



ISO/TC158 –
Analysis of gases

Activities in ISO/TC 158 “Analysis of gases”

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9th Gas Analysis Symposium and Exhibition

Rotterdam, the Netherlands, 13-15 June 2017



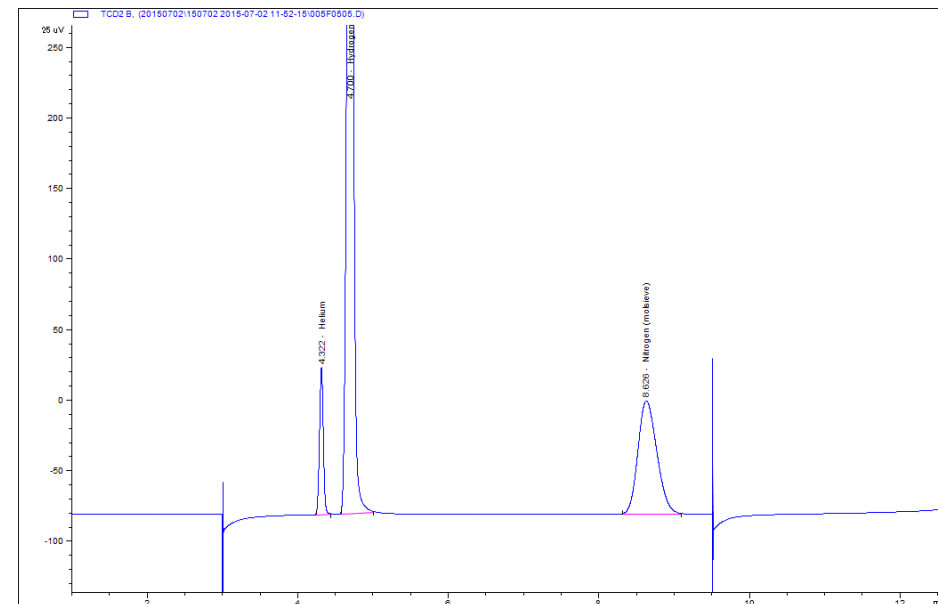
Scope ISO/TC158 “Analysis of gases”

- The scope of ISO/TC 158 is defined as standardization in the field of gas analysis, including:
 - terminology;
 - preparation of calibration gas mixtures;
 - sampling;
 - transfer lines;
 - analytical methods including evaluation of characteristics of analyzers
- Excluded are topics covered by ISO/TC193 (Natural gas), ISO/TC146 (Air quality), and ISO/TC28 (Petroleum and related products, fuels and lubricants)

INTERNATIONAL
STANDARD

ISO
6143

Second edition
2001-05-01





ISO/TC 158 Membership

P-members (11)
participating members
[blue]

China (SAC)	Netherlands, the (NEN)	Sweden (SIS)
Czech Republic (UNMZ)	Russian Fed. (GOST R)	Ukraine (DTR)
France (AFNOR)	Spain (AENOR)	United Kingdom (BSI)
Germany (DIN)	Finland (SFS)	

O-members (31)
observing members
[orange]

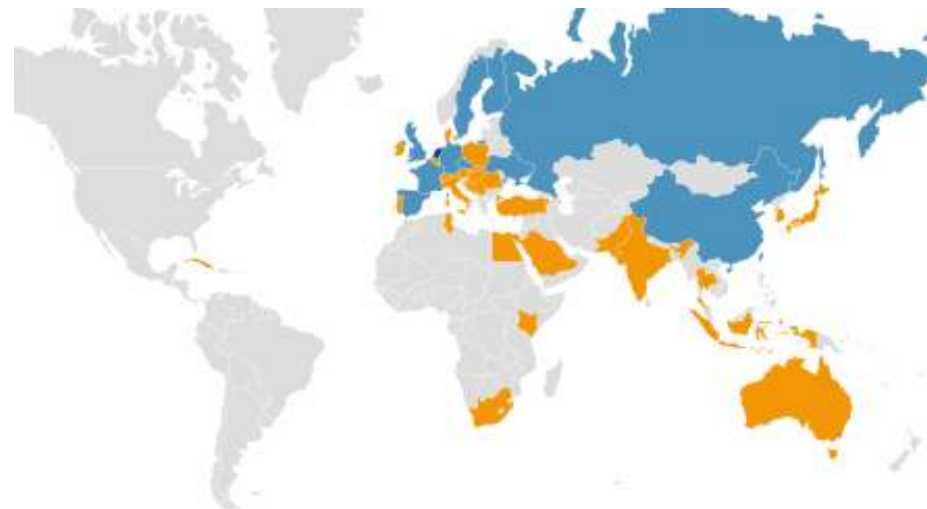
Armenia (SARM)	Hungary (MSZT)	Poland (PKN)
Australia (SA)	India (BIS)	Portugal (IPQ)
Austria (ASI)	Indonesia (BSN)	Romania (ASRO)
Belgium (NBN)	Ireland (NSAI)	Saudi Arabia (SASO)
Bosnia-Herzegovina (BAS)	Italy (UNI)	Serbia (ISS)
Croatia (HZN)	Japan (JISC)	Slovakia (SUTN)
Cuba (NC)	Kenya (KEBS)	South Africa (SABS)
Denmark (DS)	Korea, Rep. of (KATS)	Switzerland (SNV)
Egypt (EOS)	Montenegro (ISME)	Thailand (TISI)
Hong Kong (ITCHK SAR)	Pakistan (PSQCA)	Tunisia (INNORPI)
		Turkey (TSE)

