**Testing of the ISS’s Charcoal HEPA Integrated Particle Scrubber (CHIPS) Filters to Ascertain an Efficiency Curve and Most Penetrating Particle Size**

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**High air quality is a top priority in hermetically sealed environments, such as the International Space Station (ISS). Aerosol particulate filtration on the ISS is achieved via 21 HEPA filters. Traditional HEPA filters have an efficiency of 99.97%, but HEPA filters aboard the ISS have been found to achieve 99.99% efficiency. This may be due to the flight-grade HEPA filters chosen or, less likely, that they are combined with activated charcoal filters for siloxane removal in a combination referred to as Charcoal HEPA Integrated Particle Scrubbers (CHIPS) filters. All filters have a Most Penetrating Particle Size (MPPS), but, until now, the MPPS and efficiency curve of the CHIPS filters was not known. The efficiency curve of the CHIPS filters was ascertained at NASA Glenn Research Center through standard salt crystal aerosolization. This method was selected over aerosolized oil droplets due to a desire to preserve the filter’s function for further testing. The CHIPS filters were tested as they are oriented on the ISS (activated charcoal filter followed by a flight-grade HEPA filter), with the HEPA portion alone, and with the activated charcoal portion alone. The results of this experiment are generally useful but can be especially useful for the microbiology and Environmental Control and Life Support Systems (ECLSS). This is due to microbial contamination being a potential concern in the air revitalization systems on the ISS. Knowing the MMPS of the CHIPS filters, in conjunction with levels of airborne microbes, is useful for predicting which and how many microbes are likely to get through the HEPA filters that sit in the beginning of the ISS airstream. It may also be useful to other groups at NASA to know how many particulates are able to pass through high-efficiency filtration, and even for healthcare cleanrooms and other air purification pursuits.**