A Comparison of conventional sprinkler and water mist, reproducibility vs. representativeness within OH1 approval tests

by

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- **OH1 Test Method**

- **Test Setup "Office"**

- **Test Procedure**

- **Test Results Sprinkler Reference**

- **Discussion**

- **Reproducibility vs. Representativeness**

- **comparison of water mist system directly with "classical" sprinkler**

- **same test setup**

- **same procedure**

- **counting of damages**

- **sprinkler reference**

    - **test setup "under one nozzle"**

    - **test setup "between four nozzles"**

    - **repetition of the test with <u>worse</u> result**

    - **two references with the best results**
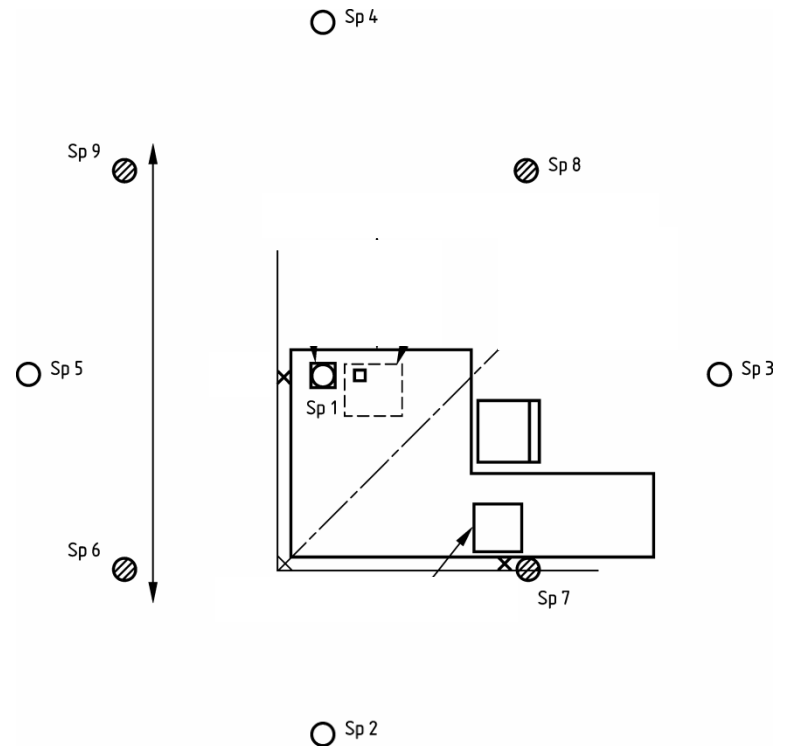
- **WM comparison**

