

## Multi-level protection of materials for vehicles by “smart” nanocontainers

### Motivation and Objectives

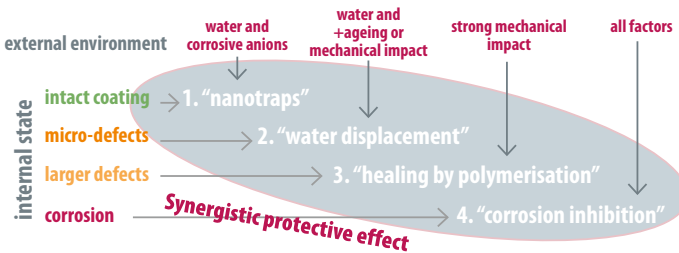
The destructive effect of environment and the corrosion induced degradation are the important problems which determine the service life of a vehicle or its components. The application of organic coatings is the most common and cost effective method of improving protection and durability of metallic and plastic structures. However the degradation processes develop faster after disruption of the protective barrier. Therefore an active protection based on “self-healing” of defects in coatings is necessary to provide long-term effect. Another indispensable issue for manufacturing of future vehicles is adhesive joining of structural components. The contact of adhesively joined structures with environment containing water and other aggressive species leads to the ageing and the degradation of adhesive joints as in the case of coatings.

The main vision of the project MUST is development of new active multi-level protective systems for future vehicle materials. Products like self-healing coatings, adhesives and other composite materials will be based on “smart” release nanocontainers incorporated into the polymer matrix of current commercial products. A multi-level self-healing approach will combine - within one system - several damage prevention and repairation mechanisms, which will be activated depending on type and intensity of the environmental impact

### Project Plan, Milestones and Deliverables



### Technical Approach



### Achievements

- WP1 Coordination and project management
- WP2 Lab-scale development of nanocontainers of corrosion inhibitors, compatibility evaluation of some nanocontainers with coating formulation, development of model coating and adhesive systems.
- WP3 The pre-industrial applicability of the technology developed in WP2 will be demonstrated in WP3. The activity will start on month 24
- WP4 Training, dissemination and exploitation strategy. Presentation of preliminary results in 2 international congresses, first training course in the frame of the MUST and Multiprotect projects.

### Organisational Information

|             |  |              |                    |
|-------------|--|--------------|--------------------|
| Budget      | 10.53 M€   | Funding      | 7.14 M€            |
| Duration    | 48 months  | Start        | June 2008          |
| DG          | Research, SST  | Contract No. | 214261             |
| Coordinator | Theo Hack, EADS  | Contact      | Theo.Hack@eads.net |
| Partners    | 20 beneficiaries from 10 different European Countries among which CR FIAT, DAIMLER |              |                    |
| Website     | www.sintef.no/Projectweb/MUST/   |              |                    |