

Johannes Gutenberg-University Mainz  
(Drosophila fly)

## Research project

### Valid research results thanks to precise air humidity

A stable and controllable room climate is an essential prerequisite for many production processes. Fluctuations in humidity and, above all, excessively dry air affect raw materials, their processing and thus the quality of the end products. In addition, optimal air humidity has a positive effect on the feeling of warmth in the rooms.

In many areas of research, constant and precisely controllable air humidity is usually indispensable for the quality of the results. For this need, HygroMatik offers heater type steam humidifiers that have been specially developed for use in precision and process humidification. The FlexLine „Plus“ and the FlexLine „Process“ are used in sensitive areas of industrial production as well as for stabilising the relative humidity in laboratories and research facilities.



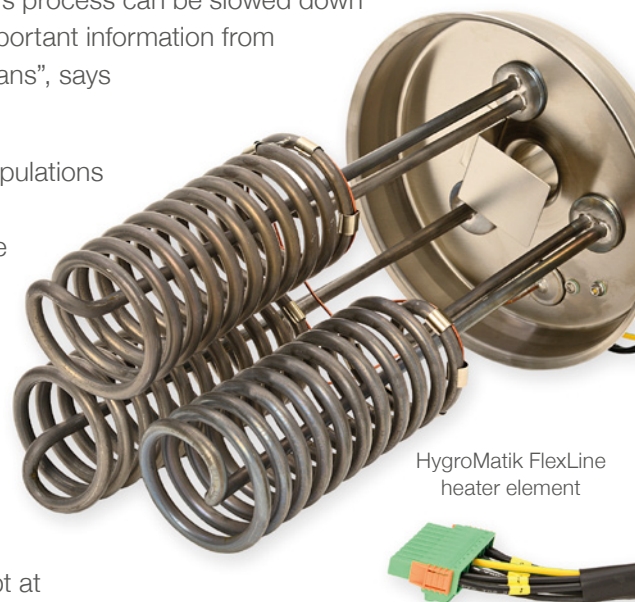
HygroMatik FlexLine FLP25-TPRO-AA10

## Practical example of research projects at Johannes Gutenberg-University Mainz

What do humans and fruit flies (*Drosophila*) have in common? The layperson probably doesn't think of much in response to this question - the scientists at the Institute of Developmental Biology and Neurobiology at Johannes Gutenberg University Mainz (JGU), on the other hand, can report something astonishing: „In fact, we are successfully researching with populations of the *Drosophila* fly in two important areas,“ says Prof. Dr. Roland Strauss from JGU. „One is the question of how depression develops and how resilience can be built against it. We are also looking at the process of memory loss in old age and how this process can be slowed down or prevented. In both areas, the experiments with the fruit flies provide important information from which conclusions can certainly be drawn about larger mammals or humans“, says Prof. Dr. Roland Strauss.

However, the experiments in the laboratory only work if the *Drosophila* populations have optimal living conditions. The flies and also other insects are bred in 12 chambers and kept and observed in different life phases. „In one of the chambers, the larvae are bred for the experiments,“ Strauss explains.

„The larvae are on a maize mush that also contains soy, brewer's yeast and molasses. This mush is the basis of life for the flies; they eat their way through it. The development time from egg to hatching of an adult fly from the pupa is 10 days.“ It is important that the room temperature in the chamber is exactly 77.0°F and the humidity 60%. Because only with these parameters can it be guaranteed that the porridge neither moulds nor dries out. The scientists can set the temperature and relative humidity in each of the chambers. „In another chamber, fly strains are kept at 64.4°F and 60% humidity,“ Prof. Dr. Strauss continues. „These flies have a four-week development period due to the lower temperature and consume less food in the process. They form a kind of backup for the populations in the experiment. Because of the longer period, it is even more important here to maintain the exact humidity.“



## Success with a perfect indoor climate

„In order to be able to guarantee such precise control and reliable stabilisation of the air humidity, we installed our FlexLine Process precision steam humidifier in the institute,“ reports HygroMatik Sales Manager, Stefan Ullrich. „This product allows for a very individual configuration of the system that exactly fits the customer's requirements.“ But the steam humidifier offers

even more advantages for the operator: by using robust and high-quality stainless steel cylinders, hygienic and mineral-free steam is generated. They can be easily opened and cleaned without chemicals. „In the cylinder, the water is heated by means of one, three or six resistance heating elements, you can think of them as immersion heaters,“



Fruit fly (*Drosophila*)

explains Mr Ullrich. The heaters are made of a highly corrosion-resistant chrome-nickel-molybdenum alloy and are therefore extremely durable. The integrated flushing and limescale collection system results in very long operating times between two maintenance operations. „Here at the Institute, operation is virtually maintenance-free due to the use of fully demineralised water as the operating medium,“ says Stefan Ullrich. The annual maintenance mainly consists of an inspection and a function test.

For the scientists at JGU, however, the accuracy of the settings and the ease of use of the system are crucial. „It is operated and programmed via a touch display and is reminiscent of a smartphone’s system,“ Prof. Dr. Strauss tells us. „We quickly figured out how to navigate it and appreciate the precise setting options.“ Constant humidity is a prerequisite for the successful rearing of *Drosophila* populations and thus also decisive for valid research results. Only when all the criteria for the experiments are met can the scientists continue to work on such important topics as Alzheimer’s and depression.

## Background

The air humidity in a room has a significant influence on the indoor climate and thus has a major impact on people’s health, well-being and performance. However, industrial processes or the cultivation of plants (indoor farming) or insects for the food or feed industry also benefit from optimal indoor air technology.

HygroMatik has been developing, producing and distributing energy-efficient and flexible solutions for air humidification in many areas of application for over 50 years, which are characterised by particular sustainability in terms of maintenance, quality and durability.

Together with universities and research departments in the pharmaceutical and food industries, HygroMatik is involved in numerous research projects. We ensure that the results are produced under reproducible and comparable climatic conditions. Our air humidification systems precisely control the room climate in the research facilities with the common goal of

- Accelerating growth phases and increasing crop yields
- Developing and optimising farming systems
- Reducing energy use
- Testing varieties and species suitable for Inhouse Farming



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member of CAREL group 

HygroMatik GmbH  
Lise-Meitner-Str. 3  
24558 Henstedt-Ulzburg  
Germany

T +49 4193 895-0  
F +49 4193 895-33  
[hy@hygromatik.de](mailto:hy@hygromatik.de)  
[www.hygromatik.com](http://www.hygromatik.com)

