



# Metal Seal Design – New Product Development for a Leading O&G Equipment Manufacturer

ITC Infotech partnered with a leading Oil & Gas equipment manufacturer to develop a next-generation metal seal for sour service. Leveraging advanced FEA, material optimization, and integrated project management, the team overcame complex design and validation challenges—compressing the overall timeline by 25% while achieving API 6A and API TR8 qualification.

**25%**

**Timeline reduction with IPM**

ITC Infotech is a leading global technology services and solutions provider, led by Business and Technology Consulting. ITC Infotech provides business-friendly solutions to help clients succeed and be future-ready, by seamlessly bringing together digital expertise, strong industry specific alliances and deep domain expertise. The company provides technology solutions and services to enterprises across industries through a combination of traditional and newer business models, as a long-term sustainable partner.



[www.itcinfotech.com](http://www.itcinfotech.com)

## CHALLENGES

- Material selection complexity (For Sour Service, API, and NACE requirements)
- FEA intensive design: The seal turns into a plastic zone during the sealing function, making it complex to validate
- Highly non-linear FEA with plasticity involved, convergence challenges
- Geometry sensitive design: Minor changes to the profile can alter the results to a great extent
- Consideration of ease of installation and system-level components
- Test fixture and Tooling design
- Withstand 15 K pressures and qualify testing per API 6A and API TR8

## SOLUTION

- Collective consultation with internal SMEs based on the design challenges faced
- Manufacturing Expert consultation on a need basis to address manufacturing issues
- Managing overlapping activities to best utilize the resources and achieve efficient execution till Testing and Validation
- Material review and suggestion of alternate material (approval sought from the BH material expert before finalization)
- Test reporting and RCA for any failures, and corrective action with Final Test Report

## RESULTS

- Requirements analysis
- Multiple Concept designs and shortlisting main and back-up concepts
- Validating the concepts with Design calculations using MathCAD
- Test procedure writing and conducting RCA on a need basis
- Resolve test issues
- Metal Seal that qualified 15K Pressure
- Overall timeline compressed by 25% with Integrated Project Management