure or non-compliance, our team's collective expertise can help you understand the problem, so that you are well positioned, and have the information you need, to make the necessary corrections and get your project back on track.

Let's work together

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