

Impact Inc.

User Documentation



Impact Inc.

Table of Contents

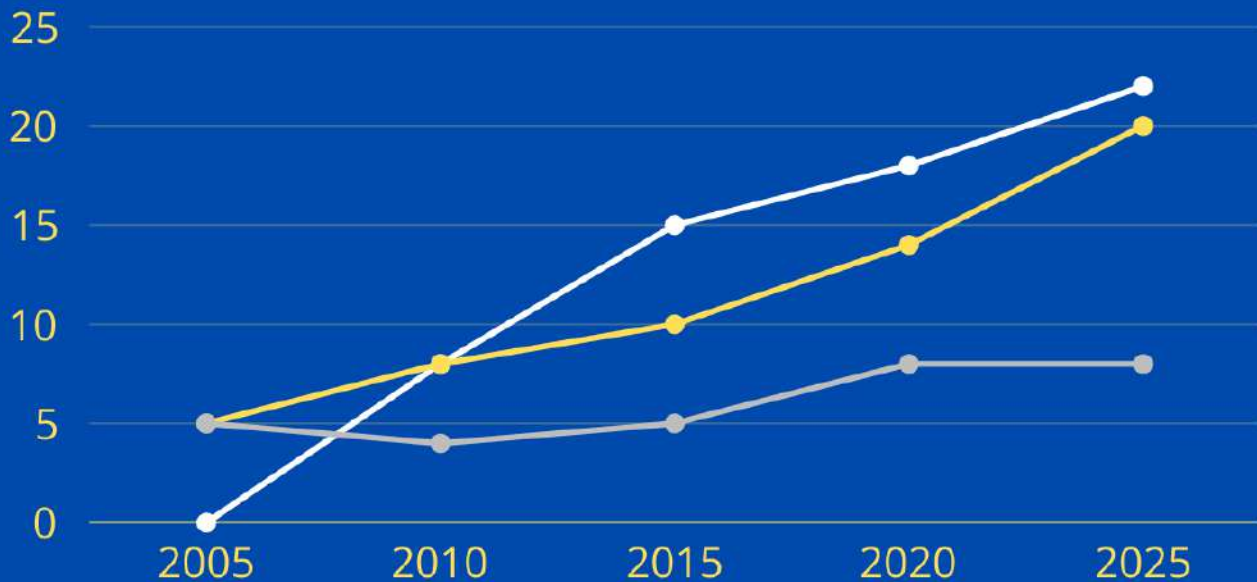
- 01** Introduction
- 02** Getting Started
- 03** Required Inputs
- 04** Understanding the Results
- 05** Special Features
- 06** Troubleshooting Errors
- 07** FAQs



WHAT CAN I DO WITH THE SOFTWARE?

About The Package

The software simulates and visualizes yield surface evolution under different hardening models (Isotropic, Kinematic, Mixed Hardening), helping users analyze material behavior during plastic deformation.



Getting Started.

1. Enter the required material properties in the 'Input' tab.
2. Click 'Run Simulation' button to start the analysis.
3. View the graphical results in the 'Results' tab.

Required Inputs.

01 Young's Modulus (E)

This represents the Stiffness of the material (MPa).

03 Initial Yield Stress (σ_y)

Initial stress at which plastic deformation begins (MPa).

05 Kinematic Hardening Modulus (H_{kin})

This controls the yield surface translation (MPa).

02 Poisson's Ratio (ν)

This is the ratio of lateral strain to axial strain.

04 Isotropic Hardening Modulus (H_{iso})

This defines the yield surface expansion (MPa).

06 Mixing Ratio

Determines the proportion of isotropic vs. kinematic hardening (0 = fully isotropic, 1 = fully kinematic, and $0 < \text{mixing ratio} < 1$ for mixed hardening).



Understanding the Results

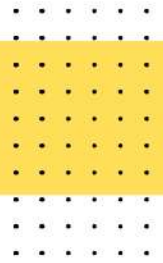
01
Strain Evolution Plot
Shows strain development over time.

03
Von Mises Stress Evolution
Tracks equivalent stress leading to yielding.

02
Stress Evolution Plot
Displays the material's stress response.

04
Yield Surface Evolution
Visualizes hardening effects on yield surface, putting into account the value of the mixing ratio.

SPECIAL FEATURES



Zoom

This feature enables the user to have an enhanced view of the generated results. Adjustments are left to the user's discretion.



Toggle Theme

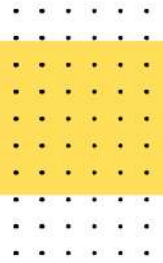
This offers the user the luxury of switching between light and dark themes. The user can always stick to what works best for them.



Plot Reading

With this feature, the user can take close-to-accurate readings from the plots with the availability of a mobile cursor.

SPECIAL FEATURES



Help

On the “help” interface, the user’s concerns are attended to. A button is available for a seamless download of the user’s documentation, which provides answers to their questions.



Clear Inputs

Instead of manually clearing parameters one by one, the 'Clear Inputs' button does it all at a single click.



Open-ended Access to Software’s Source Code

In the 'Help' tab, a link is available for users to access the open-ended software's source code, allowing them to explore, modify, and contribute to its development.

Troubleshooting Errors

In this section, you'd find help to all your troubling issues, and how you're to seamlessly avoid them.

Inputs.

**Invalid input:
could not convert
string to float.**

1. Ensure **ALL** parameter fields are filled.
2. Ensure **NO** alphabets are included in the fields.

Mixing Ratio.

**Mixing Ratio must
be between
0 and 1.**

Values **BELOW** 0 and **ABOVE** 1 are **NOT** allowed. Check your value.

Zoom.

**Can't get an Accurate
Zoom for a Perfect
Result Interface.**

Go back to the "Home Page" and click the **"Run Simulation"** button again.

FAQs.

What questions are people asking?

What does the mixing ratio do?

Why does the Yield Surface move?

It controls the balance between isotropic and kinematic hardening.

Kinematic hardening causes translation, while isotropic hardening expands it.



Contact the Developer.

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<https://github.com/EmmanuelImpact>