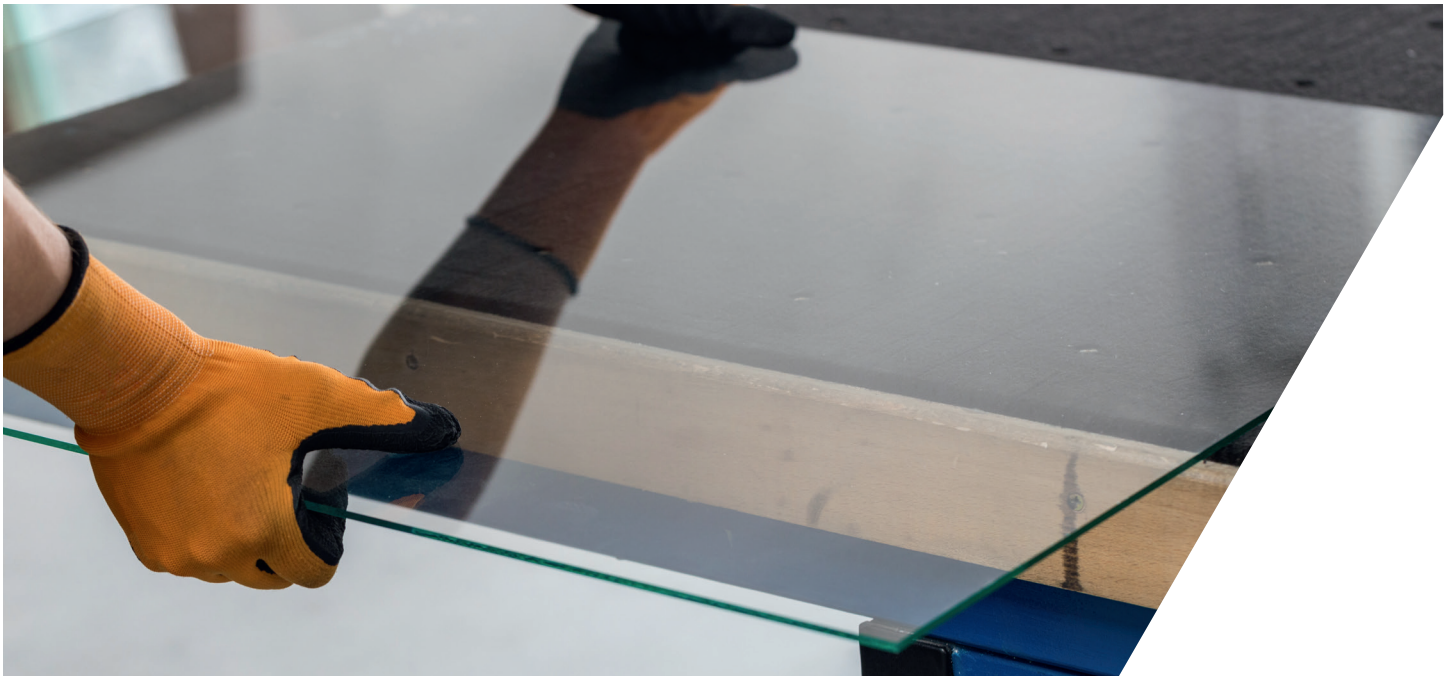
CASE STUDY



CRYSTAL CLEAR AND CERTIFIED

PY-ENGINEERING ACCELERATES COMPLEX GLASS CALCULATIONS WITH ALTAIR® HYPERWORKS®

About the Customer

Based in Rotterdam, Netherlands, Py-Engineering is a consultancy founded in 2021 that specializes in developing online tools that enable engineering automation. The company has created a white label online platform which simplifies the creation, sharing, and maintenance of online tools for their clients. Combining traditional engineering methods with state-of-the-art software development, the company delivers a one-stop solution for automation challenges. The company's customers mainly come from the architecture, engineering, and construction (AEC) industry. To complement its own software, Py-Engineering works with Altair solutions, in particular, the Altair® HyperWorks® platform including Altair® HyperMesh® and Altair® OptiStruct®.

