

# Road Pavement Forum

Salt Rock Hotel & Dolphin Resort

Warm Mix Asphalt

Gauteng Trials

5 May 2010

# Content

- History of WMA (Foam Technology)
- Double Barrel Green
- Planned Trials

# Foam Technology



# WMA - History



- Patents dating back to 1920s (120°C – soap solutions sprayed on aggregates prior to coating with binder)
- 1965 – Turbulent mass mixer (Water, additives & bitumen added simultaneously)
- 1973 – Boeing parallel flow drum plant (early injection of bitumen -moisture in aggregate cause foaming, proper coating & better compact.)



**Much  
Asphalt**



**Reframing for the Future**





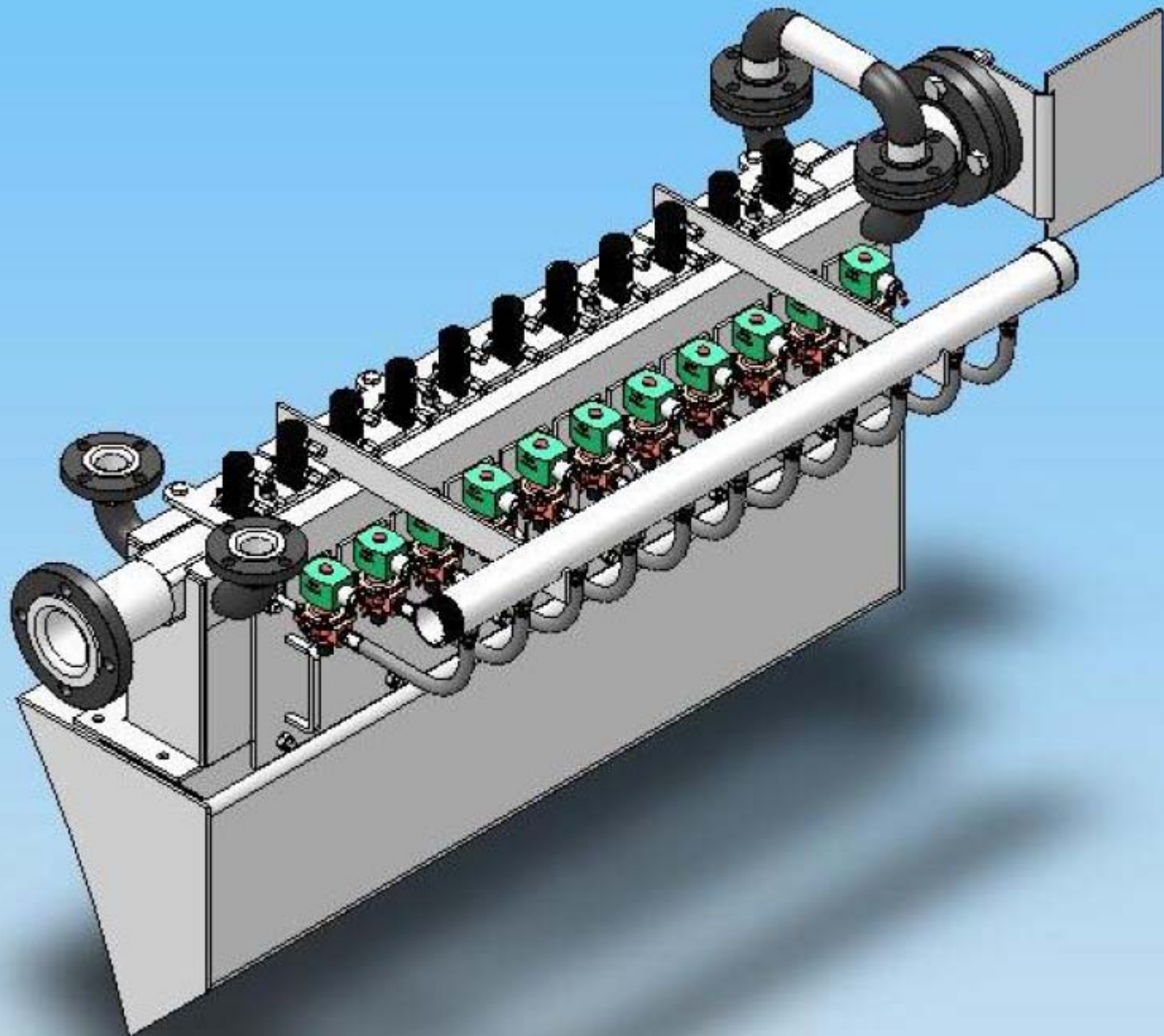
# **DOUBLE BARREL GREEN WMA PROCESS**

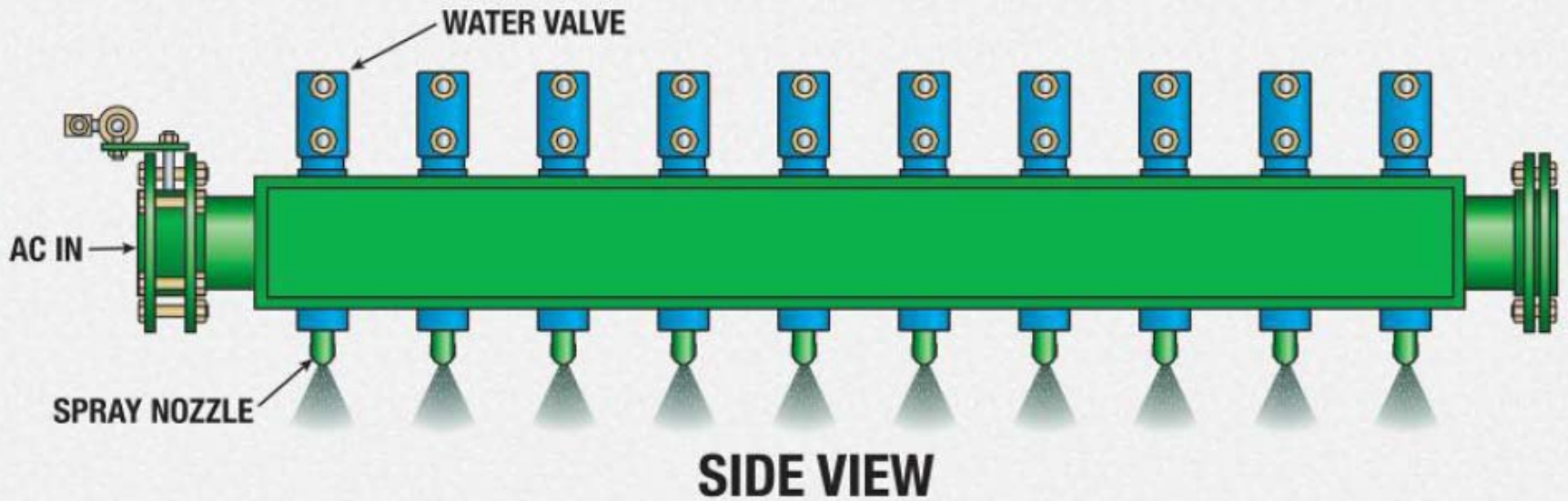
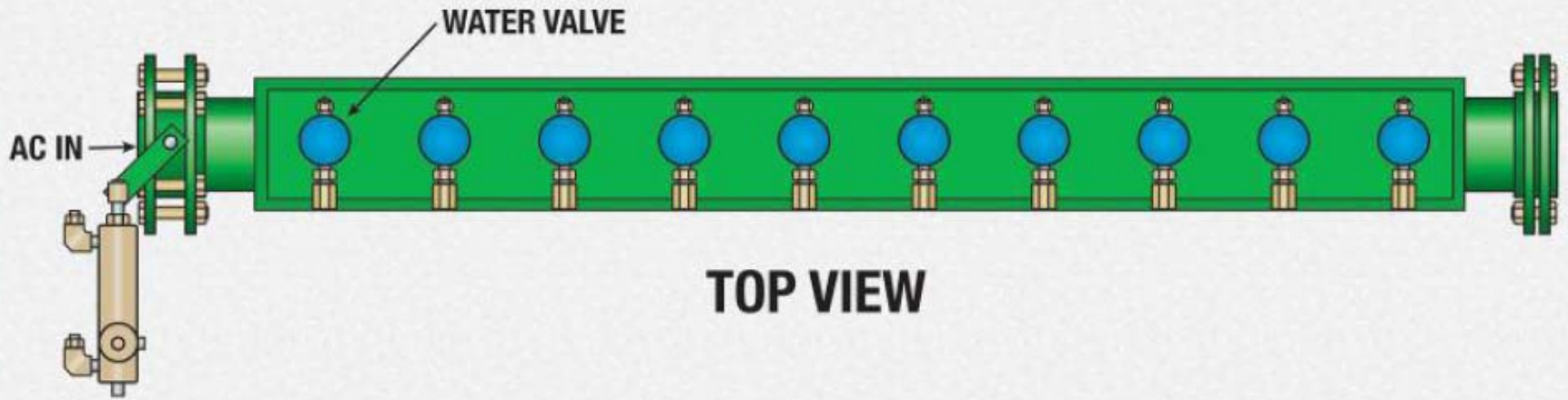
# HOW THE DOUBLE BARREL GREEN WMA PROCESS WORKS

