



Innovative Approaches to Low Cost Module Manufacturing of String Ribbon Si Pv Modules: Phase II, Annual Technical Progress Report

By National Renewable Energy Laboratory (NREL)

Bibliogov, United States, 2012. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.This subcontract resulted in a number of important advances for Evergreen Solar Inc. Foremost amongst these is the production implementation of dual ribbon growth from a single crucible (Gemini) using the String Ribbon continuous ribbon technology. This project has resulted in the flattest ribbon and the highest yields and machine uptime ever seen at Evergreen Solar. This then has resulted in significantly lowered consumables costs and lower overall direct manufacturing costs. In addition, methods to control the as-grown surface of Gemini ribbon have permitted the usage of the so-called no-etch process that allows for direct transfer of as-grown ribbon to diffusion without any intermediate etching step. In-line diagnostics for Gemini were further developed -- these included more accurate methods for measuring and controlling melt depth and more accurate means to measure and control ribbon thickness. Earlier in the project, the focus was on monolithic module development. With the Gemini advances described above, monolithic module work was brought to a close during this second year of the overall three year project. A significant advance in this technology was the...



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