PRODUCT DEVELOPMENT: through MATERIAL and PROCESSES RESEARCH.

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MATERIALS MODELLING FOR IMPROVING KAYAK PADDLE SHFT SIMULATION PERFORMANCE.

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Abstract: The objective of this study was to develop a computer aided design (CAD) model of a kayak paddle that could be used in finite element simulation for the purpose of optimizing the paddle's shape and performance. The model was developed using commercial CAD software and the results were validated against experimental data. The model was used to optimize the paddle's shape and improve its performance. The results showed that the model was able to accurately predict the paddle's performance and that the optimization process was successful.

MATHEMATICAL MODELLING, SIMULATION AND MATERIALS TESTING.

PREDICTION OF THE FLEXURAL MODULUS OF COMPOSITE MATERIALS FOR SPORTING EQUIPMENT.

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Abstract: The Flexural Modulus of composite materials is an important property for sporting equipment. This study presents a method for predicting the flexural modulus of composite materials using mathematical modeling and simulation techniques. The method was validated against experimental data and showed good agreement. The results indicate that the method can be used to predict the flexural modulus of composite materials with good accuracy.

FUNDING AND COLLABORATION.

APPLICATION RESEARCH AND COMMERCIALISATION.

Metal Powder Injection Moulding, Research and Industry.

A review and assessment of MIM as a commercial process and barriers to successful fabrication.

A report presented as part of the Trade and Investment Research Scholarship 2010.

INTRODUCTION

Metal powder injection moulding (MIM) is a well-established process in the field of metal micro-manufacturing. In general, the process involves the injection of a slurry of metal powder and binder into a mould, followed by sintering to form a solid part. The process has gained popularity in recent years due to its ability to produce complex, near-net-shape parts with high dimensional accuracy and surface finish. However, the process also presents several challenges, including the need for high-quality powder, the complexity of the injection moulding process, and the high cost of equipment and materials. These challenges can act as barriers to the successful fabrication of MIM parts.