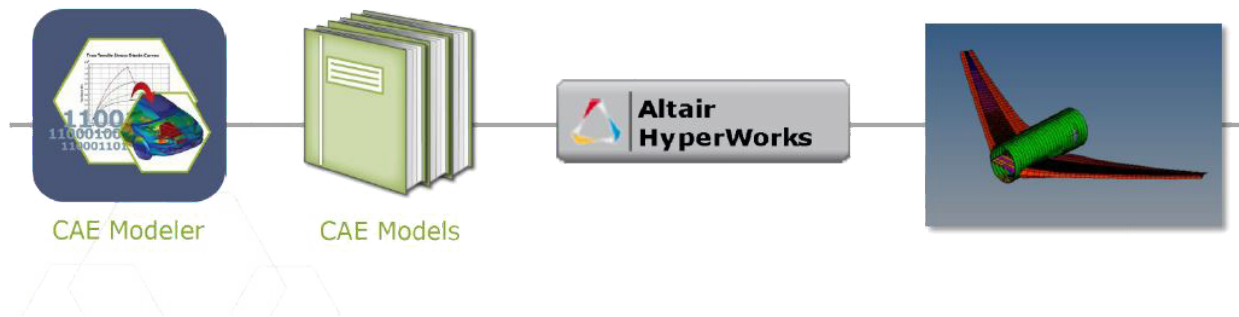


## Materials and Material Management

When simulation results don't make sense, what checks do you perform? Besides the modeling aspects of loads and boundary conditions, mesh sizes, right formulations, etc., the most often overlooked cause of problems is the wrong assignment of materials and properties in a solver input deck. In the midst of running many simulations it is so easy to modify values that users forget that what they intended for a part is not what is being analyzed. Identifying the correct material values and assigning them is such a crucial step in your analysis that any mistake can compromise the results and design decisions you make based on simulation. That's why most of the users take great care in validating the material behavior with single element models, coupon test simulations or fitting curve parameters (with some optimization) to match the test data, like force deflection or stress-strain curves. The basis of all material data is of course a physical test. Once the material definitions are validated, they are reused as material cards in different simulations on the same design or a completely new derivative using the same material.

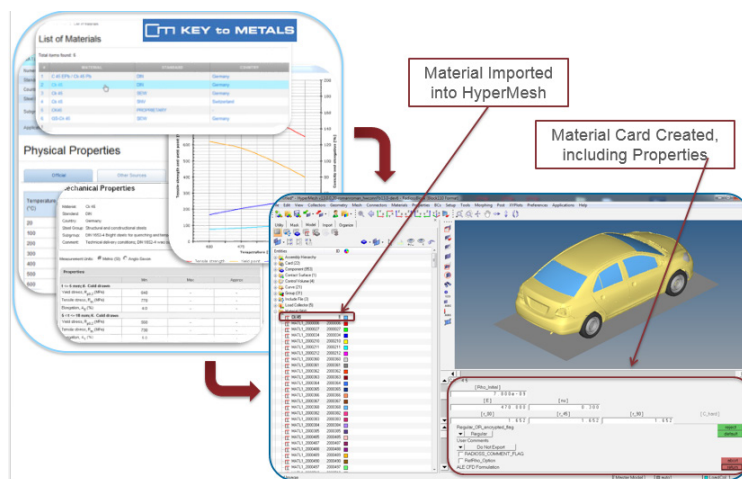
HyperWorks users have been leveraging the [Collaboration Tools](#) framework to store material data in a library and retrieve across simulations with version controls if any changes are made. A nice video on how the collaboration tools help users maintain a material database in HyperMesh can be seen [here](#).

In addition, Altair Partner Alliance (APA) users have access to Matereality and TotalMateria products that are integrated with HyperMesh to create a seamless workflow, whether it's a managed database or just a library of data. Users can create and manage databases with Matereality software and also transfer the information to popular CAE formats. Details about Matereality and HyperMesh connection can be found [here](#), along with a step-by-step [instructions](#) on how to execute the workflow.



Matereality CAE Modeler connection HyperMesh in transferring Master material files

Total Materia provides a library of materials that users can take as a starting point in the absence of any in-house material data. An overview of accessing TotalMateria data from HyperMesh can be seen in this [video](#).



TotalMateria connection to HyperMesh

With composites material management and characterization, the solution becomes even more sophisticated. The material behavior is not just a simple aggregate of the individual phases but a result of heterogeneous arrangement of these phases and how they are combined and arranged in a part geometry that makes a difference. One of the [previous articles](#) covered the concept of micromechanics and multi-scale modeling. Partner tools like ESAComp (Componeering), Digimat (e-Xstream), GENOA (AlphaStar) provide databanks for commonly used composite matrix and fiber materials and methods to derive the material behavior based on the above factors.

Questions or comments?

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To learn more about Total Materia or Matereality Workgroup Material DatabasePro visit [www.altairalliance.com](http://www.altairalliance.com).

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