



Standards & Cabin Air Quality

Presentation by Frank Brehany - Independent Consumer Campaigner & Commentator

Frank Brehany

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- ❖ Self-funded, Expenses from Media, not a member of any Political, Lobbying, Industrial or Consumer Grouping
- ❖ Involved in Cabin Air Quality since 2006

Motives, Intentions & Language



“Don’t trust a word
these people are
telling you. They’re
here to steal your
land”



The Problem with Air Quality

A brief overview

pneumatic

Standards

events

rights

consumer

technology

brain

sensor

air

toxic

workers

damage

synthetic

smoke

winds

laws

americas

oil

particulate

chemical

residue

chemicals

blisters

particulates

noncebo

unions

consumers

bodies

cockpit

breathing

engine

Parliament

economics

EU

enforcement

air

auxiliary

pilots

marker

airbus

event

national

unit

passenger

bleedair

crew

passengers

phase

toxic

united

regulations

law

tradeunions

usa

Transport

fumes

flight

toxic

Move

europa

cabin

cognitive

power

american

synapses

swab

chemicals

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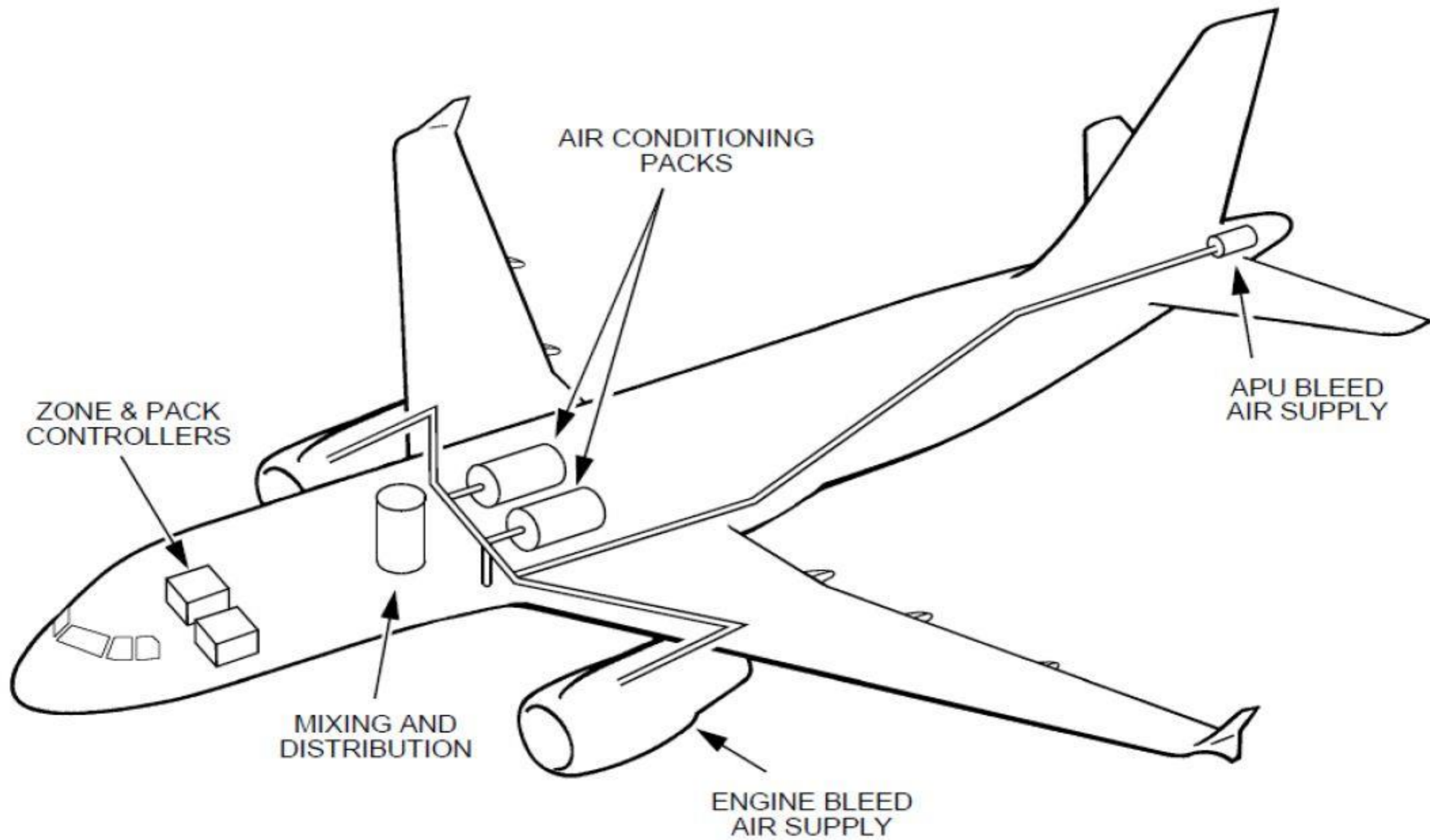
blisters



