Aircraft Cabin Air Quality:
What has happened to the CEN & SAE Standards?

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Disclosures

Airbus – aeromedical consultant

BRE – associate consultant

Jarvis Bagshaw Ltd – associate director
European Standardisation Bodies

**CEN** - European Committee for Standardisation
- 33 EU Countries
- BT – Bureau Technique

**ASD STAN** – Aerospace and Defence Industries of Europe – Standardisation

“*Standards for Industry from Industry*”

formerly

**AECMA** – Association Européene des Constructeurs de Matériel Aérospatial
AFNOR (Association Française de Normalisation) - French national organisation for standardisation

- Member body for International Organisation for Standardisation (IOS)

BNAE (Bureau de Normalisation de l’Aéronautique et de l’Espace) –

- Develops standards for French aerospace industry
International Standardisation Body

SAE International
formerly US Society of Automotive Engineers

Global standardization for engineering professionals in transport industries
Need for a Standard

- Serious and widespread concern about impact of cabin air on passengers and crew
  - UK HoL inquiry
- Exacerbated by growth of air traffic, and future generation of aircraft
- No international European Standards for environmental quality in aircraft
- Problems clearly trans-national and need to be addressed as such
European Aircraft Air Quality Standards

The cabin environment in commercial passenger aircraft

EN 4618 : 2010

- Aircraft internal air quality standards

prEN 4618 : 2013

- Proposed update

prEN 4666 : 2013

- Aircraft integrated air quality and pressure standards
EN 4618 : Cabin Air Quality

- 2001 – 2003: EC collaborative project CabinAir
- Cost: €7million
- Consortium: 16 partners from 8 countries
  - Including CAA, RAF CAM, BAHS, SAS, KLM, BRE-UK, TNO-NL, NBI-No, CETIAT-Fr
  - Aviation medicine, regulation & standards expertise
- Air quality parameters monitored in generic aircraft types - full range of domestic & international fleet
CabinAir - Key objectives

- Establish current air quality through ‘measurements in the sky’
- Produce information on relationship of air quality with ECS, filtration, air distribution and ‘impact’ performance
- Provide innovative designs in ECS, filtration, air distribution, and control
- Develop performance specification and propose draft Pre-standard
CabinAir consortium
Cabinair strategy

- Air quality (safety, health and comfort)
  - External environment impact
  - Commercial needs

Cabinair
Draft standard developed for ASD-STAN
Draft based on
- Measurements of chemical compounds in cabin air
- Existing JAA/FAA standards
- Guidelines & regulations for indoor environments
- Advice from toxicologists & indoor air quality experts
Other relevant regulatory & standards bodies (ICAO, FAA, JAA, CAA, ASHRAE) briefed throughout project
ASD-STAN working group drew up initial pre-Standard 4618
Voted on by national standards bodies
**Adopted as European Standard EN4618 : 2010**
2005 – 2008: EC collaborative project Ideal Cabin Environment (ICE)

Cost: €5million

Consortium: 15 partners from 8 countries

Medically driven with ethical approval by Royal College of Physicians

Physiological parameters –

- 1500 subjects, age 18-75yrs, M:F, 8 hour flight
- 2 at-risk groups (cardiovascular; respiratory)
Results from 8 hour flight duration:
- Current 8,000 ft max cabin altitude valid
- No adverse physiological effects in any group

ASD-STAN developed pre-Standard prEN4666 : 2013

Complementary to EN 4618
Little progress so far in developing international standard

- Powerful lobbying
- Political issues
- Conflicting scientific evidence
Crew representative bodies challenged
- Validity of research programmes
- Scientific integrity and independence of researchers
- Process of development of standards

Powerful lobbying of ASD-STAN and EC by crew bodies

Lack of understanding of issues by some national standards bodies led to vote abstentions during review
European Cockpit Association ~

- “Standards do not protect crewmember and/or passenger health – not acceptable
- “Aircrew operation and safety duties could be impaired by effects of fumes
- “ECA calls on CEN organisations to oppose these standards
ASD-STAN Board Decision

March 2013

- EN 4618 to be reissued as Technical Report (TR)
- prEN 4666 – no further work
October 2013

- Withdraw EN 4618
- Cancel all activity with regard to prEN 4666
- BNAE to establish Project Committee on behalf of AFNOR
- Participants to be appointed by CEN national members
- To proceed
  - Requires 2/3<sup>rd</sup> majority vote
  - Agreement of 5 members to participate
BNAE (Bureau de Normalisation de l’Aéronautique et de l’Espace) –
- develops standards for French aerospace industry

AFNOR (Association Française de Normalisation) -
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- Member body for International Organisation for Standardisation (IOS)
April 2014

Paris meeting hosted by AFNOR, included representatives from industry and unions
Years of rigorous ethical scientific work, with significant resource and financial commitment, wasted

No European standard for aircraft cabin environment

Proposed new project committee unlikely to have equivalent resources or expertise
Does margarine cause divorce?

![Graph showing correlation between divorce rate and margarine consumption]

Source: US Census, USDA, tylervigen.com
Questions?