

ABSTRACT for MSFC presentation at the 2012 International Workshop on Environment and Alternative Energy, Goddard Space Flight Center, Greenbelt, Maryland, Dec. 4-7, 2012.

TITLE: The Search for Nonflammable Solvent Alternatives for Cleaning Aerospace Oxygen Systems

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To obtain a high degree of cleanliness without risk of corrosion or hazardous reactivity, hydrochlorofluorocarbon (HCFC) –225 is used for cleaning and cleanliness verification of oxygen system components used on NASA's bipropellant launch vehicles, associated test stands and support equipment. HCFC–225 is a Class II Ozone Depleting Substance (ODS-II) that was introduced to replace chlorofluorocarbon (CFC) -113, a Class I ODS solvent that is now banned. To meet environmental regulations to eliminate the use of ozone depleting substances, a replacement solvent is required for HCFC-225 that is effective at removing oils, greases, and particulate from large oxygen system components, is compatible with materials used in the construction of these systems, and is non-flammable and non-reactive in enriched oxygen environments. A solvent replacement is also required for aviator's breathing oxygen systems and other related equipment currently cleaned and verified with HCFC-225 and stockpiled CFC-113. Requirements and challenges in the search for nonflammable replacement solvents are discussed.