  - **test setup "under one nozzle"**

  - **test setup "between four nozzles"**

  - **repetition of the test with <u>better</u> result**

  - **all three tests have to be better than the reference**

- **walls, plywood panels**

- **two table tops**

- **one upholstered chair**

- **drawers under the table**

- **files w. paper piles, plastic files, books, news papers, monitor, keyboard**

- **ignition source**
  - pool
  - wood crib
  - gas burner

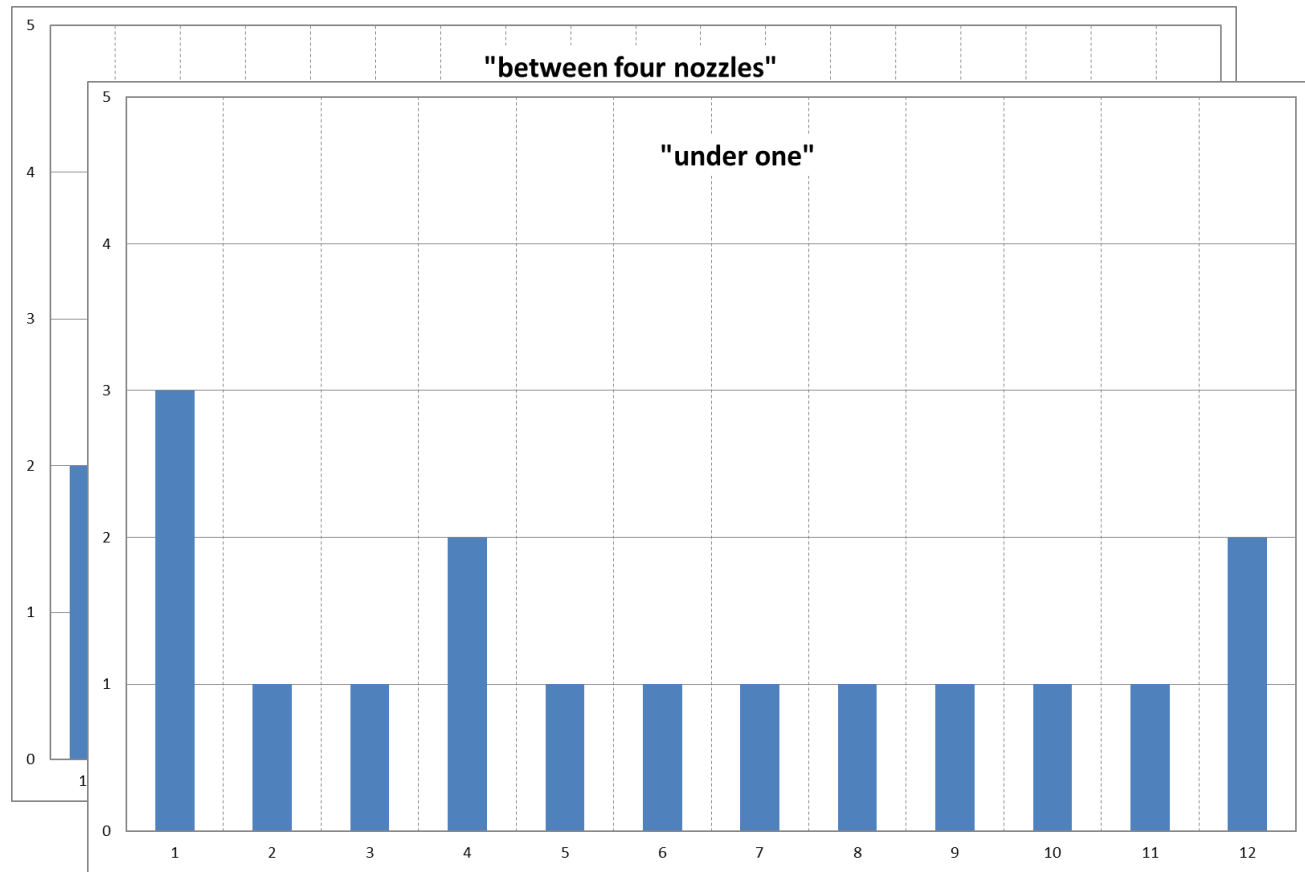- **54 items**

- ignition of the gas burner
- removal of gas burner after 5 min
- water application for 30min after first nozzle activated
- manual extinguishment
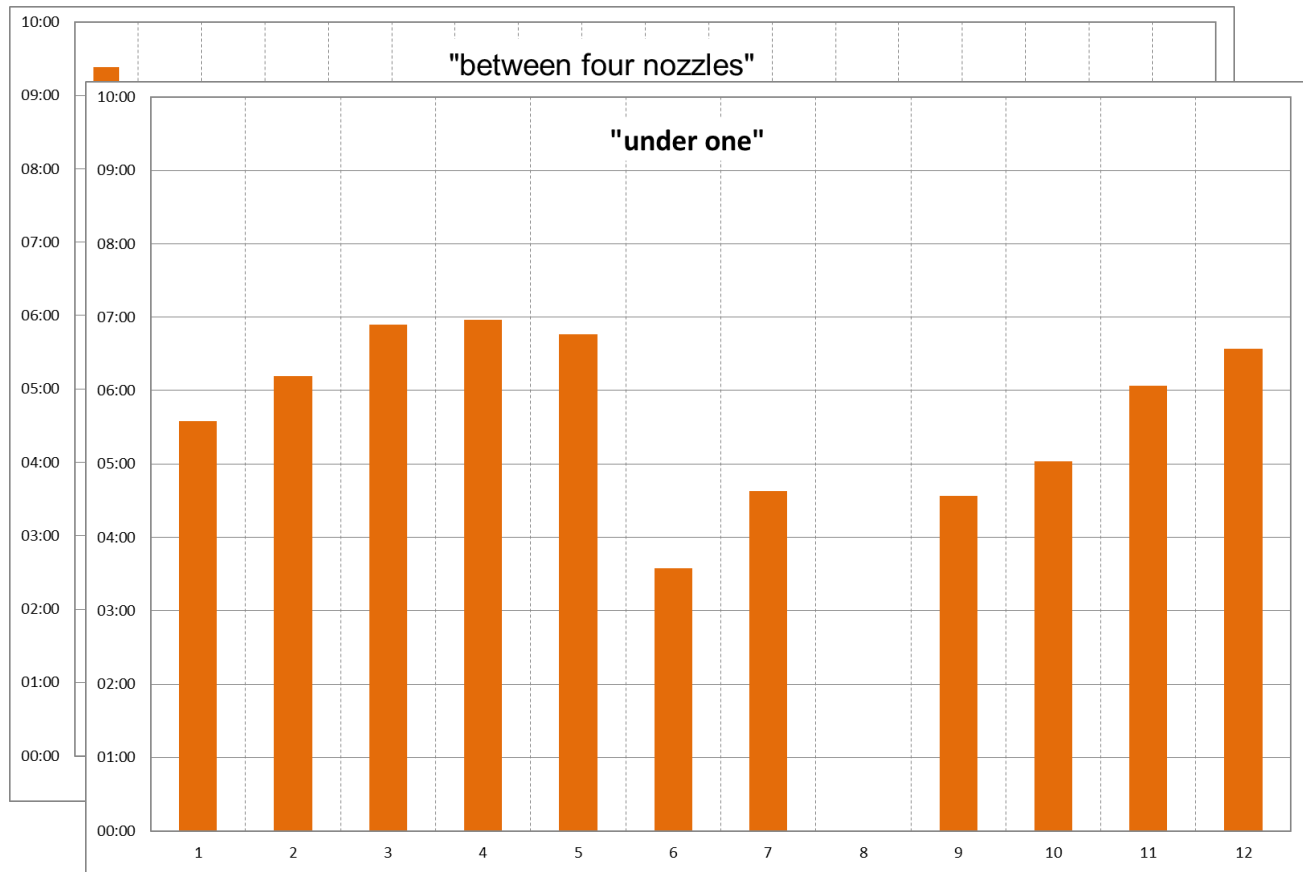- determination of the fire damage

