DELIVERABLE 4.2

Optimisation algorithms

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Disclaimer

Partners

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Executive Summary

This deliverable describes how the ROMs have been used, together with optimisation techniques, to develop inverse engineering approaches for the project pilot cases. These optimisation procedures will be used to optimise offline the design of machinery equipment in the ramp-up phase, as well as to calculate the adjusting process parameters online.

Particularly, strategies developed for each test case are next summarized:

- Booster pilot case, ZF: The global booster ROM (which embeds the Hbubble and 3DK ROMs) predicts the jump-in, and by means of an optimization algorithm, the length of the ratio disc is calculated to produce the target jump-in. The ratio disc length is adjusted to this value by means of a crushing stage downstream the line. Another optimization algorithm is the one needed for the calculation of the material parameters. As there is no direct way to measure the material parameters of each reaction disc online, an indirect method has been devised. This method consists in performing a test that can be performed online (the Hbubble test, see D2.1) and a ROM of the test. By means of an inverse fitting, the material parameters for each reaction disc are found.
- Seals pilot case, SP: the objective of the optimization algorithms for SP ROM is to determine the optimal controllable input parameters that minimize the distance of the quality points to their target, balancing the changes in non-controllable input parameters. An inverse search using a genetic algorithm is performed to obtain those controllable parameters that improve the product quality. Using this approach, several optimization strategies are tested.
- This type of algorithms are not needed in the FERSA case, as this process uses the bearing ROM in a different way.