1. Record Nr. UNINA9910808305903321 Autore Benim Ali Cemal **Titolo** Flashback mechanisms in lean premixed gas turbine combustion / / Ali Cemal Benim, Khawar J. Syed Waltham, Massachusetts:,: Academic Press,, 2015 Pubbl/distr/stampa ©2015 0-12-800826-1 **ISBN** Descrizione fisica 1 online resource (134 p.) Disciplina 621.433 Soggetti Gas-turbines - Combustion Gas-turbines - Design and construction Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Description based upon print version of record. Nota di bibliografia Includes bibliographical references. Cover: Title Page: Copyright Page: Contents: Author Bios: Preface: Nota di contenuto Chapter 1 - Introduction: Chapter 2 - Concepts Related to Combustion and Flow in Premix Burners; 2.1 - Laminar premixed flames; 2.1.1 -The Laminar Flame Speed; 2.1.2 - Effect of Flame Curvature and Stretch on the Laminar Flame Speed; 2.2 - Turbulent premixed flames; 2.2.1 -Structure of Turbulent Premixed Flames; 2.2.2 - The Turbulent Flame Speed; 2.3 - Swirl flow aerodynamics; 2.3.1 - Vortex Breakdown; 2.3.2 - Swirl Burners: Chapter 3 - Properties of Hydrogen-Containing Fuels 3.1 - Flammability limits of hydrogen fuel blends3.2 - Laminar flame speed of hydrogen fuel blends; Chapter 4 - An Overview of Flashback Mechanisms; Chapter 5 - Flashback by Autoignition; Chapter 6 -Flashback Due to Combustion Instabilities; Chapter 7 - Flashback Due to Turbulent Flame Propagation in the Core Flow; Chapter 8 -Flashback Due to Flame Propagation in Boundary Layers; 8.1 - Flame propagation in laminar boundary layers; 8.2 - Flame propagation in turbulent boundary layers; Chapter 9 - Combustion-Induced Vortex Breakdown-Driven Flashback 9.1 - Flame propagation in vortex tubes and vortex rings9.2 - CIVB in gas turbine combustors; 9.3 - The role of quenching; Chapter 10 -Flameholding by Fuel Injection Jets: 10.1 - Jet in Cross-Flow: 10.2 - Jet

Flames in Cross-Flow: References: Nomenclature: Greek symbols:

**Abbreviations** 

## Sommario/riassunto

Blending fuels with hydrogen offers the potential to reduce NOx and CO2 emissions in gas turbines, but doing so introduces potential new problems such as flashback. Flashback can lead to thermal overload and destruction of hardware in the turbine engine, with potentially expensive consequences. The little research on flashback that is available is fragmented. Flashback Mechanisms in Lean Premixed Gas Turbine Combustion by Ali Cemal Benim will address not only the overall issue of the flashback phenomenon, but also the issue of fragmented and incomplete research. Presents a coherent review of f