

**TANA**

TANA GUIDE

# **TYRES AS AN ALTERNATIVE FUEL FOR CEMENT PRODUCTION**

TANA FROM WASTE TO VALUE®

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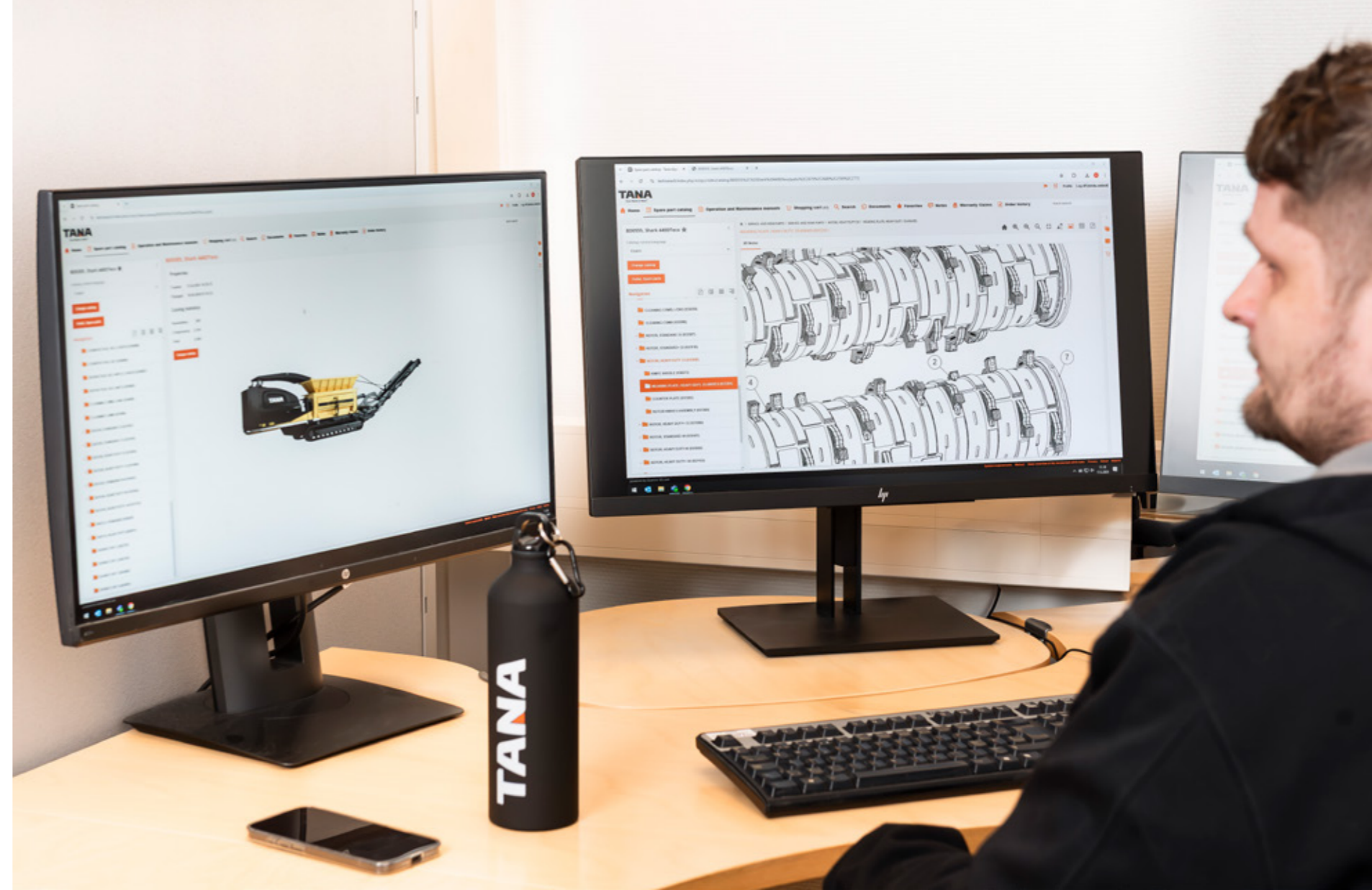
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# Dear reader,

Thank you for taking a time to read this guide, tyres as an alternative fuel for cement industry.

