Module Description, available in: EN

Plastics failure analysis and prevention

General Information

Number of ECTS Credits

3

Module code

TSM_PlaFaAna

Valid for academic year

2026-27

Last modification

2019-08-31

Coordinator of the module

Andrea Castrovinci (SUPSI, andrea.castrovinci@supsi.ch)

Explanations regarding the language definitions for each location:

- Instruction is given in the language specified for each location and module execution.
- Documentation is available in the language(s) listed for each location and module execution. If the documentation is in multiple languages, the percentage distributed is indicated (100% = all documentation provided).
- The examination, including both questions and answers, is provided entirely (100%) in the language(s) specified for each location and module execution. The exams are on-site.

	Lausanne			Lugano	Zurich		
Instruction				**X** E 100%			
Documentation				**X** E 100%			
Examination				**X** E 100%			

Module Category

TSM Technical scientific module

Profile Recommendations

This module is recommended for the following profiles:

	Lugano
Profile	ME

Lessons

2 lecture periods and 1 tutorial period per week

Entry level competences

Prerequisites, previous knowledge

Fundamentals of Inorganic and Organic chemistry.
Fundamental of polymeric materials

Brief course description of module objectives and content

Degradation of polymers is an important driver of plastic and rubber products failures during their service life. Therefore, understanding the mechanisms of polymer degradation is of paramount importance for properly engineering plastic and rubber products, ensuring performances all through their service life. This module discusses the impact of chemical and physical degradating factors on the macromolecules characteristics and performances. It provides fundamentals of macromolecule degradation mechanisms, correlating this know-how with the failure of plastic and rubber products through case study analysis.

Aims, content, methods

Learning objectives and competencies to be acquired

Understand the chemical-physical processes of degradation of polymeric materials.
Master the possible approaches to protect polymeric materials from uncontrolled degradation.

Module content with weighting of different components

The course content are:

- Impact of degradation factors (e.g. oxygen, UV, etc.) on macromolecules
- Impact of macromolecule degradation on mechanical/optical/chemical properties of plastic/rubber products
- Protection of plastic/rubber product against degradation

Teaching and learning methods

Teaching: Ex cathedra teaching (theory) and Presentation of case studies
Learing methods: Self study

Literature

Assessment

Additional performance assessment during the semester

The module does not contain an additional performance assessment during the semester

Basic principle for exams

As a rule, all standard final exams are conducted in written form. For resit exams, lecturers will communicate the exam format (written/oral) together with the exam schedule.

Standard final exam for a module and written resit exam

Kind of exam

Written exam

Duration of exam

120 minutes

Permissible aids

No aids permitted

Exception: In case of an electronic Moodle exam, adjustments to the permissible aids may occur. Lecturers will announce the final permissible aids prior to the exam session.

Special case: Resit exam as oral exam

Kind of exam

Oral exam

Duration of exam

30 minutes

Permissible aids

No aids permitted