

TANA

Tana guide

TYRES AS AN ALTERNATIVE FUEL FOR CEMENT PRODUCTION

TANA FROM WASTE TO VALUE®

Introduction

Building a sustainable future

In recent decades, we've witnessed a shift in the use of fossil fuels. More and more industries resort to alternative fuels instead of traditional fuels, due to affordability and nature preservation. In a world where sustainability has become nearly a requirement, the use of alternative fuels is not anymore only a good deed, but an intelligent action against an environmental crisis and in addition, a smart business move.

This pressing environmental crisis has forced industries to rethink their reliance on fossil fuels. The stark reality of climate change has pushed alternative fuels to the forefront as a viable and responsible solution. These alternative fuels encompass a diverse range of options, each with its unique advantages and challenges. Sustainable practices and reduced carbon emissions can lead to cost savings, improved corporate image, and access to growing markets for eco-friendly products and services.

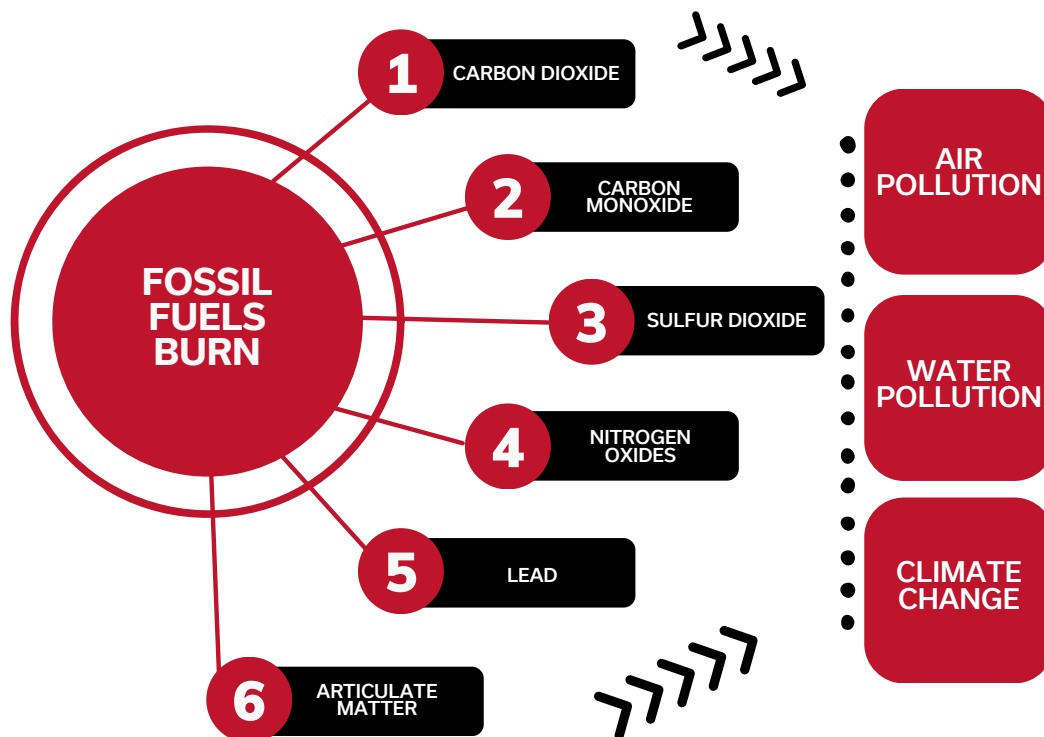
Moreover, governments around the world are implementing policies and regulations to incentivize the use of alternative fuels and curb greenhouse gas emissions. Incentives such as tax credits, rebates, and emissions reduction targets are encouraging industries to invest in cleaner technologies and fuels.

Businesses, governmental entities, and individuals collectively assume pivotal roles in this transformative endeavor, thereby facilitating the widespread adoption of alternative fuels as the prevailing standard, rather than an exception, in our pursuit of a cleaner and more environmentally sustainable planet.

Traditional method

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.



Contemporary method

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

Alternatives

Even though the traditional kilns still use fossil fuels for energy, the cement industry has advanced greatly in the last few decades. The use of alternative fuels hasn't gone unnoticed in cement production. Huge environmental benefits, renewability and the reduction of cost have influenced companies in varying sizes.

In the future, profits lie in sustainable solutions such as alternative fuels: tire-derived fuel (TDF) is an environmentally-friendly and cost-efficient replacement for materials like oil and coal that have traditionally been used in cement kilns.

The energy consumption of cement kilns is one of the largest expenditures in cement production. If it can be optimized by switching to alternative fuels, there is a direct effect on cement producers' bottom line. Using TDF saves significantly in fuel costs as the heat value of tire shred is almost equal to oil and 25% better than that of coal. Additionally, TDF decreases the NO_x emissions produced by cement plants and makes cement producers less affected by the changes in the oil price.

"Using only alternative fuels in cement production is the future. There are already examples in the market where fossil fuels have been substituted by 85% with alternative fuels coming out of waste streams."

- Josef Imp, SVP Business Development, Global Accounts



Waste to energy

Here at Tana Oy we're experts in transforming waste to energy, so much so that our company slogan is From Waste to Value. With this said, rest assured we know how to help you.