This guide is designed to help cement producers understand the full potential of TDF, the critical role of shredding in its production, and how Tana's solutions can support a seamless transition to alternative fuels. Whether you're exploring TDF for the first time or looking to optimize your existing process, this guide offers practical insights, technical guidance, and real-world examples to support your journey, from waste to value.

Kind regards,

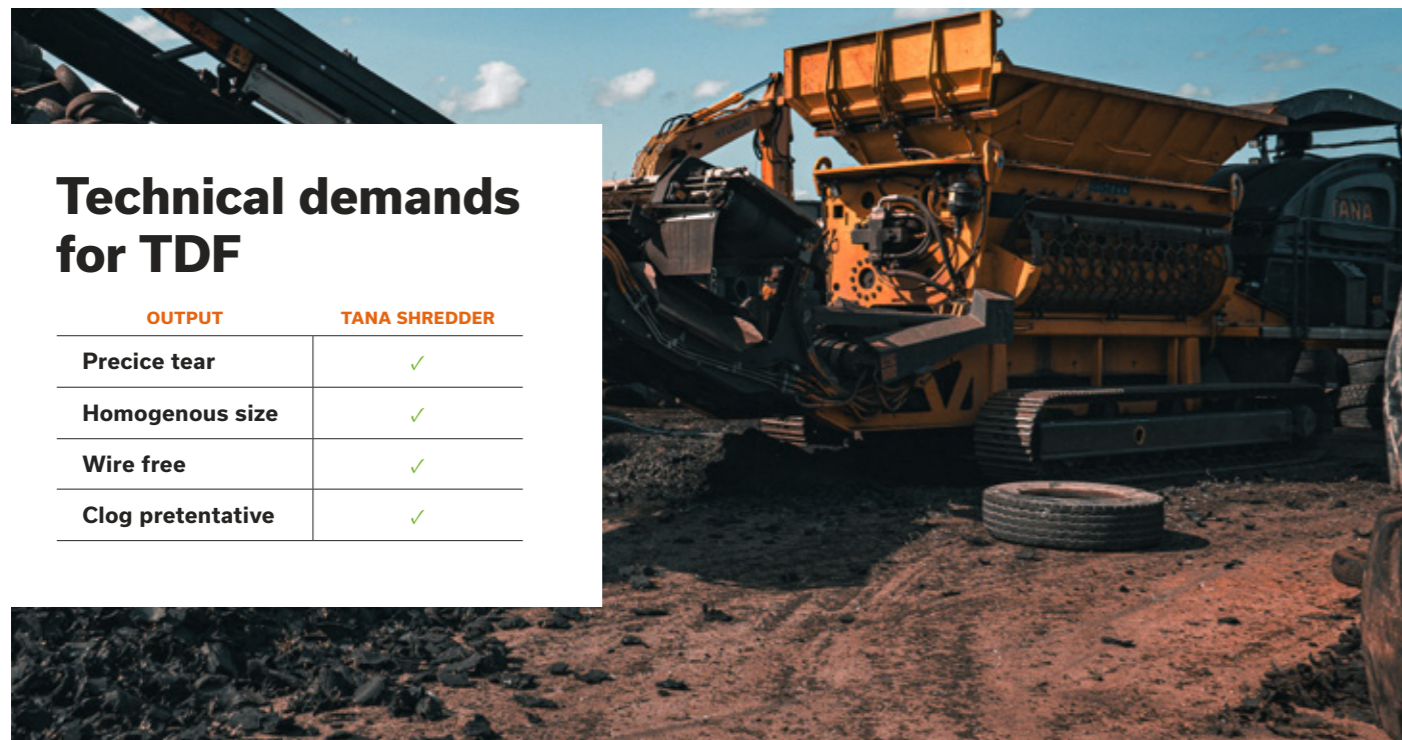
*Team Tana*

# Methods

## Alternative fuel from machine manufacturer perspective

In the global push toward sustainability and circular economy practices, cement producers face growing pressure to reduce their carbon footprint while maintaining operational efficiency. One of the most promising solutions is the use of alternative fuels, particularly tyre-derived fuel (TDF) — a high-calorific, cost-effective, and widely available energy source made from end-of-life tyres.