L-members (2)
liaison organizations

OIML – International Organization of Legal Metrology (cat. A)
EIGA – European Industrial Gases Association (cat. B)

Liaisons within ISO

ISO/TC 28 – Petroleum products and lubricants
ISO/TC 146, SC 1 and SC 6 – Air quality;
ISO/TC 193 – Natural gas;
ISO/TC 197 – Hydrogen technologies;
ISO/REMCO – Reference materials committee;



<https://www.iso.org/committee/53314.html>



What does an ISO technical committee do?

- Develop new international standards
- Revise and update international standards
- Withdraw international standards





Working groups

WG	Title	Convenor	Country
1	Terminology		
2	Quality assurance of gas analysis	Adriaan van der Veen	The Netherlands
3	Gravimetric methods	Rob Wessel	The Netherlands
4	Comparison methods and certificates	Wolfram Bremser	Germany
5	Static and dynamic methods	Tony Banfield	United Kingdom
7	Hydrogen (jointly with TC197)	Martine Carré	France



Completed projects since GAS 2015

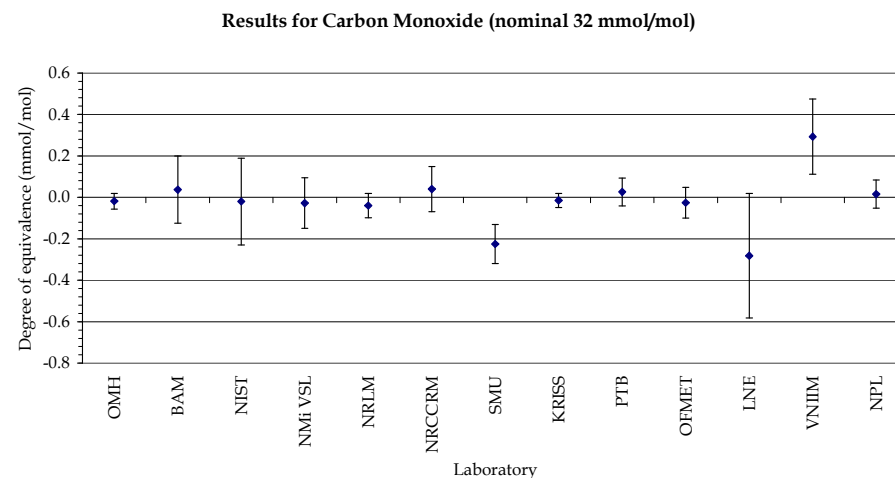
- Published international standards:
 - ISO 6141, *Gas analysis – Contents of certificates for calibration gas mixtures* (4th edition) published February 2015
 - ISO 7504, *Gas analysis – Vocabulary* (3rd edition) published May 2015
 - ISO 19229, *Gas analysis – Purity analysis and the treatment of purity data* (1st edition) published February 2015
 - ISO 6142-1, *Gas analysis – Preparation of calibration gas mixtures – Part 1: Gravimetric method for Class I mixtures* (1st edition) published in August 2015
 - ISO 12963, *Gas analysis -- Comparison methods for the determination of the composition of gas mixtures based on one- and two-point calibration* (1st edition) published May 2017
- Appearing soon:
 - ISO 6145-6, *Gas analysis -- Preparation of calibration gas mixtures using dynamic methods -- Part 6: Critical flow orifices*, 3rd edition
 - ISO 16664, *Gas analysis -- Handling of calibration gases and gas mixtures -- Guidelines*, 2nd edition



