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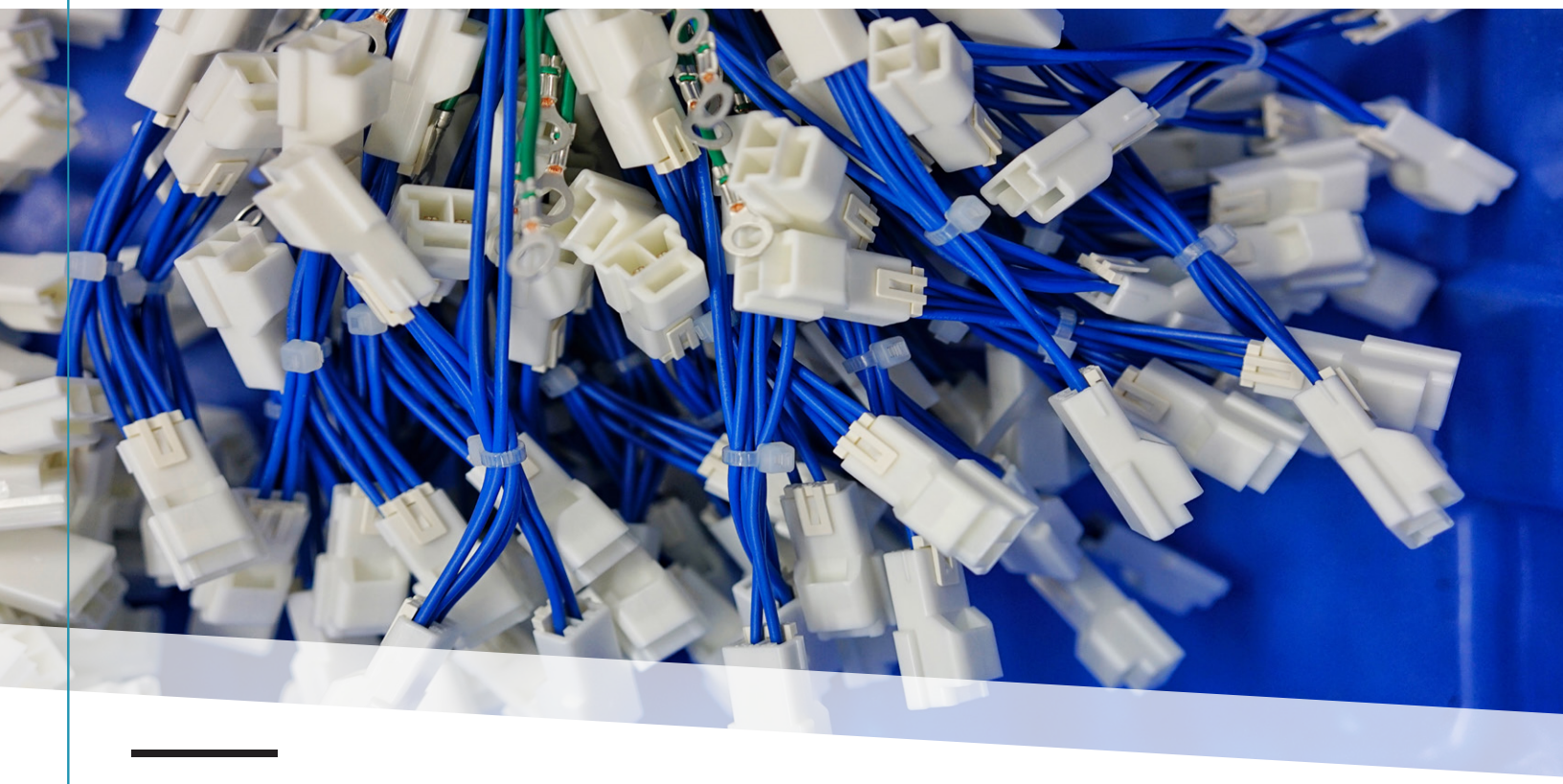
Prepare for the Future: What Global Standards Harmonization Will Mean for the Wire Harness Industry

WHITE PAPER

Most of the industries that shape our daily lives have all experienced technological revolutions. For the automotive industry, it all began with the internal combustion engine. From there, powertrain and digital revolutions have occurred, and breakthroughs in the evolution of the autonomous car are just upon the horizon. When looking at energy production, we've gone from fire to steam to coal to petroleum to fossil fuels, and the list goes on and on. Not far behind, telecommunication now includes the transmission of information by wire, radio, optical, and other electromagnetic systems.

With the important responsibility of serving a wide range of segments, wire management products are undeniably crucial to maintaining organization, functionality, and safety in the environments they serve. While countless industries have managed to flourish and evolve by consistent benchmarks for performance and quality, varying wire harness standards result in slower progress and create unexpected total business costs.