As a machine manufacturer specializing in waste processing technology, Tana offers a unique perspective on the TDF value chain. The expertise lies in designing shredding solutions that meet the technical demands of TDF production while helping cement producers achieve cleaner combustion, lower emissions, and consistent fuel quality.



### Technical demands for TDF

OUTPUT	TANA SHREDDER
Precise tear	✓
Homogenous size	✓
Wire free	✓
Clog pretentative	✓



The unique tyre tear made by TANA shredder



## Fossil fuels

Burning fossil fuels creates energy for people all over the world. While that is incredible, fossil fuels are also responsible for heavy releases of greenhouse gases into the atmosphere, which in continuation increases the temperature of our globe, and causes climate change.

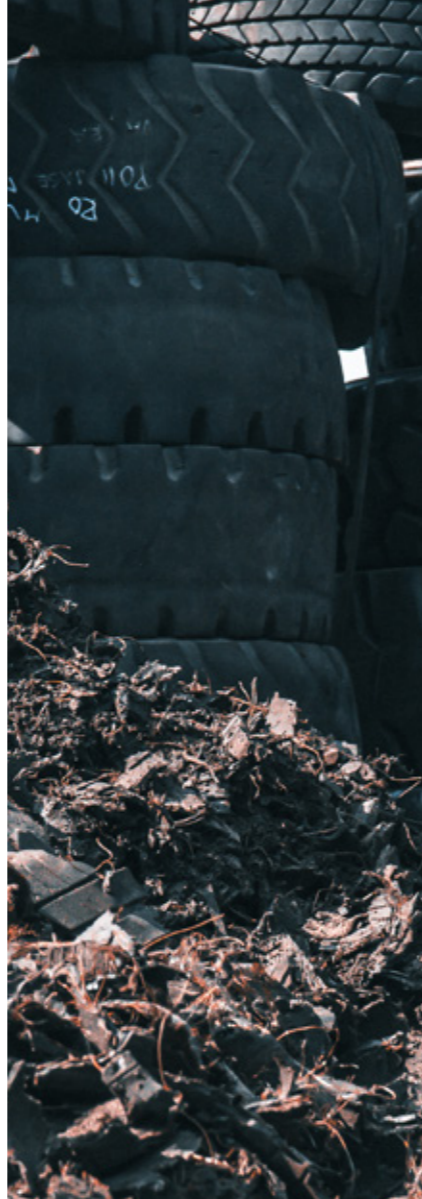
## Alternative Fuels

An alternative fuel to fossil fuels is, **renewable energy**. Common alternatives to coal, oil and gas are; waste lubricating oils, chlorinated hydrocarbons, solvents, plastics, used tyres, refuse derived fuel, sewage sludge and timber waste, to name a few.

## Alternative Fuels in cement production

Tana specializes in transforming waste into energy, a commitment reflected in the company slogan, TANA From Waste to Value®. With this expertise, customers can rely on Tana to deliver effective solutions tailored to their needs.

**Given the high calorific value of tyre shred, which is nearly equivalent to that of oil, this material presents a compelling case as an alternative fuel (TDF) for cement kilns.** Basically the waste is first shredded, then the raw material is transported to be burned in a kiln, the heat separates a rock hard substance called clinker, which is eventually mixed with some gypsum or other materials to produce cement.



**Clean end product from wires and contaminants**

A magnet collects the loose wires, which are then placed onto an additional conveyor, resulting a secondary revenue stream.