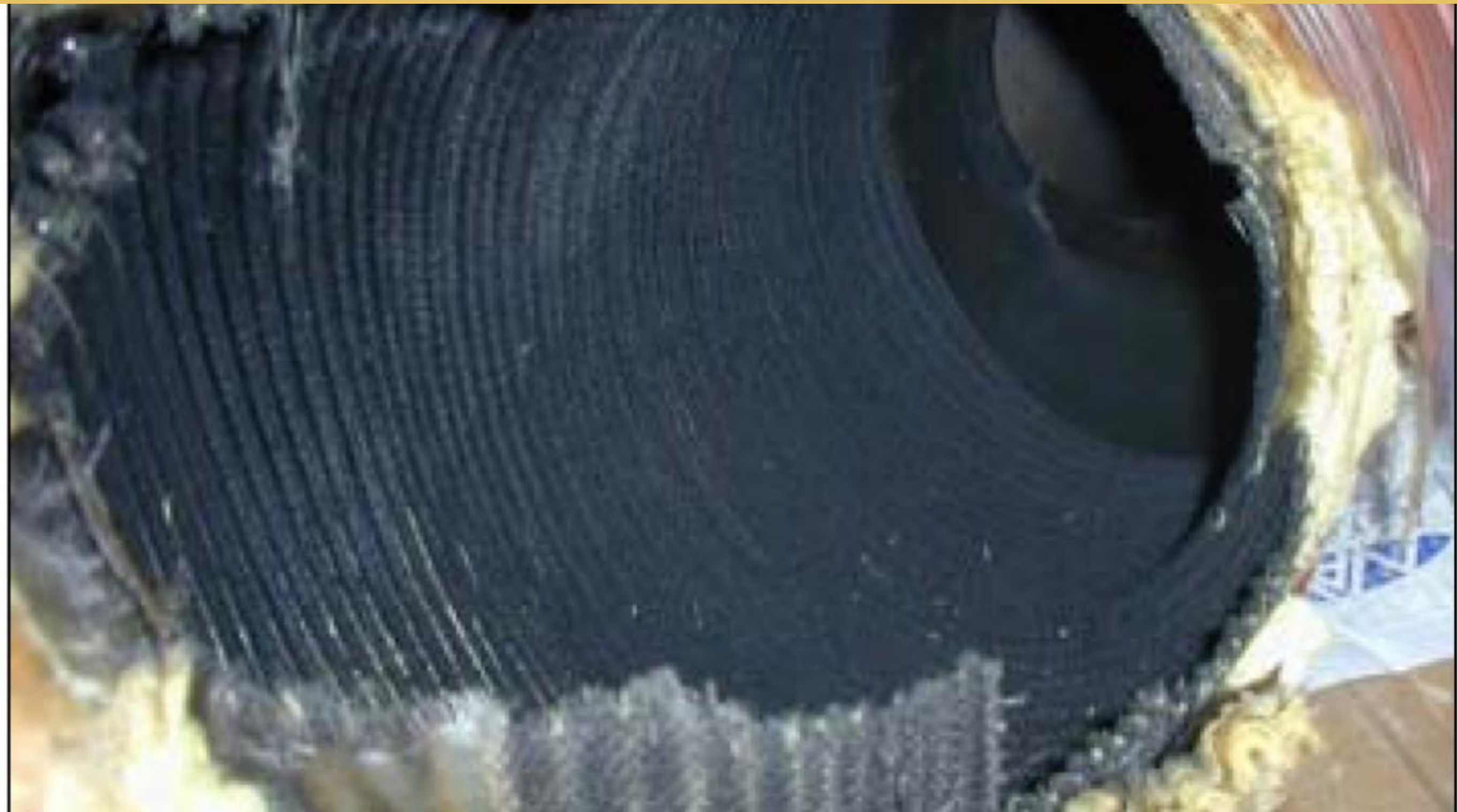
AuxilliaryPower Unit (APU)

