Challenges, Joints Workshop 2012

Out of the discussions of requirements to make progress in our focus areas, a new set of challenges has been developed. This is the principle outcome of the Joints Workshop. Each of these challenges is associated with a set of deliverables. The challenges are listed here.

1. Round Robin/Benchmark Exercise for Hysteresis Measurements (**Ewins**, Nowell, Gola, Eriten, Schwingshackl)

December 2012 – Define scope, hardware, measurement technique
April 2013 – Mid-year progress report
September 2013 – Report results

2. Round Robin/Benchmark for Measurement/Prediction of Dissipation in Standard Joints (**Jacobs,** Goyder, Gaul, Ind, Vakakis, Allen, Eriten, Harris, Segalman)

December 2012 – Define scope, hardware, measurement technique
April 2013 – Mid-year progress report
September 2013 – Report results

3. Methodology to quantify cost benefits of improved joint design (Brake, Goyder, Ewins, Reuss, Schwingshackl, Allen)

Definition of calculation criteria
How to pose the question to stakeholders
December 2012 – Draft delivery

4. GRAND CHALLENGE – Define Mechanisms of Friction (Interface Mechanics) (Nowell, Brake, Eriten)

January/February 2013 – "Green" paper

5. Modelling non-metallics (Gaul, Goyder, Petrov)

February 2013 – "Green" paper

6. Multiscale modeling framework (Eriten, Masud, Petrov)

February 2013 – "Green" paper

7. Definition of variability and uncertainity (linked to Round Robin Challenges 1 and 2, also address how to model in the absence of experimental data) (Mignolet, Starr)

January 2013 – Framework for data/criteria

8. Epistemic and Aleatoric Modeling (Segalman, Bergman, Brake, Vakakis, Willner)

January 2013 – Problem definition

9. Time varying model parameters, modeling and experiment "surface chemistry" (Dini, Medina, Eriten, Schwingshackl)

April 2013 – Problem definition, including scales, wear, meeting at ISFF7

10. The derivation of constitutive equations based on physical parameters (including measurement of spatial dependence of key physical parameters) (Gaul, Hoffmann, Starr, Mayes)

January 2013 – "Green" paper

11. Eventual implementation of prediction methods in commercial numerical codes (Brown, Goyder, Petrov, Brake)

January 2013 – "Green" paper

12. Develop Statement of Mission and Workshop Report (Ewins, Bergman, Starr)