

# World Fluid Power Summit

Las Vegas, Nevada March 2017

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**Standards: The Importance of Relevance and the Need for Technical Support to Meet Market Needs**

Gary Baumgardner, Chair ISO TC131



# Purpose of my presentation today

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- **My desire to increase commitment and support for standards development and maintenance.**
  - **All Standards have a useful life.**
  - **Standards need to be kept up to date to the meet the ever changing needs of industry**
  - **Finding the people with the talent, time, and commitment to maintain standards is critical.**
  - **Employer's support.**
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# How ISO standards *connect the world*

There was clear support for the role of standardization in better serving economic trade and social development at ISO's 39<sup>th</sup> General Assembly in China, which brought together some 400 delegates from more than 120 ISO members.

President Xi Jinping of China underlined how "standards have become the common language of the world" in a written message addressed to some 400 delegates from over 120 member countries at the 39<sup>th</sup> ISO General Assembly (ISO GA), which ran in Beijing from 10 to 14 September 2016. The message was delivered by Zhi Shuping, Minister of the General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ) of the People's Republic of China.

**"With the deepening of economic globalization, standardization is playing an increasingly important role in facilitating business transactions, supporting industrial development, promoting scientific progress and regulating social governance,"** President Xi Jinping said. **"Standards have become the common language of the world."**

In his message, the Chinese President pointed out how "International Standards are the major technical foundation of [...] the development of economic and trade cooperation", leading the way for progress in our times.

## **Fostering partnerships**

This was the second time that the ISO GA was held in China. "The first time was nearly 20 years ago," reminisced ISO's President Dr Zhang Xiaogang. "Much has changed during that time, but the importance of different countries working together to solve global challenges, rather than acting alone, remains as important as ever."

The week-long event was hosted by SAC, ISO's member in China. Tian Shihong, Administrator of SAC, pledged his country's full dedication to the collaborative work done in ISO. "China will continue to increase exchanges with other countries and international organizations in terms of its development strategies, and enhance cooperation in standardization," he said.

To mark the occasion, China Post issued a stamp for the 39<sup>th</sup> ISO General Assembly a day before its opening, making it the first commemorative stamp in the history of the ISO GA – and a nice token of China's commitment to world standardization.

**“With the deepening of economic globalization, standardization is playing an increasingly important role in facilitating business transactions, supporting industrial development, promoting scientific progress, and regulating social governance.”**

**“Standards have become the common language of the world”**

President Xi Jinping of China at ISO 39<sup>th</sup> general assembly in china



## Graphical Standard

# 1219

BY GARY BAUMGARDNER, PRINCIPLE ENGINEER AT PARKER HANNIFIN CORP.,  
TC 121 CHAIRMAN

We use or are guided by graphical symbols every day of our lives. Stop signs are standardized hexagonal graphical symbols indicating when you need to stop and yield to oncoming traffic. School zone signs, caution signs, and no-passing zone signs all have standardized shapes and give us graphical indications of pertinent information for our day-to-day activities. Standardization of graphical symbols is necessary to make graphical symbols universally understood. Today's family of ISO 1219 graphical standards provides universally understood graphical symbols that are used in the fluid power industry and understood globally.

The use of graphical symbols goes back to prehistoric times. Cave art conveys graphical information for what early man found important to depict and preserve. Egyptian hieroglyphics are basically a form of graphical communication. The ability to read and understand the meaning of the Egyptian hieroglyphics was lost over time, and it wasn't until the Rosetta Stone was discovered by soldiers attached to Napoleon's army and used to help decipher the Egyptian hieroglyphics that the meanings of these symbols was understood. Graphical standards like ISO 1219 can be thought of as a form of a "Rosetta Stone" for the understanding and use of fluid power graphical symbols.

ISO standard 1219 was first published in 1976, but it was not the first attempt to define and codify industrial fluid power symbols. Standardized electrical symbols were first published in 1947 by IEC (Joint Industrial Council). IEC hydraulic graphical symbol standards were then published in 1948; pneumatic standards followed in 1950. In 1954, the American Standards Association (ASA) developed a joint standard

for hydraulic and pneumatic graphical symbols (ASA Y32.10-1-1958). ISO 1219 was first published as a recommendation in 1970, and the first official publication of ISO 1219 as a standard took place in 1976.

