Performance Specifications for Odor Control Systems

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Two types of odor performance guarantees

- Percent removal:
  90% removal of odor

- Maximum system outlet allowed:
  200 “odor units per cubic meter”
Setting an odor performance standard

- Standard developed from Policy making
- Collaboration (input) from all Stakeholders
- Standard is transparent – open for review
Setting an odor performance standard

✓ Is the Standard valid?    Can its validity be tested?
✓ Is the Standard referenced to a regulatory standard or industry standard?
✓ Is the Standard achievable?
✓ Are consequences and remedies provided?
Key sampling elements

Sampling protocols

- multiple sample times?
- multiple samples?
- constant sample conditions?
- Sampling bags, shipping, etc.
Key measurement elements

- Clear Odor Performance Measure
  - EN13715:2003 and ASTM E679-04

- Setting a cut-score
  - bright line?
  - arbitrary?
  - developed from good information?
Key statistical elements

- Is probable error acknowledged?
- Is sampling bias acknowledged?
- Is precision & accuracy variance included?
What is the Precision and Accuracy of Odor Testing for Odor Control Systems?
How do we know if an odor control system passes a performance test?
This is Precise?

But not Accurate
This is Precise and Accurate
Precise ?
More Precise!
EN 13725:2003

Committee for European Normalization (CEN)

Created a framework for qualifying:

- ✔ Odor Assessors
- ✔ Odor Panels

Standard odorant: 1-butanol (n-butanol)
EN 13725:2003

“The odor laboratory’s precision and accuracy to n-butanol, the standard odorant, is transferable to all environmental odor samples tested by the laboratory.”
BOD Method #5210

“The wastewater laboratory’s precision and accuracy to the GGC BOD test is transferable to all environmental wastewater samples tested by the laboratory.”
This is Odor Testing Precision
This is Odor Testing Precision and Accuracy

n-butanol Testing creates the Target
EN13725 Minimum std. dev. 0.172
Acceptable
Inter-Panel
std. dev. 0.10
Within Panel
std. dev. 0.05
Percent Removal – example

EN13725:2003  Annex H

- Test a Biofilter odor control system
- Required 90% odor removal efficiency
- Inlet and Outlet sampled in triplicate (3)
Maximum Outlet Odor – example

EN13725:2003 Annex G

- Test a scrubber odor control system
- Maximum outlet odor concentration of 200
- Outlet of scrubber sampled in triplicate (3)
Precision and accuracy of odor testing for odor control systems is defined by EN13725 and verified by the laboratory.
An odor control system passes a performance test when it meets the specification’s acceptance criteria and is verified by statistical analysis.