September 26, 2016

MSA North America
Ryan Lab
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Sub: MSA G1 Facepiece Cross Contamination Performance

To Whom it May Concern,

The purpose of this letter is to address the absence of cross contamination from facepiece to second stage regulator. MSA has completed internal testing and has validated the absence of cross contamination.

Facepiece Design:

The G1 facepiece air flow pathways were designed to prevent cross contamination. Specific design features include:

- The G1 facepiece has a separate ambient air port that is used for both inhalation and exhalation when worn without the second stage regulator in place.
- The ambient air port is sealed and separated from the incoming second stage supplied air stream when the second stage regulator is attached. The o-ring seals prevent supplied air from coming in contact with the ambient air port.
- The G1 facepiece utilizes an inhalation check valve when the second stage regulator is connected, while the exhalation valve diverts air outside of the mask, helping to ensure potentially contaminated exhaled air does not enter the second stage regulator.

Test Setup

The flow path design was validated internally using a custom testing setup built to mimic the sharing of an SCBA between to firefighters, see figure 1 below.

Test Method:

1. A clean facepiece (facepiece #1) is mounted on the breathing machine headform.
2. Facepiece #1 is tested without a regulator for 10 minutes at 100 lpm. Fluorescent vapor is introduced into the exhalation air path during each breathing machine exhalation phase.
3. Facepiece #1 is then tested with regulator #1 for 10 minutes at 100 lpm. Fluorescent vapor is introduced into the exhalation air path during each breathing machine exhalation phase.
4. Regulator #1 is NOT cleaned after testing with facepiece #1.

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5. Facepiece #1 is removed from the breathing machine headform.
6. A second clean facepiece (facepiece #2) is mounted on the breathing machine headform.
7. Facepiece #2 is tested with regulator #1 (previously tested with facepiece #1) for 10 minutes at 100 lpm. NO fluorescent vapor is utilized when testing facepiece #2.
8. After breathing machine testing, facepiece #2 is inspected with ultraviolet lighting to detect fluorescent media contamination.
9. After breathing machine testing, regulator #1 is inspected with ultraviolet lighting to detect fluorescent media contamination.
10. After breathing machine testing, the breathing machine headform collector is inspected with ultraviolet lighting to detect fluorescent media contamination.

Test Results:

Completion of the testing revealed that the G1 SCBA facepiece and second stage regulator design prevents cross contamination from the facepiece to the second stage regulator.

Conclusion:
The G1 facepiece and second stage regulator were designed to prevent cross contamination, utilizing specific air flow pathways, o-ring seals, and check valves. This design was validated using a fluorescent vapor to simulate contamination during breathing machine testing. The testing validated that the design works as planned, and that it prevents cross contamination from the G1 facepiece to the second stage regulator.

Customer satisfaction remains top of mind for us here at MSA. We would like to thank you again for this opportunity. Should you have any further questions, comments, or concerns please don't hesitate to contact me.

Sincerely,

Dennis Capizzi
Fire Service Marketing Manager

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The Safety Company

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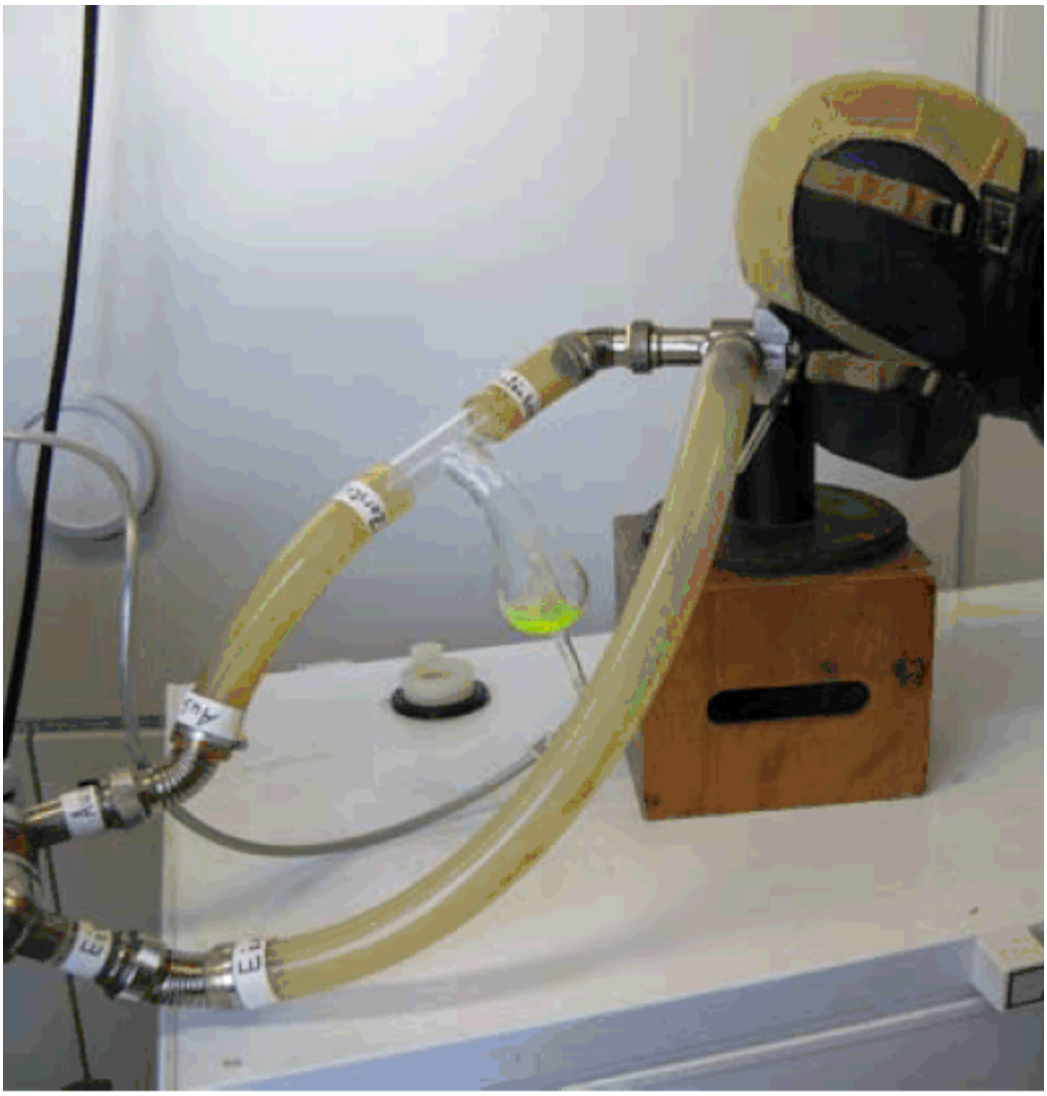
FIGURE 1:



- Breathing machine inhalation and exhalation flow path configuration.
- Fluorescent media is vaporized and introduced into the exhalation flow path.
- Headform includes a collector to capture fluorescent media during inhalation phase.

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