

# CASE STUDY | Fabrication conversion into a casting

## INDUSTRY

Rail

## PROJECT

An identified need, a fabricated part for the rail safety industry that was prone to breaking.

## DESIGN ISSUE

Developed to be low cost and functional, the simple fabrication was produced from formed sheet stainless steel and weld assembled.

## DESIGN CONSTRAINTS

Sheet steel comes in a variety of standard thicknesses and the perfect size may not be available, only simple forms can be produced economically.

## STRATEGY

Dean Group's design team used 3D CAD simulation and stress analysis software to develop a functional bracket that is stronger, lighter and ultimately lower in cost to produce.

With the flexibility of investment casting, normal fabricated design constraints do not apply, optimised material sections can be incorporated in the highly stressed areas and non functional areas can be weight relieved at no additional cost. It is one piece of metal, no reliance on welding.

## OBJECTIVES

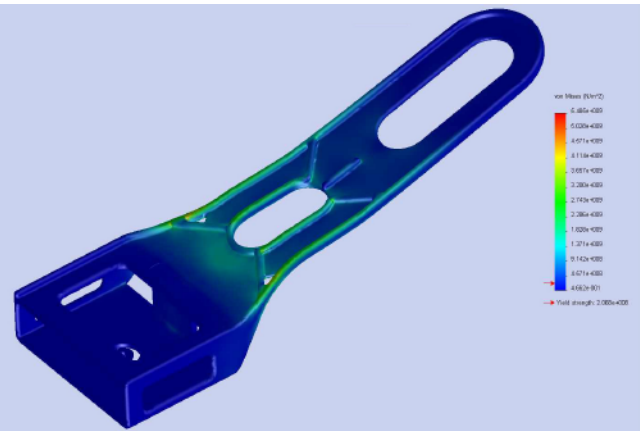
- Design a solution to a quality problem
- Add value in the design
- Reduce cost if possible

## KEY CHALLENGES

- Fairly ridged design constraints
- High profile, safety critical application
- Tight commercial constraints
- Resistance to change



Before and after: fabrication converted into a casting



Finite Element Analysis (FEA) Testing: increased strength

## OUTCOME

- Investment casting design solution using a highly repeatable process overcomes an inherent quality problem
- Accepted as the industry benchmark
- Significant quality improvement, inventory and overall costs down