

EUROPEAN TISSUE SYMPOSIUM

The European Tissue Paper Industry Association

Chairman: Roberto Berardi

Administrative office:

Kunstlaan 44 Avenue des Arts B-1044 Brussels
phone 0032-2/5495230 – fax 0032-2/5021598



Protocol for the assessment of the microbiological contamination of three types of hand drying equipment in public wash rooms in Germany: V5 29 November 2011 Final, prepared by the European Tissue Symposium.

Introduction

Previous studies sponsored by the European Tissue Symposium and others have shown that when hands are dried with paper hand towels the number of microorganisms on the hands decrease. However when hands are dried with conventional hot air driers or with jet stream driers the number of microorganisms increase. In addition in a study carried out in 2008 by the University of Westminster where hands were artificially contaminated with yeast and then dried with different drying systems, there was significant spread of the yeast throughout the washroom by both conventional and jet steam driers. There was insignificant spread of the yeast cells when the hands were dried with paper hand towels. <http://www.europeantissue.com/facts-studies/research/hygiene/uow/>

In view of the above results ETS would like to carry out further research into the possible contamination the surfaces of hand drying equipment and the floors below the devices within wash rooms. The three systems are paper hand towel dispensers, conventional hot air driers and jet stream driers. The protocol described below has been designed to test whether differences in the microbiological contamination of the three different hand drying systems can be detected.

Proposed protocol: for discussion with test laboratory

1. The test laboratory should select establishments from the ETS survey of washrooms in the Ruhrgebiet region of Germany so that 50 jet stream driers, 50 hand towels dispensers and 50 warm air driers can be sampled and tested. The establishments should be ranked in terms of hygiene and frequency of use. For example a washroom in a hospital would be classified as one requiring high hygiene, whereas a drier in a station or airport will be considered as one requiring a lower standard of hygiene. Both would be classified as high traffic. Hand drying systems in a restaurant would also be classified as requiring high hygiene, but is likely to be of lower traffic and a washroom in a shopping mall would be high traffic, but can operate at a lower level of hygiene. The level of hygiene and traffic should be matched for all three hand drying systems so there is an equal spread of different hygiene

types i.e. all the jet stream driers should not be sampled in department stores or paper hand towel dispensers in hotels.

Suggested classification for the washrooms:

- A- High hygiene – low traffic
 - B- High hygiene – high traffic
 - C- Standard hygiene – low traffic
 - D- Standard hygiene – high traffic
2. In certain establishments it is recognised that that it may be necessary to gain permission to perform the testing. ETS will provide a letter from Covington and Burling (ETS's lawyers based in Brussels) that will explain the purpose of the ETS study. In some public establishments it may not be necessary to gain approval of the management; this decision will be left to the discretion of the test laboratory.
 3. Once appropriate permission has been obtained from the establishment, visit the washroom and note its size and layout, take photographs of the hand drying system under test.
Eurofins representatives may only take photographs of the hand drying devices and not of any other furniture or areas of the washrooms. Furthermore, Eurofins representatives must not take any photographs of users and must immediately delete in the washroom any photographs that accidentally capture the image of a user. The privacy of washroom users must be respected at all times, and where possible Eurofins representatives must only take samples and information from the washrooms when there are no users.
 4. The standard of hygiene should be recorded in a short questionnaire, factors to note are: when the wash room was last cleaned, do the hand driers look visibly dirty, are paper hand towels dispensers full and is there litter in the washroom? Also any other factor that could affect the hygiene of the washroom should be recorded. The test laboratory is requested to design the questionnaire that will be agreed with ETS before the sampling commences.
 5. Take swabs using sterile sponges of the whole of the inside surface of the jet air drier, the entire surfaces (inside and outside) of the outlet tube of the warm air drier and the outlet of the towel dispenser (bottom of the dispenser not the sides). Occasionally pools of water can be detected in the bottom of jet air driers. If this is observed a sample of the liquid should be taken and transferred into a sterile bottle. After approval by ETS, this liquid should be tested for total bacterial count, total yeasts and moulds, total Staphylococci and total coliforms.
 6. Using sterile sponges, swab the floors directly under the warm air driers and the hand towel dispenser using a template to sample a 10X10cm area. In the case of the jet air driers if the side vents of the driers are not blocked or restricted by walls or wash basins, swab the floor 25cm from one side of the device using a 10x10cm template. If the vents are restricted in any way take the sample from the floor directly below the jet air drier.
 7. Take a sample of the paper hand towels (min. 5 sheets/ towels) from each washroom in a sterile bag. Ensure that the bags are labelled with the date and location where the sample was taken. No analysis should be undertaken until the results of the swabs for the hand drying dispensers are available and further action agreed with ETS.
 8. The test laboratory is encouraged to take samples of any unusual/extraordinary contamination/item that could affect hand drying. Approval by ETS to test these samples will be required.

9. Measure the total number of microorganisms in the swabs (total aerobic count and total yeast and moulds). In addition test the swabs for the presence of presumptive pathogens: Staphylococci, *E.coli* & total coliforms using appropriate selective agar. Take examples of typical colonies of *Staphylococcus aureus* and *E.coli*, and any other potential pathogen which the test laboratory may isolate and maintain on nutrient agar (or equivalent) slopes for confirmation of species identity at a later stage. ETS will need to give its approval for identification of isolates to species level using API strips or other test kits.
 10. The results for the swabs on the floor should be quoted as colony forming units per unit area. In the case of the swabs from the hand drying equipment the counts should be quoted as colony forming units per device.
 11. Laboratory to complete all microbiological analyses and issue test report.
- NOTE1: The laboratory should operate a documented system of good laboratory practice



Roberto Berardi

Chairman
EUROPEAN TISSUE SYMPOSIUM

E-mail roberto.berardi@fastwebnet.it



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