



“Improved Composite Damage and Failure Simulation with RADIOSS”

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Abstract:

The application of composite materials in the industry has been growing up for the past decades. As the knowledge and confidence in composite materials increase, they are more and more applied to parts subject to potentially critical hazards in the transport industry as well as many other fields.

As tests can be costly or even impossible to perform, the ability to predict and if necessary improve the behaviour of composite materials through computer simulation has become very important for manufacturers

In order to meet this challenge, several new developments were made to improve RADIOSS capacity to predict the behaviour of composite materials under heavy, highly transitory loadings such as impact, crash ...

The purpose of this presentation is to make an overview of those developments which will soon be available. :

- A new thick shell property similar to the shell composite elements was introduced in order to model thick composites as thick shell elements with a high number of layers of various orientations.
- The Crasurv material law was made compatible with thick shell elements as well as solid elements.
- A new improved composite solid material law has been developed
- Several rupture criteria such as Puck and Hashin were added. Additionnally, several failure criteria can now be applied to a single material in order to represent with accuracy the complex rupture phenomenon which can occur.
- The Ladeveze delamination criteria was finally added.

Several examples of application will be presented in order to validate and demonstrate the interest of those new development especially for impact and crash.

Keywords:

- Composites
- Delamination
- Rupture
- RADIOSS