

ICS 49.020
CCS V 71



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 34512-2017

**Requirements for the interface of manned spacecraft peripheral
docking mechanisms**

载人航天周边式对接机构接口要求

Issued on: November 1, 2017

Implemented on: May 1, 2018

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine;
Standardization Administration of the PRC**

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard proposed by China Aerospace Science and Technology Corporation. This standard by the National Aerospace Technology and Standardization Technical Committee (SAC/TC425) centralized. This standard was drafted. Shanghai Aerospace Systems Engineering Institute. The main drafters of this standard .Liu Zhi, Zhang Chongfeng, Jin Zongxiang, Qiu Huayong, Yao Jian, Wei Zhi, Yang Guodong, when the CMC, Yuan Hui collar, Wang Xi, He Hui, Shi Fei.

0.1 This standard is based on the Shenzhou-manned spacecraft docking mechanism and the Tiangong-1 target aircraft docking interface based on the proposed regulation Fan space docking docking interface design, to ensure the use of different manned spacecraft in-orbit docking tasks and collaboration. This standard provides one Set of peripheral docking interface design parameters, used to guide the design side can independently design compatible with China's docking station dock docking Agencies, at the same time, but also provide design basis for foreign spacecraft to participate in docking cooperation in China's space station.

0.2 The development of this standard refers to the "International Docking System Standard Interface Definition File" approved by the International Space Station Multilateral Coordination Committee (Version D This), this standard and international docking system standards with interface compatibility, suitable for docking of manned spacecraft and China's space station Cooperation.

0.3 This standard proposes the necessary interface requirements, to ensure compatibility of different spacecraft docking interface, this standard also provides some recommendations The design parameters, such as the docking initial conditions, these parameters as a reference to the design side. This standard does not involve docking between docking agencies and spacecraft Port requirements, but also does not involve docking interface implementation, design features, fault tolerance, reliability and space environment requirements. So, design Party should be flexible according to the needs of specific projects and requirements to design a docking interface with a common interface.

0.4 This standard specifies the heterogeneous isomerism (hermaphrodite) peripheral

docking interface requirements. Therefore, in line with the requirements of this standard interface Under the circumstances, any two main, passive docking institutions have docking interface matching. Under normal circumstances, the target spacecraft configuration standards Passive docking interface, visit the spacecraft configuration standard active docking interface. If the visiting spacecraft's active docking interface is not fully met Standard (ie, some interface parameters are different from the standard), the standard passive interface to the target spacecraft in the interface design is still acceptable To achieve matching, in this case, before the task of space docking mission needs to be done on both sides of the docking interface matching ground validation test. Though come Spacecraft docking docking interface does not use the provisions of this standard active docking interface parameters, but also can be achieved with the target spacecraft docking interface However, this adds interface compatibility risks and ground verification costs. Therefore, to encourage the use of this standard interface requirements. Manned spacecraft docking docking interface requirements

1 Scope

China's national standard for the interface of a peripheral docking mechanism on a manned spacecraft. It specifies the requirements for the universal docking interface, covering the mechanical interface, the thermal interface, the load requirements, and the capture and docking performance, and it applies to manned spacecraft in near-Earth orbit. Docking is the operation that turns separate spacecraft into a station. A peripheral mechanism is one whose structure sits around the outside of the passage, leaving the centre clear so that crew and cargo can move through once the seal is made - which is why every station docking port uses one. The interface is where two vehicles built by different organisations must fit, and the requirements are unforgiving: the mechanism must capture a vehicle that arrives with residual velocity and misalignment, absorb that energy without damaging either craft, pull them together, form a pressure seal good enough to hold an atmosphere, and then release cleanly, possibly years later and possibly in an emergency.

This standard specifies the universal docking interface manned space shuttle docking requirements, including mechanical interface, thermal interface and load requirements, floating Breaker and docking performance requirements. This standard applies to near-Earth orbit manned spacecraft and docking docking missions such as docking interface design, manned lunches and other airlines Spacecraft docking interface design can refer to the use.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version applies to this article Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 1184 shape and location tolerances are not tolerance values

GB/T 1804 General tolerances Tolerances for linear and angular dimensions without tolerances

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Space docking mechanism spacecraftdockingmechanismsystem The two spacecraft operating in space orbit are structurally connected as a combined body system, generally including an active docking mechanism and Passive docking organizations.

3.2 Allogenic homogeneous peripheral docking mechanism androgynousperipheralassemblysystem; APAS Hermaphrodite peripheral docking institutions Body parts to achieve docking functions are arranged around the butt passage, the butt mating surface designed by the anti-symmetrical space docking machine Structure, both as an active docking institutions, but also as passive docking institutions.

3.3 Active docking mechanism activedockingmechanismsystem Able to take the initiative to complete docking and separation of space docking capabilities.

3.4 Passive docking mechanism passivedockingmechanismsystem With the docking system docking docking and separation functions of the docking space.

3.5 Initial conditions for initial docking docking When the two spacecraft docking systems are in mechanical contact for the first time, the docking system of the active docking mechanism (or the interface) relative to the passive docking The relative coordinate value (relative displacement and relative rotation angle) and its first derivative of the coaxial deviation between mechanism docking coordinate system (or interface) (relative speed Degree and relative angular velocity).