

# EroSolve Metamorphic Trim Solves Chronic Control Valve Problem in the Petrochemical Market

## The Challenge

A major petrochemical producer in South Korea was suffering from chronic problems with their slurry pump recirculation valves. The valves were installed in the pump recirculation line located at the bottom of a mixing drum, and the viscous fluid was susceptible to clogging. To avoid clogging, the customer had to operate the original valves in a fully open position, which made process control of the line impossible. Additionally, the valves were intended to control a high pressure drop.

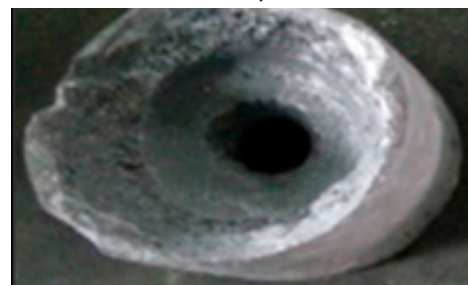
Due to improper trim selection, the installed competitor valves had trim exit velocities exceeding 100m/s and were experiencing trim damage due to cavitation. The cavitation damage also extended to the valve body, which could have resulted in atmospheric leaks and health and safety issues. The trim damage caused the valve to leak continuously which led to repeated maintenance every 4 weeks, severely impacting the plant and operating efficiency.

The original valve supplier attempted to solve the problem by providing harder trim materials such as Hastelloy C and titanium to prevent cavitation damage, but this was not effective.

This particular plant, which produces aromatics, is located in a large petrochemical complex with many other plants nearby. The customer tried to find a solution by collaborating with the other plants that experience the same type of problems. However, they quickly realized that no known solution was available and that problems associated with this application were a persistent issue for the whole petrochemical complex.



Body



Seat



Plug

Figure 1: Damage to customers original single stage contour plug valve

## The Solution

IMI Critical Engineering introduced the customer to the new EroSolve Metamorphic Trim (MMT) product, the world's first self-cleaning Metamorphic valve trim, combining the benefits of multistage-labyrinth and cascade technologies. The EroSolve MMT solution provides 8 pressure reducing stages avoiding cavitation and controls the trim exit velocity below <math>23\text{m/s}</math>. The multi-stage flow passage has a minimum size of 3.5mm which effectively passes particles and avoids clogging.

Installation of the EroSolve MMT solution was made easy with a customized body which met the customer's piping dimensions. The EroSolve MMT solution was shipped early and installed by the customer in January 2022.

## The Benefits

After three months of service, an inspection of the EroSolve MMT internals was carried out on-site by the customer and IMI Critical Engineering representatives. During this visit, the customer's first words were "It's just fantastic!!" and confirmed that the MMT valve is effectively operating in the slurry pump line. In addition to solving the chronic valve issue, EroSolve MMT increases the operational safety and reliability of the plant.

The customer has also asked IMI Critical Engineering to provide additional valve proposals and spare parts and has shared the success of the new EroSolve MMT with the other plants within the complex.



Figure 2: EroSolve MMT valve in service in the petrochemical plant



Figure 3: EroSolve MMT parts inspected after 3 months of service

**"It's just fantastic!!"**

Manager, Instrument Section  
Instrument and Electrical team

## Could EroSolve MMT solve your problems?

EroSolve MMT:

- Allows solid particles to pass through the valve trim without clogging
- Is a self-cleaning valve that needs less maintenance and causes less plant downtime
- Offers multistage high-pressure letdown that prevents velocity induced erosion and cavitation
- And is easy and fast to install on site

**Get in touch with  
IMI Critical Engineering  
today to find out more.**

**Americas**  
imiccisales.americas@imi-critical.com

**Asia-Pacific**  
imiccisales.apac@imi-critical.com

**China**  
imiccisales.china@imi-critical.com

**Europe**  
imiccisales.europe@imi-critical.com

**India**  
imiccisales.india@imi-critical.com

**Middle East and Africa**  
imiccisales.mea@imi-critical.com

**Other**  
imicci.sales@imi-critical.com