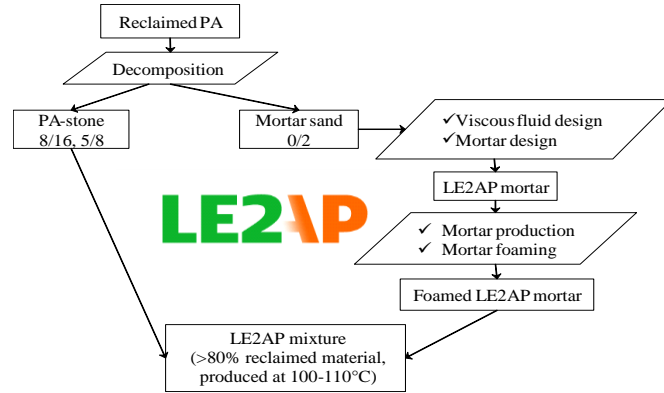


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**1. INTRODUCTION**

- Paris Agreement on Climate Change
- Dutch National Road Authority Rijkswaterstaat: 50% circular and 100% climate neutral of asphalt industry in 2030
- Limitations/challenges in high quality surface-to-surface recycling (limited to 30% RA for PA, 0% RA for SMA)
  - Challenge 1: **Black Rock and partial blending**
  - Challenge 2: **Inhomogeneity and high variations**
- → → Component level recycling, **LE2AP 100% surface-to-surface recycling** (high quality warm recycling technology with reuse up to **95%** and at a production temperature of **100-110°C**)



Scan for animation of the LE2AP process



**3. DECOMPOSITION PROCESS AND RECLAIMED STONE LINE**

- Production speed of decomposition process 50-150 ton/hour



- Reclaimed stone has very limited variation, 200K ton have already been applied in different mixtures

Sieves passing	22.4 mm	16 mm	8 mm	2 mm	0.063 mm	Bitumen Percentage
	mm	mm	mm	mm	mm	Percentage
Sieved Reclaimed PA 8/20	100	97.6	32.9	15.2	6.1	3.3
Bestone 11/16	100	88.5	3.5	1.1	0.4	0
Reclaimed stone 8/16	100	97.8	9.2	3.6	1.9	1.0
Standard deviation reclaimed stone production 2016 [%]	-	1.2	3.1	0.6	0.2	0.2



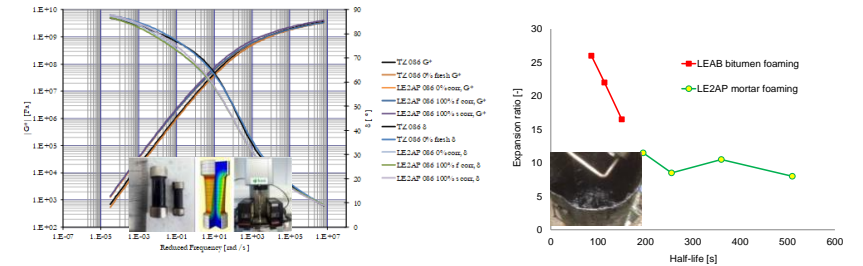
**2. LE2AP TECHNOLOGY**

- European LIFE+ (2013-2016), LE2AP (Low Emission2 Asphalt Pavement), Component level recycling by **decomposition**
- **Reclaimed stone**: >2 mm, less than **1%** bitumen, direct reuse as aggregate
- **Reclaimed mortar sand**: <2 mm, **10-12%** bitumen, heating-rejuvenating- enriching- homogenizing- foaming
- Reclaimed stone + foamed LE2AP mortar to produce mixture with **95% reuse @100-110°C**

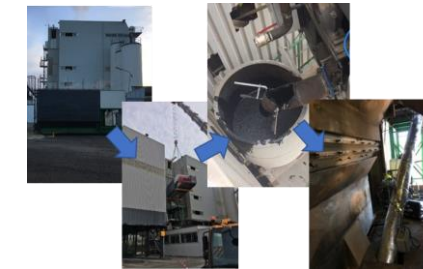


**4. MORTAR LINE**

- Heating- rejuvenating- enriching- homogenizing- foaming, performance of LE2AP mortar is identical to the virgin mortar



- Up to 75 ton/hour of mixture production with very limited temperature fluctuation



	Average production speed [ton/hour]	Average temperature mixture [°C]	Standard deviation of temperature [°C]
LE2AP SMA 8B N317 (2018)	74	118	2
STD SMA 8B N317 (2018)	136	163	7
LE2AP SMA 8B N625 (2018)	75	116	3
STD SMA 8B N625 (2018)	118	158	23

**5. APPLICATIONS**

- The LE2AP technology has been applied in various projects (**PA, 2L-PA and SMA**) since 2016, with a recycling percentage up to **95%** and a production temperature of **100-110°C**. The LCA benefit (A1 to A3) and the **CO<sub>2</sub> reduction** are about **50%**.
- The LE2AP technology will be surely contributing a **sustainable, circular and climate neutral** of asphalt industry.