Making impact – ISO 6142

- Recognised by the industry as *the* standard for top-class calibration gas mixtures in cylinders
- Gravimetric gas mixture preparation widely viewed as a quality mark
- National metrology institutes use the standard in their comparisons of national measurement standards (“key comparisons”)
- Use of the ISO 6142 no longer limited to “stable” gas mixtures ...
- ... in the newest edition (ISO 6142-1:2015) there is guidance on how to conduct and evaluate stability studies
- Well connected to ISO/IEC 17025 (calibration laboratories) and ISO 17034 (reference material producers)

$$y_k = \frac{\sum_{j=1}^P \left(\frac{x_{k,j} \times m_j}{\sum_{i=1}^n x_{i,j} \times M_i} \right)}{\sum_{j=1}^P \left(\frac{m_j}{\sum_{i=1}^n x_{i,j} \times M_i} \right)}$$

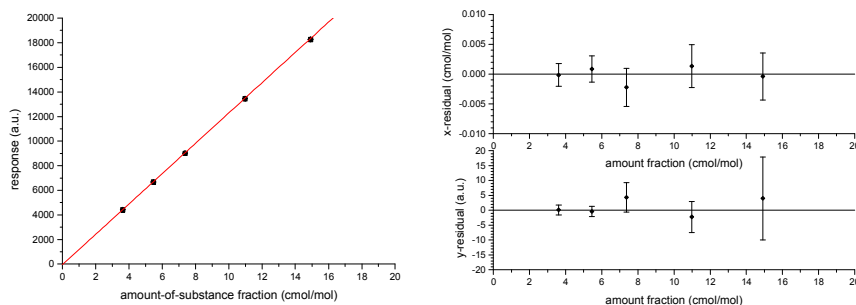


CCQM-K3 Automotives (2000)



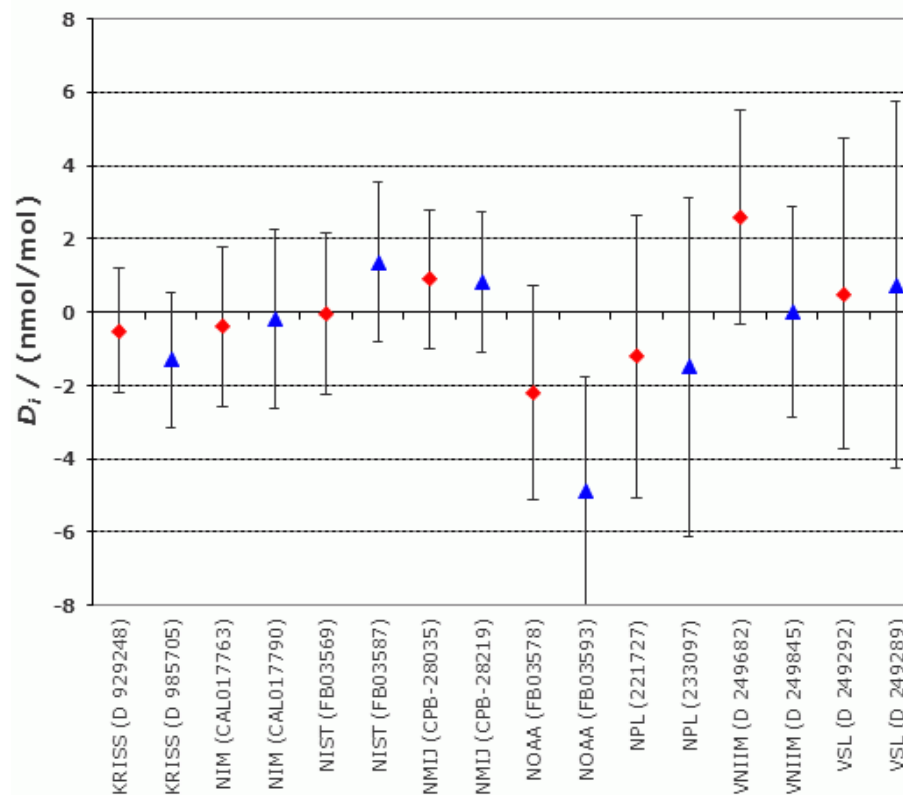
Making impact – ISO 6143

- Widely recognised as *the* standard for multipoint calibration
- First standard to recognise the uncertainty of the calibration gas mixtures in fitting the data
- Widely used for certifying calibration gas mixtures based on an analytical value
- National metrology institutes use the standard in their comparisons of national measurement standards (“key comparisons”)
- First comparison of this kind organised in 2000



