

XIII Congreso Mexicano del Asfalto. 20, 21y 22 de agosto de 2025, Cancún, Quintana Roo, México



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Tema: **XIII Congreso Mexicano del Asfalto**



Eng. Filippo D'Addato

20 de agosto 2025

GESTIÓN Y TRAZABILIDAD DEL RAP EN PLANTAS ASFÁLTICAS

Eng. Filippo D'Addato



XIII Congreso Mexicano del Asfalto. 20, 21y 22 de agosto de 2025, Cancún, Quintana Roo, México

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WHAT IS RAP RECYCLING ABOUT?

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WHAT IS RAP RECYCLING ABOUT?

THE ORIGIN OF RAP

1

ROAD DEMOLITION

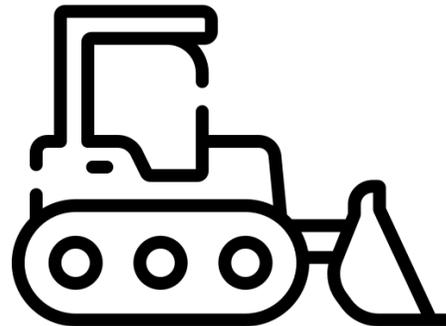
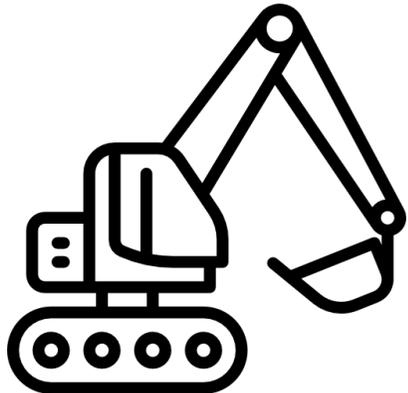
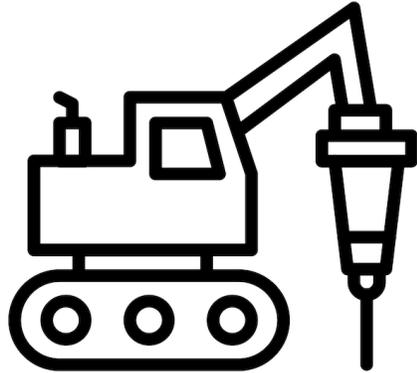
2

ASPHALT PLANT BYPRODUCTS



WHAT IS RAP RECYCLING ABOUT?

THE ORIGIN OF RAP - ROAD DEMOLITION



RAP is obtained by road demolition.
A process that can be carried out using several machines.

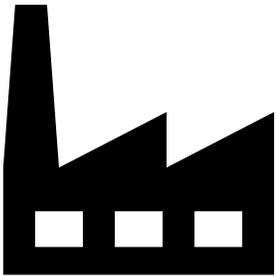
Such as:

- Hydraulic breakers
- Milling machines
- Dozers
- Excavator



WHAT IS RAP RECYCLING ABOUT?

THE ORIGIN OF RAP – ASPHALT MIXING PLANT BYPRODUCTS



RAP is obtained by material that has been rejected by the asphalt mixing plant.

Rejected mixes can be due to:

- Wrong mixing temperature
- Bad logistics
- Adverse weather conditions



WHAT IS RAP RECYCLING ABOUT?

