



# THE SPECIFIC ROLE OF EMULSION IN ROAD STRUCTURES FOR WHAT USE ?

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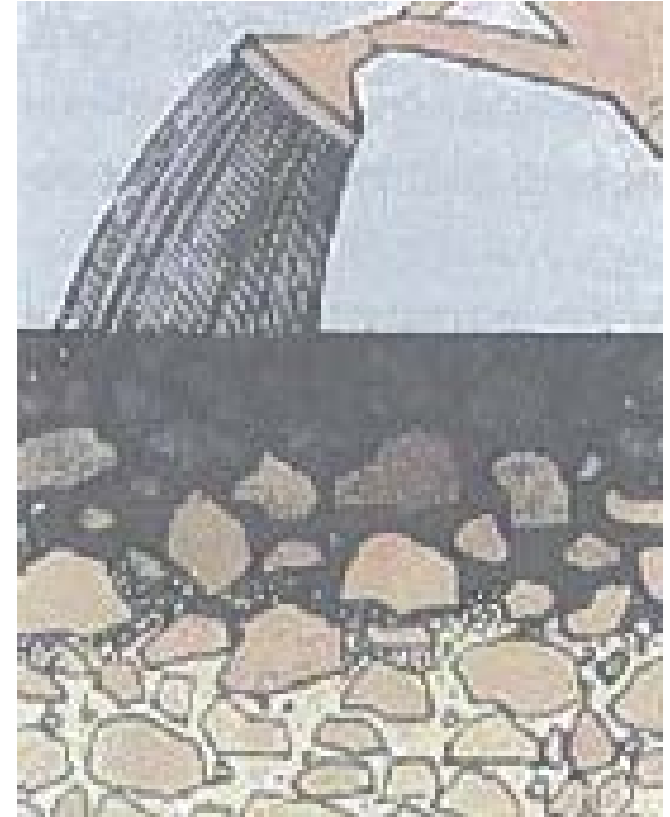
# Spraying Emulsion

- Penetration prime coat
- Protecting or curing coat
- Tack or bond coat
- Surface course preservation



# Penetration Prime coat

- Emulsion spraying on unbound compacted base course
- Emulsion comes into the unbound material on a depth of around 1 or 2 cm by capillarity
- For stabilizing the upper part of the material and then surface dressing as wearing course
- Need a fluid emulsion !!!



# Protecting or curing coat

- To protect the unbound granular materials and the cement bound materials in order to avoid runoff and evaporation
- To keep the right water content and
- To maintain the Proctor optimum