13 June 2017

CCQM-K82 Ambient methane (2012)



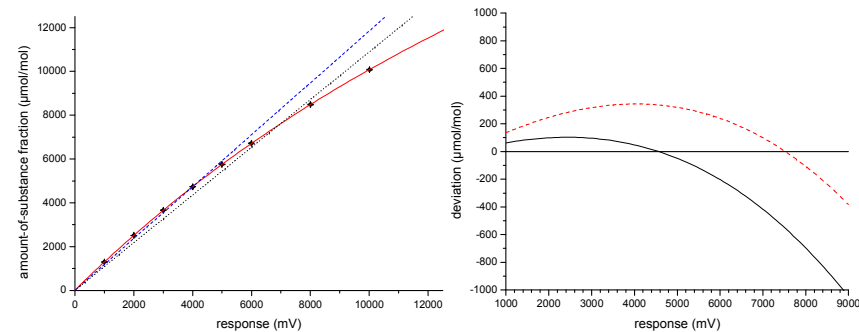
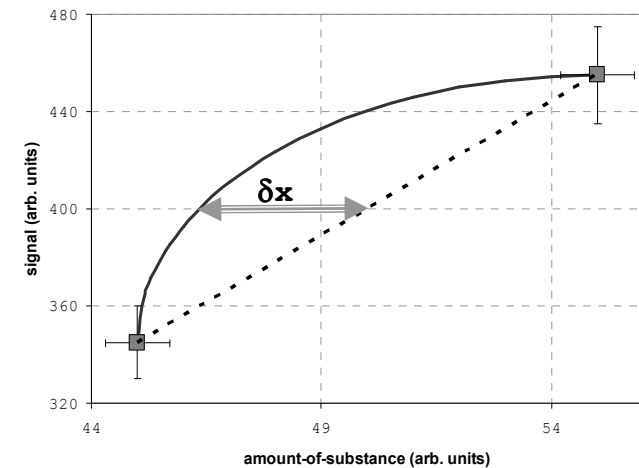
GAS Analysis 2017



ISO 12963 -- Gas analysis -- Comparison methods for the determination of the composition of gas mixtures based on one- and two-point calibration

- The standard provides methods for
 - calibrating an instrument with one or two calibration gas mixtures,
 - determining the composition of a gas sample, and
 - evaluating the uncertainty of the composition of the gas sample in relation to the uncertainty of the composition of the calibration gases used and the contribution of the measurement process.

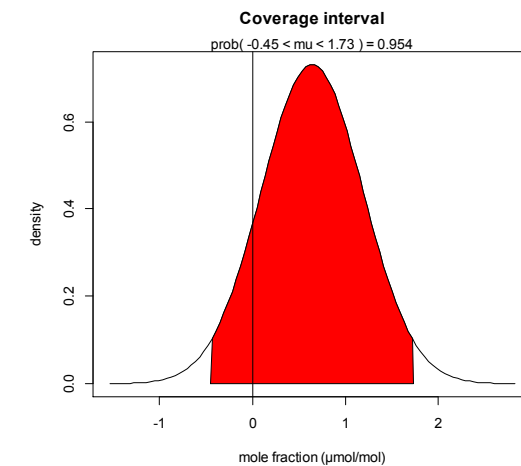
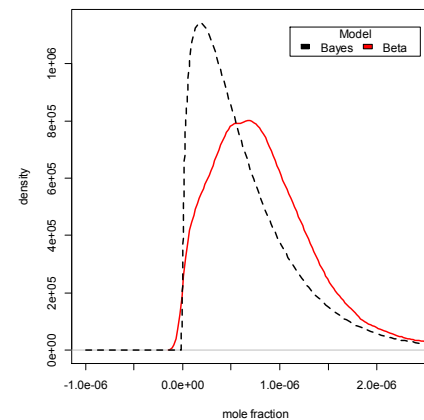
- ISO 12963:2017 sets requirements to, and acceptance criteria for, the utilization of different measurement calibration designs with a small number of calibration gas mixtures used in calibration.





