

ISO's container standards are nothing but good news

Containers standards help remove technical barriers to trade

By Michael Bohlman, Chairman ISO/TC 104, *Freight Containers*



ISO/TC 104's standards have fostered the growth, over the past 40 years, of an entirely new system of freight transportation, one that has revolutionized the transportation industry. In fact, the work of TC 104 has been so successful, so widely adopted and implemented, that the senior members at TC 104 were beginning to question if there was any need for TC 104 to continue! However, world trade continues to grow and freight containers are, and are expected to remain, the most economical balance between cargo security, transportation costs and speed of delivery for the majority of pack-

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aged cargo. Similarly there is increasing economic pressure driving traditional bulk commodities into containerized transport.

Developing technologies and their application to containerization are helping this economic push to containerization for an increasing number of commodities.

ISO/TC 104, *Freight Containers*, is one of ISO's most successful technical committees. This is perhaps a very biased opinion since it belongs to the author, TC 104's Chairman, but it is also one with some significant basis.

The history of TC 104 is rich in the technical give-and-take that surrounds any healthy debate. It is also rich in successes – witness the large family of widely used and referenced standards that TC 104 has produced and maintained. TC 104's official scope is "Standardization of freight containers, having an external volume of one cubic meter (35,3 cubic feet) and greater, with regard to terminology, classification, dimensions, specifications, handling, test methods and marking." Within this broad scope, TC 104 has developed standards for six distinctly different container types, and the supporting handling, securing, marking and nomenclature standards.

TC 104's objective is to provide current standards that continue to define intermodal freight containers and related equipment and technology applicable to the intermodal, containerized movement of freight. Specific areas of expertise codified or being codified in TC 104's series of standards includes:

- design and testing of all types of intermodal freight containers;
- terminology;
- equipment to secure freight containers to vessels and other conveyances;
- container handling equipment;

- electronic tagging and identification of containers and their contents;
- electronic container seals;
- power line transmission of data relating to electrically powered containers such as refrigerated containers;
- electronic data interchange message formats; and
- container markings.

ISO's standards have fostered the growth of a new system of freight transportation

TC 104's standards have fostered the growth, over the past 40 years, of an entirely new system of freight transportation, one that has revolutionized the transportation industry. In fact, the work of TC 104 has been so successful, so widely adopted and implemented, that the senior members at TC 104 were beginning to question if there was any need for TC 104 to continue. Perhaps its work was done; perhaps the committee could rest on its laurels, and watch the industry it helped create continue to grow without any need for further standardization. But, as with many mature industries, containerization has not become stagnant in its maturity. Rather the industry continues to push its operational envelope and this has provided TC 104 with fertile ground for on-going standards refinement and development.

World trade continues to grow and freight containers are, and are expected to remain, the most economical balance between cargo security, transportation costs and speed of delivery for the majority of packaged cargo. Similarly there is increasing economic pressure driving traditional bulk commodities into containerized transport. Developing technologies and their application to containerization are helping this economic push to containerization for an increasing number of commodities.

In excess of 90 % of world trade in non-bulk goods moves in ISO freight containers. The total number of Twenty Foot Equivalent Units (TEU) traded annually is approximately 1,7 billion. Container Growth from 1981 to 1999 has been 319,9

%, from 40 850 676 to 171 528 276 containers (TEUs) and annual growth in the TEU population continues at 6 to 7 % a year. This is a direct reflection of the benefits that containerization has and continues to offer. Containerization has reduced the time and cost of moving goods across the oceans to market by 84 % and 35 % respectively. ISO freight containers have helped remove technical barriers to trade, and have helped open markets in various regions of the world. The work of ISO/TC 104 is a vital part of the current trend of globalization of the world economy. These ISO standards permit free interchange of transportation assets among users on a worldwide basis. Containerization has greatly reduced pilferage and theft in the transportation of goods and led to enormous improvements in the safety and health of transportation workers. ISO/TC 104 standards have even helped harmonize national and regional standards.

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ISO's freight container standards are recognized worldwide by many national governmental bodies and major international organizations, with which ISO/TC 104 is in liaison. These run from United Nations bodies such as the International Labour Organization (ILO) and International Maritime Organization (IMO) to Non-governmental organizations (NGOs) like the International Cargo Handling Co-ordination Association (ICHCA) and the International Chamber of Shipping (ICS), and International governmental organizations (IGOs) such as the European Commission; and Trade associations as, for instance, the Asian Packing Federation (APF).

ISO/TC 104 has 32 Participating (P) members and 23 Observer (O) members.

So what's new and what's potentially controversial?



TC 104 has identified an on-going issue with available radio frequencies for transportation applications such as automatic container identification (AEI), “intelligent” container seals and other applications that are being pursued to allow wireless transmission of data between containers and various systems. The problem, simply stated, is that different regions of the world assign certain frequency bands for these types of applications and the bands assigned are different in different regions of the world. This effectively precludes, for example, an application that works in Asia from also working in the United States or Europe, unless the extra circuits and components are built into the device to support dual or triple frequency range capabilities. This approach, although possible, greatly raises both the costs of each application and the probability that the device will fail prematurely in service. Currently the 433.92 MHz, 862-928 MHz, 902-928 MHz and

2.45 GHz bands are in use. To resolve this issue TC 104 has reached out to the ITU (International Telecommunication Union), IEC (International Electrotechnical Commission), and ETSI (European Telecommunications Standards Institute) with a request to standardize on a universally recognized frequency band for logistics purposes. Preliminary responses from these organizations have been positive.