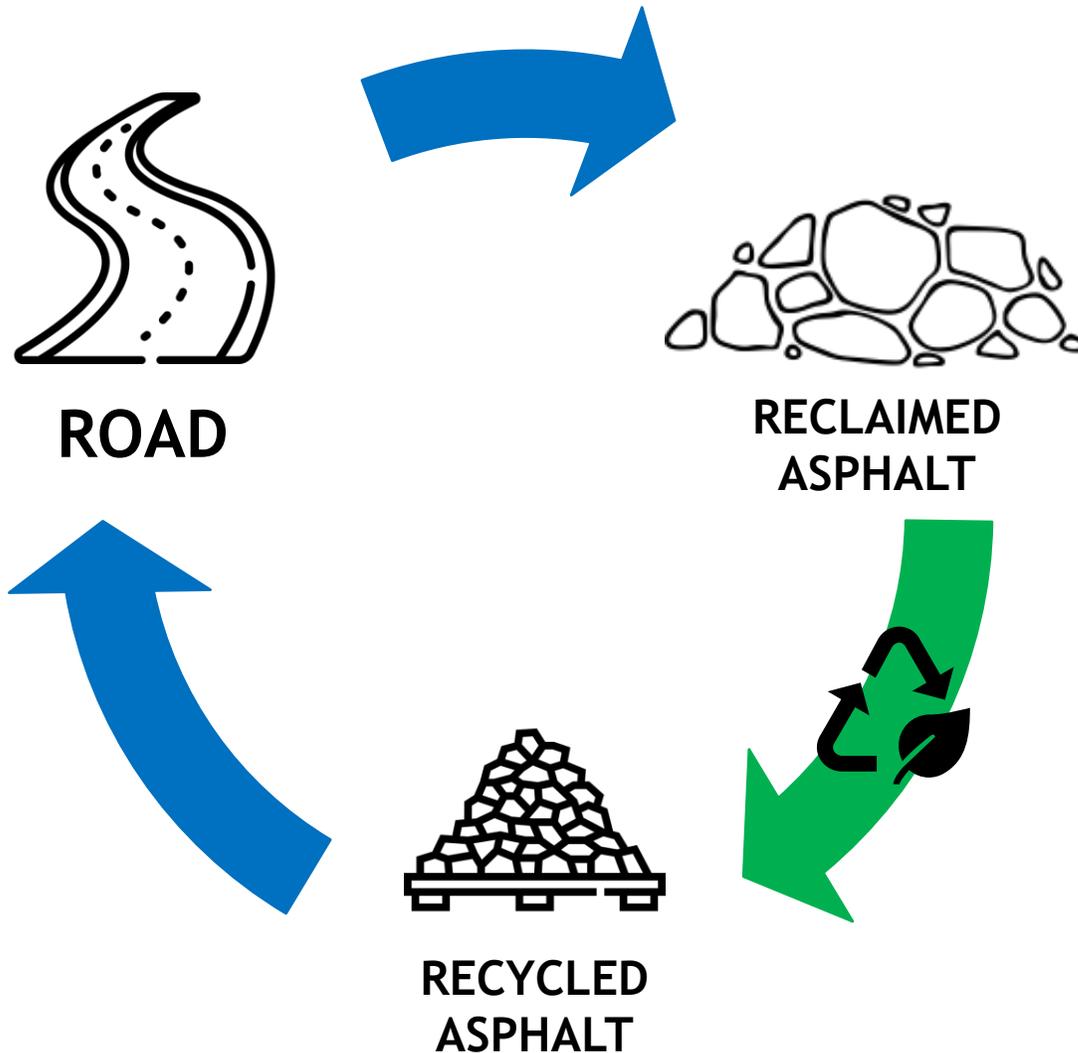
GOOD RAP MANAGEMENT

Before being recycled, asphalt has to be properly stored to avoid any contamination that will affect the quality of your finished product.

- **Use clean trucks:** avoid contamination at the beginning of the process
- **Different origin, different location:** know where your RAP comes from and store it accordingly
- **Stock it where it's safe:** don't store your RAP over contaminated soil and, when possible, use concrete underlayers
- **Don't mix it:** avoid dirt, trash, or vegetation in RAP reserves



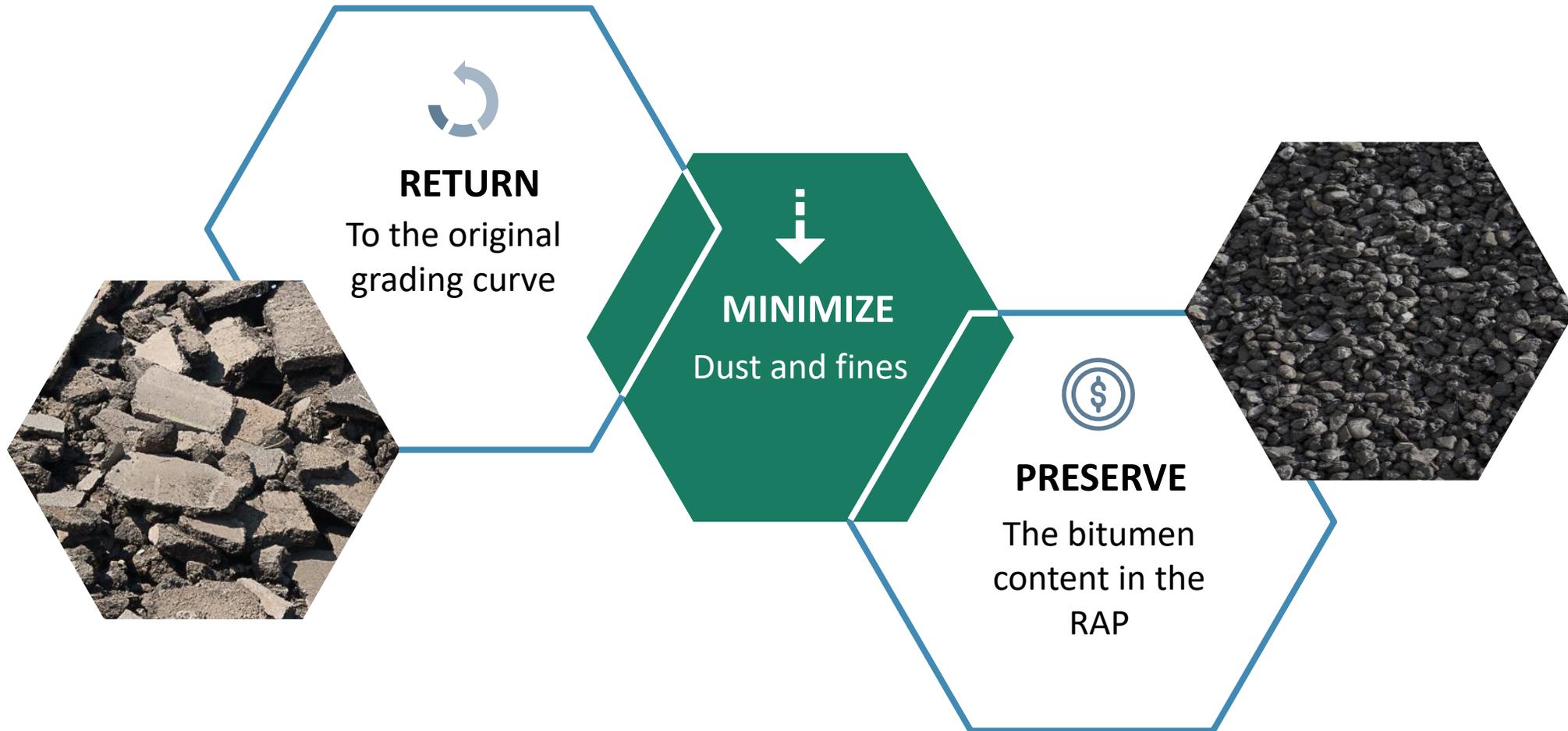
WHAT IS RAP RECYCLING ABOUT?



