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Titolo	Plasma-Material Interactions in a Controlled Fusion Reactor // by Tetsuo Tanabe
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Descrizione fisica	1 online resource (XII, 207 p. 110 illus., 78 illus. in color.)
Collana	Springer Series in Plasma Science and Technology, , 2511-2015
Disciplina	621.484
Soggetti	Nuclear fusion Materials Catalysis Force and energy Materials - Analysis High temperature plasmas Physics Nuclear Fusion Materials for Energy and Catalysis Characterization and Analytical Technique High Temperature Plasma Applied and Technical Physics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Introduction -- Discharges in Current Tokamaks -- Power Load on Plasma Facing Materials -- Responses of Plasma Facing Surfaces to Heat and Particle Loads -- Erosion and Deposition & their Influence on Plasma Behavior (Material Transport in Tokamak) -- Material Modification by High Power Load and its Influence on Plasma -- Fundamentals of Hydrogen Recycling and Retention -- PMI in Large Tokamaks -- Estimation of T Retention in a Reactor -- Selection of PFM Materials -- Closing Remarks.
Sommario/riassunto	This book is a primer on the interplay between plasma and materials in a fusion reactor, so-called plasma-materials interactions (PMIs), highlighting materials and their influence on plasma through PMI. It

aims to demonstrate that a plasma-facing surface (PFS) responds actively to fusion plasma and that the clarifying nature of PFS is indispensable to understanding the influence of PFS on plasma. It describes the modern insight into PMI, namely, relevant feedback to plasma performance from plasma-facing material (PFM) on changes in a material surface by plasma power load by radiation and particles, contrary to a conventional view that unilateral influence from plasma on PFM is dominant in PMI. There are many books and reviews on PMI in the context of plasma physics, that is, how plasma or plasma confinement works in PMI. By contrast, this book features a materials aspect in PMI focusing on changes caused by heat and particle load from plasma: how PFMs are changed by plasma exposure and then, accordingly, how the changed PFM interacts with plasma.
