

Plastics failure analysis and prevention

General Information

Number of ECTS Credits

3

Module code

TSM_PlaFaAna

Valid for academic year

2020-2021

Last modification

2019-08-31

Responsible of module

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Explanations regarding the language definitions for each location:

- Instruction is given in the language defined below for each location/each time the module is held.
- Documentation is available in the languages defined below. Where documents are in several languages, the percentage distribution is shown (100% = all the documentation).
- The examination is available 100% in the languages shown for each location/each time it is held.

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

Module Category

TSM Technical scientific module

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 degrading 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 acquired competencies

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

Contents of module with emphasis on teaching content

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

Learning methods: Self study

Literature

Assessment

Certification requirements

Module does not use certification requirements

Basic principle for exams

As a rule, all the standard final exams for modules and also all repetition exams are to be in written form

Standard final exam for a module and written repetition exam

Kind of exam

written

Duration of exam

120 minutes

Permissible aids

No aids permitted

Special case: Repetition exam as oral exam

Kind of exam

oral

Duration of exam

30 minutes

Permissible aids

No aids permitted