- 30 sprinkler tests - partly used as references
- 18 "between four"
- 12 "under one"

- **number of released nozzles**
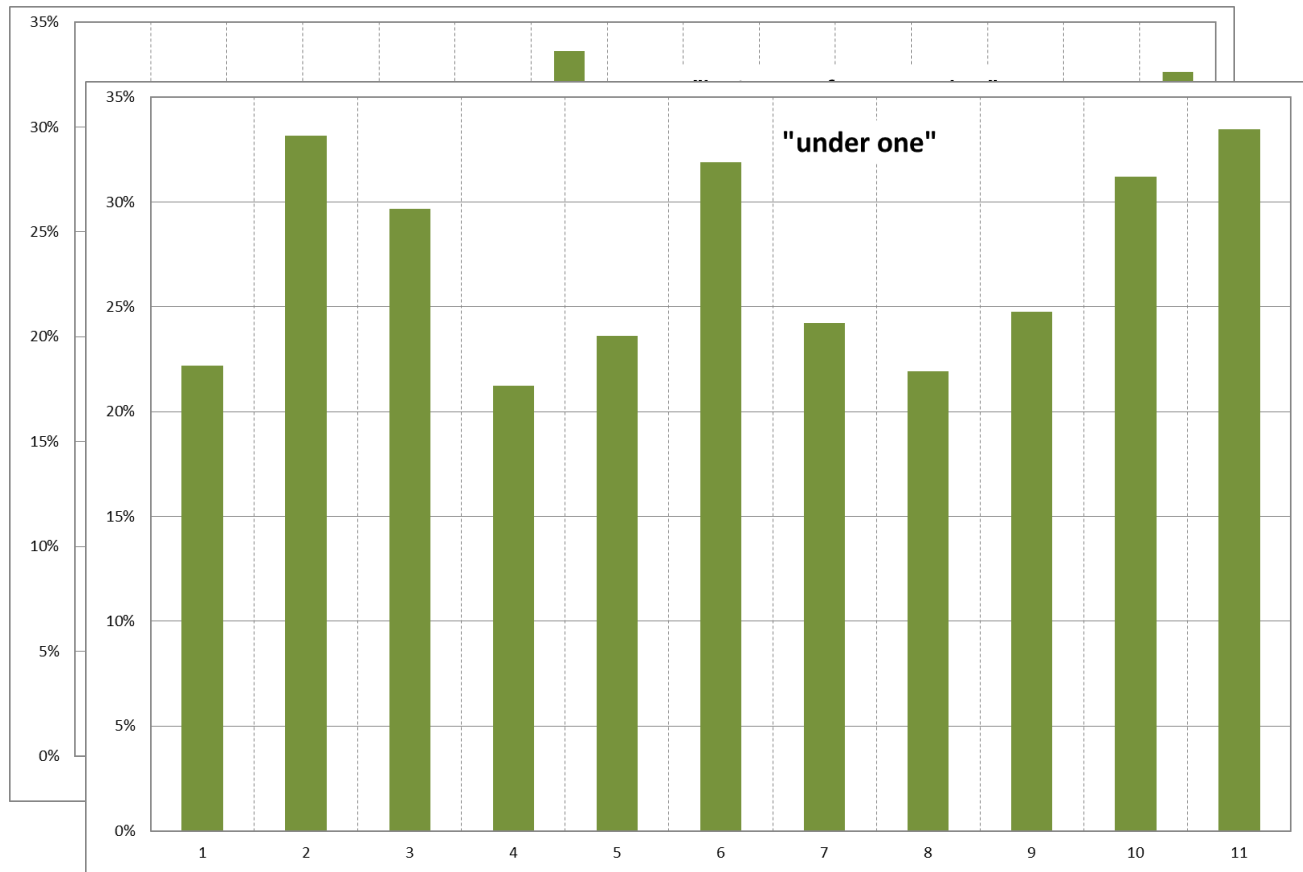

"between four nozzles"

"under one"

- **activation times**