## Contamination risks

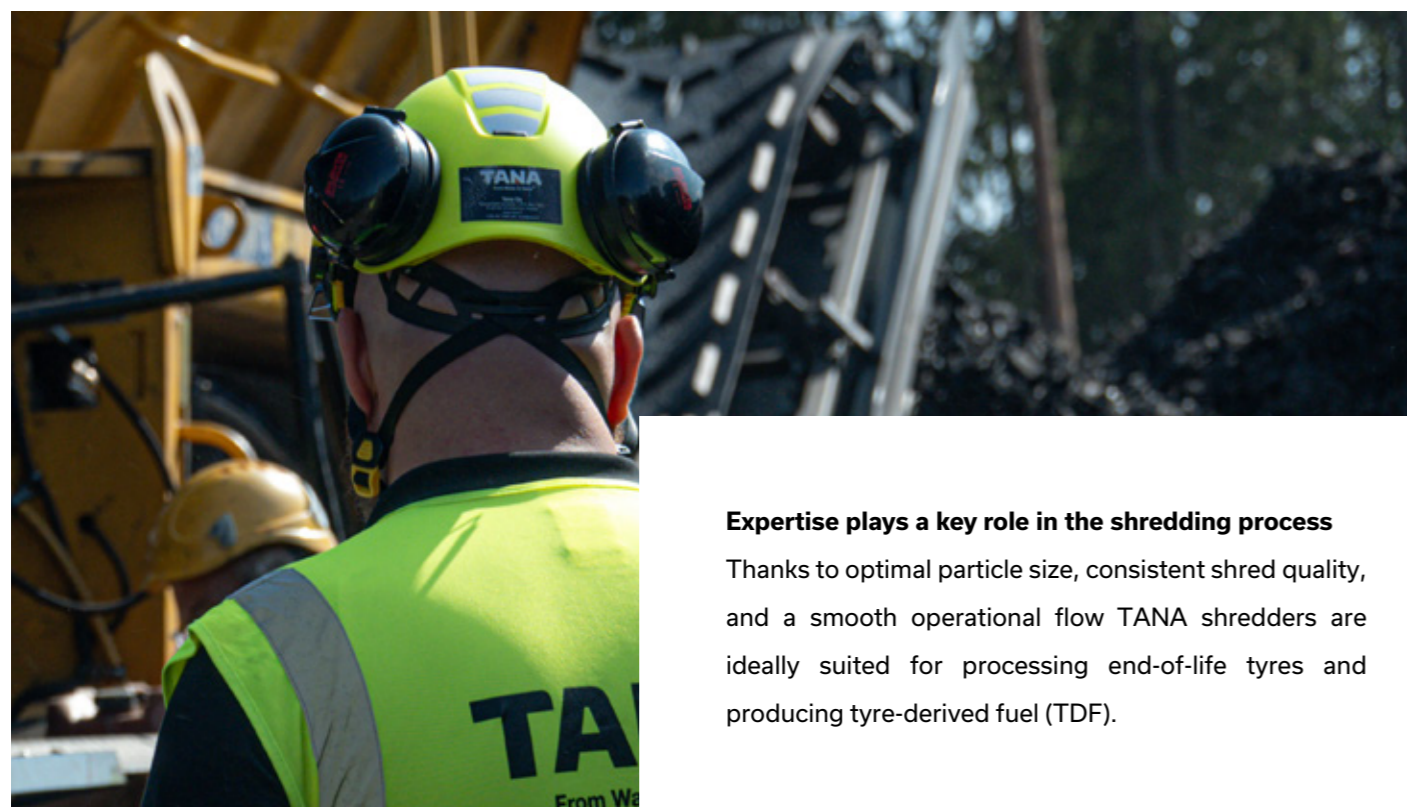
Metal wires pose a significant challenge when tyre-derived fuel (TDF) is used in cement kilns. These wires can contaminate the kiln and must be removed as thoroughly as possible to ensure clean combustion and protect equipment. Early removal of metal during the pre-shredding phase is especially critical to streamline the multi-step TDF production process.

