

WP 3 Intermetallics and adv. materials for marine engines



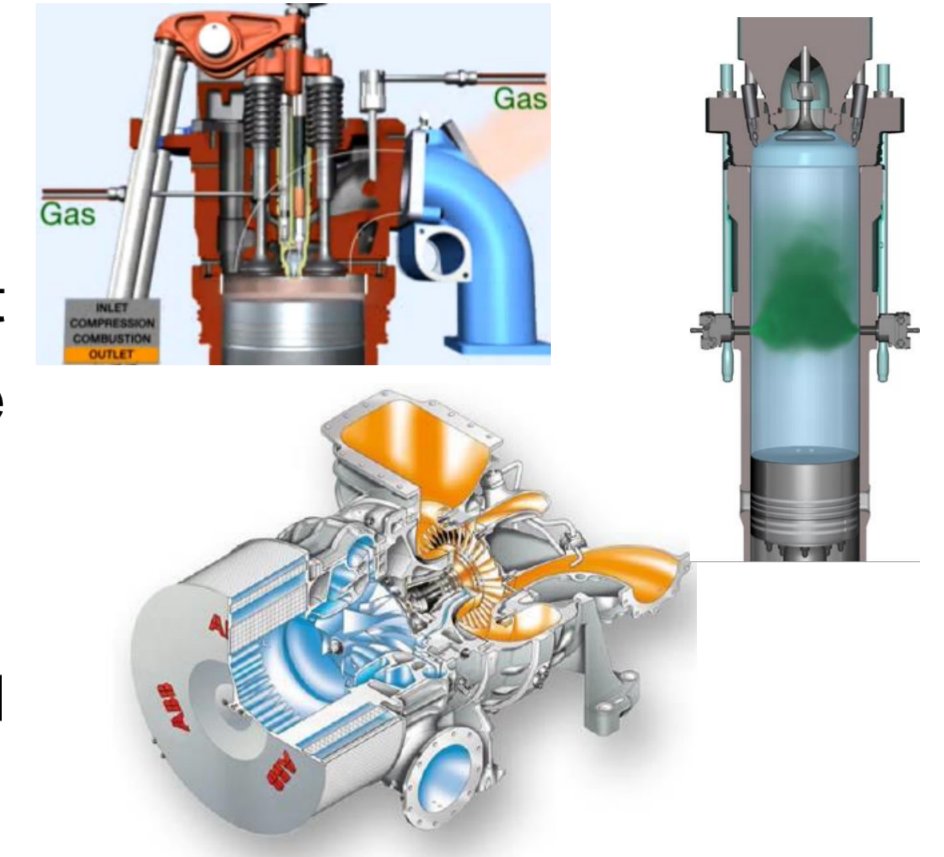
WP OBJECTIVES

Subproject 3.1: Novel materials for engine applications

Examine possibilities of using novel materials in engines to facilitate the development of components that enable higher engine loads, hereby increasing efficiency and lower emissions. Ensure proper lifetime performance and durability.

Subproject 3.2: Novel materials for turbine casing

Material of turbine casing is reviewed in respect of material and design in order to meet requirements needed for higher exhaust gas temperatures.