Since the calorific value of tyre shred is high - it has nearly the same heat value as oil - we chose to elaborate how end-of-life tyres can be an alternative fuel (TDF) in cement kilns. Basically the waste is first shredded and mixed, 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.

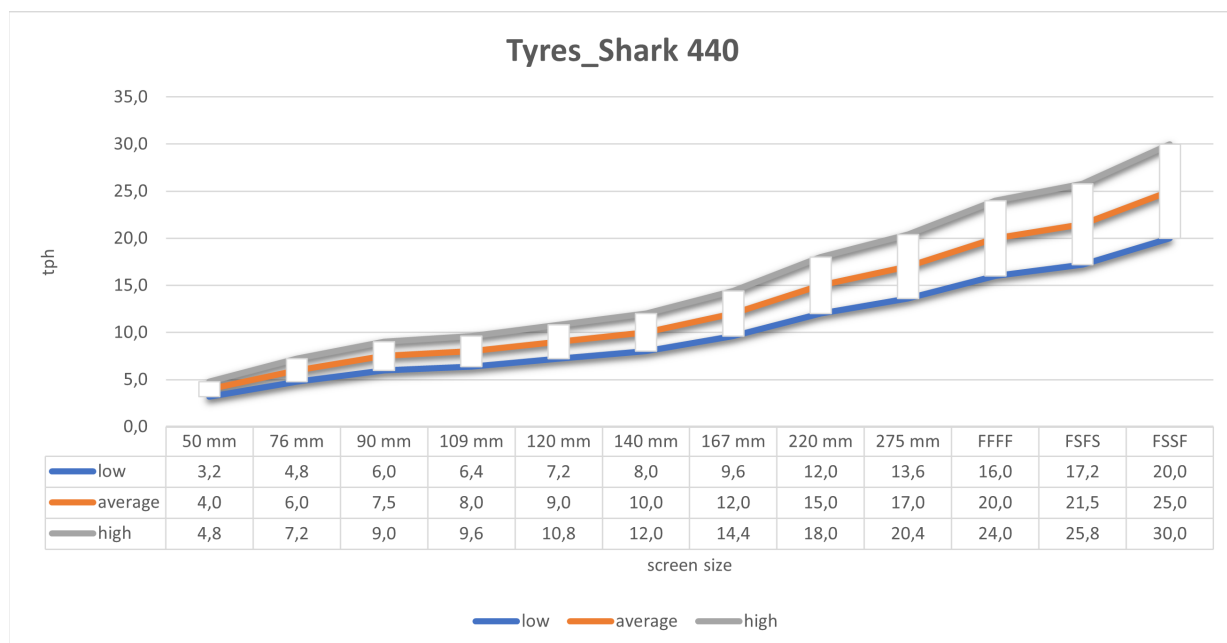
Where does our expertise come in? In the shredding process. Due to the optimal particle size, good shred constitution, smooth shredding process and unique versatility, our shredders are perfect for processing end-of-life tyres and producing TDF.



TANA Shark 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. An overband magnet separates a majority of the metal wires directly from the shredded material flow on the conveyor. Once separated, metals can be sold and shredded tyres reused.

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.





Mobility

- easy relocation across facilities
- eliminate need to move waste around

Versatility

- process multiple waste streams
- desired particle size in one pass

Design

- robust construction
- selection of rotors available

Benefits of producing TDF with a TANA shredder

Utilizing TDF saves significantly in fuel cost as traditional fuels can be replaced with cheaper tyre shred that has almost equal heat value to oil and is even 25% more effective than coal.

Compared to the typically used refuse-derived fuel (RDF) or solid recovered fuel (SRF), there is less variability in tyre derived fuel (TDF), which makes the burning process easier to manage.

The number of end-of-life tyres is growing globally and at the same time many countries are banning the dumping of tyres in landfills. Thus, there is a huge amount of precious raw material—which many consider problematic waste—available basically everywhere.

Using TDF in cement kilns reduces emissions of nitrogen oxides NO_x and costs since less urea is needed. In addition, emissions of particulate matter are lower.

Extra

In addition to being an excellent alternative fuel, shredded tyres are valuable in other fields as well:

- Asphalt companies buy large quantities of shredded rubber crumbs to mix with their hot melt asphalt to make pavements cheaper.
- Shredded tyres are perfect for increasing the burning value of refuse-derived fuel (RDF) in incineration plants.
- Other road construction companies purchase large quantities of medium-sized shredder tyres to use in road beds for minimizing vibration and for highway sound barriers.
- Pure rubber can be granulated and used in the foundations of racetracks, playgrounds and garden beds. It is used in bark mulch to hold in water and prevent weeds from growing.
- Tyre manufacturers are always looking for recycled tyres that can be reused to manufacture new tyres.
- Landfill sites can use shredded tyres for leachate lines and to help them build new cells.
- Steel mills can use shredded tyres as a carbon source by replacing the coal or coke during manufacturing.
- Rubber tyres can be used in barriers for collision reduction, erosion control and rainwater runoff, as well as to protect piers and marshland from wave action.

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.



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