On unbound material, it's also called prime coat



# Protecting or curing coat

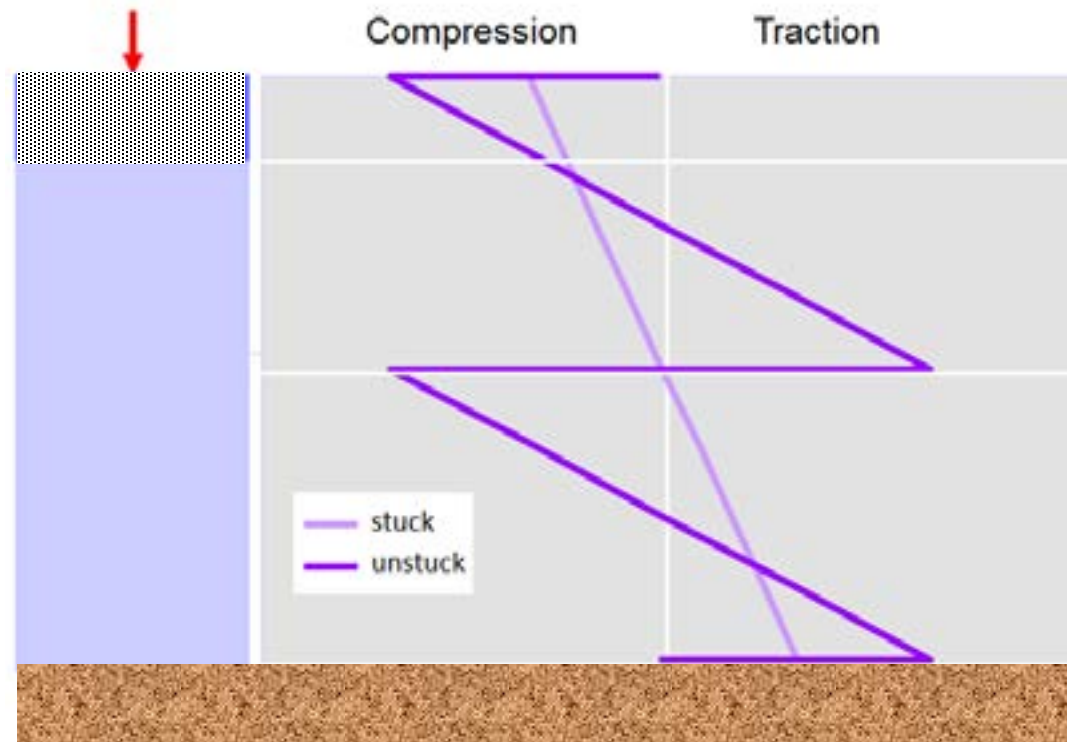


# Tack or bond coat

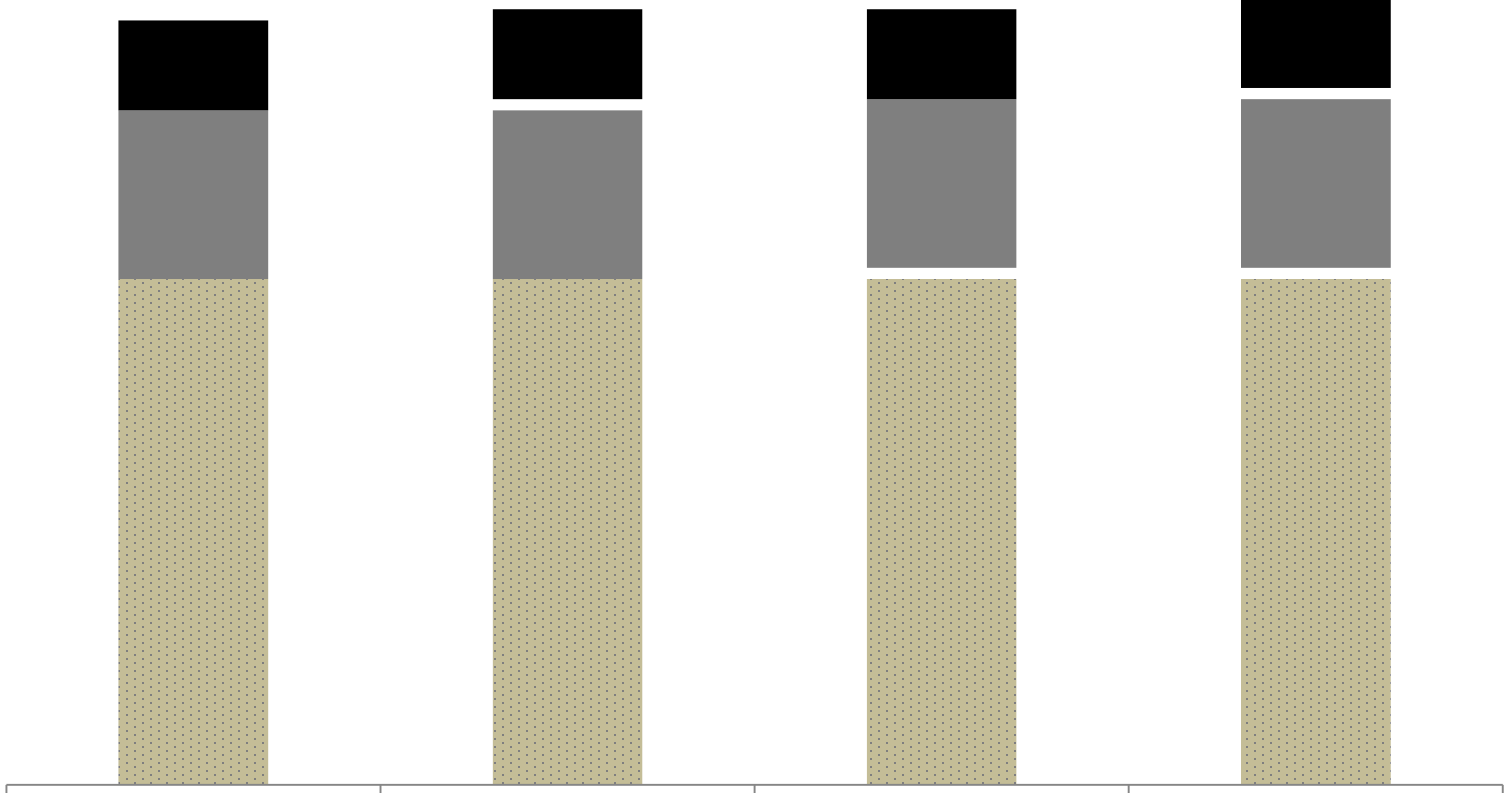
- Importance of spraying /using emulsion on sub-base material and cement stabilization before laying asphalt
- Importance of emulsion-correct application for bonding asphalt layers and its impact on road life span (background conditions, weather conditions, amount of emulsion, emulsion spray tanker)
- Tests for measuring bonding between two asphalt layers (new European standard)



