

**ΜΟΡΦΟΠΟΙΗΣΗ ΜΕΤΑΛΛΩΝ ΔΙΑ ΤΗΣ ΕΚΤΟΝΩΣΗΣ ΣΦΑΙΡΙΚΟΥ
ΚΡΟΥΣΤΙΚΟΥ ΚΥΜΑΤΟΣ ΣΤΟ ΝΕΡΟ (IMPACT METAL FORMING USING A
SPHERICALLY EXPANDING SHOCK – WAVE IN WATER)**

ABSTRACT

The aim of this current thesis is the impact of metal forming using a spherically expanding shock wave in the water and the design of the experimental setup using the software SolidWorks. The basic advantage of this package is designing 2D or 3D objects, which can be assembled. Many elements of the explosive forming of metals were obtained from scientific articles, books and research of similar efforts.

The first chapter presents and describes the literature review of the explosive, the explosion, the explosive wave transmission, etc. There are also listed some of the requirements to select the explosive charge. Finally, it is outlined the energy released by the explosive charge and the explosive forming, and some of its applications.

The second chapter describes the mechanics of energy transfer and discusses the methods of free metal shaping. Moreover, it refers to mechanics of metal shaping with explosives and there is also an explanation of the methods.

In the 3rd chapter, the literature review indicates the free metal shaping and refers to the results of other researchers regarding the free metal forming. Finally, reference is made to the proposed theoretical model and explanation of the method selected.

In Chapter 4, it is provided a description of the experimental procedure and process and there is also relevant information from experiments. Moreover, it is given a measurement of the dome depth depending on the mass of the explosive charge.

Chapter 5 contains a description and analysis of the results.

Chapter 6 describes the design process and the design package SolidWorks. It shows the design of the experimental setup and the parts of which it is composed.

After designed the experimental setup and gathered the results, we observe some useful clues. In summary, the sub-chapters of this work, present the details of explosives in tables and integrated drafts of the experimental setup with all the relevant information. Finally, it is given the literature used for the preparation.

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