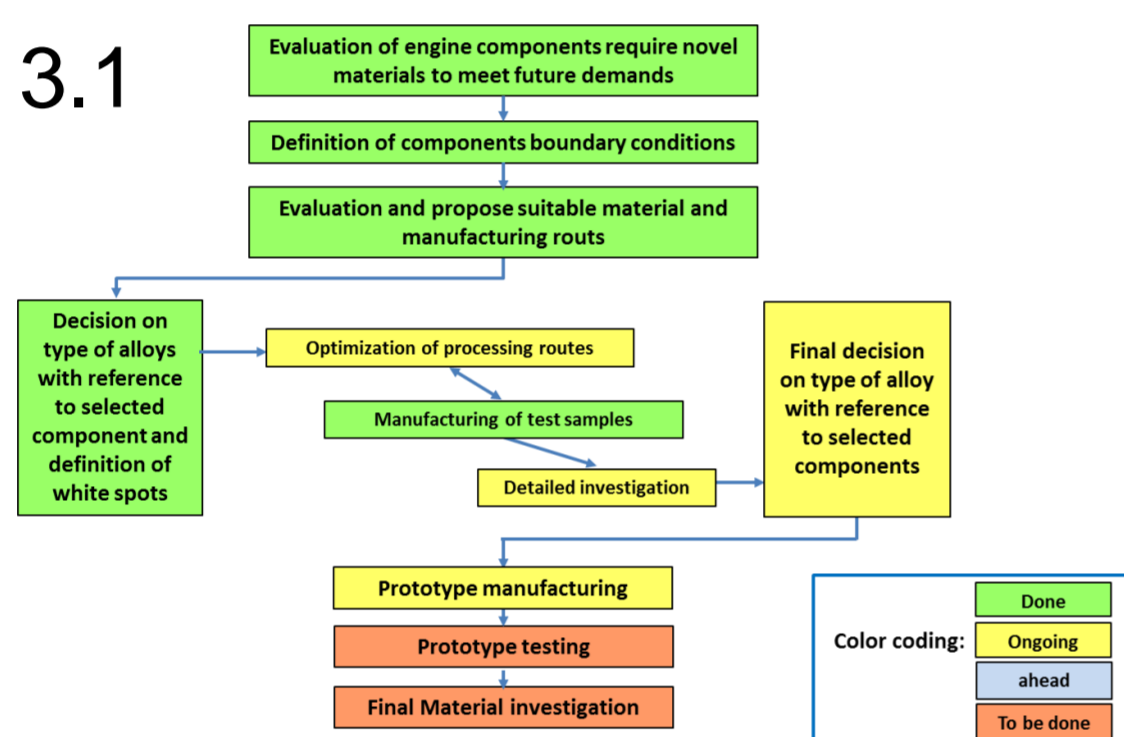
EXPECTED OUTCOME

Subproject 3.1: Suitable new materials can be identified for at least two components for higher load operations and longer life time.

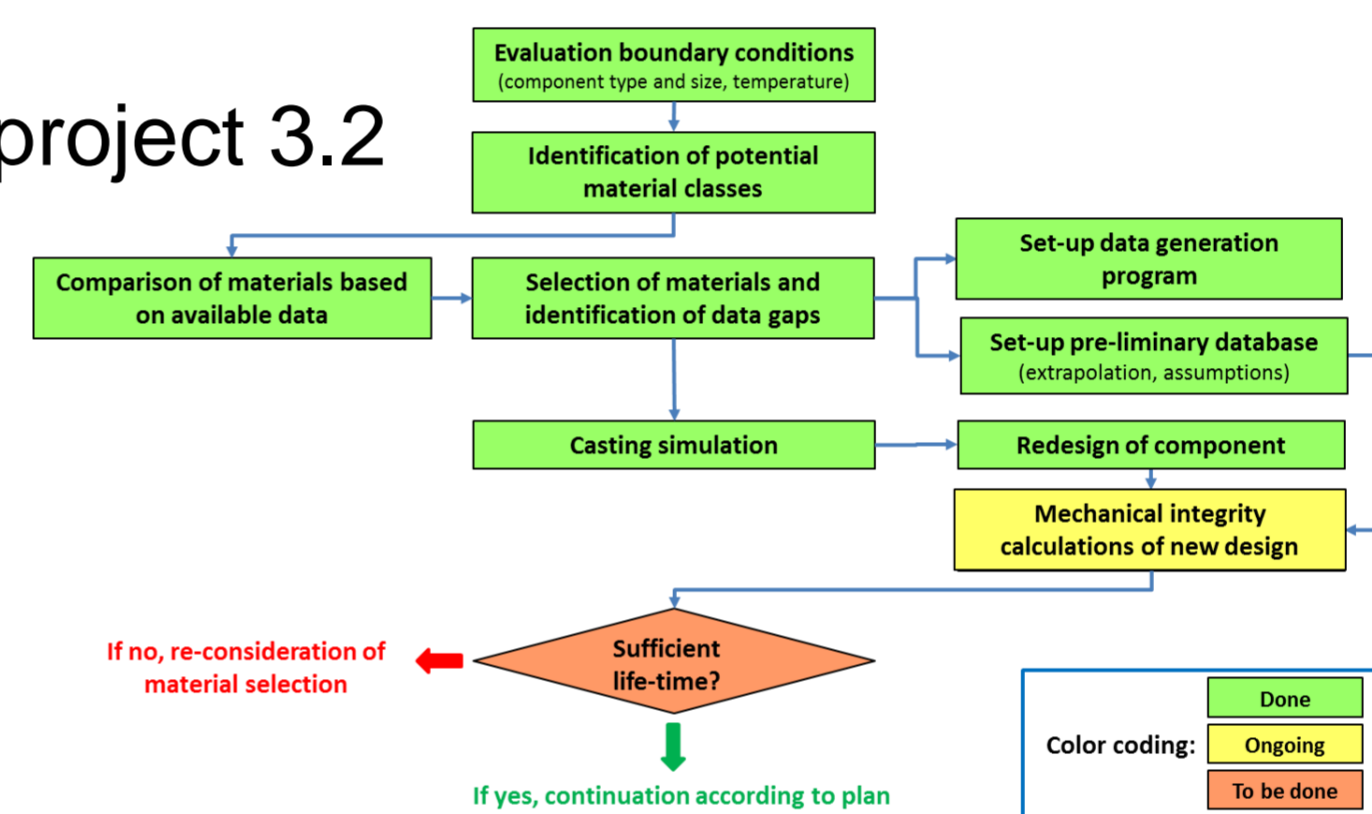
Subproject 3.2: Performance is improved through material / design optimization.

