



# PICKING THE Parts

## EXAMINING THE LIFETIME COSTS OF FABRICATED PARTS FOR VIBRATING SCREENS

### Special Report

One of the ways operation managers naturally presume to increase profits in a mining or aggregates operation is to cut costs. Parts are often an area that production managers eye as a way to save money, but it's important to look beyond the price and understand the part that a component is playing in the performance of a vibrating screen and long term productivity.

Operation managers need to be sure they are choosing the most reliable parts for their equipment. They need to consider the knowledge, experience and resources required to manufacture the part, the potential hazards of using a fabricated version and the value of having the support of the original equipment manufacturer (OEM). Here's a look at the difference between the two and how those differences can impact production.

### OEM Expertise

Consider the difference between fabricated and OEM components. Fabrication shops have come a long way and are often able to produce quality components, but some equipment, such as vibrating screens, need such a precise tolerance that a fabricated part might not work correctly no matter how closely it resembles the OEM version. Only a machine's manufacturer has the precise equipment drawings, measurements, plus/minus tolerances, material

composition and know-how on what needs to be heat tempered. This means only the manufacturer can produce a component that fits those fine tuned parameters. Even a reputable fabrication shop with capabilities similar to that of the OEM has to rely on reverse engineering and guesswork to fashion a replacement. The part may look identical, but if it's even a little off it could cause problems.

A vibrating screen isn't so much a machine as a complete system where every component works together to accomplish a specific goal. If an operation screens 1,200 tonnes per hour, for example, a manufacturer designs parts with different strength and rigidity than they would for a 200-t/h application. This customization ensures the entire system runs to the proper g-force and is strong enough to resist the forces of the material running over the screen. The weight of the parts, the required running speed plus amplitude are all taken into consideration when balancing the screen. If an operation chooses to fabricate a side plate and the weight is wrong, for example, it could impact the machine's balance. This could lead to improper motion in the vibrating screen causing poor stratification of material, lower bearing

Above: Manufacturers design and build vibrating screens as a total system. The weight of the parts, required running speed and amplitude are all taken into consideration when balancing the machine.

life, or premature breakage of body components due to improper operation.

**Call for Backup**

Custom fabrication shops can't offer the support benefits of the original equipment manufacturer. OEMs usually have the infrastructure to ensure fast, efficient problem solving. If there is a problem with a part, the OEM will take full responsibility, quickly assess the situation and send a replacement almost immediately. Most parts shops don't have the resources for a quick, precise turn-around if the part doesn't work right, and there is no guarantee the replacement fabricated part will be correct.

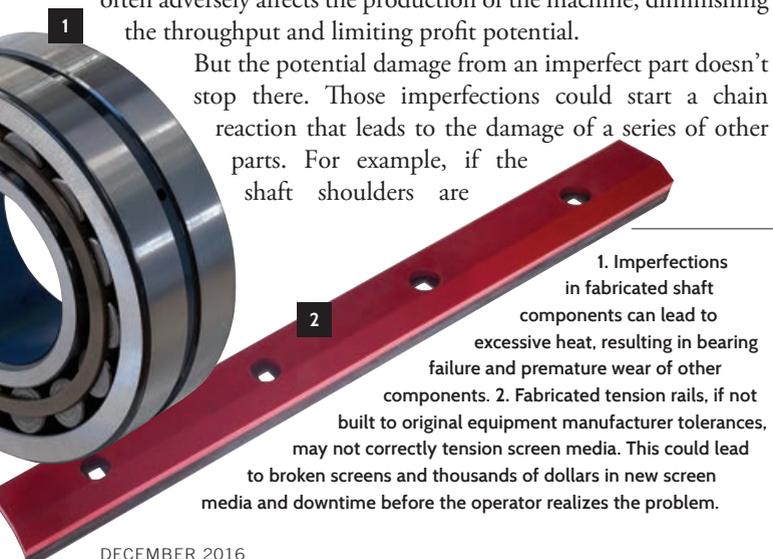
In addition, working with an OEM means having a support team that understands an operation, its production and equipment. They know what parts will wear quickly and what parts need to be on hand to limit downtime. They often offer OEM supplier agreements that ensure they will have critical parts in stock for immediate delivery, limiting or eliminating extended downtimes.

