The use of titanium metal in the sport and leisure industry.

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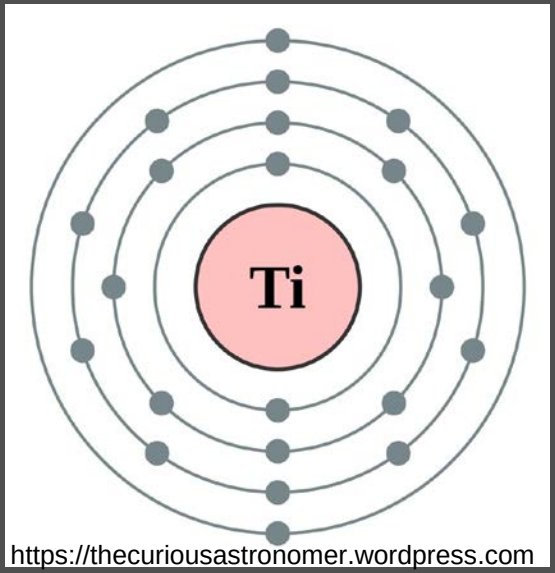
Introduction
Industry today
Devices & Equipment
Materials
Manufacturing
Current usage
The why



https://thecuriousastronomer.wordpress.com

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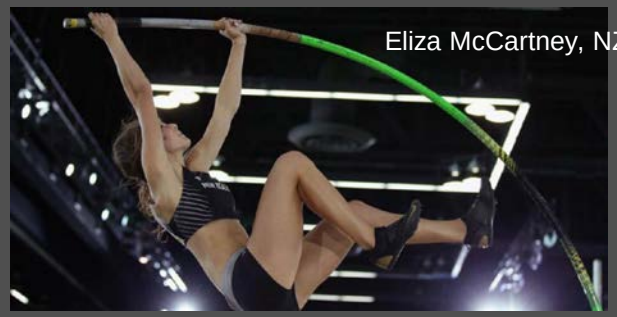
Eliza McCartney, NZ

Introduction

Sporting performance improvements are linked to adaptation of developments in material technologies.

Aluminium alloys

Polymer composites

Titanium metal

Head Tennis

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Industry today

RAM 3D, Bastion Cycles

Titanium ore is an abundant resource

Many manufacturing methods

Growth in the additive manufacturing sector is good for advanced materials.

Low demand

Coast of Patea. Photo: PHOTO NZ

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Equipment & Devices

Titanium use;

Golf

Para sports

Injury and rehabilitation

Athletics/team sports

Skiing

Cycling

Instrumentation and smart devices

MPIF images,
www.mimaweb.org

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Material properties

Titanium;

low mass, high strength, high corrosion resistance, bio compatibility, quality perception

Challenges;

cost, processability, supply/demand

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Manufacturing processes

Mizuno forged head

Traditional; Machining, casting, forging, fabrication

Advanced; Spray coating, vapour deposition

Powder metallurgy; Additive manufacturing, press and sinter, particulate injection moulding (PIM).


