
**Space systems — Unmanned
spacecraft — Estimating the mass of
remaining usable propellant**

*Systèmes spatiaux — Véhicules spatiaux non habités — Estimation de
la masse d'ergols résiduels utilisable*



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Published in Switzerland

Foreword

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ISO 23339 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 14, *Space systems and operations*.

Introduction

This International Standard acts as one of the supporting technical standards for orbital debris mitigation.

For spacecraft disposal manoeuvres to be performed as planned, the estimation of available propellant mass is essential. The aim of this International Standard is, through requirements for the estimation of remaining propellant, to improve spacecraft disposal techniques and thereby mitigate orbital debris.

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Space systems — Unmanned spacecraft — Estimating the mass of remaining usable propellant

1 Scope

This International Standard gives requirements for estimating the mass of the remaining usable propellant of an unmanned spacecraft in low Earth orbit (LEO) or geostationary Earth orbit (GEO), and for designing propellant measurement systems. It is applicable to spacecraft with either mono- or bi-propellant propulsion systems using liquid or gaseous chemical propellants, and is limited to such systems because they are the most common for spacecraft in LEOs and GEOs.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 24113, *Space systems — Space debris mitigation requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 24113 and the following apply.

3.1

book-keeping method

method for determining fluid consumption by monitoring flow rates and the duration of propellant expenditure periods

3.2

disposal manoeuvre

orbital manoeuvre that disposes of a spacecraft from the protected regions by either decreasing or increasing the altitude of the spacecraft

3.3

PVT method

method for determining the remaining mass of gas by deriving density in a known volume from pressure and temperature measurements

NOTE PVT: pressure, volume, temperature.

3.4

remaining usable propellant

propellant that remains in the propellant system and that is effective for attitude and orbit control manoeuvres