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**Contamination control requirements for spacecraft optical
remote sensing instruments**

星载光学遥感仪器污染防治要求

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part

1. Structure and Drafting Rules of Standardization Documents" Drafting. Please note that some of the contents of this document may involve patents. The issuing agency of this document is not responsible for identifying patents. This document was proposed and managed by the National Aerospace Technology and Application Standardization Technical Committee (SAC/TC425). Drafting organizations of this document. Shanghai Institute of Satellite Engineering, Shanghai Institute of Technical Physics, Chinese Academy of

Sciences, China Aerospace Standardization Institute. The main drafters of this document. Zhang Liguang, Wang Shaolin, Zhang Ruyi, Chen Qiang, Wang Shaoyou, Wang Zijun, Zhao Qichang, Dai Haishan, Shu Rui, Sun Liwei, Zhang Yang, Li Yefei, Li Qiang, Zhou Hongwei, Guo Lingling, Yu Xiaochen, Xu Dongyan. Requirements for pollution protection of spaceborne optical remote sensing instruments

1 Scope

China's national contamination control requirements for spacecraft optical remote sensing instruments. It specifies the terms and definitions, the abbreviations and the general requirements. Contamination on an optical instrument is not a cleanliness matter but a performance one, and it is irreversible. A molecular film condensed on a mirror or a detector window absorbs and scatters light, and the loss is greatest at short wavelengths - so an instrument with an ultraviolet channel can lose most of its sensitivity there while its visible channels look fine. Particles do the same by scattering. The sources are the spacecraft itself: the polymers, adhesives and coatings that outgas in vacuum, the thruster plumes, and everything deposited during assembly on the ground. Since nothing can be cleaned after launch, the entire discipline is preventive - material selection, cleanroom assembly, purge, venting design and orientation - which is what these requirements set out.

This document specifies the general requirements for pollution protection of spaceborne optical remote sensing instruments, sensitivity levels, pollution sensitive parts, and material selection control. Control, pollution protection measures and process control requirements. This document is applicable to the pollution protection of spaceborne optical remote sensing instruments (hereinafter referred to as "instruments"). The pollution protection of other spaceborne optical instruments can be Refer to use.

2 Normative references

The contents of the following documents constitute the indispensable clauses of this document through normative references in the text. Among them, dated quotations Only the version corresponding to that date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to This document.

GB/T 8979-2008 pure nitrogen, high-purity nitrogen and ultra-pure nitrogen

GB/T 29085-2012 Satellite pollution prevention technical requirements

GB/T 34517-2017 Evaluation method for vacuum outgassing of non-metallic materials for spacecraft

3 Terms and definitions

The following terms and definitions defined in GB/T 29085-2012 and GB/T 34517-2017

apply to this document.

3.1 Molecular contamination Condensation and deposition of pollutants in the form of molecular membranes on the sensitive parts of the instrument pollution, resulting in the decline of instrument performance or life.

3.2 Water vapor deposition pollution In a vacuum environment, the condensation and deposition of water vapor released by the instrument material on the sensitive parts of the pollution, causing the performance of the instrument to decrease or the life of the instrument attenuation.

4 Abbreviations

The following abbreviations apply to this document. CWS. Contamination Reference Sample (ContaminationWitnessSample) OSR. Optical Solar Reflector (OpticalSolarReflector) TQCM. Temperature-controlled Quartz Crystal Microbalance (Temperature-controlled Quartz Crystal Microbalance)

5 General requirements

The general requirements for instrument contamination protection are as follows: