TEMPERATURE SENSITIVE BRITTLE COATING (TSBC) – AS A PERFECT EXAMPLE ON THE SYMBIOSIS BETWEEN THEORY AND PRACTICE

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According to the title and the purpose of the conference we will display a possible tool to analyse structures, mainly mechanical engineering ones. Being at a university, by the way, one of the oldest and most famous one in Europe, let us mention also the clear scientific aspects of the problem:

- to develop the paint (coating),
- to work out the (mechanical) measurement method,
- to prepare the evaluating software of the problem.

There are three main trends in the up-to-date development of the solid mechanics, namely

- theoretical one,
- practical one,
- the effect of the new tools.

The TSBC in both sense, i.e. as a procedure and as a tool unites the above-mentioned trends, purposes. On the other side, there are multi-lateral interactions among them. The theoretical basis is the coupled fields, or generally the interdisciplinary. The practical ones are the

- new materials and
- fast(er) processes, i.e. impossible to neglect the coupling in both sense
- objects: heat & moisture,
- mode: conduction and convection.

The effects of the new tools are the following:

- numerical (IT, e.g. FEM, CAD, etc.),
- experimental (video, electrical analogy, etc.),
- there are interactions among these:
- experiments -> numeric, e.g. analogy -> calculations,
- FEM -> experiments.

Returning to the scientific basis, i.e. to the fast processes of the thermomechanics (TM), it is clear that a well elaborated theory (fast TM as a part of the thermo-hygro-mechanics [THM]) makes possible the practical application and the latter one needs further theoretical basis. It is a really exceptional example of the symbiosis between theory and practice, in other words research and engineering.

The paper deals with the above-mentioned problems based mainly on the following references:

References

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