It is often said that "a picture is worth a thousand words," and this is definitely true of graphical symbols. Graphical symbols can convey clear meaning for a system component with only one symbol, whereas verbiage to convey the same idea may take a paragraph or more to explain—and then not be universally understood. One of our young engineers was asked to prepare a training narrative on some of our standard products and was having trouble understanding the inner workings of our MixKing valve, one of our older 4-ported, 4-way valves (Fig. 1).

The catalog description read like this: "4-way, two-position, solenoid-operated, spring return valve with manual override" (Fig. 2). The catalog gave a simplified schematic for the MixKing valve, but the function of the valve was not well understood from the catalog information. We discussed the mechanism, but still the func-

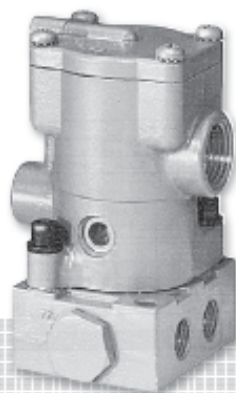


FIG. 1: MixKing valve



FIG. 2: MixKing graphical symbol from valve catalog

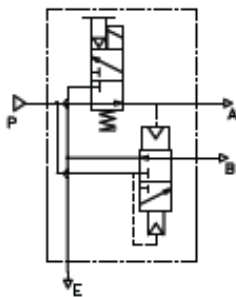


FIG. 3: More complete graphical symbol for the MixKing valve

tion was not apparent to the new engineer. To depict the function more clearly I made a more detailed diagram of the valve's internal function. From this expanded diagram, the inner workings of the valve became obvious (Fig. 3).

The MixKing is really two 3-way valves working together to provide a 4-ported, 4-way valve function. With the solenoid de-energized, air flows from the inlet to port A. Port B is open to exhaust. When the solenoid is energized, air flow from port A is redirected to the common exhaust port of the MixKing. The pilot signal to the internal air-piloted 3-way valve is lost, allowing the air-piloted 3-way valve to shift, pressurizing the B port of the MixKing valve. It is not uncommon to use two 3-way valves to create a 4-way valve function, but in this case it was not immediately apparent from looking at the valve symbol or the valve detail drawing how this was accomplished.

The current version of ISO 1219 is published in three parts:

- ISO 1219-1 Part 1: Graphical symbols for conventional use and data-processing applications
  - ISO 1219-2 Part 2: Circuit diagrams
  - ISO 1219-3 Part 3: Symbol modules and connected symbols in circuit diagrams
- ISO standards are systematically reviewed every five years. The current version of ISO

1219-1 was last revised and republished in 2012, and it will be again up for review in 2017.

Fluid power graphic symbols will continue to evolve, but their utility and understandability have not lost their meaning over time. To day's young users, with a minimum amount of exposure to ISO graphical standards, can readily view and understand the meaning of system schematics using these symbols. It makes little difference if you are looking at symbols or schematics made using the most up-to-date software and the latest version of ISO 1219 or looking at schematics drawn 50 years ago. The message conveyed by the symbols clearly depicts the function of the component or system.

Standardized symbols also transcend language barriers. Users in Europe, Asia, or the Americas can look at individual symbols used in complex system schematics and understand the basic function of the components without having to understand a foreign language. Graphical symbols go beyond languages to give universal understanding of intended function.

The next issue of *Fluid Power Journal* will contain another article in our series focusing on ISO standards awareness.

### ISO Resources

The NFPA Standards Locator  
[www.nfpa.com/standardization/findstandard.aspx](http://www.nfpa.com/standardization/findstandard.aspx)


"Why Standardize?"  
[www.nfpa.com/standardization/whystandardize.aspx](http://www.nfpa.com/standardization/whystandardize.aspx)

Interested in joining a TAG committee?  
[www.nfpa.com/standardization/standardcommittee.aspx](http://www.nfpa.com/standardization/standardcommittee.aspx)

Contact Gary Baumgardner, current TC 121 chairman, at [gbaumgardner@parker.com](mailto:gbaumgardner@parker.com) or call John Domingo at [jdomingo@parker.com](mailto:jdomingo@parker.com). Learn more about NFPA and ISO standards at [www.nfpa.com/standards](http://www.nfpa.com/standards).