When Industries Have Benchmarks They Thrive

MIL-SPEC, which addresses the technical requirements for military-use material, evolved from the need to ensure the proper performance, logistical usefulness, maintainability, and reparability of military equipment. Defense standards provide many benefits, including ensuring quality during production the compatibility of tools. For example, vehicle parts can be quickly swapped into the place of damaged ones and the ability to have screws, bolts, and nuts that fit foreign equipment properly can become fully interchangeable. EN45545-2, the railway standard on fire safety in the rolling stock sector, evolved in Europe over the last 20 years and has had a huge impact on the rail industry and affected a wide range of operators and manufacturers, including upholsterers, cable suppliers, and producers of floor coverings and ceilings. But, it also created much-needed consistency.

When industries have consistent benchmarks for performance and quality, they thrive, but wire management products have been overly complicated by their base standards, which includes various regional standards from the Association of Standardization and Certification (ANCE), the CSA Group (CSA), International Electrotechnical Commission (IEC), and Underwriters Laboratories (UL). Due to this complexity, wire management customers have not had a consistent benchmark of performance and quality, often resulting in unexpected total business costs.

Because of standards not being harmonized, the industry was being served varying benchmarks for compliance testing and certifications.

Reducing the number of separate standards and testing requirements will provide a substantial opportunity for manufacturers to promote products that are high value, have consistent quality, and have a safe and efficient application, while also ensuring product performance and high quality based on the successful completion of test standards. Global standards harmonization will assure customers that the product will deliver the optimal performance at a lower installation cost and with reduced risks.

Relying heavily on people and processes to manufacture the materials, wire assembly has traditionally been a very manual industry. The harmonization of standards will provide a global test plan for wire harness manufacturers to conduct rigorous tensile strength, minimum operating and installation temperature, vibration, corrosion, flame, and plenum tests, among others, through one organization. Furthermore, the availability of harmonized standards to wire harness manufacturers will encourage innovation in different sectors from working with customers to solve application issues and to reduce installation labor costs. As an industry, everyone wins by embracing standards harmonization.

Why Global Standards Harmonization is Needed

When countries around the world establish different requirements for wire harness manufacturers in order to have their solutions offered there, it adds an unnecessary amount of complexity to an already complex industry. Furthermore, to meet these differing standards, wire harness manufacturers are then faced with the task of designing and testing multiple products for multiple markets and complying with multiple safety standards so that they may sell their products in these desired markets. Meeting these requirements adds multiple, unnecessary steps that ultimately result in added costs. In addition to this cost, the extra steps slow down production and increase the amount of time it takes for a solution to get to the customer, with the added longevity bringing the entire industry to a slow pace when it comes to innovation.

Internationally harmonized standards are critical to making the global reach of wire harness products more efficient, accessible, and economical.

By removing the barriers making it difficult to do business anywhere in the world, time and money can be saved, and safety and quality improved.

When it comes to global harmonized standards, there are several advantages associated with the corresponding simplicity. Because it enables wire harness manufacturers to make one solution that can be used in all markets, a cost savings occurs. No more time is spent designing multiple solutions for the differing markets and manufacturing and testing the same product becomes relatively simplified, saving time and money that otherwise would be needed to purchase the extra materials for these multiple tests. These cost savings can then be passed on to the consumer to make products even more readily accessible, or passed on internally for further research and development to advance the products to a design that better serves the consumer. Standardization also cuts the amount of money manufacturers must spend on compliance costs, which too can be passed along to the customer.

By reducing the number of standards, less time is spent keeping up with the proper documentation necessary in order to obtain certification of meeting various standards. Reducing the number of products that need to be tested

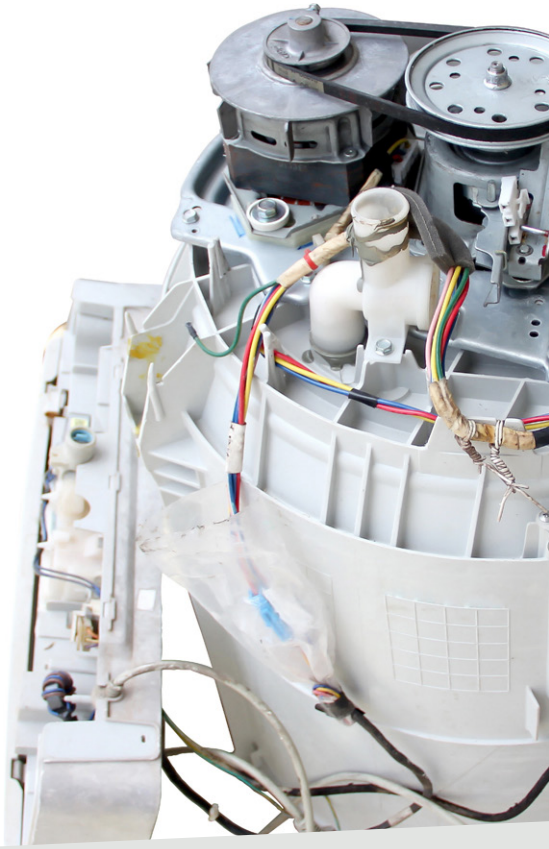
and then manufactured saves the amount of time needed to supply a solution to the consumer. This also ensures an increase in quality and safety because the organizations developing and implementing the standards would be able to leverage the technical experience and expertise of their members to focus on the one set of comprehensive test standards that would ensure reliability and consistency across the board.