- RAP recycling is more than just turning large pieces of reclaimed material into smaller pieces
- **Process matters:** how companies recycle impacts **quality**
- Aim is to retain the original characteristics

Not just size reduction – quality preservation counts

WHAT IS RAP RECYCLING ABOUT?





QUALITY DEPENDS ON RECYCLING TECHNOLOGY

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QUALITY DEPENDS ON RECYCLING TECHNOLOGY



OPERATING PRINCIPLE

Both primary and secondary shredders recycle material by shearing effort rather than impact or compression. This makes the recycling process **more efficient**



DRIVE

Using electric powered shredders allows for **cleaner and more efficient power**



PRODUCT QUALITY

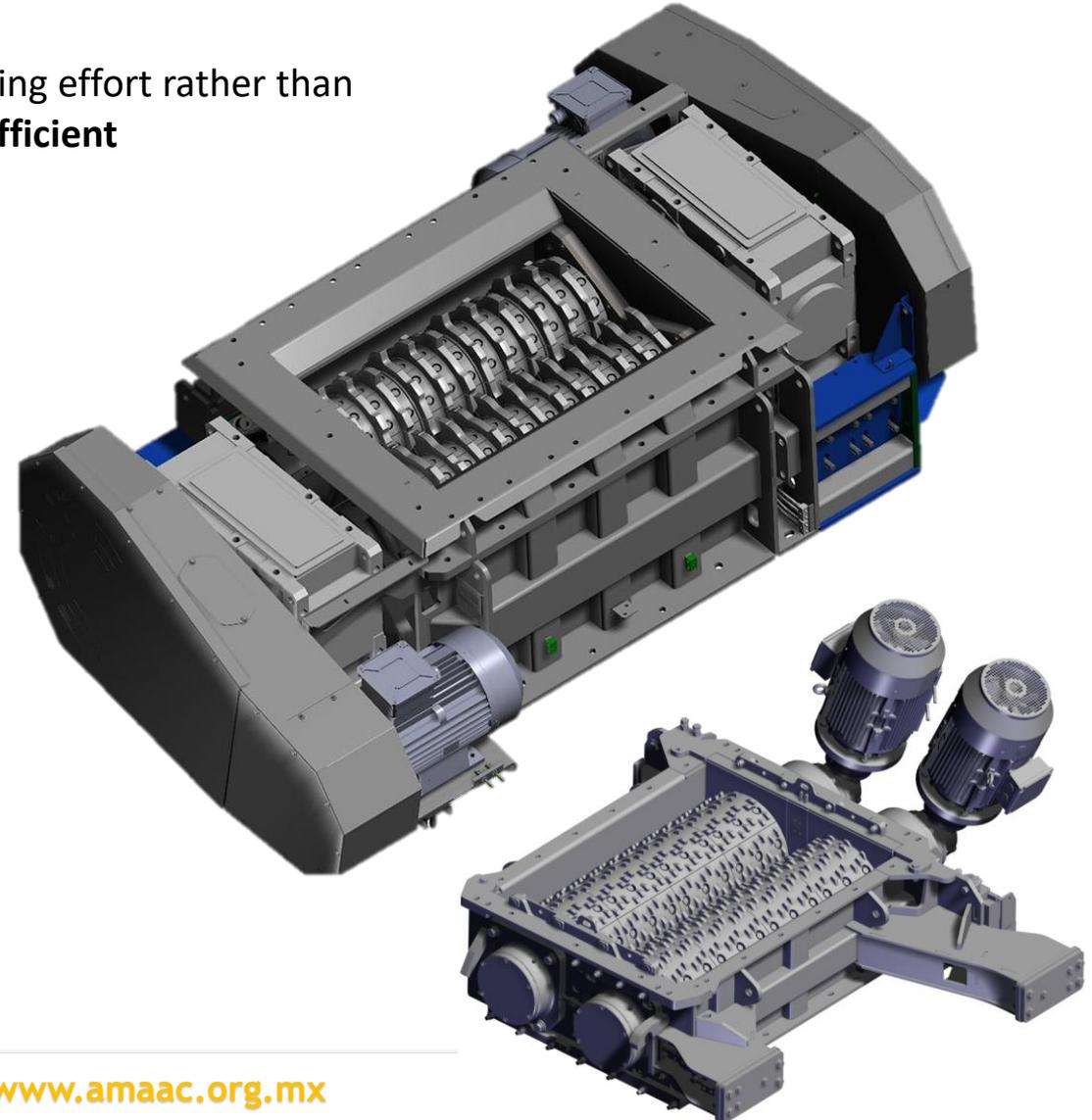
Slow rotors speed ensures:

- Minimal production of fillers
- 100% recovery of the original bitumen content



LOWEST WEAR

Low-speed shaft rotation **minimizes wear**



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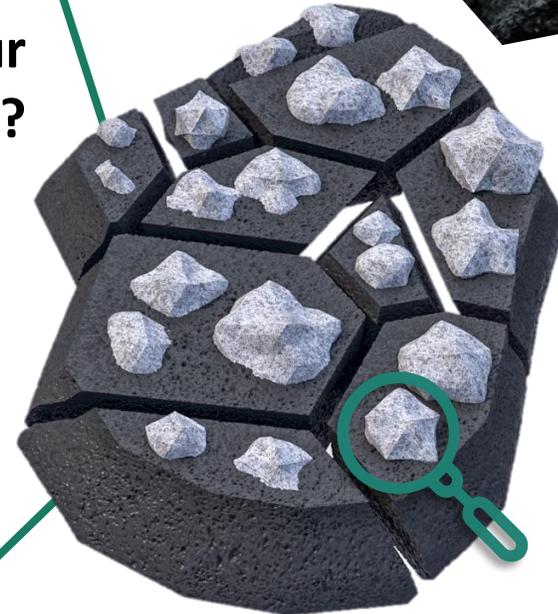
QUALITY DEPENDS ON RECYCLING



- Crushed stones absorb humidity over time, This requires energy to evaporate

Can a shredder that's kinder and gentler than a traditional impact crusher help your recycling operations?

The answer is **YES**. The patented gentle shredding action of CAMS machines results in fewer fines and guarantees 100% of original bitumen content reuse, the **essential source of economic efficiency**.



Shredded RAP does not generate crushed stones +



QUALITY DEPENDS ON RECYCLING TECHNOLOGY

100% BITUMEN PRESERVATION WITH ELECTRIC SHREDDERS

Electric shredders retain 100% of the original bitumen. Impact crushers burn off valuable material

PRESERVED BITUMEN

Electric shredder material



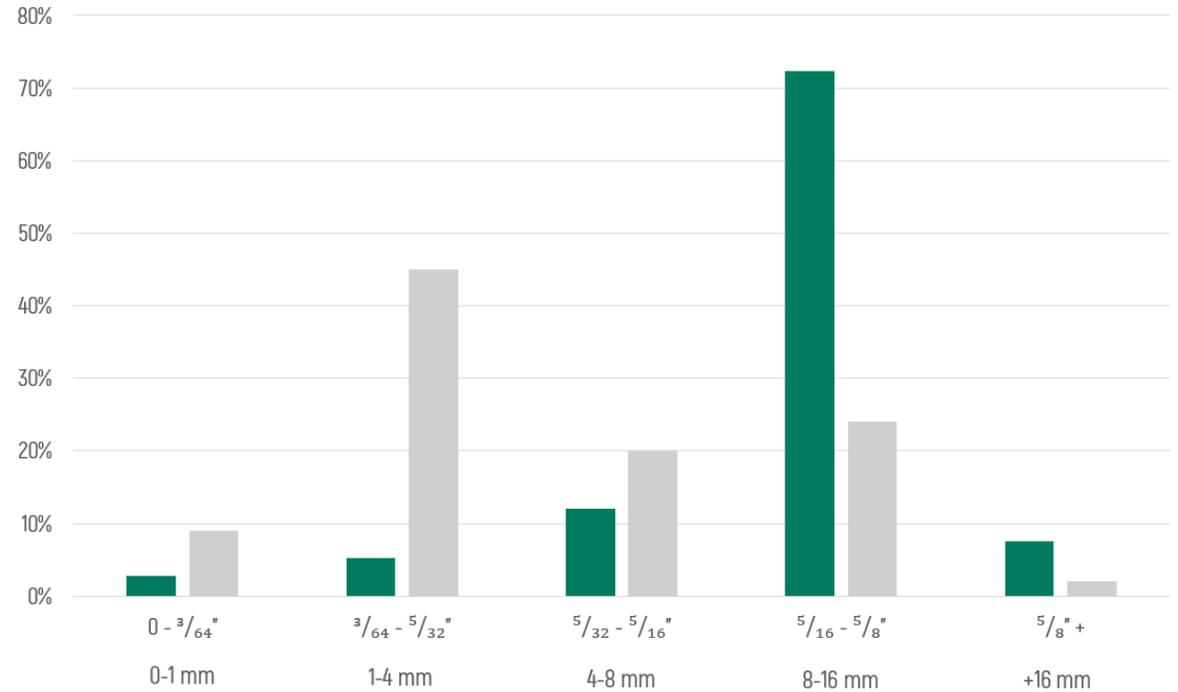
LOST BITUMEN

Impact crusher material

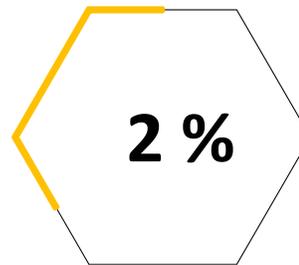
QUALITY DEPENDS ON RECYCLING TECHNOLOGY

The comparative plot is based on two 0-20 mm RAP samples processed with an electric shredder and a traditional impact crusher.

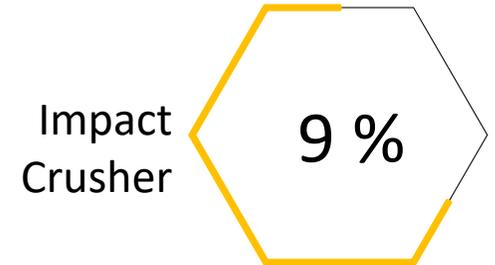
Percentages of filler coming from the shredder are significantly lower.



