

Nuclear Research Centre Negev - NRCN
Israel Atomic Energy Commission
Be'er Sheva, Israel

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Presentation Title

Mapping the tray of Electron Beam Melting (EBM) Ti-6Al-4V samples -
Properties and Microstructure

Abstract

We present a study on the dependency of physical properties (density, elongation, tensile strength and fatigue limit) and microstructure on the geometrical location in a tray of powder bed EBM. It was found that the mechanical properties slightly depend on the order of melting. It seems that when applying high percentage (above 50%) of melted surface, there are density variations and the mechanical properties deteriorate near the edges of the tray. Nevertheless, upon applying HIP (Hot Isostatic Pressure) post process, samples can reach higher density accompanied by very high elongation (>18%) with uniform strength and fatigue limits of 570 MPa.

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Biography

Dr. Ori Yehekel is an expert on processing-properties-microstructure relationships in ceramics and metals. He has more than 35 years of experience on these issues.

Dr. Yehekel received his degrees (B.Sc., M.Sc. and Ph.D.) in Materials Science and Engineering from the Ben-Gurion University in Israel. He served as a Group Leader on powder technology at NRCN and was the chair of the Israeli Powder Technology Committee. He was a visiting scientist at NIST (1988), Visiting Prof. at Drexel University (2008), Visiting scholar at the Weizmann Institute of Science (2013) and at University California Davis (2014). His current areas of interests are processing and properties of nanometric materials and Additive Manufacturing of metals.

About Israel Atomic Energy Commission

On June 13th, 1952 Mr. David Ben-Gurion, then Prime Minister of Israel, declared the establishment of the Israel Atomic Energy Commission (IAEC). The IAEC operates two research centers: the Soreq Nuclear Research Center and the Nuclear Research Center Negev. The IAEC is headed by the Director General who reports directly to the Prime Minister. The IAEC advises the Government of Israel in areas of nuclear policy and in setting priorities in nuclear research and development. The commission implements governmental policies and represents the State of Israel in international organizations in the nuclear field, such as the International Atomic Energy Agency. The IAEC maintains relations with relevant national authorities of other states. The Commission's activities began in a research institute near Rehovot. In 1958 the Soreq Nuclear Research Center was founded. The Soreq research reactor was first operated in 1960. The Nuclear Research Center Negev was established at the end of 1959, and the research reactor in the center was operated afterwards. The location was chosen as part of the policy for the development of the Negev Desert.

About Nuclear Research Centre Negev - NRCN

In the end of 1959 work began on the NRCN as a part of the national policy to develop the Negev desert. The IRR-2 reactor operates on the NRCN with nuclear fuel, heavy water cooled and moderated. Periodic authorizations to operate the reactor are granted following extensive safety tests. The research conducted at the NRCN is designed to broaden the basic knowledge in nuclear sciences and adjacent fields, and to provide the foundation for the practical and economic utilization of nuclear energy. A national radioactive waste disposal site is situated at the NRCN. Radioactive waste from hospitals, research institutions, higher education facilities and factories is delivered to the site. NRCN personnel are involved in the community, especially in the field of education, and maintain good connections with the local authorities around NRCN.