

AlphaCell Top Use Cases

NVH Software

Material Database with Acoustic Properties

Challenge

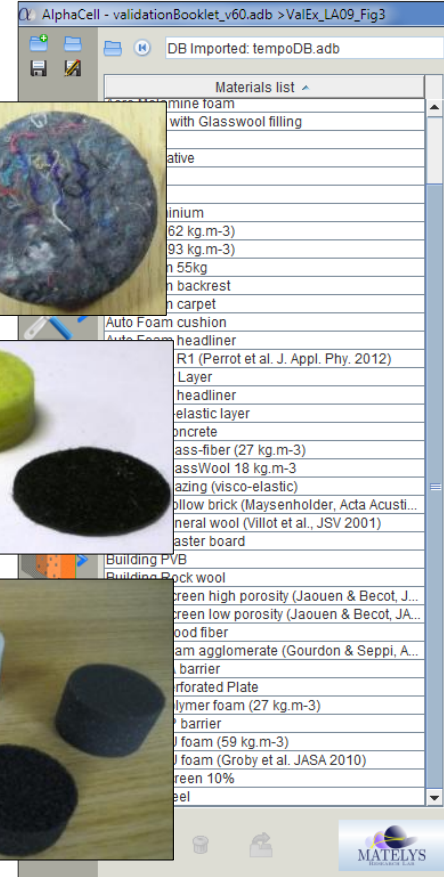
- Get accurate parameters for isotropic solids, visco-elastic materials ...
- Get accurate parameters for Biot type materials (foams, fibrous, felt, shoddy...) to use new Biot model in OptiStruct : porosity, air flow resistivity, tortuosity ...

Solution

- AlphaCell embeds a complete material database
- AlphaCell export material cards directly readable by OS which contains
 - Either the list of dedicated parameters
 - Or the frequency dependent variables

Benefits

- AlphaCell allows simulation of a large variety of systems in auto, aero, building, heavy industry ...
- With the two entry feature of the database, AlphaCell may also be used during B2B meetings without disclosing internal references



Design of Sound Packages

Challenge

- Optimize the composition of the sound package with a reduced computation load and time cost
- Quantify the exact influence of perf plates, screens & fabrics

Solution

- TMM algorithm implemented in AlphaCell is fast and low computationally demanding and uses parallel computations (new version)
- AlphaCell covers materials and excitations which are representative of industrial applications
- AlphaCell includes a complete set of perf plates (circ, square, slits, conical) and a dedicated model for screens & fabrics

Benefits

- AlphaCell may be called by an external script to test virtually a large series of combinations
- Truck manufacturer said that AlphaCell results were never belied by the test experimental results.



AlphaCell Works with OptiStruct for Further Validation

Challenge

- Reduce time and costs when switching from the design tool (AlphaCell) to integration tool (OptiStruct) without loss of information


Solution

- AlphaCell produces impedance data and material cards (Nastran format) which are readily usable by OptiStruct
- The same material properties are used by AlphaCell and OptiStruct avoiding any lack of physical information between the two

Benefits

- Once the pre-design phase achieved with AlphaCell, the results are directly imported into OptiStruct model for further validation
- The sound package governing parameters may be tracked using AlphaCell

σ	1.15E04	(N.s.m-4)
ϕ	0.96	
α_{∞}	1.01	
Λ visc.	1.08E-04	(m)
Λ th.	1.38E-04	(m)
κ^0	4E-09	(m2)
ρ	1.8E01	(kg.m-3)
μ	8.1E-01	(kg.m-2)
E	3E03	(Pa)
η	2.1E-01	
v	3E-01	

SolverKeyword	MATPE1
Name	BIOT_Mat
ID	4
Color	
Include File	[Master Model]
Defined Entity	<input checked="" type="checkbox"/>
Card Image	MATPE1
User Comments	Hide In Menu/Export
MAT1	MAT1_BIOT_Str (5)
MAT10	MAT10_BIOT_Porous (6)
BIOT	1.0
VISC	0.108
GAMMA	1.402
PRANDTL	0.71
POR	0.0
TOR	
AFR	0.0
VLE	0.0
TLE	0.0



Prepare to be MATELYS approved !