PERCENTAGE OF FILLER



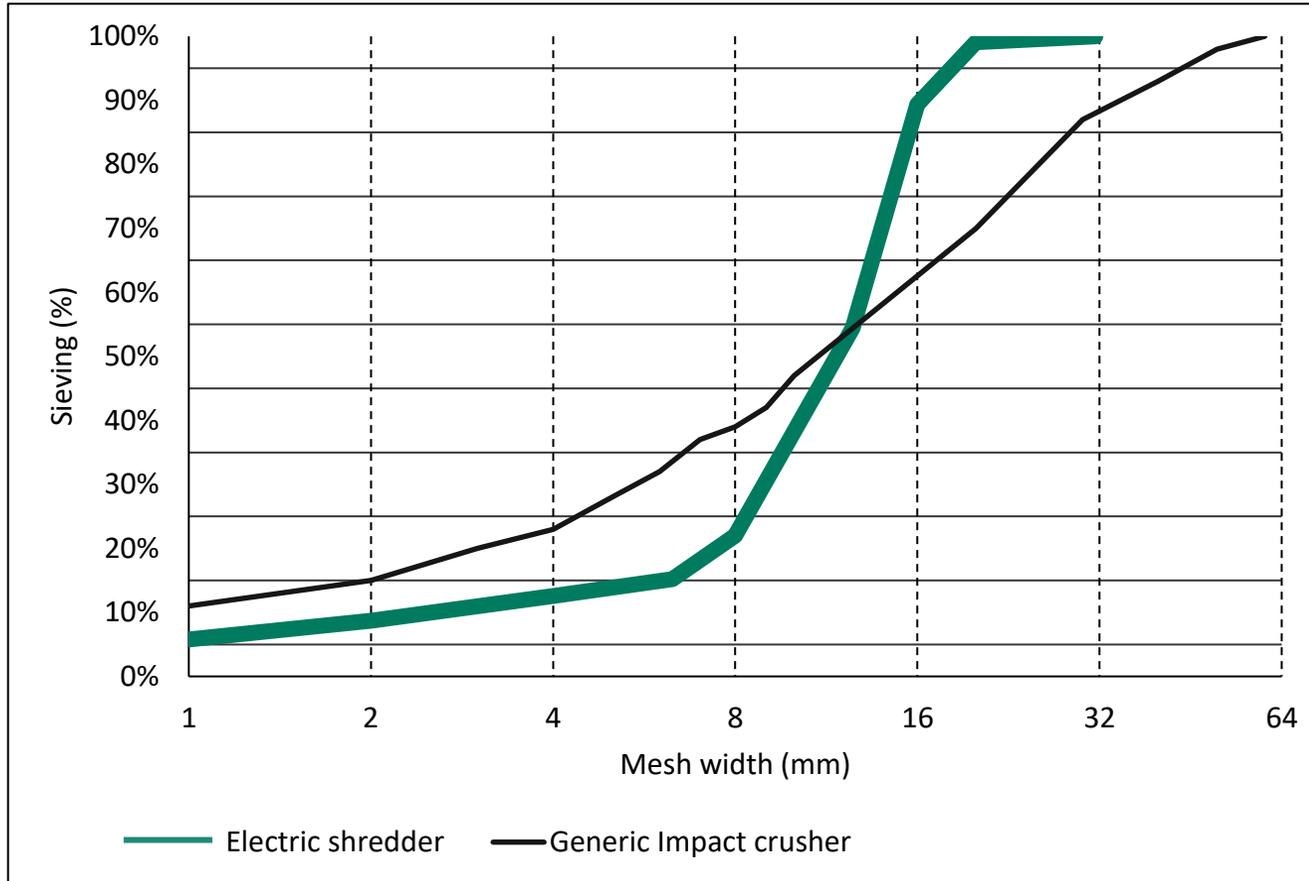
Electric Shredder



Impact Crusher

QUALITY DEPENDS ON RECYCLING TECHNOLOGY

Tests performed on the same demolished asphalt samples



**FEWER FINES
STANDS FOR
HIGHER QUALITY**

Crushing
curve
comparison



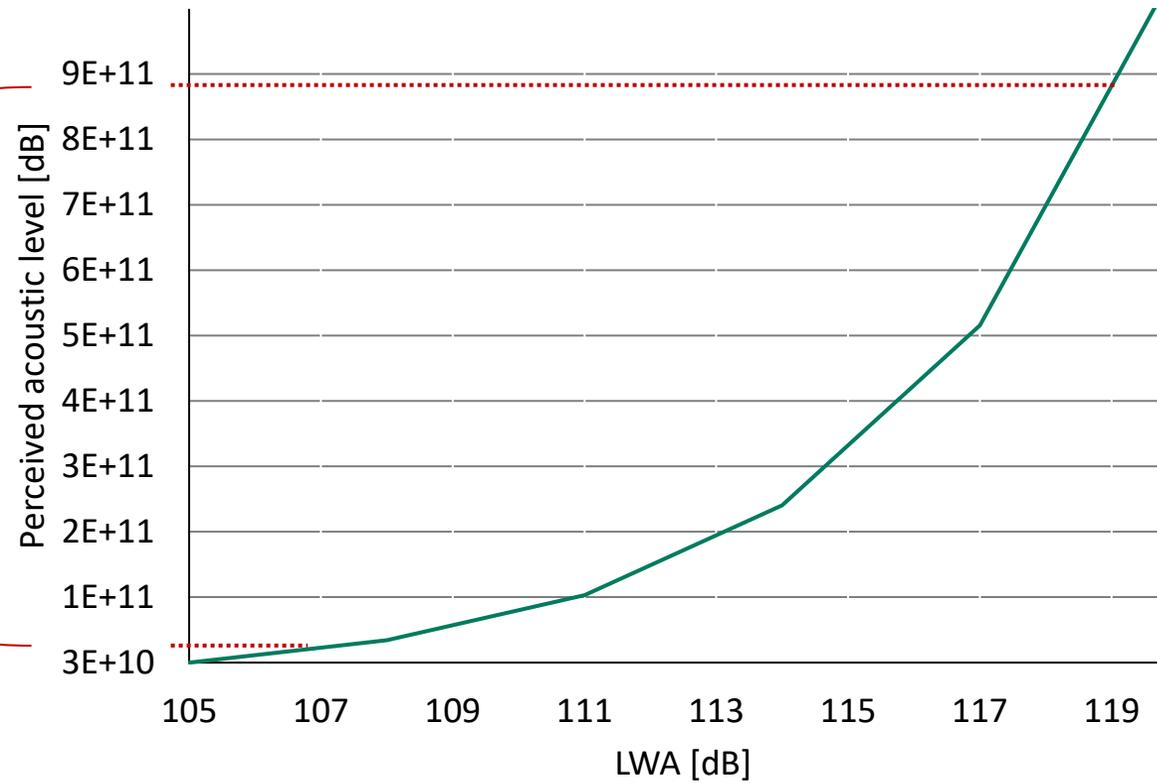
TECHNOLOGY THAT MAKES A (*GREEN*) IMPACT

