

## Structuring and preparation of a lesson: **EAS module 6 (Testing and analysis)**

time	Theme, core information, statements or questions	Learning objectives <sup>1</sup>	Methods (e.g. presentation/ discussion/group work)	Media/ training material
2 h	<p><u>Property determination for adhesives, Adherend or Joints:</u></p> <p>Methods to measure the properties by preparing bulk specimens of the adhesive (e.g. static testing, dynamic testing, rheological characterization)</p> <p>Methods to measure the properties by using specially designed joint geometries to measure the failure strength and to analyse the fracture and failure behaviours</p>	<p>-recognise the variety of adherend or substrate properties (1);</p> <p>-recognise methods for determining adherend or substrate properties (1);</p> <p>-analyse the adhesive or substrate property results (3);</p> <p>-select with limited autonomy the adequate methods for measuring mechanical properties of the adhesive and substrate;</p>	<p>Ppt content presentation</p> <p>Practical (individual/group) exercise about adhesive and substrate properties measurement, including results analyses.</p> <p>or</p> <p>Hands on about the selection of adequate methods for properties measurements;</p>	<p>Beamer / printed ppt presentation</p> <p>White board</p> <p>Text book</p> <p>Practical exercise</p>
4 h	<p><u>Characterisation of raw material</u></p> <p>Determination of properties of Raw Material (e.g. Viscosity, reaction time for adequate adhesive)</p>	<p>-recognise the variety of raw materials properties (1);</p> <p>- recognise methods for determining raw materials properties (1);</p>	<p>Ppt content presentation</p> <p>Practical (Individual/group) exercise about raw materials</p>	<p>Beamer / printed ppt presentation</p> <p>White board</p> <p>Text book</p>

<sup>1</sup> (1) Know and understand, (2) transfer and practically apply, (3) analyze and assess; (0) no learning objective; additional information

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		<p>-analyse the raw materials property results (3);</p> <p>- select with limited autonomy the proper methods for determining the properties of raw materials.</p>	<p>properties measurement, including results analyses.</p> <p>or</p> <p>Hands on about the selection of adequate methods for raw materials properties measurements;</p>	<p>Practical exercise</p>
3 h	<p>Destructive Testing (DT)</p> <p>National, EN or ISO Standards Industry Specifications and standards</p> <p>Destructive testing of the Assembly (e.g. Failure strength measurements; fracture testing and failure analysis; Thermal properties and temperature effects)</p> <p>Tests for the durability of the Assembly (e.g. Thermal constraints, Moisture, Chemical environment, UV and combined effects);</p>	<p>-recognise standards and specifications from the industry for testing materials (e.g: adhesively bonded test pieces); (1)</p> <p>-describe destructive test objectives and the limitations of the data generated; (1)</p> <p>-analyse the data generated from the destructive testing (3);</p> <p>- supervise with limited autonomy destructive testing methods applied to test pieces.</p>	<p>Ppt content presentation</p> <p>Practical (Individual/group) exercise about inspection objectives and selection of proper DT methods, including the analyses of results;</p> <p>Video presentation /demonstration (e.g: destructive testing)</p>	<p>Beamer / printed ppt presentation</p> <p>White board</p> <p>Text book</p> <p>Practical exercise</p> <p>Video</p>

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5 h	<p><u>Non Destructive testing (NDT)</u></p> <p>National, EN or ISO Standards Industry Specifications and standards</p> <p>Fields of application and limitations</p>	<p>-recognise standards and specifications from the industry for testing materials;</p> <p>-describe the field of application of each type non -destructive test and the limitations of the data generated;(1)</p> <p>- analyse the data generated from the non-destructive testing NDT(3);</p> <p>- supervise with limited autonomy non-destructive testing methods applied to adhesive fabrications.</p>	<p>Ppt content presentation</p> <p>Practical (Individual/group) exercise about inspection objectives and selection of proper NDT methods, including the analysis of results; <i>or</i> Hands about /brainstorming about DT field of application and limitations;</p> <p>Video presentation /demonstration (e.g: non destructive testing)</p>	<p>Beamer / printed ppt presentation</p> <p>White board</p> <p>Text book</p> <p>Practical exercise</p> <p>Video</p>
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