

# VisualDOC Interface with Moldex3D

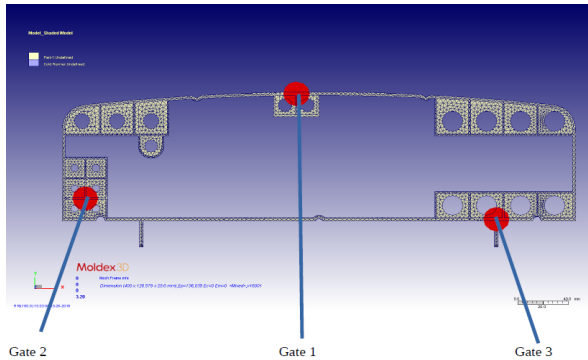


Moldex3D plugin simplifies coupling Moldex3D models with VisualDOC to perform gate location and process parameter optimization.

## Overview

- Unique capability to perform gate location and process parameter optimization simultaneously for models with BLM mesh
- Intuitive and user-friendly interface for quick and easy setup
- Supports all available VisualDOC modules like DOE, Optimization, RSA, and Reliability
- Can be set up to run locally or in parallel

## Optimization Case Study



Frame Model

Objective: Minimize Pressure

Design variables: Gate co-ordinates

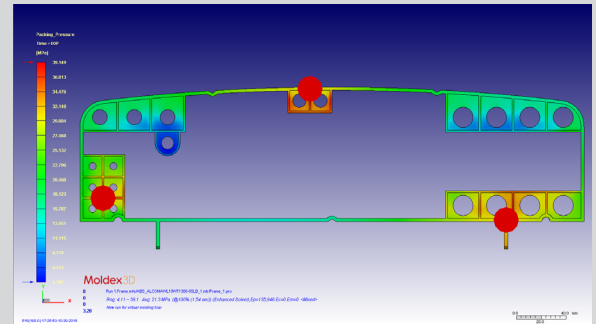
## Optimization Result:

Pressure plots for the initial and optimum design are shown on the right.

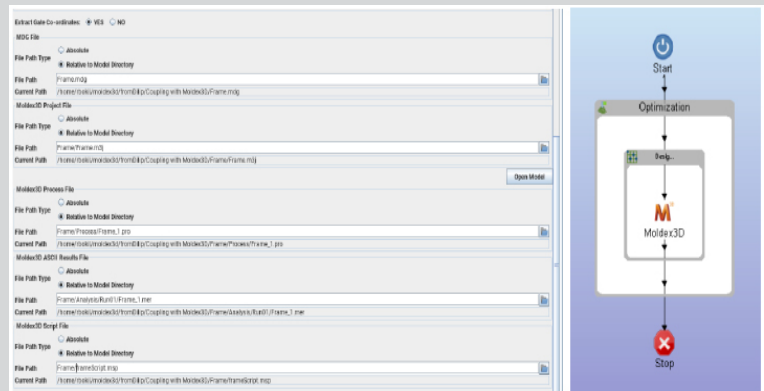
The following table summarizes the optimization information

Initial Max Pressure	39.15 MPa
Optimum Max Pressure	30.76 MPa
% Reduction	21 %
No. of Iterations	4