# Key elements of 1219 and other standards

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- **ISO Graphical Standard 1219 can be thought of as a form of “Rosetta Stone” for the understanding and use of fluid power graphical symbols.**
  - **When the first ISO 1219 graphical standard was published in 1976 the standard was 23 pages long.**
  - **The current version of ISO 1219 is now made up of 3 parts and is 285 pages long.**
  - **It has grown over time to meet the needs of global industry.**
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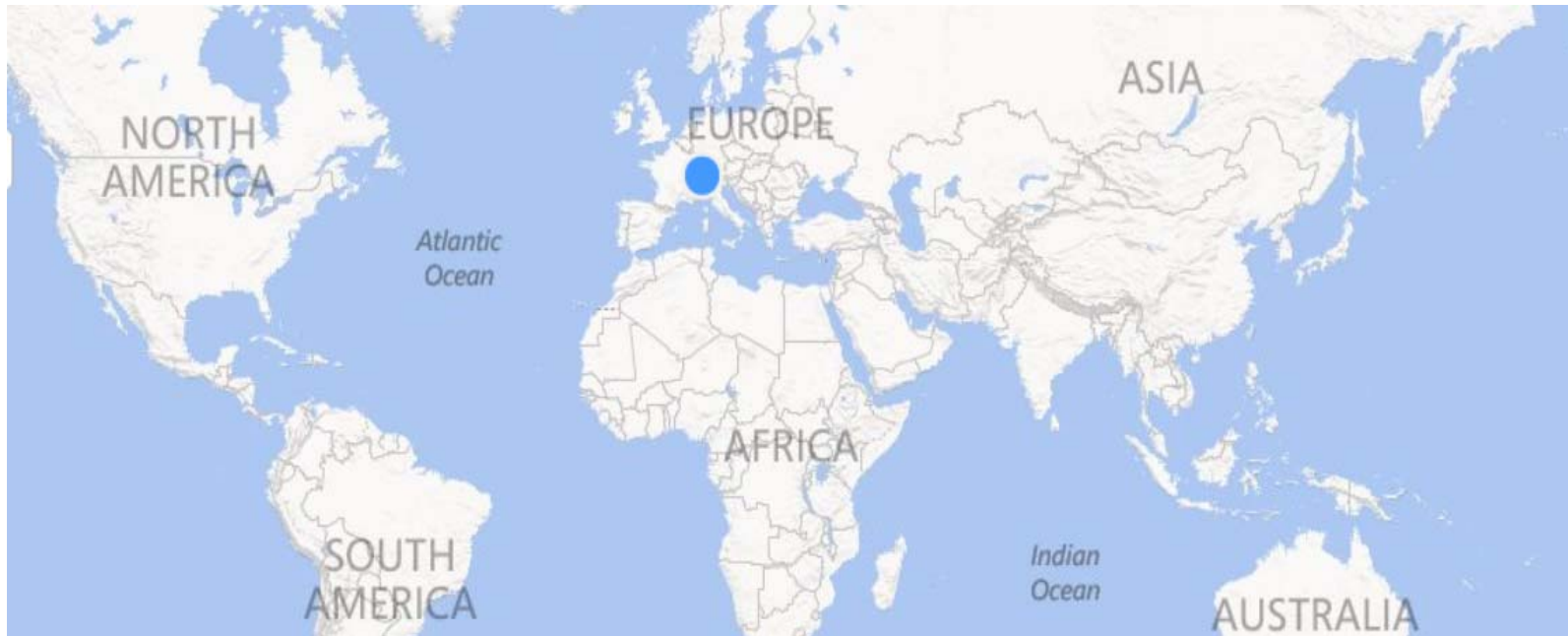
## The beginnings of ISO



In 1946 delegates from 25 countries met at the Institute of Civil Engineers in London and decided to create a new international organization 'to facilitate the international coordination and unification of industrial standards'.

On February 23, 1947 the new organization, ISO, officially began operations.

