Wedge Kammprofile Gasket Critical to Complete Turnaround in October 2021

LAMONS.COM

CASE STUDY

INDUSTRY DESCRIPTION

A refinery in Billings, MT produces gasoline, jet fuel, and other products refined from crude oil.

BUSINESS SITUATION

A refinery was wrapping up a turnaround in their FCC unit in October 2021 when one of the last flanges needing bolt up had a major parallel misalignment.

THE LAMONS DIFFERENCE

Lamons was contacted immediately due to its strong reputation for solving complex gasketing challenges under pressure. The Lamons engineering team responded without delay, coordinating directly with refinery engineers to assess the issue on-site. Through hands-on collaboration, the team gathered precise dimensional data and rapidly designed a custom wedge Kammprofile gasket tailored to the flange misalignment.

A detailed drawing was quickly provided for review and approval, ensuring the solution aligned with the customer's technical and operational requirements. Lamons proactive, responsive approach, backed by deep technical expertise, enabled the team to deliver a fast, effective resolution that minimized downtime and kept the turnaround on track.

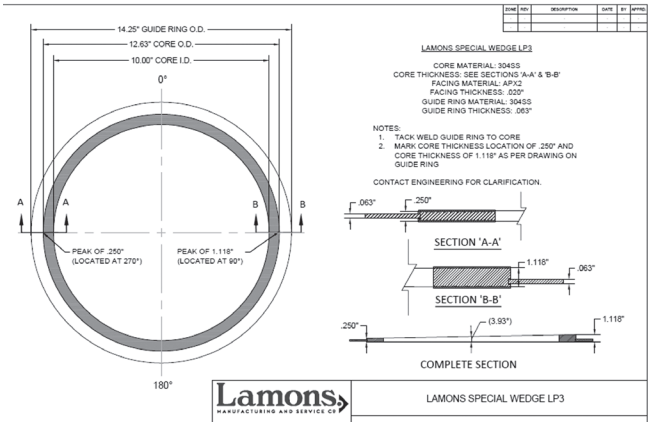
In October 2021, a refinery was nearing the completion of a turnaround on its Fluid Catalytic Cracking (FCC) unit when they encountered a critical issue: one of the final flanges required for startup was severely misaligned. While minor misalignment is common and typically resolved by experienced pipefitters through field adjustments, this situation was more severe. Despite repeated attempts by the refinery to correct the problem, all conventional methods failed. The misalignment was too severe to allow for standard gasketing solutions or piping adjustments.

It became clear that a custom-engineered gasket was the only path forward. Lamons was uniquely positioned to solve the problem with the limited time available thanks to our engineering expertise, rapid response capabilities, and proven ability to deliver precision solutions under pressure.

THE PROBLEM

The problem occurred on an angled pipe at the bottom of the FCC reactor, where the flange did not align parallel with the mating flange, commonly known as "bird beak." Despite attempts to manually adjust and bend the pipe, the angle remained off, and the flanges could not be brought into proper alignment for a secure connection.

This misalignment created a substantial delay in the restart process and required further evaluation and corrective action. Ultimately, the customer was unable to resolve the issue before the end of the turnaround, halting progress and jeopardizing the schedule.



Kammpro wedge gaskets are designed to address flanged connections where one or both flanges have fallen out of parallelism. The unique angled profile of the Kammpro core allows for even compression without the load loss required to straighten flanges.

Flange misalignment is a serious concern in refinery operations, especially in high-pressure systems like an FCC unit where precision and mechanical integrity are essential for safe and efficient operation. Misaligned flanges pose several risks. From a safety standpoint, they can lead to gasket failure, hydrocarbon leaks, or the release of high-pressure steam, any of which could present a serious hazard to personnel and equipment. Mechanically, even slight misalignment introduces stress on piping systems,

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CASE STUDY

LAMONS PRODUCTS AND SERVICES

Working closely with the refinery's engineering team, Lamons engineers designed a custom wedge Kammprofile gasket to specifically address the severe flange misalignment. Accurate dimensional data gathered on-site ensured an exact fit for the application. Once specifications were confirmed, the gasket was machined on a precision lathe to achieve the required thickness and sealing surface finish, then subjected to rigorous quality checks to validate performance.

Leveraging expedited manufacturing and logistics, Lamons air-freighted the gasket to Montana in under 24 hours, meeting the refinery's critical startup schedule. This rapid, engineered solution showcases Lamons ability to deliver precision sealing products under extreme time constraints, minimizing downtime and restoring operational readiness for the customer.

To discuss a challenge you are experiencing in your facility, contact Info@Lamons.com.

For technical assistance, contact Engineering@Lamons.com.

To contact a Lamons office near you, visit our website.

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bolts, and joints, which can contribute to fatigue and long-term failure. Operationally, issues like these delay startups and reduce throughput, creating significant downstream impacts across the site.

Misalignment can stem from several root causes, including inadequate pipe support or settling over time, thermal expansion that wasn't properly accounted for in the design, weld shrinkage or poor fit-up during reassembly, and tolerance stack-up in long pipe runs or modular skid packages. In this case, what initially appeared to be a mechanical detail quickly became a critical roadblock to safe and timely startup

LAMONS LP3 WEDGE GASKET

THE SOLUTION

The Kammpro gasket was manufactured to precisely match the engineer's gap measurements, effectively compensating for flange misalignment and ensuring a more uniform seal around the flanges. In many refineries, injuries occur when contractors attempt to manually bend piping to align unparallel flanges for gasket installation—an unsafe and unnecessary practice. Tapered wedge Kammprofile gaskets offer a safe and efficient solution by allowing proper sealing without forcing misaligned flanges into position.

THE RESULTS

Finding a solution for this misalignment, manufacturing it, and expediting delivery to the Montana refinery was critical to get the FCC unit back up and running on time. In terms of engineering assistance, reduction of downtime, and reduction of maintenance work, the wedge Kammprofile gasket generated $75,000 in direct cost savings compared to alternative piping modification solutions, in addition to hundreds of thousands in indirect savings by allowing the unit to start up on schedule without days of delay.

Performance/Efficiency: The Kammpro gasket offers superior sealing performance compared to spiral wound and other traditional gasket styles, largely due to its solid metal core design. This core is serrated and faced with a 0.020" layer of flexible graphite, creating a highly effective and reliable seal. One of the key advantages of the Kammpro is its versatility—it can be custom manufactured to virtually any shape or size, making it particularly well-suited for challenging applications, such as flanges with misalignment.

Unlike spiral wound gaskets, which require significant compressive force that acts directly on the metal winding, the Kammpro is a low stress sealing solution. Its performance comes from densifying the graphite into the serrations of the core, rather than relying on metal deformation. This allows it to maintain integrity under variable loads while minimizing stress on flanges and fasteners—an ideal choice for applications where alignment issues or mechanical limitations are a concern.

LASTING BUSINESS BENEFITS

This solution is not just a temporary fix—it can remain in service for the full operational cycle, lasting five years or more until the next unit shutdown.

For nearly a decade, Lamons has leveraged its precision lathe in Houston to manufacture wedge Kammprofile gaskets, effectively resolving flange misalignment issues for our customers. To the best of our knowledge, Lamons is the only manufacturer in the industry producing this specialized wedge-style Kammprofile gasket.

Learn more today by contacting your Lamons representative or by visiting Lamons.com.

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