# Layer interface condition



# Tack or bond coat



15 years

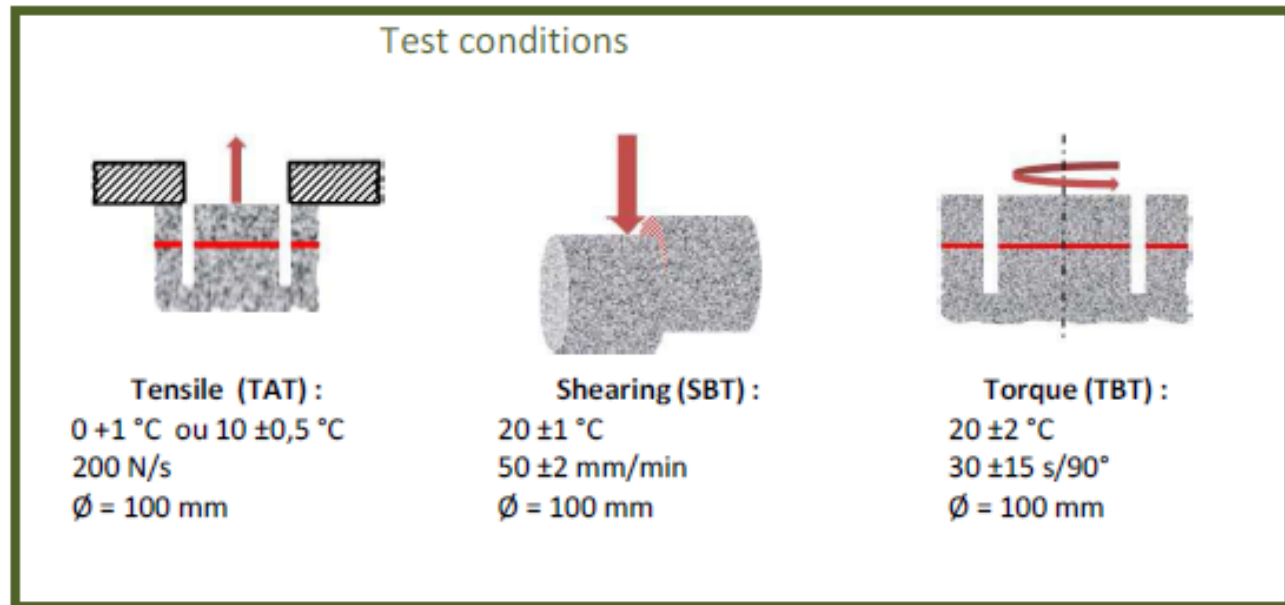




# Bonding tests

## EN 12697-48 Interlayer bonding

- Torque Bond Test (TBT)
- Shear Bond Test (SBT) or Leutner test
- Tensile Adhesion Test (TAT)



# Tack or bond coat

- Tack coat: pure bitumen emulsion  
or
- Bond coat: modified bitumen emulsion

Constant and right spread rate

Clean tack coat is available !!!

**Essential for life span**



# Tack or bond coat spread rate

Porous asphalt	Very thin asphalt concrete	Other asphalt concrete
$\geq 350 \text{ g/m}^2$	$\geq 300 \text{ g/m}^2$	$\geq 250 \text{ g/m}^2$

Residual binder      Pure or modified

Should be adjusted according to  
the support (milling)

**Don't forget to do it**



# What we must not do !!!



# What is missing?



# What happens when :







**Bad choice**



# Surface course preservation

- To regenerate the surface of an “old asphalt concrete”
- By spraying special emulsion (spread rate from 0,5 to 1 kg/m<sup>2</sup>)
- By spreading fine aggregate (sand 0/2mm) to build a mortar between the old AC aggregates (around 1 kg/m<sup>2</sup>)



# Surface course preservation principle

1. Rejuvenating  
the adhesion



- 2.



- 3.

- 4.



# Surface course preservation

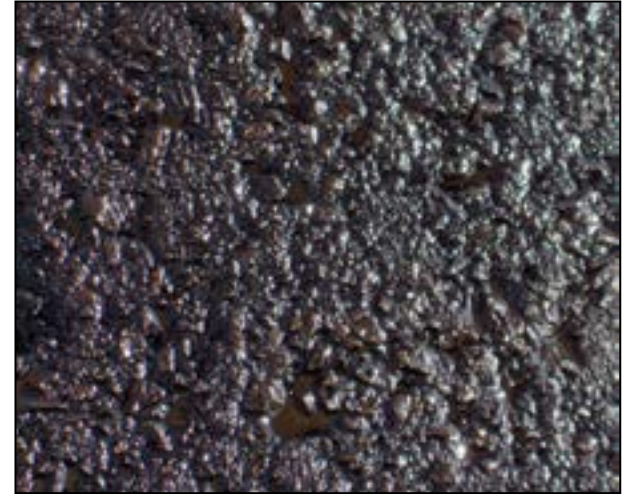
## Drying time

Before sanding off, the emulsion must break and water evaporate.

Special emulsion penetrates the asphalt and begins to migrate together with the old binder.

Little amount of binder at the top of the stones after drying.

From 2 to 5 hours for the coating to dry, depending on weather conditions.

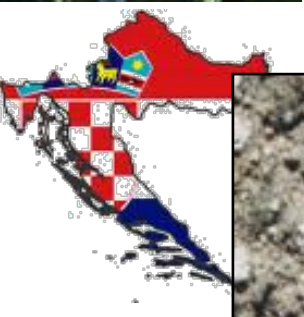




# Surface course preservation

**Before**

**After**



# Conclusion

- Prime and curing coats are essential to have right performances (unbound or CBM)
- Tack/Bond coat is fundamental for the road life span
- When aged, seal coat is one of the best solution to regenerate an old pavement at the cheapest cost

**EMULSION IS ESSENTIAL**





**Thank you for your attention**

**Hvala na pozornosti!**

