Warm Waste Asphalt Recycling in Belgium
Overview of 30 years of experience

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Warm waste asphalt recycling in Belgium

1. Why recycle?
2. History & RAP Recycling possibilities
3. Belgian Regulations
4. Recycling percentage
5. Production of hot mix asphalt containing RAP
6. Conclusions
Why Recycle?

**Environnement**
- Reuse of a qualitative product of which ±1,000,000 of metric tonnes comes on the market each year
- Less use of non-renewable natural resources
- Toxic and greenhouse gas emissions are lower

**Financial**
- Price of the mix ↓ (bitumen)
- Landfill costs ↓

**But, Take care!**
- Maintenance ↑
- Plant Energy consumption (if warm recycling) ↑
- Investments ↑
- Laboratory staff ↑
- Production staff =
Energy consumption and equivalent CO2 production for a bituminous base course layer of 6 cm thickness without RAP and with 50% of RAP. (1 = Mix without RAP, 2 = with 50% of RAP)
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History & RAP recycling possibilities

Unbound granular foundation

- 1975 - 1981
- To Firm up the upper part of road foundations in sand
- Road foundations with warm milled RAP
- Reuse “as is”

⇒ Compacting difficulties
⇒ Possible correction of grading curve with 10 to 20% of sand

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Unbound granular foundation

- Bituminous emulsion
- Mix of RAP 0/10 - sand - cement - water
- In situ - in mixing plant

Bound foundation

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History & RAP recycling possibilities

• 1977 - 1985
  • Reforming
  • Repaving
  • Remixing
  \(\Rightarrow\) Not or hardly used anymore since 1986

Unbound granular foundation

Bound foundation

In HMA - In situ

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Begin: 1980
Fast evolution between 1983 & 1985
In batch plant or drum mixer
Cold (<20%) or Warm (20-60%) reuse
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Recycling percentage

Depends on the:

- Imposed maximums in the regulations
- Technological limits of production tools
- Homogeneity of the used RAP
- Water content of used RAP
- Type of layer (wearing course, base course)
- Desired Quality of the product
- Test Results on RAP
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Production

Batch Plant

Cold RAP Direct in mixer

Rap warmed up by contact with new aggregates
Production

Batch Plant

RAP warmed up in parallel drum
Drum mixer

Cold introduction of RAP
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Conclusions

- Thanks to 30 years of research & development, Belgium belongs to the leaders in Europe for recycling of RAP in new bituminous mixes.
- Recycling of RAP is very strongly regulated via European standards and national regulations. Product Certification is also possible (in Wallony) and compulsory (in Flanders).
- It would be possible to produce qualitative mixes with more than 50% of RAP with the modern mixing plants. This is not allowed for public works, due to the regulation.
- For the future: bad influence of CO₂ emission trading ????