



Risks with PMA humidifier pads

This white paper outlines some risks associated with using Parts Manufacturer Approval (PMA) humidifier pads in aircraft humidification systems.

But there is a solution.

WHITE PAPER

CTT Systems
Optimizing humidity in aircraft

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www.ctt.se

Summary

Risks with PMA humidifier pads

This document outlines some risks associated with using Parts Manufacturer Approval (PMA) humidifier pads in aircraft humidification systems.

Original Equipment Manufacturer (OEM) humidifier pads result from development, testing and certification conducted by CTT Systems together with Airbus and Boeing. CTT Systems had to develop an application-specific humidifier pad material to meet specs and achieve total system compatibility.

The use of non-original PMA pads can compromise the safety and performance of not only the humidification system but, more importantly, impact the air supply to the flight deck, crew rests, and passenger cabin areas.

Munters' Standpoint



Given the considerable differences in material, manufacturing processes, testing, and certification, **Munters strongly advises against using humidifier pads with GX30 material in the CTT Systems Humidifiers.**

The GX30 pad material is not developed, produced, or tested for aviation, unlike the GX60 pad material certified for aviation used in CTT Systems Humidifiers. Ensuring that approved materials like the GX60 developed for the specific way the humidifiers wet the pad material, are used is essential for maintaining the highest air quality and safety.



Introduction

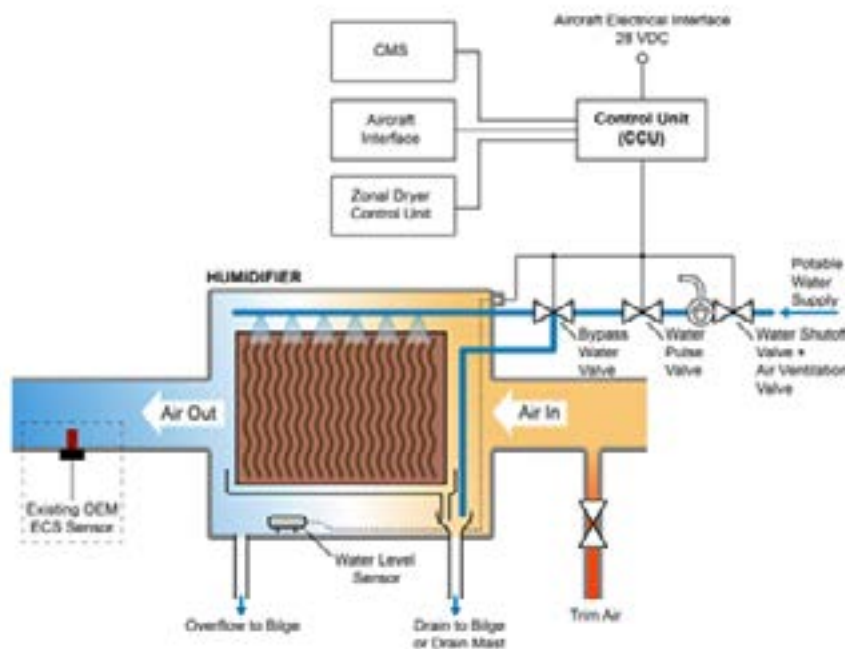
How the system work

The CTT Systems Humidifier Onboard system is integrated into the air duct for a specific cabin section and, thus, part of the aircraft Environmental Control System (ECS).

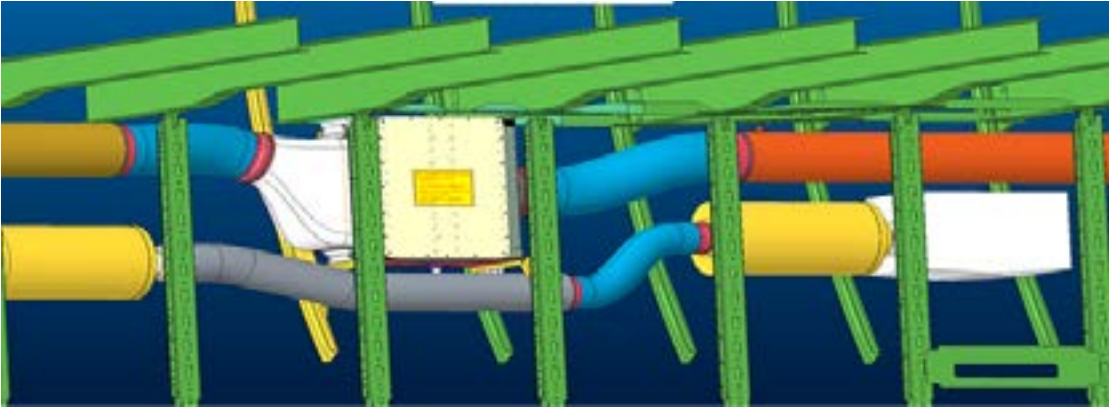
The Humidifier Onboard system consists of a humidifier housing, a humidifier pad, and a Control Unit (picture 1 below). After approx. 4,000 FH (pending design and certification approvals), the humidifier pad shall be taken out and replaced.

