

# White Paper : Personnel Protection Test using KI-DISCUS on Viva® Dual Access Animal Handling Workstation

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## INTRODUCTION

Since the birth of science, animals have constantly been used as a test subject for many research studies especially in the biomedical field. Animals have been used to investigate how certain bacteria or virus behave by using them as hosts and how potential cures would react with these bacterium and viruses in the bodies of animals. With such a need to handle animals, it is therefore important to protect the laboratory personnels from the very beginning. Even though at the initial stages of tests, the animals may not have been used for any potentially infectious diseases, there is still a need to protect the laboratory personnels from any allergens which might cause undue discomfort to operators.

Such protection is especially beneficial when handling animals not breed for laboratory purposes, but handling animals that are from the streets in which their cleanliness might be questionable.

Therefore it is very important for laboratory personnels to protect themselves from any potential form of contamination even at the very initial stages of animal handling. Figure 1 shows how an animal handling workstation may look like. The workstation is ESCO's Viva® Dual Access Animal Handling Workstation.



Figure 1: ESCO's Dual Access Animal Handling Workstation

## PURPOSE OF STUDY

The purpose of this study is to determine the effectiveness of the ESCO's Viva® Dual Access Animal Handling Workstation in providing protection to operators using this workstation. Using operator protection tests conducted on biosafety cabinets as a reference, similar tests are also conducted on this animal handling workstation. Even though personnel protection tests are not required on such workstations, but because ESCO believes strongly in providing safety to its users, therefore has come up with this test to show and prove that over at ESCO, we are serious about safety and would take the extra steps and take the extra precautions in our designs to ensure safety is not compromised.

## METHODOLOGY



Figure 2: KI-Discus Test

The KI (potassium iodide) Discus test is defined in the European Standard for microbiological safety cabinets, EN12469:2000 as a test method for validating the operator protection capabilities of the cabinet. The KI-Discus test has been designed to enable operator protection factors to be measured for class I and Class II open-fronted biological safety cabinets.

Using the testing principles behind the use of KI-Discus, the parameters and procedures have been changed slightly to accommodate to the design of the animal handling workstation as well as the recommended work practices for such workstations.

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The following are the changes made to the testing parameters:

- The height of the rotating disc has been set to be at 200mm from the work surface instead of having it level with the lower edge of sash window in a biosafety cabinet.
- The position of the rotating disc is at the geometric center of the work surface instead of at a distance of 100mm from the lower edge of the sash window.
- The top 2 suction ports of the KI-Discus is level with the rotating disc instead of the lower edge of the sash window for biosafety cabinets.
- The suction ports are at a distance of 150mm from the front edge of the inflow grill instead of 140mm – 160mm from the sash window.

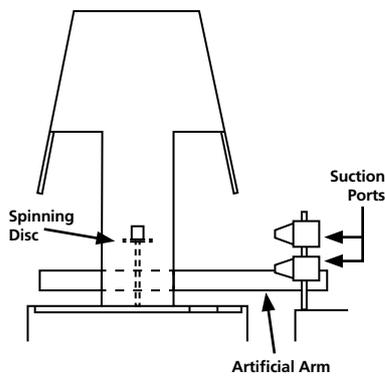


Figure 3: KI-Discus setup

When the test is started, a fine mist of potassium iodide droplets used as a challenge aerosol is produced by a spinning disc inside the workstation. At the same time, the 4 suction ports would

draw in and sample the air. If the containment of the workstation is good, the potassium iodide droplets would not be able to escape and hence the air sampled by the suction ports would be clean. Otherwise the droplets would be entrapped by the filter membranes found inside the suction ports. The generation of the mist and sampling of the air would take place for a period of 9 minutes after which the filter membranes would be processed to determine the presence of potassium iodide. After 9 minutes, the filter membranes are soaked in palladium chloride which would react with potassium iodide if they are present on filter membrane, to produce visible brown dots on the membrane. Containment is considered to be a failure if any of the filter membranes show more than 62 brown dots.

## RESULTS AND DISCUSSION

From the processing of the filter membranes, the following is the result acquired during this KI-Discus Test.

Suction Ports				
X	X <sub>1</sub>	Y	Y <sub>1</sub>	
38	20	5	6	Passed

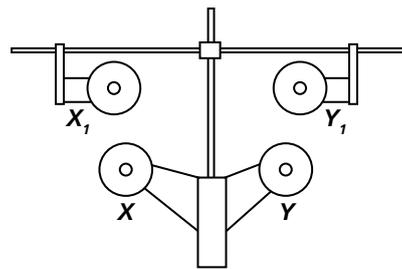


Figure 4: Results from the KI-Discus Test with respect to their individual suction ports

The results in the above table shows that overall the workstation is able to provide personnel protection when operating under its normal conditions.

NSF Standard 49 Biological Safety Cabinets • Animal Containment Workstations • Fume Hoods • Clean Benches

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