PROGRESS AND PLANS

Subproject 3.1



Subproject 3.2



Subproject 3.1 Progress of material characterisation / testing activities up to date and planned next:

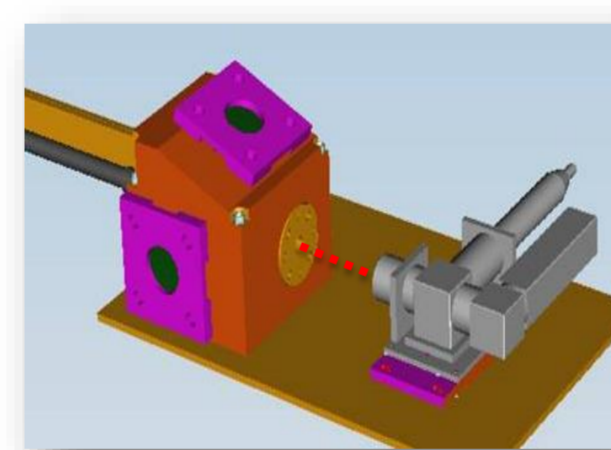
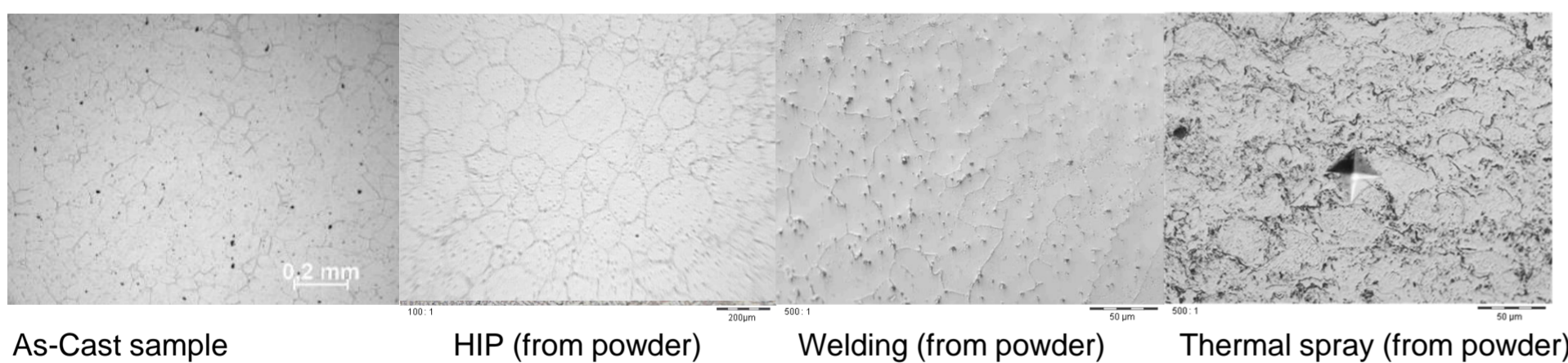


