

### RESPIRATORS AND BARRIER MATERIALS

#### **Avian Flu or Bird Flu Virus**

*(Influenza A)*

There have been recent concerns with Influenza A virus. Avian flu or Bird flu is a Type A influenza virus. An article issued by the U.S. Department of Labor – Occupational Safety and Health Administration states, “Influenza viruses range in size from 0.08 to 0.12 micrometers” which is equivalent to 80 to 120 nanometers. The influenza virus is enveloped and spherical or filamentous. For those who may come in contact with the virus or with infected patients the following contact precautions are recommended:

- *Use gloves and gown for all patient contact.*
- *Use a fit-tested respirator, at least as protective as a National Institute of Occupational Safety and Health (NIOSH)-approved N-95 filtering facepiece (i.e., disposable) respirator.*

See more information from the CDC web site at: <http://www.cdc.gov/flu/avian>

Nelson Laboratories offers test services to help manufacturers assess their products compliance and barrier performance for viruses.

#### **42 CFR Part 84 – “Approval of Respiratory Protective Devices”**

According to the CDC and OSHA the minimum recommended protection when there is possible contact with the virus is a N95 disposable respirator. N-series filters are evaluated using a Sodium Chloride aerosol tested at a flow rate of 85 L/min. Nelson Labs can pre-qualify your product for certification by NIOSH and can also perform routine testing following certification to verify the assurance quality level is maintained as required by NIOSH. The required tests for pre-qualification are 1) filtration efficiency, 2) inhalation resistance, 3) exhalation resistance, and 4) exhalation valve lead (when applicable).

#### **ASTM F1671-03 – Viral Penetration Tests**

A procedure commonly used to test the barrier properties of gowns is ASTM F1671-03 “Standard Test Method for Resistance of Materials Used in Protective Clothing to Penetration by Blood-Borne Pathogens Using phi-X174 Bacteriophage Penetration as a Test System.” This test system uses a liquid challenge of the phi-X174 bacteriophage virus to simulate contaminated body fluids.

The ASTM F1671-03 method is an excellent surrogate test for how barriers might perform against harmful or infectious viruses (i.e. HIV, Hepatitis B and Hepatitis C).

#### **The Case for phi-X174 Bacteriophage:**

The ideal properties of a suitable surrogate include small size, spherical or polyhedral morphology, environmental stability, low or non-human infectivity, high assay sensitivity, rapid growth, and high titer. The phi-X174 bacteriophage was selected as the most appropriate surrogate because it satisfies all of these criteria. The phi-X174 bacteriophage is one of the smallest known viruses (25-27nm) and is nonenveloped, with icosahedral or nearly spherical morphology. It has excellent environmental stability, is non-infectious to humans, and has a limit of detection which approaches a single virus particle. It grows rapidly and can be cultivated to reach high titers.

#### **Request More Information**

We are committed to helping our clients improve the quality of life by providing the highest quality viral and bacterial barrier testing available. Call today or email our Sales group to receive a quote. For new customers, mention this White Paper #N05-1 and receive a 10% discount for on your initial test (up to \$200).

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