# ISO Headquarters, Geneva, Switzerland



**119 countries with full membership**  
**38 countries as correspondents**  
**5 countries subscribing members**



## DEVELOPMENT OF INTERNATIONAL STANDARDS

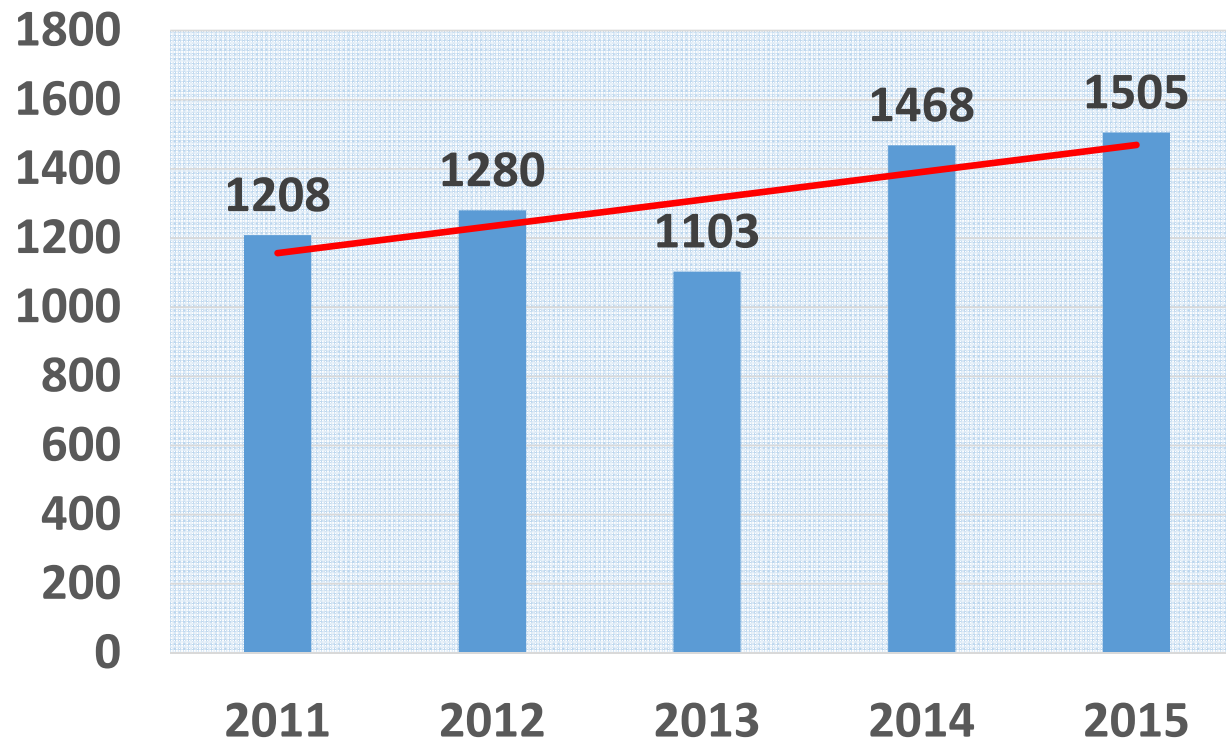
**21 133** International Standards and standards-type documents published to date



**1505** deliverables in 2015 alone  
= **940 797** pages in English and French  
(terminology is also often provided in other languages)