OEMs' focus on vibrating screens also brings an in-depth product knowledge that's rare elsewhere. Some manufacturer's certified technicians test each machine as a system before each leaves the factory, and they run the same tests once the vibrating screen has been commissioned to ensure results are identical. They use this information to make sure every component is running at OEM standards, and the machine plus components are backed by a strong warranty program. Not only do some manufacturers offer warranties on new equipment purchases, some guarantee parts for up to a year if an operation uses OEM certified technicians and parts and performs regular maintenance. Any fabricated parts introduced to a machine during a warranty period will void the entire machine warranty.

**Fabricated Parts' Hidden Price Tag**

While at first a fabricated component seems to make sense because it can often cost less than an OEM part, those savings are often short term. Minor imperfections in the part or lower tolerances for the stress placed on the machine can cause the component to fail prematurely, resulting in additional replacement costs on top of unscheduled maintenance. Even while the part is functioning, it often adversely affects the production of the machine, diminishing the throughput and limiting profit potential.

But the potential damage from an imperfect part doesn't stop there. Those imperfections could start a chain reaction that leads to the damage of a series of other parts. For example, if the shaft shoulders are



1. Imperfections in fabricated shaft components can lead to excessive heat, resulting in bearing failure and premature wear of other components. 2. Fabricated tension rails, if not built to original equipment manufacturer tolerances, may not correctly tension screen media. This could lead to broken screens and thousands of dollars in new screen media and downtime before the operator realizes the problem.

not machined within the OEM tolerances, an operation could see problems within hours of operation. This slight difference in size can cause the shaft assembly stack up to be too tight or too loose, leading to excessive heat and or wear of the shaft components. This can cause bearing failure or premature breakage of shaft components or body components.

This chain reaction of issues could result in maintenance costs far greater than the price of the fabricated component, but the cost is compounded by the fact that rarely is the heart of the problem diagnosed on the first pass. Most operators miss the true cause of the problem and begin fixing the symptoms – a cracked panel, a cross member or sections of screen media. Then the damage is destined to repeat and those parts must be replaced again. These symptoms might become obvious within 48 hours; while the root cause might take a month before it's realized. By the time technicians find the issue, the cost of the initial part fix could be greatly multiplied and could be much higher than what the OEM counterpart would have cost.

Take tension rails, for example. A customer might wonder why his screen media is breaking after just a week of use, where before it lasted a month or more. An OEM representative visits the site and finds the operation has been buying tension rails from a local fabrication shop to save money. The tension rails looked right but were not tensioning the screen media properly across the screen deck, causing the sections to break. What saved the operation a few bucks up front on new tension rails cost them thousands of dollars in screen media and downtime for change-outs. In addition, if the faulty part caused the vibrating screen to operate incorrectly, there's a good chance that the stratification didn't occur correctly and that materials may have to be rescreened or discarded.

If operators do notice a problem soon after installing a fabricated part, they can prevent further damage by shutting the machine down quickly. However, this still results in costly downtime, as mechanics order parts and make repairs. Any time the vibrating screen can't run will bite into profits, particularly for operations in the midst of production season or a mining operation, where a few hours of lost time can result in tens of thousands of dollars of profit losses. This cost alone would quickly offset any savings from choosing fabricated parts.

**Stick with OEM**

Choose carefully when looking at replacement parts. While fabricated components are usually cheaper and may appear to work correctly, any variance could cause damage and downtime down the line. Continue to work with the original equipment manufacturer to guarantee a supply of reliable parts and the backing of a company with the resources to solve problems quickly. The right choice means more uptime, more profits and the assurance that a part will only make a machine run better. **CMJ**



Information for this Special Report provided by Duncan High, division manager of processing equipment technology, Haver & Boecker Canada.