A ground-based aircraft motor

Bleed - Air



Ducting & Particulates





Aviation Law & Safety

A brief overview

❖ The Basic Regulation:

Regulation (EU) 2018/1139 - Common Rules for Civil Aviation. Binding in all its elements, (adopted by the EU Parliament & Commission)

(<https://www.easa.europa.eu/regulations#regulations-basic-regulation>)

Implementing Rules to Basic Regulation (adopted by EU Commission)

(<https://www.easa.europa.eu/regulations#regulations-basic-regulation>)

Supported by Aviation Standards ([https://www.easa.europa.eu/document-](https://www.easa.europa.eu/document-library/acceptable-means-compliance-amcs-and-alternative-means-compliance-altmocs)

[library/acceptable-means-compliance-amcs-and-alternative-means-compliance-](https://www.easa.europa.eu/document-library/acceptable-means-compliance-amcs-and-alternative-means-compliance-altmocs)

[altmocs](https://www.easa.europa.eu/document-library/acceptable-means-compliance-amcs-and-alternative-means-compliance-altmocs)):

Certification Specifications (CS);

Acceptable Means of Compliance (AMC) (Non-binding - not legislation);

Alternative Means of Compliance (AltMoC) (Non-binding - not legislation);

Guidance Material;

All adopted by EASA



EU Regulation & Standards

A brief overview

❖ Need to understand **TFEU**;

EU Reg 1025/2012 (<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R1025&from=EN>)

The starting point for all Standards work;

Important for Single Market and External EU Relations

Preamble 19: *“Standards can contribute to helping Union policy address the major societal challenges such as climate change, sustainable resource use, innovation, ageing population, integration of people with disabilities, consumer protection, workers’ safety and working conditions”*

Article 10 allows EU Commission to Mandate a Standard

Satisfies EU 1985 ‘New Approach’ to Legislation & Standardisation



The 2012 Challenge

Motives, Intentions & Language

❖ Unions, Representative Groups, Consumers

Challenged the monopoly of Industry to make a Standard

First time a Standard was challenged

Lobbying of Commission & DG's

Formal challenge at CEN

Argument: Standard not fit for purpose - ignored science -
one-sided - did not protect workers or PX's

Overtaken

New Standard ordered!



EU

The EU Standards Experience

A brief overview

✿ Process started in 2012

Still at it, but, we have a draft Standard!

The battle between 'Technical' & 'Ambition'

Some are interested in 'nuts and bolts'

Others wanted greater processes and
protections

Data: who will share the data?

Identifying Compounds: March 2018!

❖ Draft Standard:

Identifies 16 Chemical Marker Compounds, reliably found;

Identifies sources of contamination;

Invokes the Precautionary Principle (<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52000DC0001&from=EN>):

Hazard Characterisation/Identification;

Qualitative/Quantitative assessment of Exposure

Risk Characterisation, but

No measurements - not agreed!

It speaks to sensor technology

Blood tests for crew

Information to Passengers

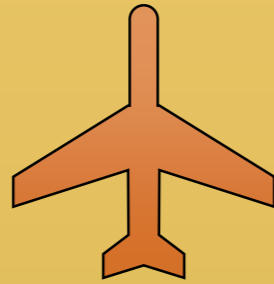
UFP's!

The Standard is broad and ambitious!

