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Hydromechanical Aspects and Unsaturated Flow in Jointed Rock

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Fluid flow analysis plays a major role in various geotechnical applications , including mining and petroleum industry. Predicting water-gas flows occurring within a network of rock joints under mining conditions is a very difficult task, due to the wide array of hydrogeological variables involved. Rock joints are usually unsaturated, and they conduct both gas/air and water together.

This book covers in detail, the fundamental aspects of fluid flow phenomena in a jointed rock mass, as well as various geological (structural) features and their influence on flow deformation characteristics. Various types of laboratory triaxial apparatus employed for testing saturated and unsaturated flow are also highlighted. Methods of testing and analysis of fluid flows have been compared where warranted, and modifications based on the authors' research findings are described. Especially, the salient features of a unique Two-Phase, High Pressure Triaxial Apparatus and its role in analysing the relative permeability of unsaturated flow through fractured rocks are presented. A new mathematical model representing two- phase flow in discontinuities is also introduced. The book is intended for final year thesis students, postgraduate researchers and practitioners.

CONTENTS

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| 1. Characterization of jointed rock mass | 5. Fluid flow modelling techniques |
| 2. Specialized triaxial equipment and laboratory procedures | 6. Flow analysis through an interconnected fracture network - numerical modelling |
| 3. Fully saturated fluid flow through a jointed rock mass | 7. Highlights of hydro-mechanical aspects of fractured rocks and recommendations for further development |
| 4. Unsaturated flow through a jointed rock mass | |

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