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TECHNOLOGY THAT MAKES A (*GREEN*) IMPACT

	ELECTRIC SHREDDER	GENERIC IMPACT CRUSHER	
Sound power level (L_{WA})	107 dB	119 dB	-12 dB

- 94%
PERCEIVED
ACOUSTIC
LEVEL



Electric shredders cut noise emissions by 12 dB

Reducing perceived sound levels by 94%

TECHNOLOGY THAT MAKES A (*GREEN*) IMPACT

**Breathable dust
concentration (TLV-TWA)**

Data measured according to UNI EN 481/1994 UNI
EN 10568/1997 DIN/SAE equivalente

**ELECTRIC
SHREDDER**

3 mg/m³

Electric slow speed shredders allow for **only 3 mg/m³ of breathable dust concentration.**
The fewest in the market.



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TECHNOLOGY THAT MAKES A (*GREEN*) IMPACT

FUEL EFFICIENCY

ECONOMY & SUSTAINABILITY WITH ELECTRIC SHREDDERS



ELECTRIC SHREDDER

≤ 20 L/h



CAN RUN ON GRID
POWER FOR ZERO
FUEL CONSUMPTION



HYDRAULIC CRUSHERS

≥ 30 L/h



ECONOMIC ADVANTAGE

- Up to 55% lower fuel consumption
- Reduced operating cost
- Flexibility: diesel or grid connection

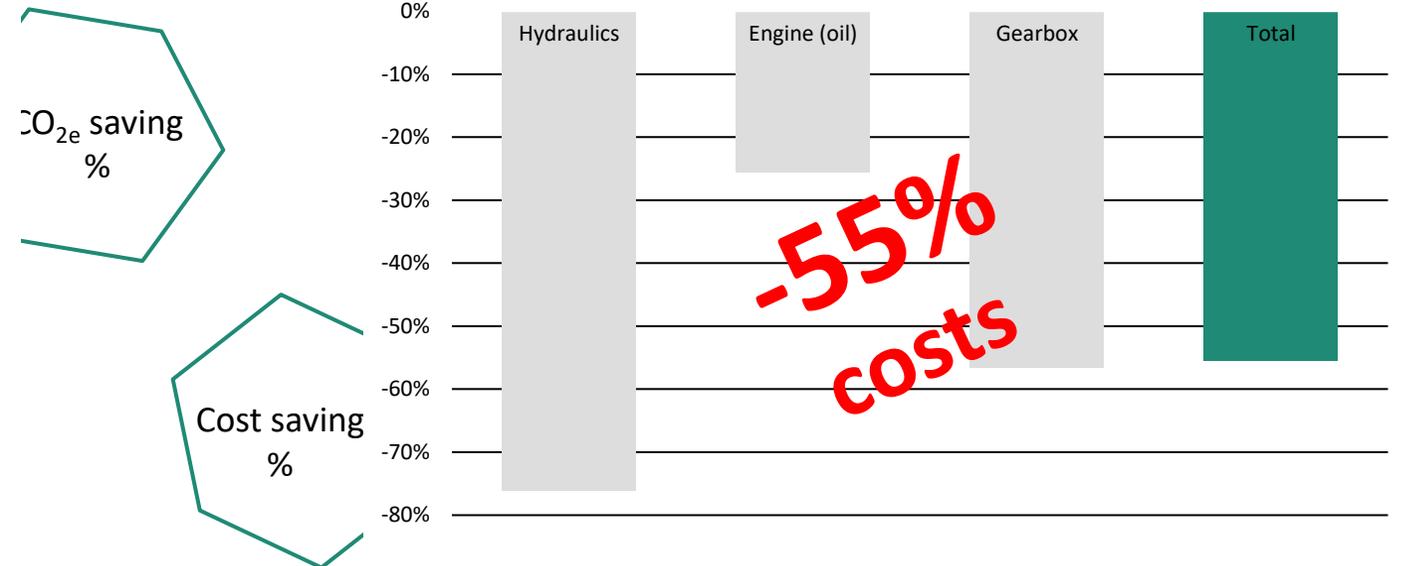
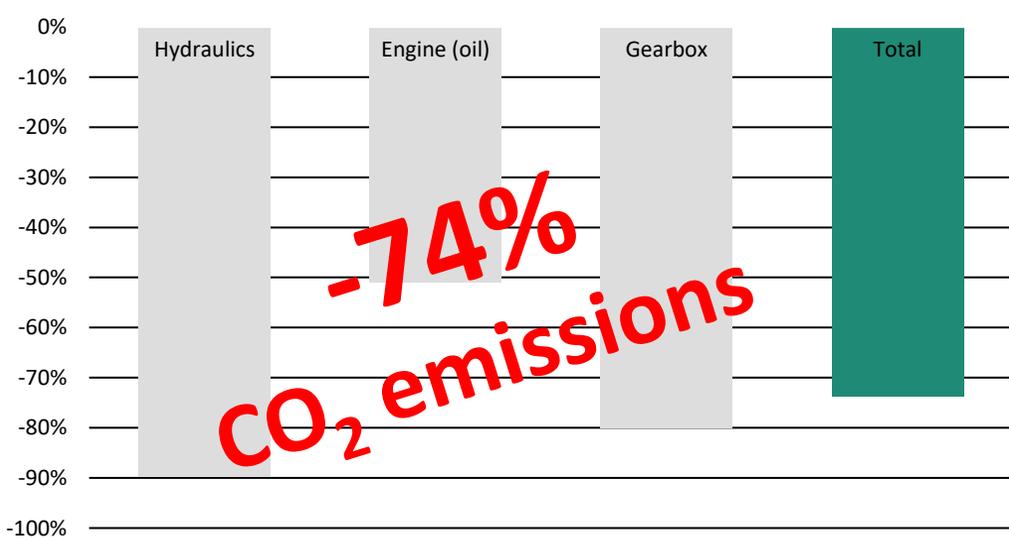
ENVIRONMENTAL ADVANTAGE