TANA shredders are specifically designed to meet this challenge. Instead of cutting, the rotor tears the tyres apart, a method that significantly improves the liberation of metal wires from the rubber during the initial processing stage. As the process exposes the wire, it allows the overband magnet on the shredder to efficiently capture and remove a substantial portion of the exposed metal, reducing contamination and improving fuel quality from the very first step.

### TWO-STEP MODEL OF REMOVING THE WIRES

TANA shredder

	FEATURE	RATING	OUTCOME
Tana technology	Rotor torque	440 kNm	Tyre tear and metal liberation
	Neodymium HD magnet	675 gauss 250 mm	Removal of metals



### Expertise plays a key role in the shredding process

Thanks to optimal particle size, consistent shred quality, and a smooth operational flow TANA shredders are ideally suited for processing end-of-life tyres and producing tyre-derived fuel (TDF).

# ROLE OF SHREDDING

## TANA in action

Impossible for other shredders with the same fuel efficiency and capacity, TANA high-torque shredders make it possible to shred tyres to a very homogeneous 80 mm (3") particle size in just one pass and separate most of the metals during the shredding process.

You can easily adjust the particle size of the tire shred to the required size within a 50–500 mm range. The optimal particle size is dependent on the feeding method, mixture used, and the technology of your cement kiln. The particle size can be adjusted by changing the counter-knife setting on the side door and choosing a suitable rotor screen. The bigger the particle size, the higher the capacity. By using the operating program for tyres, the machine automatically adjusts itself to the optimal level, thereby protecting the machine and optimizing operating costs.

- ▶ Operating programs for applications, incl. tyres
- ▶ Desired particle size in one pass
- ▶ Robust construction
- ▶ Selection of options available
- ▶ Easy to operate and maintain



## How to assess facility readiness

Producing tyre-derived fuel (TDF) efficiently requires not only the right shredding technology but also the right platform configuration to suit the operational environment. Tana offers a range of shredder variants designed to meet the diverse needs of cement producers, whether operating in remote areas, urban facilities, or integrated waste processing sites.



### PLATFORM VARIANTS

PLATFORM VARIANT	OPERATION TYPE
Semitrailer	Multi-site use
Tracked	Outdoor processing areas
Stationary	High-volume, continuous operation

All TANA shredders share the same intelligent technology and power rating, regardless of platform variant.

### POWER OPTIONS

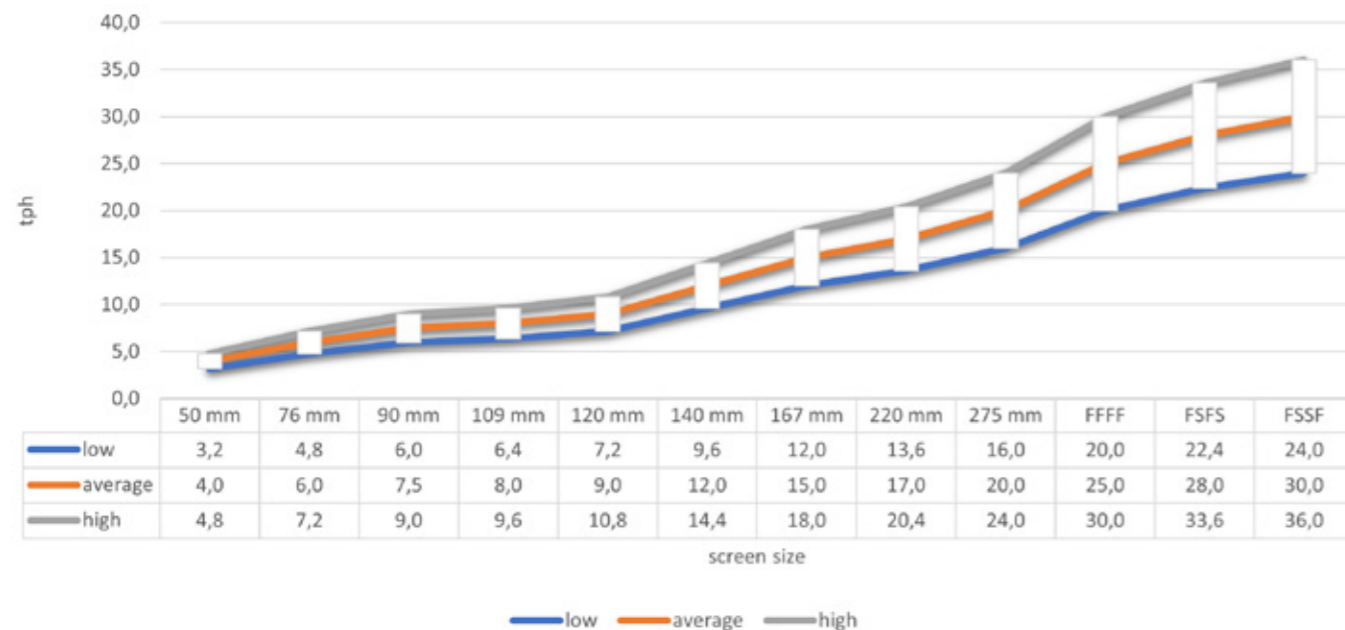
You can choose either diesel or electric power as the energy source. However, all TANA shredders use diesel when moving the machine.