Perhaps most importantly, a reduction in redundant or conflicting standards can provide a common understanding between international markets.

Buyers and sellers in different markets no longer would have to compare different products that meet different standards, rather, they can compare products that have each met one standard and focus on the offerings they deem to be the most critical to their decision. Outside the buyer and seller relationship, simplifying the process of meeting standards for different markets reduces the complexity for those testing and auditing standards compliance. This would simplify international trade by reducing the amount of technical barriers.

The Most Impactful Standard to the Wire Harness Industry

As created by Underwriters Laboratories, the new ANSI UL 62275 publication harmonizes with CSA C22.2 No. 62275 (Canada), NMX-J-623-ANCE (Mexico) and IEC 62275 (Europe) and establishes a scheme for standard type classifications and performance ratings. All regional standards have a stability date of December 2018, with updated standards being introduced in 2019. The passage of this updated version of the UL 62275 standard will be critical moving forward because of how it will create commonality between international markets and reduce confusion.



The major changes being introduced in ANSI UL 62275 includes the requirement of parallel entry metallic cable ties to be tested with the locking mechanism positioned at 9:00, whereas testing may have been conducted previously at 12:00. Additionally, coated metallic cable ties are currently classified as Type 21 products but will be classified as Type 2 under ANSI UL 62275. The contribution to fire test will now be needed to classify coated metallic cable ties as Type 2, and products classified as outdoor use products will be required to run the environmental exposure test at a spectral irradiance of 0.51, with the previous irradiance value being 0.35.

Solutions affected by ANSI UL 62275 include plastic cable ties, mounts, metallic cable ties, and integral cable tie mounts. Testing under ANSI UL 62275 will include tensile strength, minimum operating temperature, minimum installation temperature, minimum and maximum bundle diameter, UV resistance, vibration for metallic cable ties-cycling, corrosion, contribution to fire-needle flame, and plenum.

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The Base and Regional Standards for Wire Management Products

Four organizations and their wire management standards are currently the most prominent when it comes to discussing standards harmonization in the wire management industry.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

The International Electrotechnical Commission is a global organization that publishes international standards and manages conformity assessment for electric and electronic products, systems, and services. The standards it creates reflect agreements on the technical description of the characteristics to be fulfilled by the product, system, service, or object in question and are widely adopted at the regional or national level to be applied by manufacturers, trade organizations, purchasers, consumers, testing laboratories, governments, regulators, and other interested parties. In the US, IEC 62275 specifies requirements for metallic, non-metallic, and composite cable ties and their associated fixing devices used for the management and support of wiring systems in electrical installations. This second edition cancels and replaces the first edition published in 2006 with technical revisions incorporating additional tables, with annex and figures.

ANCE

ANCE is a non-profit product certification organization in Mexico focused on the legality and security of electrical products that provides product test standards and regulations in the electricity sector. NMX-J-623-ANCE-2009 specifies the requirements for metallic, non-metallic, and composite belts for cables and their associated fastening devices that are used for the management and support of wiring in electrical installations. It is based on the International Standard IEC 62275 and has been adapted to the needs of the country to ensure that the straps for fixing cables that are within the scope of this standard are compatible and safe to operate in the infrastructure conditions of the national electrical system incorporating national deviations.

THE CSA GROUP

The CSA Group exists to develop standards in 57 areas and is composed of representatives from industry, government, and consumer groups. Most standards are voluntary, but adherence to standards is beneficial to companies because it shows products have been independently tested to meet certain standards. The CSA mark is a registered certification mark and can only be applied by someone who is licensed or otherwise authorized to do so by the CSA. CSA C22.2 No. 62275 for cable ties contain the two basic Type 1 and Type 2 classifications from IEC 62275, but also adds Type 11 and Type 21 to indicate that the product is produced from polymer materials that are subjected to a separate material performance investigation for long-term thermal properties.