- Lower CO₂ emissions with reduced fuel use
- Zero-emission operation when connected to grid
- Supports greener jobsites

TECHNOLOGY THAT MAKES A (*GREEN*) IMPACT

ADVANTAGES IN USING BIO LUBRICANTS - HOURLY RATES

Lubrication point	CO _{2e} (lbs/h)		Costs (USD/h)	
	Electric Shredder	Generic Impact Crusher	Electric Shredder	Generic Impact Crusher
	Bio oil	Mineral oil	Bio oil	Mineral oil
Hydraulics	0.07	0.68	0.16	0.67
Engine (oil)	0.26	0.53	0.35	0.47
Gearbox	0.04	0.20	0.10	0.23
Total	0.37	1.41	0.61	1.37





EFFICIENT RAP RECYCLING

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EFFICIENT RAP RECYCLING

DIFFERENT KINDS OF SHREDDERS

A CHOICE TAILORED TO THE JOBSITE'S NEEDS

MOBILE PLANT



STATIONARY PLANT

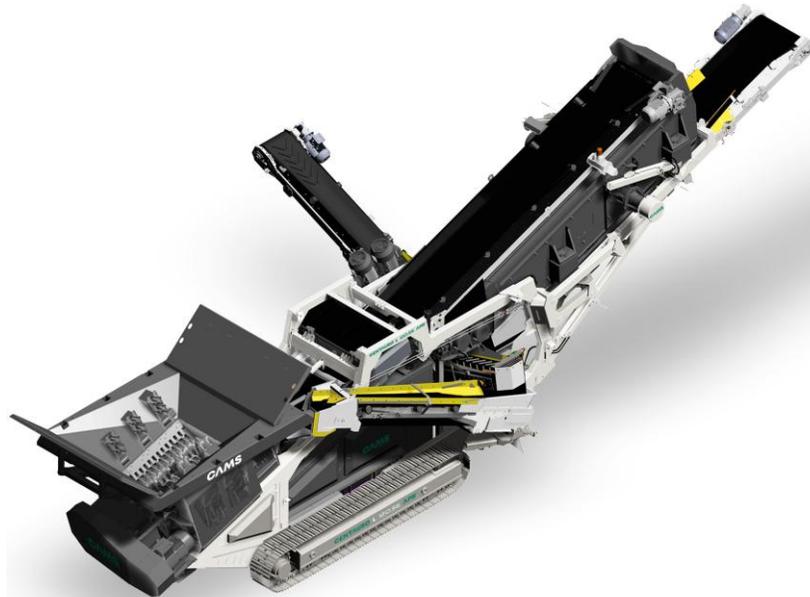


EFFICIENT RAP RECYCLING

DIFFERENT KINDS OF SHREDDERS

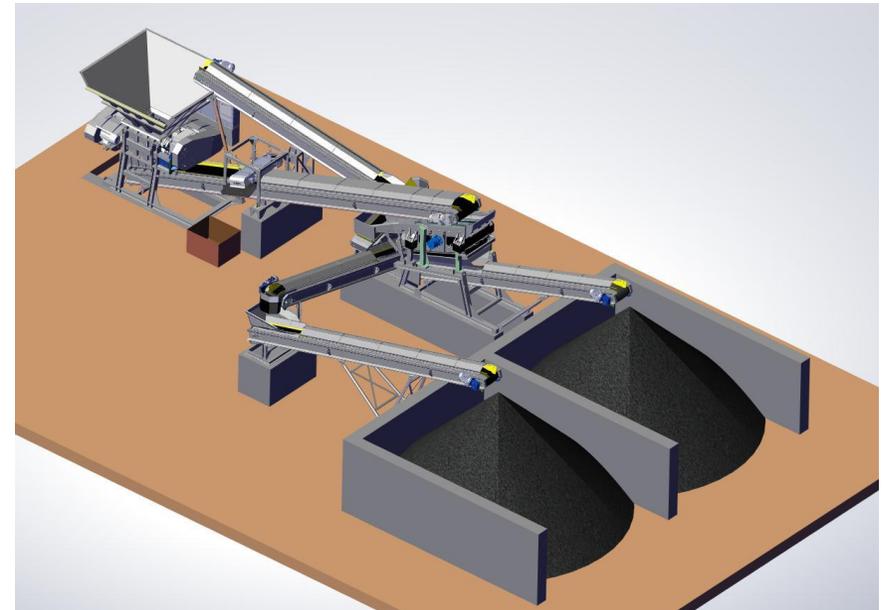
A CHOICE TAILORED TO THE JOBSITE'S NEEDS