- **damages**

IFAB
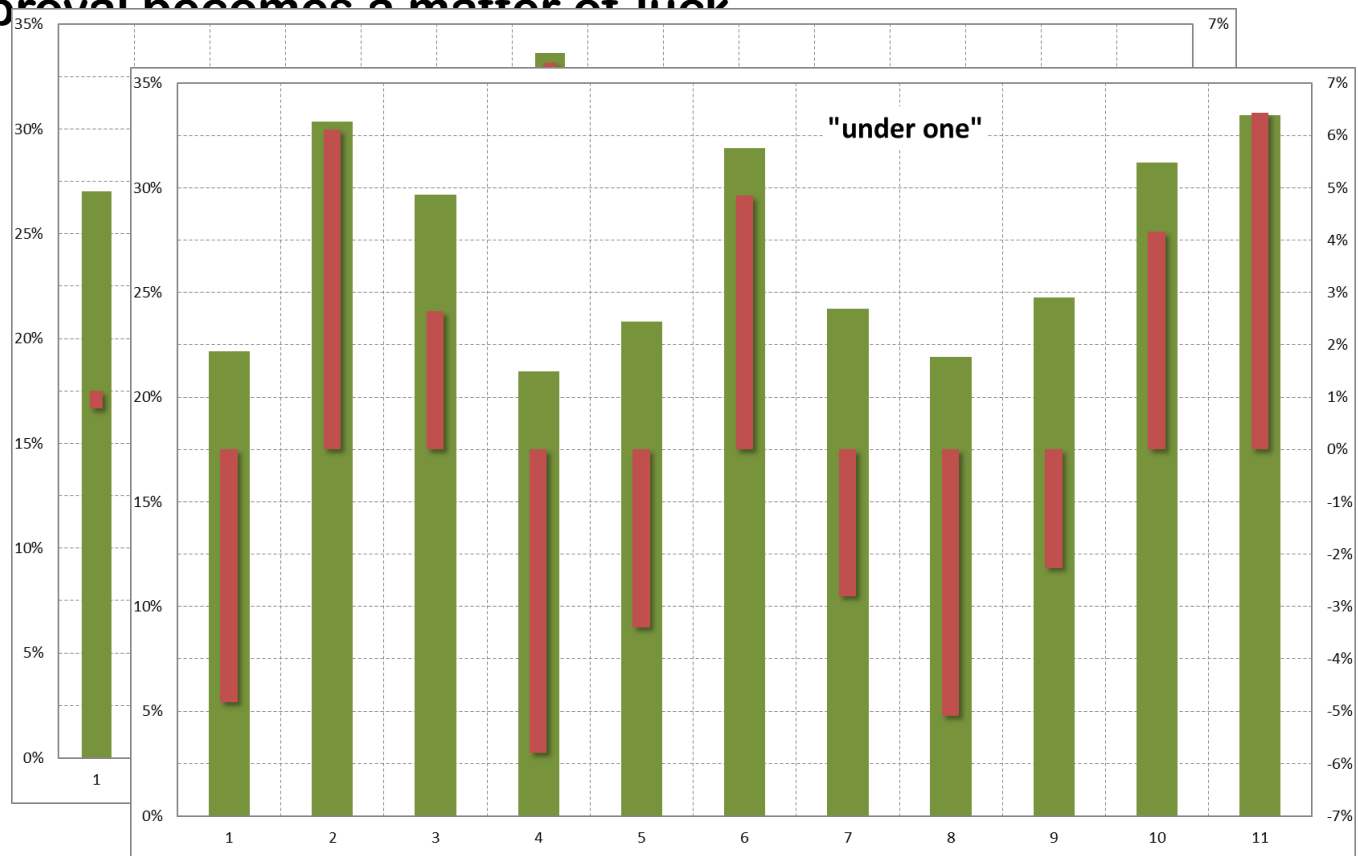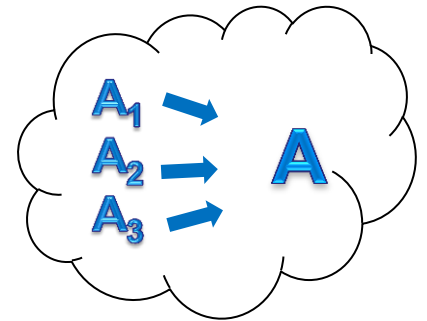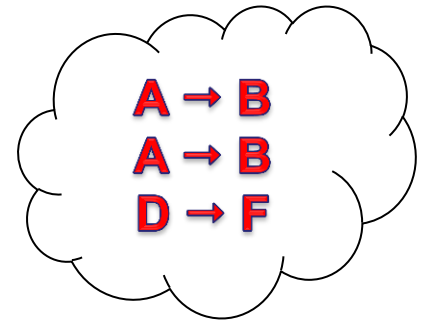
- **broad variety of reference results (sprinkler) make difficult to pass**

