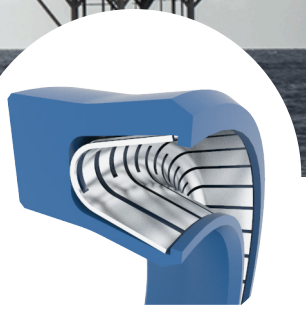
M SEALS
- Part of Diploma PLC

Case Study

Oil & Gas



Reverse Engineering Seals for API 10,000 Gate Valves

We recently partnered with a leading industry valve specialist on a time-critical reverse engineering project supporting the refurbishment of API 10,000 gate valves used in high-pressure service.

They had received a batch of valves requiring urgent overhaul as part of a scheduled maintenance programme. Due to the critical role these valves play in high-pressure systems, any delay in refurbishment could have resulted in operational disruption and increased downtime risk.

We were asked whether we could rapidly provide like-for-like sealing solutions capable of matching the performance characteristics of the original components while meeting an accelerated delivery schedule.

ASSESSMENT

Our customer supplied original seal samples removed from the valves to enable accurate reverse engineering. Each component was carefully evaluated to capture critical dimensions, tolerances and material characteristics required to maintain sealing integrity in high-pressure environments.

Given the demanding operating conditions associated with API 10,000 valves, maintaining dimensional precision and material performance was essential to ensure reliable sealing during service.

Close collaboration between our engineering team and the customer enabled rapid clarification of technical requirements throughout the project, supporting efficient decision-making and minimising delays.

During the process, opportunities were also identified to improve future procurement efficiency. Enhancements were made to the customer's internal procedures for measuring and documenting seal dimensions from existing components, enabling future replacement seals to be specified more quickly and accurately, reducing lead times for repeat orders.

SOLUTION DEVELOPMENT

Following assessment, prototype seals were produced for validation. The sealing solution was based on our KB19 profile from the M-Flex® range of single-acting, spring-energised seals.

We recommended PTV-WD57, a virgin PTFE (Teflon™) compound selected for its excellent chemical resistance, low friction properties and suitability for demanding sealing environments.

The reverse engineered design replicated the performance characteristics of the original seals while ensuring consistent quality and reliability. Testing confirmed the prototypes met installation and operational expectations, allowing the project to progress to full production without delay.

Manufacturing was completed within our Engineered Seals Division, enabling rapid transition from prototype to production quantities and ensuring delivery aligned with the critical project timeline.

OUTCOME

Production was completed and the seals were delivered on schedule, enabling the valve rebuilds to proceed as planned.

By combining reverse engineering expertise with responsive manufacturing capability, we supported the customer in maintaining project continuity while ensuring sealing performance was not compromised.

CUSTOMER FEEDBACK

> *"This turnaround would not have been achievable without the exceptional level of support provided by M Seals. Their commitment, technical expertise, and in-depth product knowledge were evident throughout, and the quality of their advice and service was exemplary. We greatly value our relationship with M Seals as a trusted supplier, and their ongoing support continues to be of significant importance to our operations."*

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