- Known Astec Double Barrel concept
- Using Foam technology
- Similar to insitu cold recycling

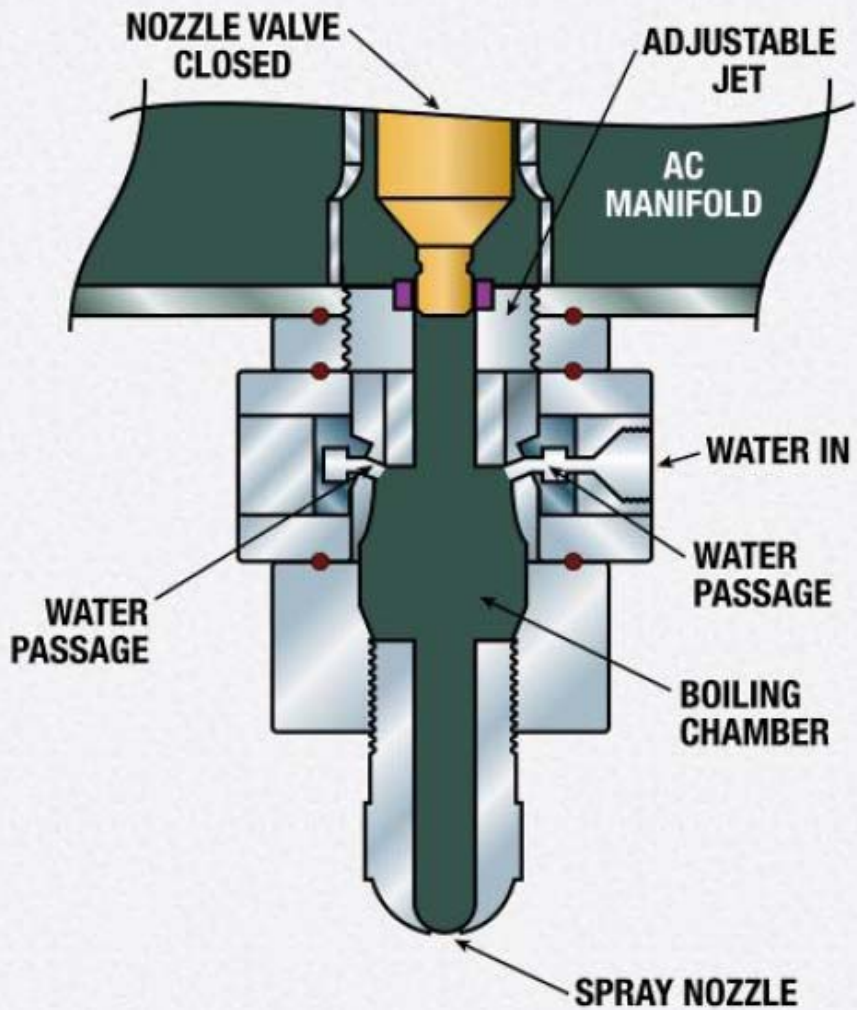




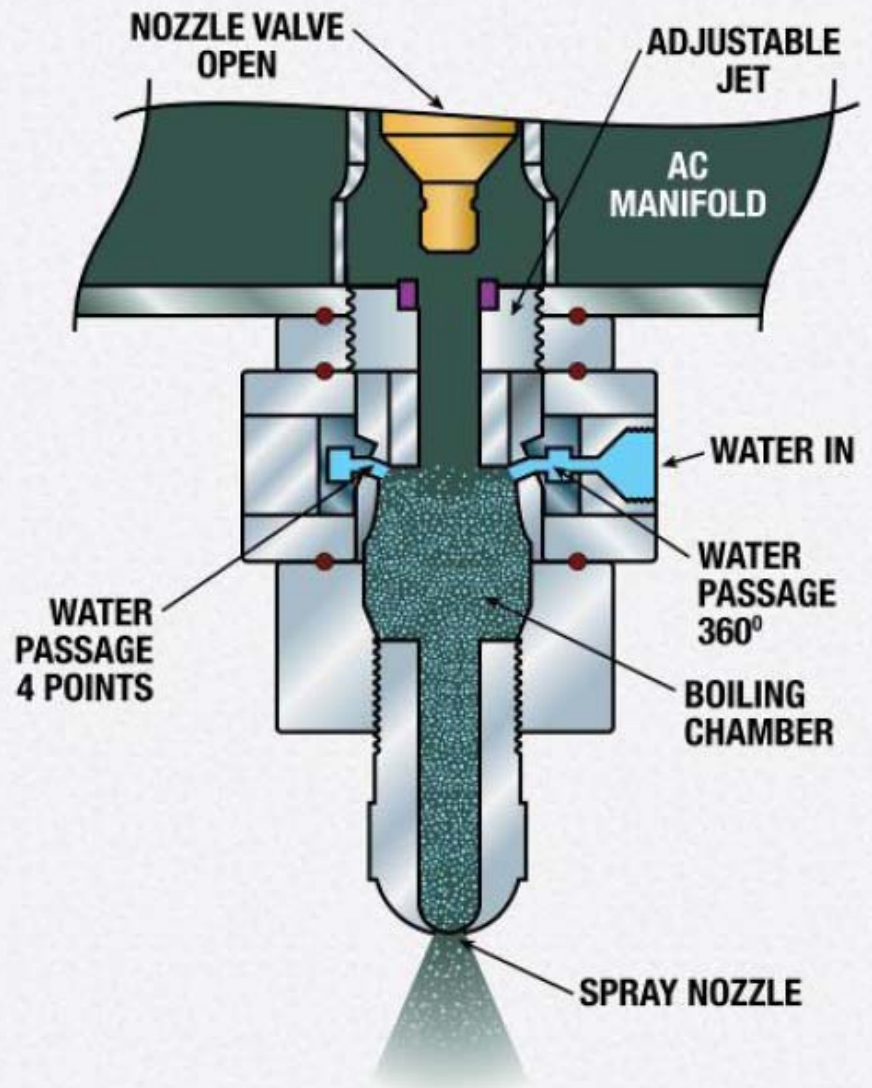