UNDERWRITERS LABORATORIES

As a global company, Underwriters Laboratories works with customers and stakeholders to support the responsible design, production, marketing and purchase of various goods, solutions, and innovations while also striving to make them safer, more secure, and more sustainable. It works to confirm compliance to recently established ANSI UL 62275, which is quickly becoming the most impactful standard in the wire harness industry in North America.

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How ANSI UL 62275 will Impact Manufacturers

With more than 120 years of expertise, UL is made up of a worldwide network of industry-leading engineers that look to support the responsible design and production of solutions and innovation. Customers can be assured products that meet the highest industry standards for optimizing wire management applications.

By creating a harmonized benchmark, wire harness manufacturers will now have the opportunity to bring their solutions to market faster and easier than ever before.

When a global component supplier is selected, customers can be assured those products will be acceptable when shipped to US locations, Europe, Canada, Mexico, or other regions that accept ANSI UL 62275. Whereas before a wire processing company may have been required to use different products based on the end destination, now that no longer is a problem being presented.

This promotes high value, consistent quality, and a safe and efficient application, and ensures high quality and product performance based on the successful completion of test standards. Manufacturers conduct rigorous tensile strength, minimum operating and installation temperature, vibration, corrosion, flame, and plenum tests through one organization. This too, assures customers a product is high quality and at lower installed costs with reduced risks.

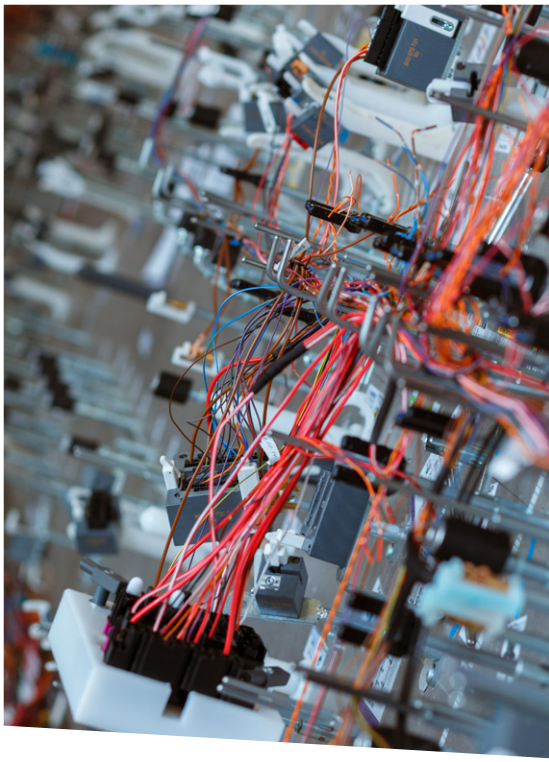
Value Delivered Through Simplification and Reduction in Price Risk

An OEM who builds container ships was faced with a new requirement for wire management products from a governmental approval agency. These new requirements would significantly increase the cost of wire management products due to the special materials required to meet this new requirement that products would not contribute to flammability.

Panduit representatives, who are engaged in standards activities on a global basis, worked on this with the government agency, along with the engineering team from the OEM. The collaboration focused on the importance of utilizing the harmonized global standard for wire management products that includes a “needle flame test” to ensure products do not contribute to flammability.

After review and additional research, the governmental agency found that the harmonized UL standard addressed the issue of certification of product as “does not contribute to flammability” when successfully passing the “needle flame test.” Consequently, the OEM was provided documentation directly from the governmental agency to allow the use of more standard product that also passed the “needle flame test” within the harmonized UL standard.

This led to the simplification of part selection and removed the risk of a large component price increase that would have resulted from using more specialized material.



Moving Forward with Global Standards Harmonization

While the harmonization of standards increases quality in products and more efficiency in making them, this will directly impact the marketplace of the wire harness industry. An improved market access because of reduced trading costs will emerge because of standardization and the increase in competitiveness that will occur.

With the consumer feeling the positive impact directly when the time comes to make a purchase, this improved relationship with the wire harness industry will only be improved by the fact that a better relationship between suppliers and clients will derive from the improved safety of consumers. An immense value from competitiveness will occur and an easier introduction of innovative products and an increased amount of interoperability between new and existing products, services, and processes will follow suit.

Because of standardization, the gap between research and marketable products or services will be bridged. Standardization is a key factor in trade and it contributes to the removal of technical barriers and increases market access and international trade. This enhances cooperation at the international level and enhances access to global products.

The wire management industry and the wire management products and manufacturers that make it up serve a wide range of segments and are undeniably crucial to maintaining organization, functionality, and safety in the environments they serve. Because of this important responsibility it is crucial the wire management industry is allowed to flourish.

Countless industries have managed to evolve because of consistent benchmarks for performance and quality, and the harmonization of wire harness standards will ensure the wire management industry to reach new heights.

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