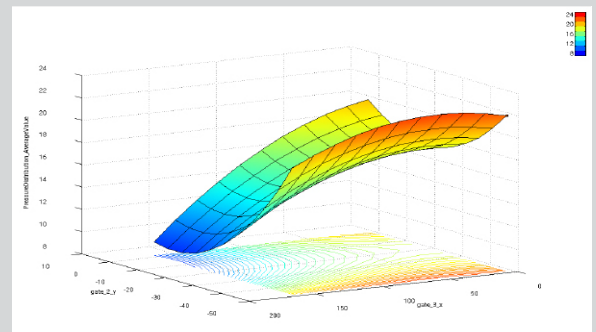
## Moldex3D Results Plot



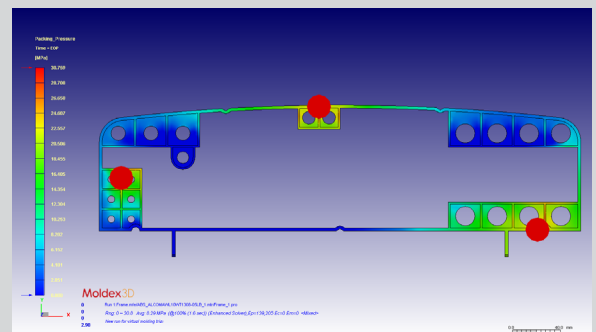
Initial Design



VisualDOC Optimization



Response Surface



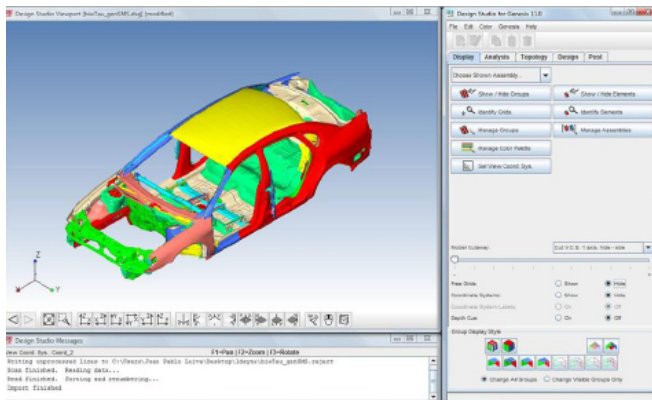
Optimum Design

## GENESIS - Structural Analysis & Optimization

GENESIS is a fully integrated finite element analysis and design optimization software package. Analyses include static, normal modes, direct and modal frequency analysis, random response, heat transfer and system buckling. Design optimization is based on the advanced approximation concepts approach to find an optimum design efficiently and reliably. Actual optimization is performed by the well established DOT and BIGDOT optimizers, also from VR&D. Design capabilities include: topology, shape, sizing, topography, topometry, and freeform optimization. Typically the optimization requires less than ten detailed finite element analyses, even for large and complex design tasks.

## Design Studio for GENESIS

Design Studio for GENESIS is a design oriented pre- and post-processor graphical interface for the GENESIS program. It features built-in and easy-to-use trails for setting up the optimization problem and running GENESIS from the interface. It also supports post-processing of the optimization results with contour plots, deformed plots, animations, etc.



Design Studio for GENESIS

## GSAM - GENESIS Structural Optimization for ANSYS Mechanical

GENESIS Structural Optimization for ANSYS Mechanical (GSAM) is an integrated extension that adds topology, topography, freeform, sizing, and topometry optimization to the ANSYS environment. Designers benefit by automatically generating innovative designs in a reliable, robust and easy-to-use interface. The extension allows the user to setup the structural optimization problem, optimize, post-process, export optimized geometry all within the ANSYS environment.

## GTAM - GENESIS Topology for ANSYS Mechanical

GENESIS Topology for ANSYS Mechanical (GTAM) is an integrated extension that adds topology optimization to the ANSYS environment. GTAM is a subset of GSAM. GTAM is limited to topology only.

## About Vanderplaats Research & Development, Inc.

Vanderplaats Research & Development, Inc. (VR&D) mission is to provide the best technology, software, staff of experts and client support in the optimization world. The company was founded by Dr. Garret Vanderplaats, one of the best known experts in the optimization world. VR&D has a track record for consistently delivering a competitive advantage to customers in a broad range of industries.

**Headquarters:** 1767 S. 8th St. Suite 200 Colorado Springs, CO 80905  
Ph. 719-473-4611 Fax. 719-473-4638 Email: sales@vrand.com www.vrand.com

**Michigan office:** 41700 Gardenbrook Suite 115 Novi, MI 48375  
Ph. 248-596-1611 Fax. 248-596-1911

## VisualDOC - Multidiscipline Design Optimization

VisualDOC, a multidiscipline design study (MDS) tool, allows users to perform design studies including multidisciplinary optimization (MDO) in deterministic and stochastic domain. VisualDOC has powerful tools which provide valuable insights into the design space. It can be easily coupled with any 3rd party commercial or proprietary analysis code and also comes with dedicated interfaces to several commonly used software packages. It is equipped with a powerful and intuitive GUI along with gradient and evolutionary optimizers,

## DOT - Design Optimization Tools

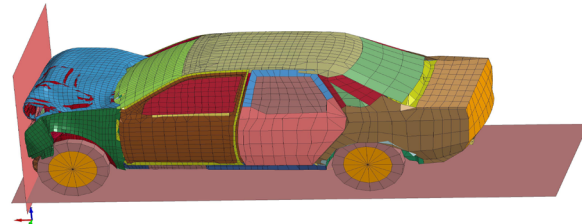
DOT is a general purpose numerical optimization software library which can be used to solve a wide variety of nonlinear optimization problems. If you require only an optimization engine to incorporate into your design software, DOT will serve that purpose.

## BIGDOT

BIGDOT is intended to solve very large, nonlinear, constrained problems where gradient information is available, and function and gradient evaluation is efficient. BIGDOT is capable of solving continuous, discrete/integer or mixed variable problems. Problems in excess of three million variables have been solved by BIGDOT.

## ESLDYNA - Optimization Software for LS-DYNA

ESLDYNA is based on the Equivalent Static Loads (ESL) method to perform optimization based on a nonlinear finite element analysis with GENESIS as the structural optimization program. ESLDYNA takes advantage of the capability of GENESIS, a linear structural optimization program, to solve large scale optimization problems based on the responses from a LS-Dyna nonlinear finite element analysis. It also helps to significantly reduce the design time by identifying high performance designs with five to ten nonlinear



Topometry Optimization to Minimize Firewall Intrusion

## SMS Fast Eigensolver

The SMS eigensolver may be added to existing NASTRAN installations to offer significant performance advantages over the default method when a large number of eigenmodes are required for a system with many degrees of freedom. Benchmark studies and user experience show 2-10 times speedup. SMS may also be embedded into your product/software.