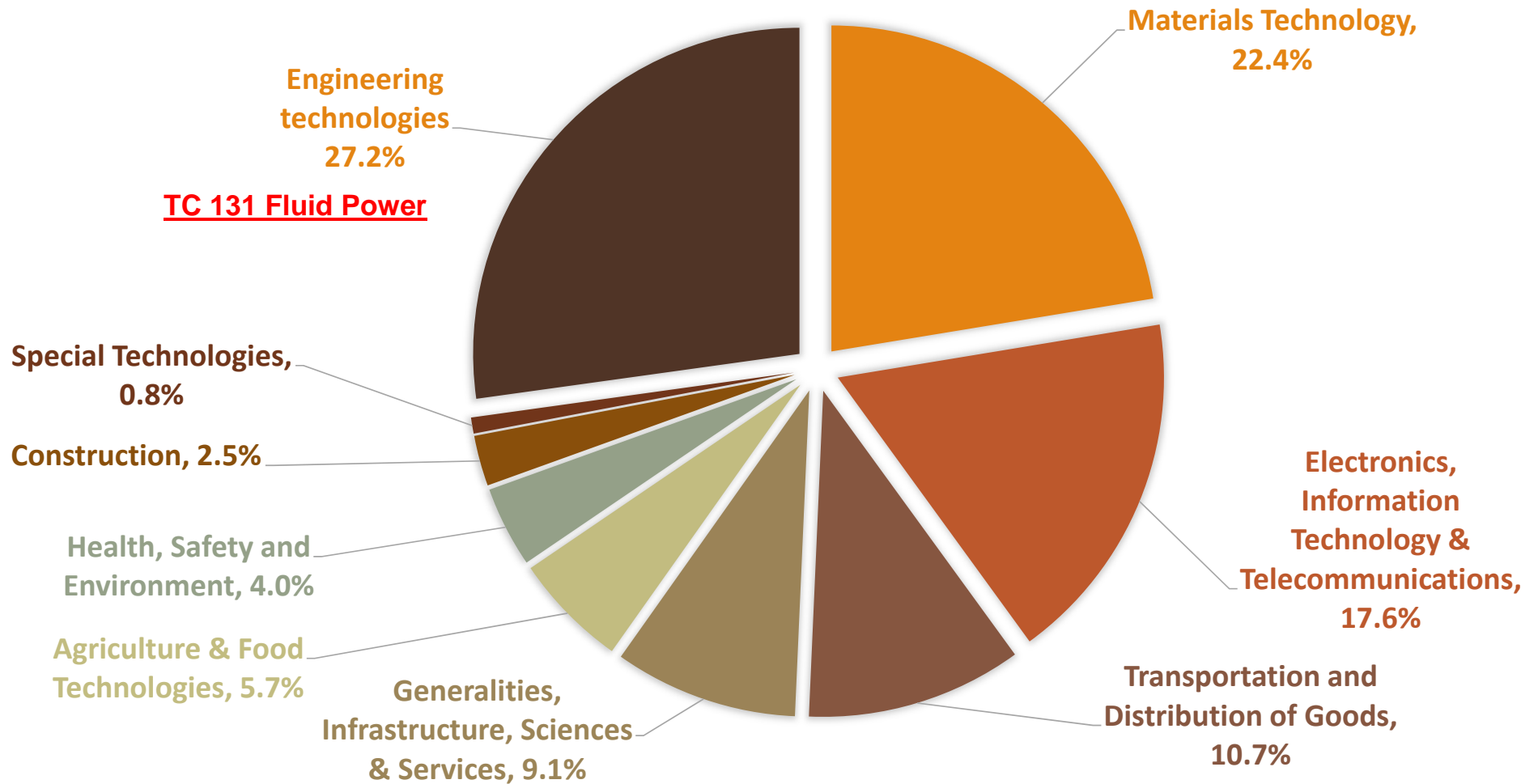
Source ISO annual report 2015

## Standards Published




21,133 Standards or standards-type documents published

# ISO Standards Cover



# ISO/TC 131 work includes:

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- **220 currently published standards**
  - **Currently 14 standards are under development**
  - **Published standards come up for systematic review every 5 years. Which means you could have 44 or more standards up for review at any one time.**
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# ISO/TC 131 Participating Countries

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- **15 actively participating countries.**
  - **23 countries that observe TC131 activities**
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# To cope with the work load

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- **5 direct working groups**
- **9 Sub Committees**
- **The sub committees currently have 24 active working groups**


# ISO and NFPA Focus - Energy Savings

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- **Efficient system design key**
- **Steady state power losses can be quite significant in both pneumatic and hydraulic systems**
- **Good system design and PM are critical for energy efficiency.**

# Pneumatic systems


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- **The single biggest cost in a pneumatic system is the cost to compress the air.**
  - **The compressors need only deliver enough air pressure to perform the tasks needed.**
  - **System leaks are frequently the biggest single cause of energy loss.**
  - **Filters elements need to be changed periodically to reduce pressure loss.**
  - **Line losses need to be minimized.**
  - **Dual pressure systems for end effectors can significantly reduce energy consumption.**
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# Why Standards?

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- **Standards benefit both manufacturers and end users.**
  - **Standards level the playing field so customers can better compare product offerings.**
  - **Manufacturers benefit by being able to show how their product offerings better fit a customer's individual needs.**
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# What is needed to promote and promulgate useful standards?

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- **The biggest key to developing and maintaining good standards is commitment:**
  - **Personal commitment**
  - **Developing standards takes time. Gaining consensus is often difficult and time consuming**
  - **Company support and commitment**
  - **International travel and lodging is not inexpensive – company commitment to sponsor participants.**
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# Questions

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Thank you for your time and attention

Gary Baumgardner  
Principle Engineer,  
Parker Hannifin Corporation  
Pneumatic Division, North America  
Chair ISO TC 131