MOBILE PLANT



- Easy to move from site to site
- Compact and self sufficient
- Ready to work in a few minutes

STATIONARY PLANT



- Less maintenance
- More customization possibilities
- Usually more economical than mobile



EFFICIENT RAP RECYCLING

DIFFERENT KINDS OF SHREDDERS

A CHOICE TAILORED TO THE JOBSITE'S NEEDS

MOBILE PLANT

CAMS
IL FUTURO È VERDE



STATIONARY PLANT



EFFICIENT RAP RECYCLING

HOW TO OPERATE YOUR SHREDDER

FEEDING & MATERIAL HANDLING

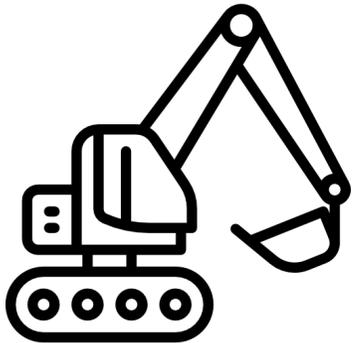
EXCAVATOR

Advantages

- Lower fuel consumption
- Can modulate material loading flow
- Can densify feed material

Disadvantages

- Can't manage material handling



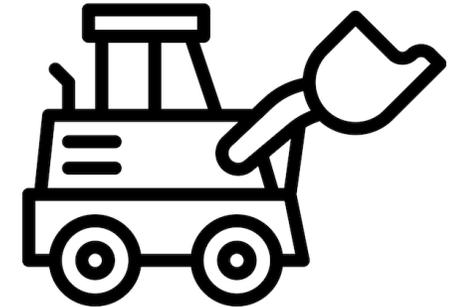
WHEEL LOADER

Advantages

- A single machine manages both feed and material handling

Disadvantages

- Higher consumption of fuel
- Can't modulate material loading flow
- Can't densify feed material



EFFICIENT RAP RECYCLING

HOW TO OPERATE YOUR SHREDDER

SCREENING EFFICIENCY IS KEY



Along with using a **slow-speed electric shredder**, an **efficient screening** system is the key to get top-quality recycled RAP.

Contractors should separate the processed material into **two stockpiles** based on the size of the RAP particles.

That allows producers to use **fine RAP** in finer asphalt mixtures and **coarse RAP** in coarse mixtures.

EFFICIENT RAP RECYCLING

HOW TO OPERATE YOUR SHREDDER

OVERSIZE RECIRCULATION



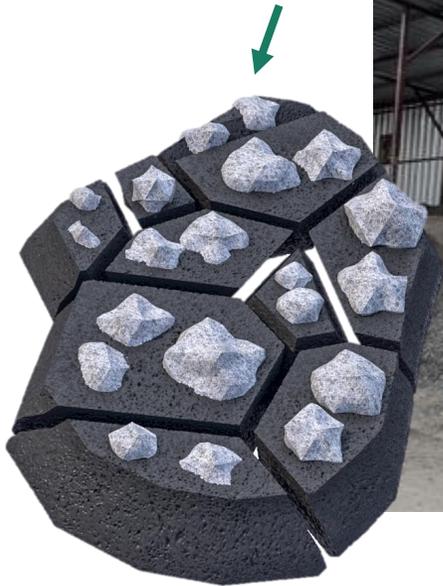
Cut down material handling and operation costs by using a **recirculation conveyor** that feeds the oversize material back into the shredder until it is sized down according to your needs.

EFFICIENT RAP RECYCLING

HOW TO OPERATE YOUR SHREDDER

MATERIAL QUALITY PRESERVATION

Bitumen coating is preserved by the gentle shredding action



Moisture content deeply affects efficiency and running costs of your asphalt mixing plant.

Even though **electric shredders preserve the water-repellent bitumen coating** on the aggregate, always store your processed RAP stockpiles **under cover** to preserve them from rain.

EFFICIENT RAP RECYCLING

HOW TO OPERATE YOUR SHREDDER

QUICK HANDGUIDE FOR AN EFFICIENT RECYCLING PROCESS



PRIORITIZE PRODUCT QUALITY: never compromise on the quality of your product



GO GREEN: use sustainable, eco-friendly shredders for true recycling



SELECT THE RIGHT MODEL: select a mobile or stationary shredder tailored to your needs



EFFICIENT FEEDING: choose the right material handling machines for your job site needs



SORT WITH PRECISION: use a high-efficiency screen to separate your finished product into two sizes



PROPER STORAGE: ensure recycled material is stored under cover to preserve its quality

¡ muchas gracias!

Ponente: Eng. Filippo D'Addato

Contacto: f.daddato@camsrsl.it

