The Untapped Value of Fugitive Emissions Reduction: 10 benefits for your plant

BY ROBBIE RIGGS

What are Fugitive Emissions?

Fugitive emissions are the unintended and uncontrolled release of gases, often from leaks of industrial equipment such as valves, pumps, and connectors. In petroleum refineries, these emissions can include methane, ethane, propane, and sometimes more harmful substances like benzene. In chemical plants, these emissions can include butadiene, ethylene oxide, ethylene dichloride, and vinyl chloride. While these volatile organic compounds (VOCs) have a short atmospheric lifespan, they tend to have lasting adverse effects on the environment.

These emissions not only pose environmental and health risks but also represent direct operational and financial liabilities for facilities. Left unaddressed, fugitive emissions can undermine regulatory compliance, increase costs, and erode public trust. However, when facilities take proactive steps to control leaks, the benefits extend far beyond environmental protection; they create

measurable business value. This is where the true value drivers of emissions reduction come into play.

What are the Value Drivers?

Most Substantial: Reduced leaks lead to reduced pollutants released to the air (VALUE)

1. Improved gaskets and valve packing reduce fugitive emissions, helping facilities comply with increasingly strict environmental regulations.
2. With reduced emissions, companies reduce the risk of incurring fines, legal penalties, or other costs associated with non-compliance.
3. Reducing emissions can qualify facilities for reduced emission fees and possibly emission credits (GHG and other pollutants).

Substantial: Reduced leaks lead to more product for sale and revenue (VALUE)

4. When fugitive leaks are minimized with improved gaskets and valve packing, the facility retains more of its valuable products for sales.
5. This not only boosts revenue but also enhances overall process efficiency.
6. When leakage is reduced the energy needed to compensate for lost (leaked) material is lessened, leading to a more energy-efficient operation.
7. Product loss due to leaks represents a significant economic cost. Reducing fugitive emissions is, therefore, often considered not only an environmental necessity but also a financial imperative.

Latent: Reduced leaks lead to lower maintenance, repair, and planning/scheduling costs (VALUE)

8. Leaks contribute to equipment degradation, leading to increased maintenance & cost, more frequent repairs & cost, and premature replacement of components & cost.
9. Proactively using low emission gaskets and valve packing meeting Industry standards - API 622, 624, 641; and ISO 15848 - extend the operational life of critical infrastructure by reducing exposure to aggressive process vapors, thus reducing corrosion and wear.
10. Reduced leaks and repairs lead to reduced equipment environmental monitoring (LDAR) costs. These savings on maintenance and repair expenses translate into lower operating costs and reduced capital expenditure over time.

The financial and operational advantages of reducing fugitive emissions become even clearer when applied at scale. Beyond lowering operating costs and extending equipment life, the cumulative effect of these improvements can transform the bottom line for entire facilities.

The 'Take Away'

The implementation of low emission gaskets and valve packing presents a compelling economic advantage for industries seeking to mitigate fugitive emission leaks. Addressing fugitive emissions through the Total Cost of Ownership (TCO) lens, evaluating 'obvious' and 'latent' costs & benefits, to reduce fugitive emissions underscores the importance of a holistic approach that considers both financial and environmental impacts.

Investing in advanced, low-emission technologies and adhering to best practices for gaskets and valves significantly reduces fugitive emissions, generates a financial return, and positions companies for the future while complying with current regulations.

ABOUT THE AUTHOR

Robbie Riggs is the President & CEO of TEADIT® North America. With extensive experience in the oil & gas, petrochemical, and chemical processing sectors, he is a degreed mechanical engineer from VCU in Richmond, VA. Robbie holds several patents on innovative sealing solutions in the oil & gas and chemical processing industries and drives the company's mission to deliver innovative, low-emission gasketing and packing solutions that improve safety, reliability, and environmental performance.