RAM 3D, Victory knifes

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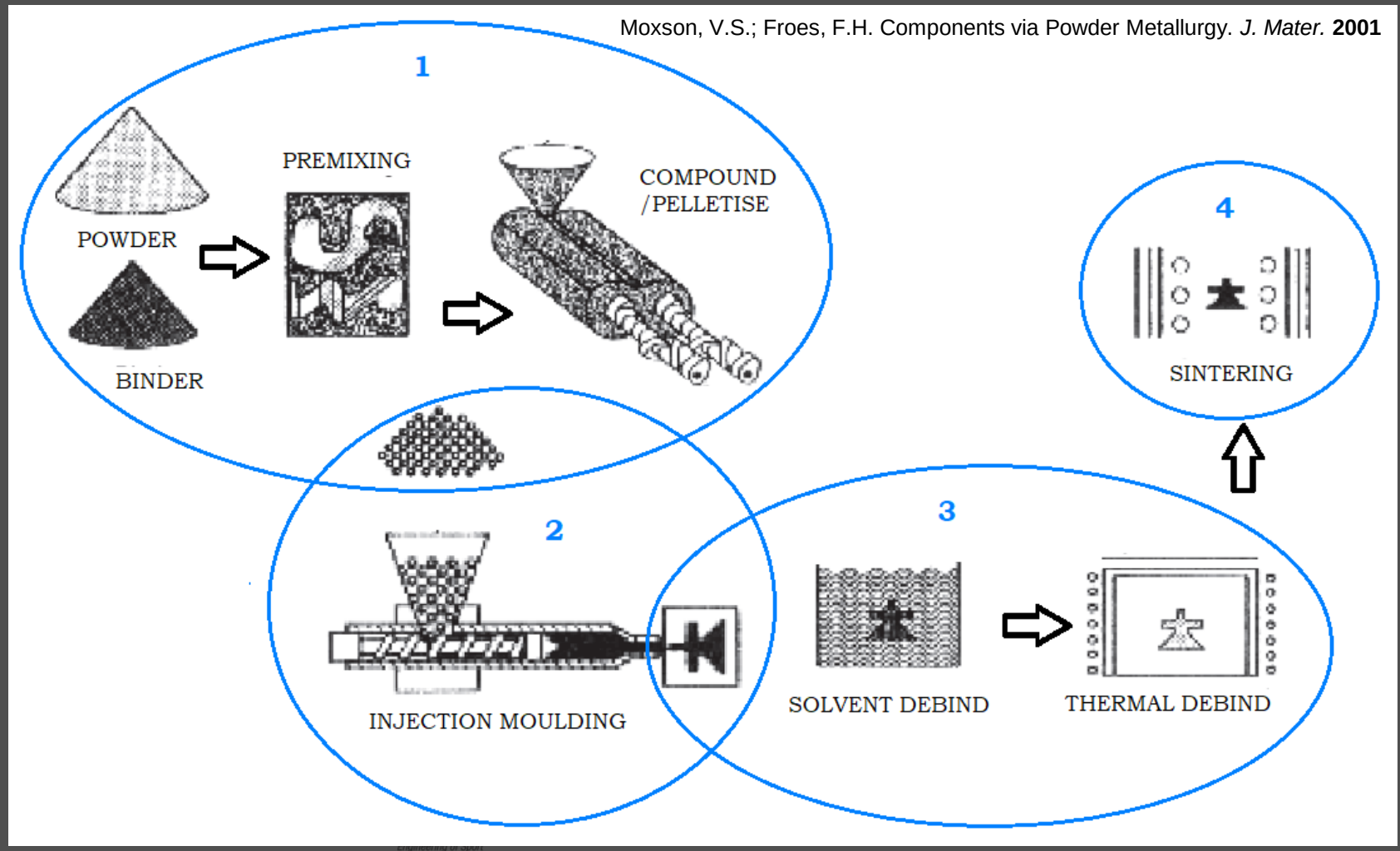
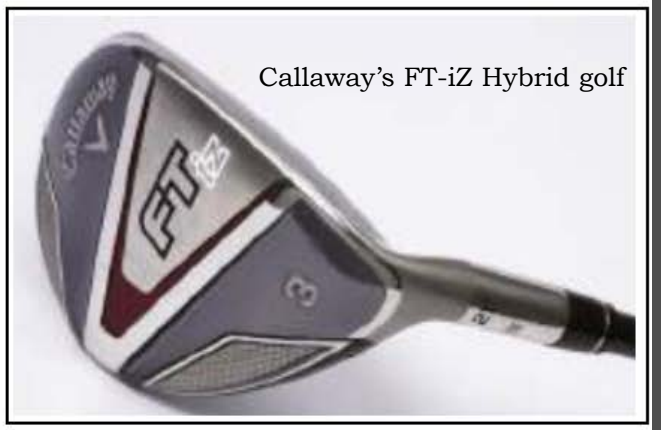
Particulate injection moulding



MIM in sport and leisure

GKN Sinter Metals Germany



Element22 Germany

Mimest SpA, Italy

AME Powder Technology Ltd

Conclusion

Materials and process research can minimise the risk element of product development.

PIM is one process to do this with benefits of;

titanium performance, waste minimisation, geometrical complexities, cost savings.

Do not look for replacement processes, use enabling technologies to support future equipment

Thank you ?

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