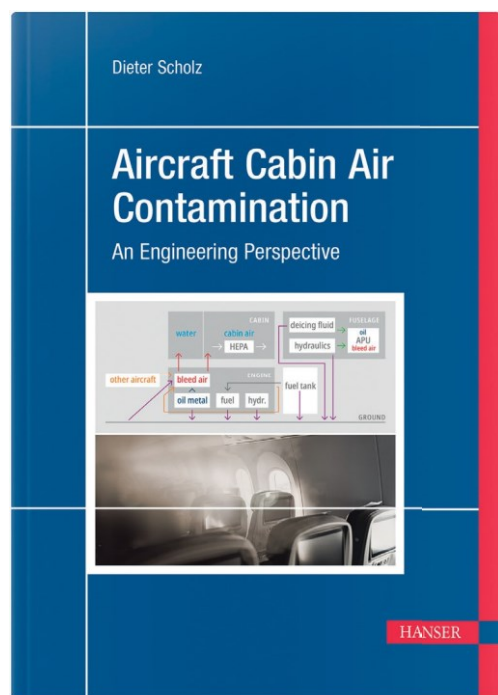


Solutions to a Hotly Debated Problem



Abstract

Purpose – This text is written to bring the engineering explanations of aircraft cabin air contamination together in one place and on another level of detail. Explanations go into technical detail, but all interested parties and people from all disciplines should benefit. --- **Methodology** – It is a review of the evidence combined with own contributions to the field. --- **Findings** – At a closer look, the aircraft is anything else but a glamorous polished machine. For technical reasons, dangerous chemicals are in use. These substances leave their intended places and get distributed everywhere. As such they just follow the law of nature: entropy. Unfortunately, while spreading, the substances also arrive in the human body with health and flight safety consequences. All occupants are potentially affected, but predominantly the crew, who spend much more time in an airplane than even a frequent flyer. In this way low dose exposures accumulate and are potentially topped by a high dose exposure in a failure case. The major problem is that almost all passenger aircraft take the air for air conditioning from the compressor of the engine. This was different at the start of the jet age and needs to be changed again in the way the Boeing 787 shows. Air conditioning needs dedicated compressors and air inlets. --- **Research Limitations** – Focus is on cabin air contamination from engine oil in transport category airplanes. Contamination due to hydraulic fluid, deicing fluid, and even ozone is also considered. --- **Practical Implications** – People who suffer from consequences of aircraft cabin air contamination may find answers to the main question: Why? Others may find hints on how to get protected. --- **Social Implications** – This text can prove evidence of the engineering fundamentals in court. **Originality** – No comparable text seems to be published.

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Table of Contents

1	Introduction	8.5	How Other Contaminants and Routes Contribute towards Contamination
1.1	History, Activities, Documents	8.5.1	Potable Water Contamination by Bleed Air
1.2	A Multidisciplinary Topic	8.5.2	Leaking Equipment and Liquids Dripping on the Ground
1.3	Definition of Title Terms	8.5.3	Liquids Ingested by Aircraft Engines from the Ground
1.4	Certification Rules and Engineering Standards	8.6	How the Air Is Recirculated and Filtered
1.5	How Does it Look Like?	9	The Demonstrated Evidence of Oil in the Cabin
1.6	Toxins or Odors?	9.1	Deposits Found on the Way into the Cabin
1.7	How Often and Why?	9.2	Modeling the Concentration of Oil in the Cabin Air
1.8	Aerotoxic Syndrome?	10	The Role of Maintenance
1.9	Product Liability	10.1	Identifying the Source of the Contamination
1.10	Practical Contaminated Cabin Air Litigation	10.2	Cleaning of Contaminated Parts
1.11	Causation	10.3	Maintenance Duration
1.12	Precautionary Principle	10.4	No Fault Found
1.13	Reading Hints	10.5	Engines Are Longer on the Wing
2	Cabin Air Contamination Events are Fume Events	11	Ozone at Cruise Altitude
2.1	More Definitions	11.1	Ozone Basics
2.2	CACE Explained	11.2	Ozone Flight Planning
2.3	Severity Levels	11.3	Ozone on Board
3	The Need for Air Conditioning in Civilian Aircraft	12	Alternative Cabin Air Technologies and Operational Measures
4	The Origins of Present Cabin Air Technologies	12.1	Breathing Protection
5	The Oil within the Operation of the Engine	12.2	Flight at 10000 ft to Vent the Cabin with Outside Air
5.1	Tasks and Parameters	12.3	Sensors
5.2	Oil Checks	12.4	Filtered Recirculated Cabin Air
5.3	Nano Particles from the Engine End Up in Humans	12.5	Ozone/VOC Converters
5.4	More Than Oil: Hydraulic Fluid and Deicing Fluid	12.6	Total Air Filtration
6	The Contents of the Oil and Associated Health Risks	12.6.1	Total Air Filtration for Cabin Air
6.1	Health Risk from Hazard and Exposure	12.6.2	Total Air Filtration for Fuel Tank Inerting
6.2	Official Information about Aviation Oil	12.7	Alternative Engine Oil
6.3	TCP Isomers and Their Toxicity	12.8	Alternative Air Conditioning Design Principles
6.4	TCP and Neurotoxicity	12.9	Applied Hierarchy of Controls
6.5	Pyrolyzed Oil, VOC, PM, and UFP	13	Industry Cooperation
6.6	More Than Oil: Hydraulic Fluid and Deicing Fluid	14	Summary
7	Health and Flight Safety Implications Due to Contaminated Cabin Air		List of References
8	How the Oil Gets into the Cabin		Appendix A: Certification Rules for Aircraft, Engine, and APU
8.1	How the Air Makes Its Way from the Compressor into the Cabin		Appendix B: Event Taxonomy
8.2	How the Oil Leaves the Engine Lubrication System		Appendix C: Cabin Air Contamination Frequency
8.2.1	Jet Engine Fundamentals		Appendix D: Comparison of Symptoms
8.2.2	Sealing Fundamentals		Appendix E: TVOC and VOC Measured in the Cabin of Passenger Aircraft
8.2.3	Evidence for Leakage of Seals on Jet Engines		Appendix F: Air Distribution to the Cockpit
8.3	How the Oil Leaks from the Seal into the Air of the Engine Compressor		Appendix G: List of Videos
8.4	How the APU Contributes to Cabin Air Contamination		Appendix H: Wrong Logic Applied Arguing the ECS Case

About the Author

Dieter SCHOLZ is a professor at Hamburg University of Applied Sciences. He teaches Aircraft Systems (among other subjects) and was engaged in research with Airbus on simulation and design of the Environmental Control System (among other topics). He uses two official Airbus A320 Aircraft System Simulators (MTD) with real hardware in his laboratory for teaching. Dr. Scholz has contributed a chapter on aircraft systems to three aerospace standard handbooks and has contributed to the topic at various meetings, conferences, and hearings. Chapter 8.5 and Chapter 9.1 – which are central to this text – have been partially published Open Access with peer review. The professor is active in various functions in the German Society for Aeronautics and Astronautics and is a fellow of the Royal Aeronautical Society. Scholz holds a Private Pilot License (PPL-A and PPL-B), CVFR-Rating, Night-Rating, AZF, more than 700 Flight Hours (PIC), experience in Educational Flight Testing, ICAO Language-Proficiency in English: Level 6 ("near native").
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