ISO 19229 -- Gas analysis -- Purity analysis and the treatment of purity data

- First edition developed to support ISO 6142, ISO 6144 and ISO 6145
- Document describes good practices in purity analysis
- Second edition (under development) extends the guidance to certifying gas mixtures for impurities and purity
- Emphasis on establishing valid coverage intervals
- Connection with ISO 6141:2015





ISO 21087:

Hydrogen fuel -- Analytical methods -- Proton exchange membrane (PEM) fuel cell applications for road vehicles

■ Content:

- This International standard specifies the analytical methods for ensuring the quality of the hydrogen quality at hydrogen distribution bases and hydrogen fuelling stations for PEM fuel cells for road vehicles.


■ Purpose and justification of the standard

- This standard aims to propose validated analytical methods and procedures for hydrogen quality control at hydrogen distribution facilities in order to comply hydrogen quality required by ISO 14687-2 for permeating commercialized FCVs and hydrogen infrastructure in the market.

■ Status :

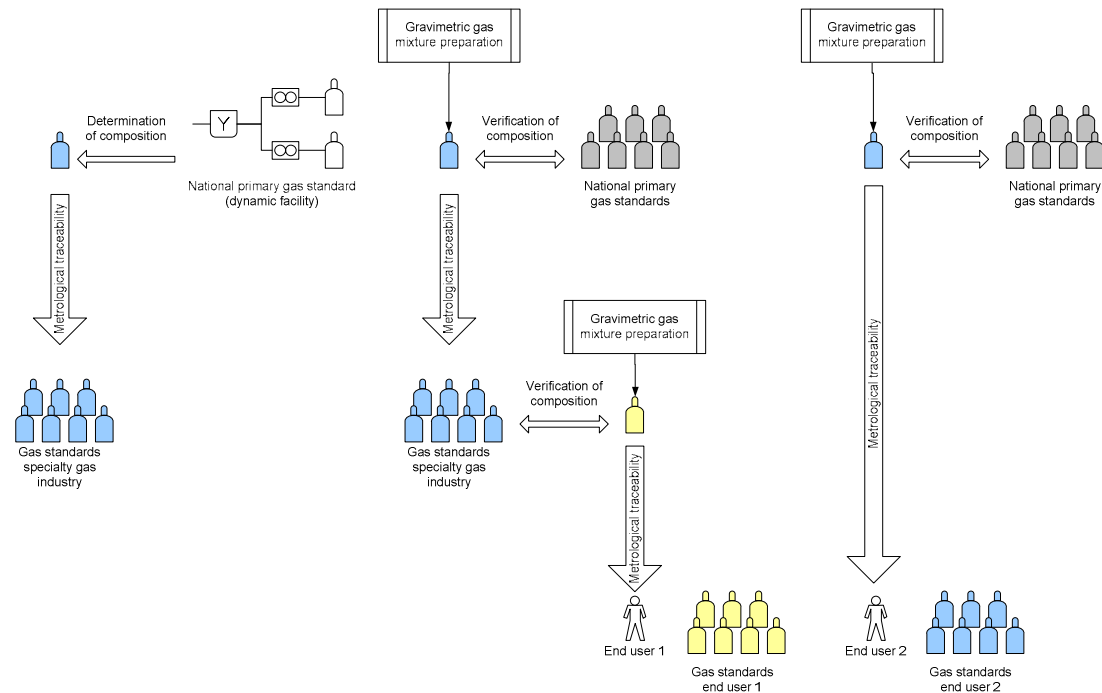
- Committee draft document under development





ISO 14167 -- Gas analysis — General quality aspects and metrological traceability of calibration gas mixtures

- General criteria for metrological traceability in gas analysis
- Dissemination of metrological traceability
- Relationships between the various preparation and comparison methods
- Relationships with quality management standards (ISO/IEC 17025 and ISO 17034)





Why joining ISO/TC158?

- To be directly involved in the development of your standards
- To decide about the future of gas analysis
- To connect with industry and other parties relevant to your business
- To be an early adopter of new or revised standards





Acknowledgement

- Dirk Tuma
- Rob Wessel
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- Wolfram Bremser
- Martine Carré
- Carine Cardella
- Stuart Hopkins
- Tony Banfield
- Bernard Hussler
- Sui Wan
- Jarno Dakhorst



Join ISO/TC158 now

and

have a good time at GAS Analysis 2017!