MODUL	RECOMMENDATION
Diesel	Remote or off-grid locations
Electric	Facilities with stable grid access, indoor installations or environmentally sensitive areas

## Performance metrics

Whether operating in mobile, stationary, or tracked configurations, TANA shredders maintain high throughput and consistent output quality. Combined with remote diagnostics via TanaConnect®, operators and service teams can monitor performance in real time, respond to issues quickly, and keep downtime to a minimum.

Application chart showcasing the capacity of TANA Shark shredding tyres.



Understanding the shredding capacity of tyre processing equipment is essential for planning efficient TDF (Tire-Derived Fuel) operations. The chart on the left page illustrates how throughput (measured in tons per hour, tph) varies with different screen sizes on the shredder.

It presents three performance levels:

- ▶ Low capacity, blue line
- ▶ Average capacity, orange line
- ▶ High capacity, grey line

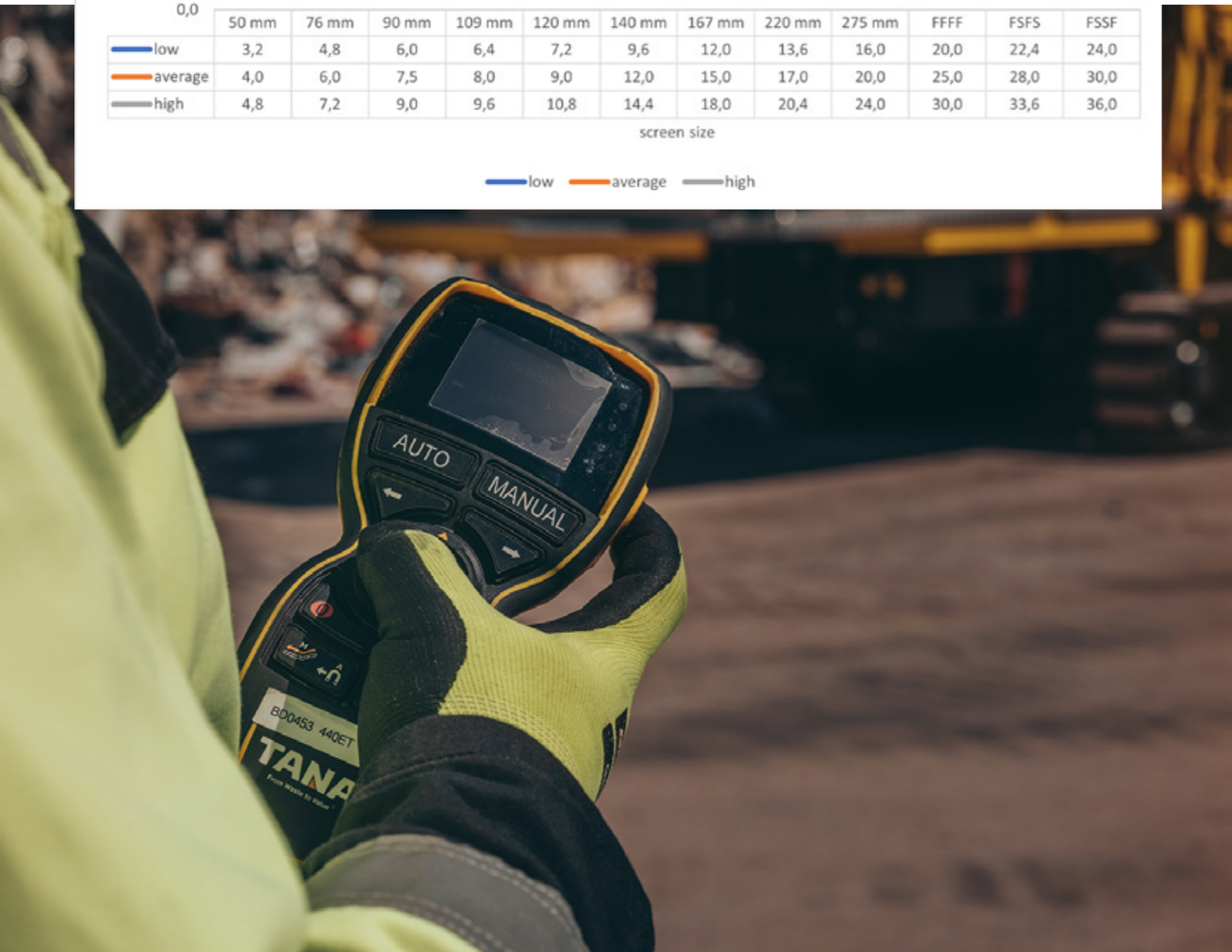
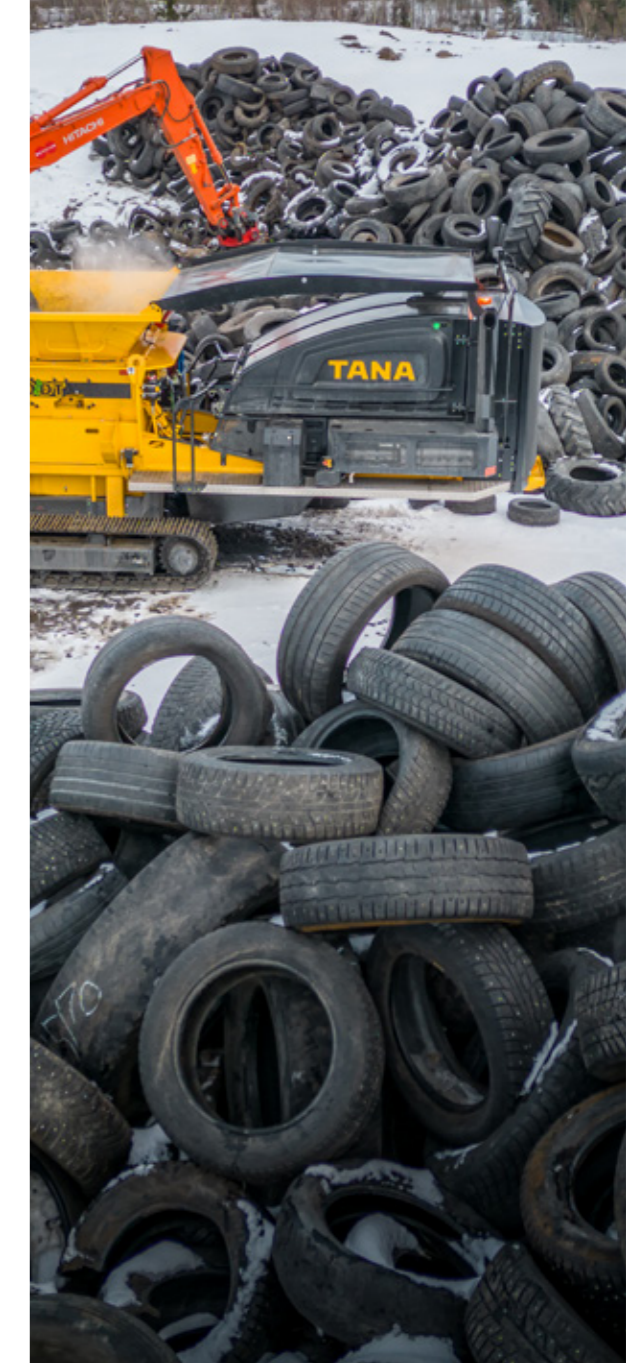
As screen size increases from 50 mm, the throughput rises consistently across all performance levels. This trend highlights the machine's ability to scale predictably, which is critical for aligning shredding output with operational demands.