Their Challenge

Glass calculations according to NEN 2608 – the Dutch legal standards mainly concerning static-loaded glass – are usually performed by glass manufacturers or engineering offices using complex, expensive finite element method (FEM) software. Using this software, it can take up to eight hours to calculate safe glass dimensions that take into account all possible loads, interactions, and proper glass thickness and composition. Working with the complex formulas and variables needed to calculate glass thickness within NEN 2608, requires expert knowledge and experience.

Jouke Lutgendorf, Py-Engineering's structural engineer and co-founder, wanted to make the process more accessible. To do this, he and former co-owner Mark Feijen started programming software for the complex glass calculations needed to meet NEN 2608 standards. Through automation, the team saw an opportunity to significantly accelerate the complex, lengthy calculations typically needed to determine glass thickness.

REDUCED DEVELOPMENT TIME BY UP TO

50% ▼

REDUCED SOFTWARE COSTS BY

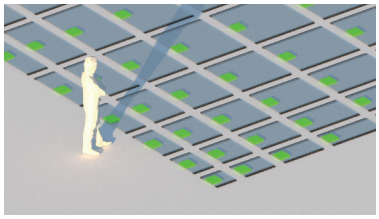
70% ▼

0%

FEM SKILLS NEEDED TO PERFORM CALCULATIONS

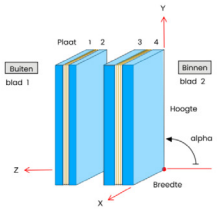
Try Altair® HyperWorks® Today: **Download Now**

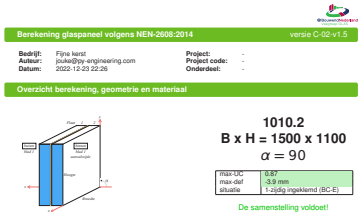
When Lutgendorf heard that Bouwend Nederland Vakgroep GLAS – the Netherlands' largest association of construction and infrastructure companies – was looking for an easy-to use glass calculation tool for its members, he started working on an innovative online solution. Ideally, the tool would enable users to calculate stresses, deformations, and perform NEN 2608 checks for glass panels of all sizes. The main challenge for the Py-Engineering team was to consider the extreme complexity of NEN 2608 while standardizing and simplifying glass pane calculations so non-experts could also perform calculations.



Our Solution

Important variables within NEN 2608 include a glass pane's width and height, its supports, its composition, and loads, including point loads, line loads, and distributed loads. To calculate these panes' thickness faster, Py-Engineering pre-calculated 80% of all common combinations using Altair® HyperStudy®. The calculation is performed with a parametric script and automated iterations, and the simulation results from thousands of combinations are stored in a knowledge database. Each new calculation that the user enters online is compared with the existing results and interpolated if necessary. Finally, the result can be downloaded as a PDF and includes traceable verification according to NEN 2608.





TOP: NEN 2608 looks at glass size, strength, materials, and weight limits. **MIDDLE:** Calculate stresses, deformations, and perform NEN 2608 checks for glass panels of all sizes. **BOTTOM:** Download PDF results with traceable NEN 2608 verification.

> "Using Altair solutions allows for more quicker, more detailed analysis that can give you a competitive edge over other companies."
>
> Jouke Lutgendorf, Co-founder Py-Engineering

Results

By combining modern software, a knowledge database, and a user-friendly interface, Py-Engineering developed a fast, intelligent tool for complex glass calculations for Vakgroep GLAS of Bouwend Nederland. The resulting tool is an automated process based on standardization, eliminating the need for manual calculations and saving users hours per calculation. The software also simplifies the serial processing (including preparation and post-processing) of FEA calculations. Providing technical expertise, the Altair team helped the Py-Engineering team benefit from the automation capabilities available within Altair software. Working together, the collaboration between Altair and Py-Engineering resulted in a flexible, standardized solution that can also optimize other products as well.

To learn more, please visit altair.com/architecture-engineering-construction