Decontaminating Natural Animal Bedding in Containment Facilities

Got Bedding? How do you treat it?

Gary Schmidt
Manager Products and Process Technology
Why Natural Bedding?

- Animal Welfare
- Integrity of Research
- Regulations
Challenges

Varying types
- Straw, wood chips, shavings

Densities

Soil loadings
- Urine, feces, feed

Volume
- Large volume, low weight

Containers
- Bags, bins

Mixed Loads
- Mixed bedding, other materials
Treatment Program

Treat directly through the containment barrier vs removing and treating externally?

Risk assessment

Treatment regimen
  Gaseous or vapor
  Autoclave
  Incineration
Gases and Vapors

Vapor condensation
Solids
Load density
Containers

This is not a viable option
Incineration

- Loading directly from containment
  - Double door issues
- High volume low mass
  - Inefficient
- Mixed materials
  - Plastics
Traditional Autoclaves

Volume

Validation

Load densities

Soil loading

Bags and containers

Low confidence in validation cycle to cycle

High volumes challenge capacity
Hybrid-Shredding Autoclave

Addresses multiple challenges
High Temperature Treatment

- Fully closed, automated system
- Treatment to $10^{-8}$ Gb Stearoothermophilus
- Can reduce volume by up to 80%
- Combination of shredding and steam
- Treatment at 138 °C, 3.5 bars pressure
Basic Sequence of Operation
Installation Options

Loading outside containment

Loading from containment through the floor
Auto Loading

Ease of loading outside containment
Shredder

- Size reduction
- Accessibility
- Uniformity of load
Mixed Loads and Containers

Before

After
Mixed Loads
Discharge
Discharge
Validation

- Temperature mapping
- Bioindicator placement
- Data Logging
Validation

The efficacy tests of the BioExtreme Sterilizers have been evaluated by various organizations such as:

*Pasteur Institute (ISO/IEC 17025 International Standard Accredited Laboratory – Accreditation No. 1-2215) WNWN International*, and many others

Tests were conducted using various microorganisms such as:

*Bacillus Stearothermophilis*, *Bacillus Subtilis* Spores and others

Samples were taken at critical points and times in the cycle with different waste compositions

Effluent water and air emissions were tested as well and were found to be within the regulatory guidelines
Flexibility  Ability to process many materials
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Summary  BSLXstream™ Hybrid Autoclave

Addresses many challenges of bedding treatment

Designs for loading from within contained facilities

Validatable process

Handles mixed loads and multiple materials
Thank you!

Questions?

PRI BIO

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