Microstructure from different manufacturing routes & materials
Mechanical properties (mostly done)

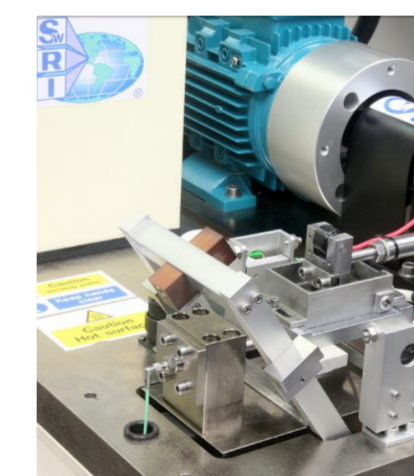


Corrosion testing (cold & hot corrosion) partially done, evaluation pending
Thermal shock testing - pending (laser for test rig under repair)
Tribo testing – samples ready / testing pending

Microstructures resulting from different manufacturing routes:



Thermal cycling test rig



Tribo tester CPT



Testing of advanced bearing materials

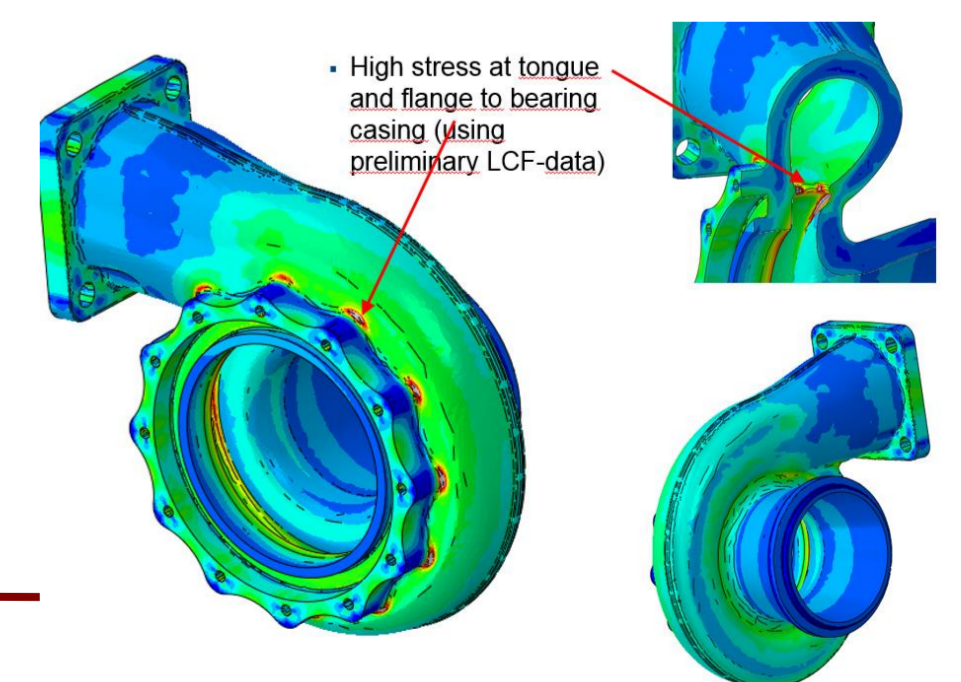
Subproject 3.2 Progress up to date and activities planned next:



Decision on casting type & manufacturing method
Preliminary material database setup
Casting simulation & parametrisation of CAD-model
Defintion of load profile
Elimination of stress hot-spots



Completion of experimental material characterisation
Production of prototype casings
Qualification tests



WP PARTICIPANTS

WP lead: WinGD WP deputy: Wärtsilä.