“ISO/TC 104 standards permit free interchange of transportation assets among users on a worldwide basis.”

TC 104’s joint work with ISO/TC 110, *Industrial trucks*, on Straddle Carrier Stability is currently being circulated as a

DIS (Draft International Standard). This DIS addresses the lack of standardization in the area of calculating the stability of straddle carriers and seeks to implement a uniform approach to this issue. It will enable purchasers and operators of these huge container-handling machines to identify the parameters within which these machines can be safely operated without tipping over.

Vertical Tandem Lifting (VTL), the practice of lifting two or more vertically connected containers as a single lift, is beginning to see acceptance in the container industry. TC 104 recognized the need for guidance on this practice so that it could be carried out safely without exceeding the structural capabilities of the containers, their components or the gear used to couple the containers together. After extensive deliberations and testing, TC 104 determined that a maximum of a three-high stack can be vertically coupled together to form a VTL unit. TC 104 also

established that twistlocks and latchlocks used in VTL operations must comply with ISO 3874, *Series 1 freight containers - Handling and securing*, and have a load carrying area or engagement area (the contact area between the face of the twistlock head or latchlock latch and the corner fitting face surrounding the fitting's aperture) of at least 800 mm². The total mass of the VTL unit cannot exceed 20 000 kg. And, the twistlocks or latchlocks used for the VTL operation must be certified for lifting with a Safe Working Load (SWL) of at least 10 000 kg.

TC 104 also recognized that there can be operational issues that are not adequately addressed by technical standards that describe structural criteria. For this reason they reached out to ICHCA's International Safety Panel (ISP) to initiate an effort to develop Operational Guidance for Safe VTL Operations. The ISP has graciously accepted this challenging task and is well on its way towards developing a finished document. They hope to be finished at the same time as TC 104 completes our balloting process and publishes our Vertical Tandem Lifting work as an amendment to ISO 3874 (the TC 104 Standard on container handling and securing).

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Coincident with the work on VTLs, TC 104 also recognized the need for greater specificity and standardization in the area of twistlocks, latchlocks, and securing fittings. The recent amendment to ISO 3874 (Twistlocks, latchlocks, stacking fittings and lashing rod systems for securing of containers) that introduced the industry's first comprehensive International Standards for these handling and securing fittings was further modified to ensure that all fittings used for lifting have the minimum bearing area required for safe operations. This enhancement to the standard is being balloted along with the VTL amend-

ments. (ISO 1161:1984, *Series 1 freight containers - Corner fittings - Specification*)

I'll defer to the reader as to any controversy attached to these items. TC 104 believes each are worthy of our time and standardization efforts.

It has become clear that the work of TC 104 continues to be of importance to the industry. As a committee we are uniformly proud of our accomplishments and ready to continue our efforts to improve the safety and effectiveness of containerization. □

How the committee divides out the work

ISO/TC 104 is organized as a technical committee (TC) with three subcommittees (SC) and eight working groups (WG). The subcommittee structure was established to concentrate the development efforts along specific lines of expertise:

- freight container structure, handling and securing (SC 1),
- special purpose freight containers such as refrigerated and tank containers (SC 2), and
- electronic data exchange, and marking and registration of containers (SC 4).

Working groups currently established and their areas of expertise are:

Under Subcommittee 1: Chairman, Mr. Michel Hennemand, with secretariat functions being handled by the Association française de normalisation (AFNOR):

- general cargo containers (WG 1),
- handling and securing (WG 2), and
- freight container straddle carrier stability (WG 3), which is a joint working group with TC 110/SC 2.

Under Subcommittee 2: chairman, Mr. Edmund Brookes, with secretariat functions being handled by the British Standards Institution (BSI):

- thermal containers (WG 1), and
- tank containers (WG 4);

Under Subcommittee 4: chairman, Dr. Christoph Seidelmann, with secretariat functions being handled by the DIN Deutsches Institut für Normung:

- visual markings and their coding (WG 1),
- Automatic Equipment Identification (AEI) for containers and container related equipment (WG 2), and
- communication and terminology (WG 3).



About the author

Michael T. Bohlman joined CSX Lines, LLC (then known as Sea-Land Service, Inc.) in 1975. In his current position as Director of Marine Services, he is responsible for the establishment of policy and procedures for the operation of CSX Lines' commercial fleet of 16 vessels. For this fleet he has primary responsibility for safety, environmental protection, Customs, ship-to-shore communications, crew management/labor relations and regulatory compliance. In addition, he has overall responsibility for CSX Lines' third party fleet management programme. Mr. Bohlman is presently Chairman of ISO/TC 104, *Freight Containers*, and Chairman of the USA's Technical Advisory Group for ISO/TC 104.

Mr. Bohlman holds a Bachelor of Science degree in Engineering and a Master of Science degree in Chemical Engineering.