The pad is inserted into the OEM humidifier housing and is a sub-system within the Humidifier Onboard system and, thereby, part of the ECS (see picture 2).

CTT Systems' OEM pads are developed and qualified to ensure 100% integration and compatibility with the Humidifier Onboard (i.e., the ECS), meeting performance and safety standards set by the aircraft manufacturers and certified by the aviation authorities.



Picture 1. Typical OEM Humidifier Onboard system schematic.



Picture 2. Typical Humidifier Onboard integration into ECS.

With support from Munters, a global leader in energy-efficient air treatment for industrial and commercial applications, CTT Systems has conducted a risk analysis. The analysis is based on CTT Systems' leading application knowledge from the development, testing, and authorization process as well as from reliability and performance data from almost 3,000 OEM Humidifier Onboard systems in-service.

Line-fit in aircraft

Requires a specific and unique humidifier media

As part of OEM development, CTT Systems had to develop an application-specific pad material, the GX60CTT, in cooperation with Munters, based on humidification system specifications set by all specific ECS and aircraft requirements. The GX60CTT pad material is the only material available that meets all requirements for use in aircraft, as defined by Boeing, Airbus, EASA, FAA, and FDA. The GX60CTT is based on improvements of Munters GX40 material which in turn is an improvement of the older Munters GX30 material.

Line-fit in aircraft

In other industrial applications, the humidifier media is “flooded with water,” and the water is then collected in a trough. In an aircraft, it is not possible to flood the humidifier media and thereby have “free water.” Therefore, a unique technique to wet the humidifier media by spraying small amounts of water in intervals had to be developed, and the humidifier media had to be further developed to support this technique (see picture 1).

The authorities, especially the FDA, as well as the OEMs, were concerned about Legionella resistance and odor control, ensuring that adding the Humidifier Onboard to the ECS would not negatively affect the quality of the airflow to the specific aircraft zones but instead would have a positive effect. Fulfilling these specific requirements was also included in further developing the humidifier media. In addition, the process of manufacturing, testing, and approving the humidifier media also had to be improved and updated.

PMA comparison

GX60CTT vs GX30

The main developments comparing GX60CTT with GX30 is:

- Developed for the technique to spray water.
- Rigid and non-flexible.
- Higher max velocity and drop stop.
- Higher carryover limits.
- Lower pressure drop.
- Odor control.
- Legionella resistant.

All improvements of GX60CTT versus the old generation GX30 are specified in [Appendix 1](#).

Based on findings at CTT during maintenance

Potential safety implications

Based on findings on humidifiers returned to CTT Systems for maintenance containing PMA pads, it is noteworthy that the PMA pads showed damage and deterioration that highlight and confirm a risk that PMA pads may create an increasing blockage of the airflow through the humidifiers during operation.

CTT Systems' main concern is a potential significant blockage of the ECS supply to the flight deck or crew rest compartments, regardless of whether the humidification system is active or not. For examples of damaged PMA pads found inside CTT humidifiers returned to CTT Systems for maintenance, please refer to the photos in [Appendix 2](#).

Conclusion

Humidifier Onboard with Original Pads ensures performance and safety

CTT Systems' original pads are developed and certified in accordance with aviation standards and OEM compliance.

The Humidifier Onboard system is integrated into the aircraft ECS.

Using CTT Systems' original pads ensures the well-being of passengers and crew, optimal system performance, and, most importantly, safety in accordance with the standards set by aviation authorities and OEMs.

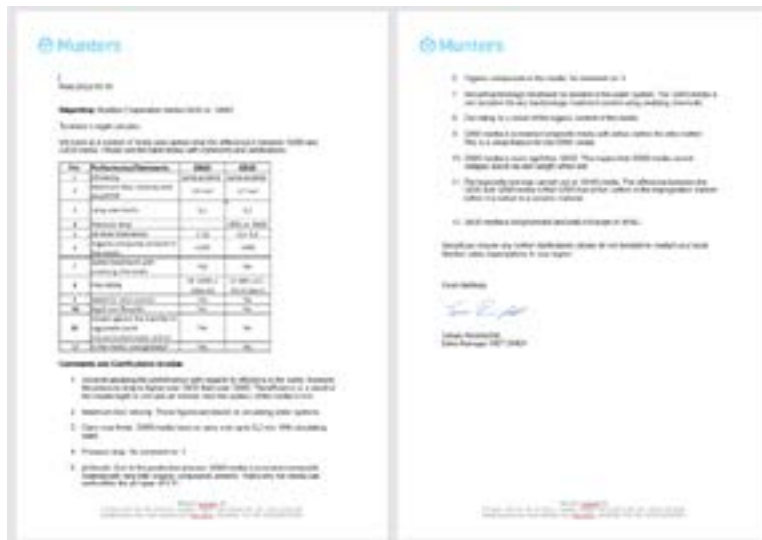
Humidifier Onboard with original pads - for safer skies and healthier pilots

Munters' standpoint



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Click on the image above to go to this white papers web page for the appendix.



Thank you for taking the time to read

We hope you found it informative and helpful.

If you have any questions or would like to discuss your specific needs, please don't hesitate to contact us. We are here to help you optimize the humidity in your aircraft.

We look forward to hearing from you!

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