

# Secure sterilization of potentially infectious waste using innovative steam injection technology

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## Abstract

The long-standing experience shows, that the waste sterilization is frequently not performed in an ideal way for person safety and environmentally harmless. Already, the transport within the laboratory block holds the danger of the spreading of infectious shoots. Moreover, the waste bags must be opened once again by the staff for the sterilization, to ensure the steam admission into the waste. This houses an enormous high-risk potential for the staff and the environment, due to the fact that many germs and spores can be whirled up by opening the waste bags. For this reason a new one-way waste bag, which can be locked tightly with a special lid after filling, has been developed. The lid of the waste bag disposes of a membrane, which can be pierced by a lance which has been specially developed for this purpose. This special multifunctional lance, which enables an immediate steam admission and evacuation inside the waste bag, has been mounted inside the autoclaves head. The lance has the additional function of temperature measurement, which allows direct temperature monitoring inside the waste bag. Another aim of the project is it, to improve and to supervise the waste air filtration by a filter integrity test, documented in regular cycles.

In the presented study, could be demonstrated during the validation (performance qualification) that by using the new process, better results concerning temperature distribution and higher safety level for environment and staff could be achieved in comparison with conventional steaming of the waste bag.

## References

- PDA Technical Report 1, Revised 2007, (TR 1) Validation of Moist Heat Sterilization Processes Cycle Design, Development, Qualification and Ongoing Control
- Grumbach C., Pino-Grace P., Czermak P.; Einbauempfehlung für Neuanlagen, Sichere Überwachung der Abluftbehandlung von Autoklaven mittels Wasserintrusionstest mit hoher Temperaturstabilität; GIT-Labor-Fachzeitschrift 08/2011 S. 540 - 542
- Czermak P., Catapano G.: Accuracy of Automated Instruments Used in the Pharmaceutical Industry for Integrity Testing Sterilizing Filters, PDA Journal of Pharmaceutical Science and Technology 57 (2003) 4, p.277-286
- Czermak P.; Catapano G.: Automated integrity testing of hydrophobic filters based on water intrusion measurements: comparative analysis of a refilling continuous-flow and a pressure-decay batch device, European Journal for Parenteral Sciences 5 (2000) 3, S. 59-63
- Einbauempfehlung für Neuanlagen, Nachrüstung oder Ergänzung, zur Wahl der Abluftbehandlung von Autoklaven, Beschluss 3/2009 des ABAS, ELATEC.