

# **SIMULATION BASED CORROSION MANAGEMENT**

## **- SICOM -**

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**Corrosion management concepts utilising the application and integration of corrosion predictive tools for corrosion occurrence and corrosion propagation will be a driver for new technical advances in the field of corrosion maintenance and in development of new structural designs, materials and processes for surface protection. Additional benefits can be expected by reduced time to market for new products.**

**SICOM will develop a numerical microscale model to simulate localised corrosion of Al-Alloys with regard to microstructure and the micro-electrochemical condition. It will provide corrosion rates of Al-Alloys in the mesoscale of occluded cells by means of numerical calculation as a function of physical and geometrical factors for given macro-environments to simulate crevice corrosion. A numerical model for prediction of galvanic corrosion behaviour will be developed and up-scaled for application to structural elements of aircraft. The influence of surface treatment on modelling results will be included with regard to inhibitor release from protection systems, role of clad layer and oxide degrading effects. A decision support tool will be established to enable exploitation and implementation of the project results in scientific and technical applications.**

**SICOM will provide models that will become an essential part of future predictive maintenance concepts to avoid unanticipated and unscheduled maintenance with high costs. Data from monitoring systems and non-destructive inspection can be used as model input. Models output will be utilised for the repair decision process or can supply structural integrity concepts and hereby fill the gap between monitoring or inspection and calculation of the structural impact of corrosion. Aircraft development costs will be reduced through saving on testing time and quantity. The predictive models can be combined with expert systems and databases for a more efficient and reliable development and selection of materials.**

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