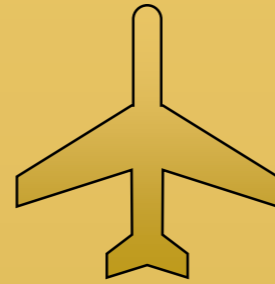
CEN TC436



TG1
Identify and
report on
appropriate
Chemical
Marker
Compounds



TG2
Identify
sampling
technologies
& means of
analysis



TG3
Identify
suitable
sensor
methods
following
TG1 &
TG2's work



TG4
Identify
suitable
training and
other
prevention
methods



**DC
Drafting
Ctte**
3 meetings
Numerous
break-out
sessions
Mirror Cttes

Chapter Headings:

- ❖ **Chemical Compounds:** (Sources/Bleed etc);
- ❖ **Requirements for Air Quality:** (PP, Monitoring, online/offline etc;)
- ❖ **Requirements for Analysis & Reporting:** (Data, reporting & recording, system etc);
- ❖ **Correction & Preventive Actions:** (To identify and remedy contaminant sources etc);
- ❖ **Airline Worker Training & Education:** (All Aviation user/workers etc)

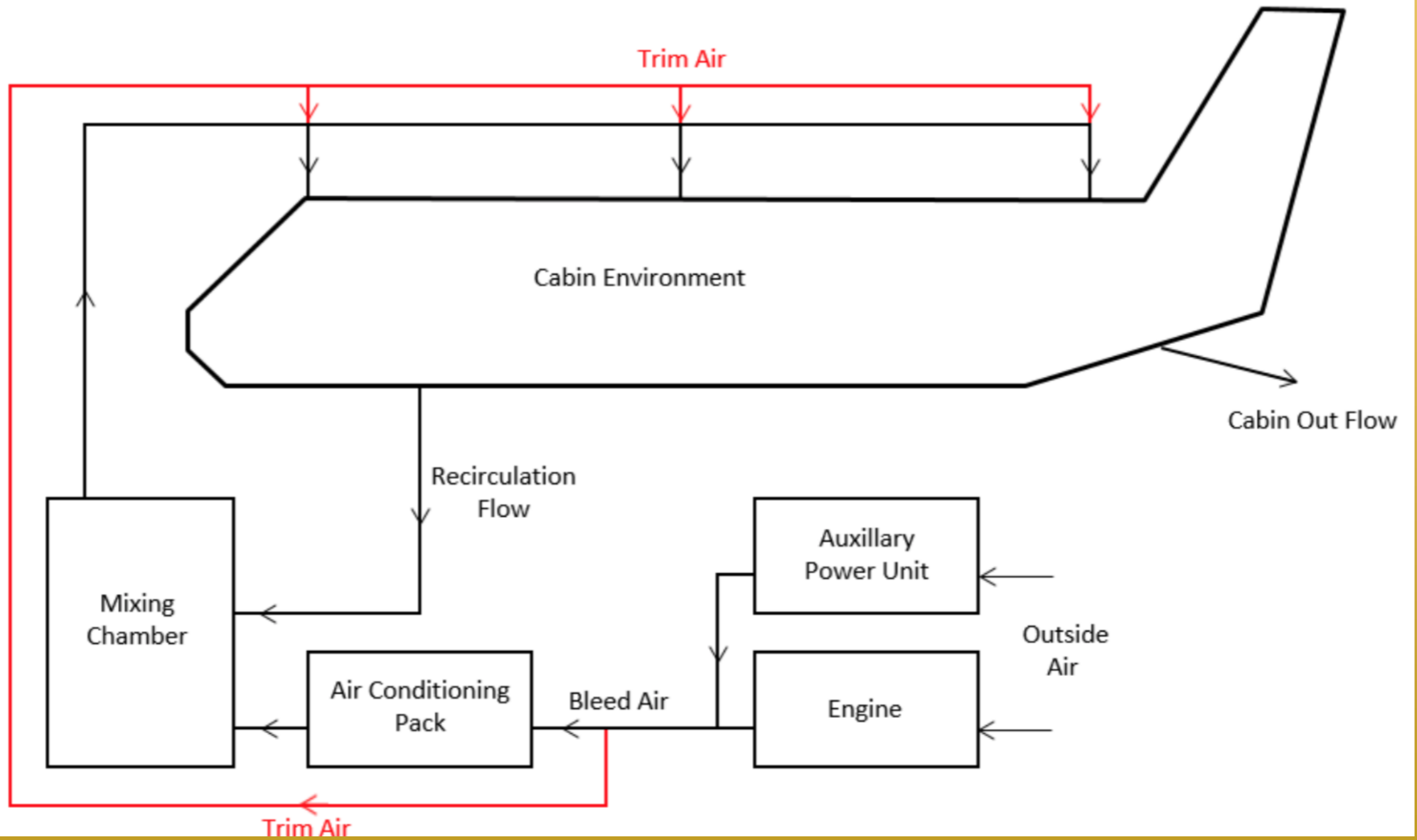
Annex Content:

- ❖ Environmental Control System (ECS): Bleed/Bleed-Free;
- ❖ Chemical Marker Compound Tables;
- ❖ PP;
- ❖ Methodology for online/offline measurements;
- ❖ Flight crew & maintenance best practice;
- ❖ Chemical Compounds Table (Introduced in Cabin);
- ❖ Sources of oil leakage;
- ❖ Overview of data

Flight phases	Aircraft System configuration and control settings				
	ECS Or E-ECS ²⁾	HUMIDIFIER	APU BLEED	ENGINE BLEED	GROUND AIR SUPPLY UNIT
Engine Start ¹⁾	OFF	OFF	OFF	OFF to ON	
APU start ¹⁾	OFF	OFF	OFF to ON	OFF	
Ramp	FULL HOT FULL COLD 20°C to 25°C or actual ³⁾	ON OFF ³⁾	ON OFF ³⁾	OFF	ON OFF ³⁾
Ramp - De-Icing ¹⁾	OFF	OFF	OFF	OFF to ON	
Taxi out	20°C to 25°C or actual	ON OFF ³⁾	ON OFF ³⁾	ON OFF ³⁾	
Take Off	20°C to 25°C or actual	ON OFF	OFF	ON	
Climb	20°C to 25°C or actual	ON OFF	OFF	ON	
Cruise	20°C to 25°C or actual	ON or OFF	OFF	ON	

Screenshot taken from Standard: Not to be shared/reprinted/reproduced without CEN written permission

Chemical marker compounds Chemical compounds	CAS number	Family compound	Relevant Source						
			Engine Oil	Hydraulic fluid	Engine exhaust gas (13)	Fuel (Unburned)	Deicing fluid	Occupants	Engine Oil
Ozone	10028-15-6	Inorganic			x (1)				
Nitrous oxides (NO _x)	-	Inorganic			x				
Carbon dioxide (CO ₂)	124-38-9	Inorganic	(10)	(10)	x			x (2)	
Carbon monoxide (CO)	630-08-0	Inorganic	x (3)	x	x		x (3)		
Acrolein	107-02-8	Aldehyde	x (13)	x (13)	x (13)				
Formaldehyde (11)	50-00-0	Aldehyde	x	x	x				x
Acetaldehyde	75-	Aldehy	x	x	x			x	



Source no. in Table B.1	Source (1)	Marker Compound (2)	Reliability Rating of Marker Compound (3)	CAS number
1	ENGINE OIL	Tricresyl phosphates (4)	A	1330-78-5
		Acetaldehyde	B	75-07-0
		C ₅ -C ₁₀ carboxylic acids	B	n/a

3. Reliability rating definitions:

A: Marker compound is an ingredient in the product being measured.

B: Marker compound is either a pyrolysis product of the product being measured or off-gasses from a bulk sample of the product.

C: Marker compound meets "B" criteria, but with some limitations, such as pyrolysis product is generated over more a limited range of temperatures, is present either at very low levels or at below-ambient levels, or limited data are available.



Final Thoughts

How to survive the Standards experience

❖ Read TFEU

Become involved via National Standards Bodies (Norway:

https://www.standard.no/en/toppvalg/about-us/standards-norway/#.XPULbi_MyuU);

Read & understand EU Reg 1025/2012;

CEN Guidelines

(<https://boss.cen.eu/reference%20material/RefDocs/Pages/CENGuides.aspx>)

CEN Code of Conduct:

(https://boss.cen.eu/ref/Code_conduct_experts.pdf)

Go beyond Technical - be Ambitious - be Constructive

Get to understand: **Motives, Intentions & Language!**



Takk for at dere hørte på
Thank-you for Listening

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