# Hairline Cracks in Sand Casting Disappear in Permanent Mold Process

## A CASE STUDY

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# The Customer

This customer is in the transportation industry, requiring pieces like this blade of a **72-inch** locomotive fan.

# The Challenge

The customer came to us because they were experiencing issues with their current supplier. The part was being **sand casted**, and the customer was receiving parts with **hairline cracks** where the base meets the blade.

# The Solution

By switching to a permanent mold process, we alleviated their concerns of hairline fractures.

## Casting

The heart of the solution was in the casting method.

**Turbulence** in the metal flow during sand casting caused hairline cracks. By performing a **Finite Element Analysis (FEA)** and implementing a **tilt-pour** method, we identified the best way to cast the part with as little turbulence as possible.

While the sand foundry was casting from the tip, we **flipped the mold upside down** and fed the molten metal through the thick base.

# The Outcome

The customer **saved time and money** by switching from sand casting to permanent mold. Instead of receiving nonconforming parts, they received **strong** blades.