### Scalability

The chart demonstrates reliable performance scaling. Whether operating at low or high capacity, the increase in screen size directly correlates with higher throughput. This predictability allows operators to plan production volumes with confidence and adjust settings based on fuel demand or processing constraints.

### Design Flexibility

The wide range of available screen sizes supports customization for different tyre types and desired output granularity. Smaller screens yield finer material suitable for specific combustion systems, while larger screens enable higher throughput for bulk processing. This flexibility ensures that the shredder can be tailored to meet diverse fuel specifications and facility requirements.



# Experiencing TDF production

Success stories around the world

## CASE AUSTRALIA

Chip Tyre's business has experienced remarkable growth, expanding from processing 200,000 tyres per year to 200,000 tyres per month. To support this scale, the company chose the TANA shredder, known for its robust design and proven performance with challenging materials like tyres. Operational efficiency means keeping maintenance costs under control. David Mohr from Chip Tyre shared a compelling metric:

**"It has cut down our wear part bill by probably 40%."**

This reduction in wear part expenses is a direct result of TANA's robust design and optimized shredding mechanics, which reduce stress on components and extend service intervals.



## CASE FINLAND

Finland processes almost 100% of used tyres, which is around 65,000 tonnes of tyres annually. One of the most critical factors in TDF production is the quality of the shred. Poorly shredded tyres can clog feeding systems and disrupt kiln operations. Ursula Kääntee, Head of Sustainable Development in the cement industry, highlights this point:

**"The fewer disruptions there are in the process, the more likely it is that the tyre shreds are made with a TANA shredder."**

This speaks to the core value of reliability in TDF production. When operations run smoothly, without interruption, the performance of the shredder becomes a trusted part of the process.

# Conclusion

End-of-life tyres are a challenging type of waste since the tyres are flammable, difficult to shred, expensive to treat and get rid of. However, tyre derived fuel TDF is an extremely effective and affordable alternative to the traditional fuels used in cement kilns.

If you'd like to discuss more about how the TANA machines can assist your business, please do not hesitate to contact us. We believe actions speak louder than words, that's why we keep our focus on the robust and simple tools that make hardworking people work smarter.

## Solution based recommendation

The TANA Shark shredder stands out as the ideal solution for tyre-derived fuel (TDF) production, thanks to its robust design, exceptional versatility, and high productivity. It has been purposefully built to shred toughest possible materials, including car, forklift, truck, and tractor tyres. Its ability to produce a wide range of homogeneous particle sizes ensures compatibility with various fuel specifications required by cement kilns.

To further enhance performance and output quality, recommended add-ons include an overband magnet for efficient metal separation and a screen for precise particle size control. These features help ensure clean output, reduce contamination risks, and support uninterrupted kiln operation, making the TANA Shark a comprehensive solution for alternative fuel production.

### TANA Shark Technical Details

- ▶ Power rating 399 kW
- ▶ Nominal rotor torque 440 kNm
- ▶ Loading volume 5 m<sup>3</sup>
- ▶ Rotor speed 28 rpm



**TANA**

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