Record Nr. UNINA9910463630403321 **Titolo** Modern blast furnace ironmaking: an introduction / / Maarten Geerdes [and four others] Pubbl/distr/stampa Amsterdam, Netherlands:,: IOS Press,, 2015 ©2015 Edizione [Third edition.] Descrizione fisica 1 online resource (228 p.) Disciplina 669.1413 Soggetti Blast furnaces Iron smelting Electronic books. 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 and index. ""Title Page ""; ""Preface""; ""Contents""; ""List of Symbols and Nota di contenuto Abbreviations""; ""Introduction of the Blast Furnace Process ""; ""Global steel consumption""; ""Short description of the process""; ""The layer structure within a furnace""; ""The equipment""; ""Book overview""; ""The Blast Furnace: Contents and Gas Flow ""; ""The generation of gas and gas flow through the burden ""; ""Furnace efficiency""; ""Removal of liquids""; ""An example of gas flow and contents of a blast furnace ""; ""The Ferrous Burden: Sinter, Pellets, Lump Ore "": ""Introduction"": ""Iron ore"" ""Quality demands for the blast furnace burden""""Sinter""; ""Pellets""; ""Lump ore""; ""Metallics charge and briquettes ""; ""Interaction of burden components""; ""Chemical control of the burden""; ""Coke""; ""Introduction: function of coke in the blast furnace ""; ""Coal blends for cokemaking""; ""Coke quality concept ""; ""Coke size distribution""; ""Strength of coke""; ""Coke deadman""; ""Overview of international quality parameters""; ""Injection of Coal, Oil and Gas""; ""Properties of coal, oil and gas""; ""Coal injection""; ""Natural gas injection""; ""Coala€? gas coa€?injection"" ""Complete combustion of injectants""""Burden Calculation and Mass Balances ""; ""Introduction""; ""Burden calculation: starting points""; ""An

example of a burden calculation""; ""Process calculations: a simplified

mass balance""; ""Estimation of direct reduction""; ""The Process: Burden Descent and Gas Flow Control ""; ""Burden descent: where is voidage created?""; ""Burden descent: system of vertical forces""; ""Gas flow in the blast furnace""; ""Fluidization and channelling""; ""Burden distribution""; ""Coke layer""; ""Ore layer thickness""; ""Blast furnace instrumentation""

""Blast furnace daily operational control""""Blast Furnace Productivity and Efficiency ""; ""Productivity""; ""Efficiency""; ""Following the gas in the furnace""; ""Hot Metal and Slag""; ""Formation of hot metal and slag""; ""Hot metal as cast from the furnace""; ""Hot metal and the steel plant""; ""Slag""; ""Casthouse Operation""; ""Objectives""; ""Liquid iron and slag in the hearth""; ""Removal of liquids through the taphole""; ""Typical casting regimes""; ""Taphole drill and clay gun""; ""Hearth liquid level""; ""Delayed casting""; ""No slag casting""; ""Onea€?side casting""

""Not dry casts"""Defining a dry hearth ""; ""Oxygen lancing""; ""Cast data recording""; ""Operational Practices and Challenges ""; ""The burden""; ""Burden descent""; ""Recirculation of alkali and zinc""; ""Circumferential symmetry""; ""Tuyeres""; ""Stops and starts""; ""Casthouse challenges""; ""Greenhouse gas emissions""; ""Annex I. Glossary ""; ""Annex II. Further reading ""; ""Annex III. Starting point for calculation examples ""; ""Annex IV. Rules of thumb ""; ""Annex V. Coal types used for coke making ""; ""Annex VI. Coke quality tests ""; ""Annex VII. Expert systems and models "" ""Annex VIII. Rist diagram ""

Sommario/riassunto

This book describes the blast furnace process for operators. As a starting point, the blast furnace is seen as a simple iron ore melter, while gradually the physical, chemical and metallurgical background is clarified. Operational observations, challenges and remedies are explained from this perspective. Optimization of the blast furnace process is not only based on "best practice transfer", but also requires conceptual understanding of what works when. In other words: operational improvement is not only based on know-how, but on know-why as well. With Modern Blast Furnace Ironmaking - An Intr