- **maybe it can be easier**

- **approval becomes a matter of luck**

- **Reproducibility vs. Representativeness?**

- **Reproducibility: identical cause → same effect**

  A → B
  A → B
  D → F

- **Representativeness: one represents a group of several, typical events**

  A_1 →
 A_2 → A
  A_3 →

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Fire tests objectives in general?

- **investigation of fire processes**
- **proof of the effectiveness of a fire safety measure**
- **training of emergency cases in a saver and a failure-tolerant way**
- **creation of data for a validation of simulation models**
- **etc.**

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Priorisation?

- **burning processes are highly complex and chaotic**

- **small modifications on the initial conditions lead to huge modifications of the processes and results**

- **reduction or increase of complexity, depending on fire test objectives**

- **both can't be distinctive with same strength**

- **decision, which feature is aimed for**

Reproducibility

Representativeness

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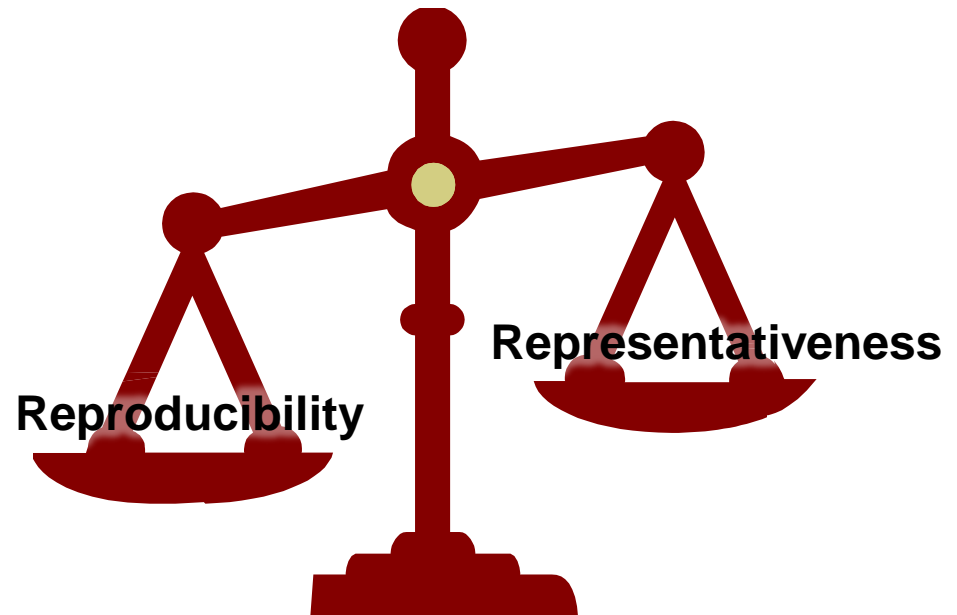
Test Method: Comparison!

- **reproducible or representative?**
- **reproducibility is required**
- **complexity must be limited**
- **reduction of the coincidence**
- **equal opportunities for providers**
- **make safety levels of approved systems comparable**