Technion-Israel Institute of Technology
Faculty of Mechanical Engineering

הטכניון-מכון טכנולוגי לישראל
הפקולטה להנדסת מכונות

סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות שתתקיים ביום ה' 29.11.2018 (כא' בכסלו, תשע"ט), בניין דן קאהן, אודיטוריום 1, 13:30.

מרצה: אדם גודינגר

מנחה: פרופ' דניאל ריטל

על הנושא:

The influence of confining stress on the ballistic properties of soda lime glass

The seminar will be given in Hebrew

תקציר ההרצאה :

Brittle transparent materials such as glass and ceramics are commonly used in both civilian and military application for armored windows and sensor protection. These materials are usually very tough under compression but fragile under tension. This translates into high energy absorption properties when impacted by a projectile but very low resistance to tensile loading. When transparent protection is needed, the ability to optimize the energy absorption and the ability to endure different loading schemes becomes crucial.

One of the approaches to improve energy absorption of a brittle armor is to compressively pre-stress the protective plate. The compressive pre-stress improves the resistance to tensile stress, thereby suppressing crack growth which weakens the armor and damages its transparency.

The present study investigates the influence of confining stress on the ballistic properties of brittle transparent soda lime glass using experimental and numerical tools. The research consists of two main parts: The first part focuses on the methodology to apply uniform and repeatable confinement pressure on the specimen. The confinement procedure is quite challenging due to the very low fracture toughness of the material. The second part deals with the quantification of the ballistic performance of the confined vs. unconfined plate specimens. The confinement pre-stress was rather high, of the order of 100 [MPa]. The study shows great improvement in the ballistic efficiency in the confined soda lima glass target versus the unconfined one when impacted by a flat tip projectile.

בברכה,

פרופ"א מתי סאס
מרכז הסמינרים