**DB GREEN MANIFOLD**



**FOAM NOZZLE CLOSED**



**FOAM NOZZLE OPEN**

**FOAM NOZZLE**

# How Much Water

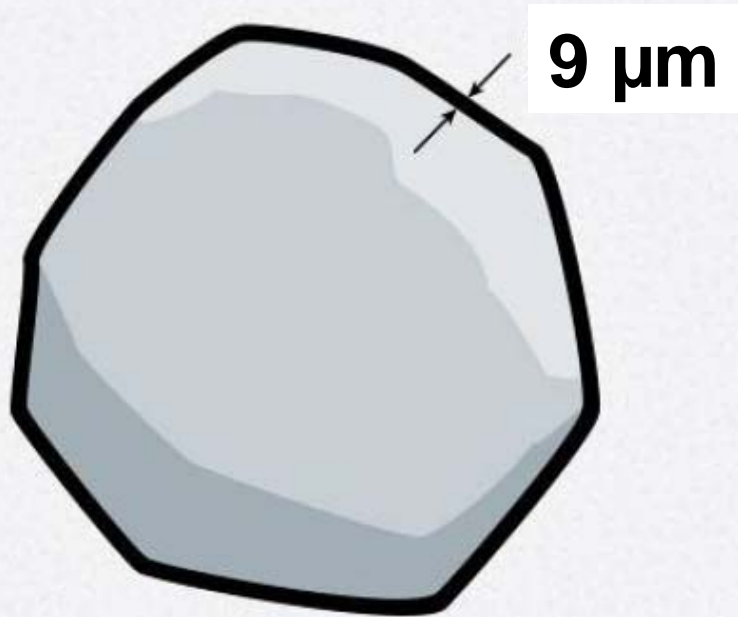
0.5kg / ton asphalt

53kg Bitumen / ton asphalt

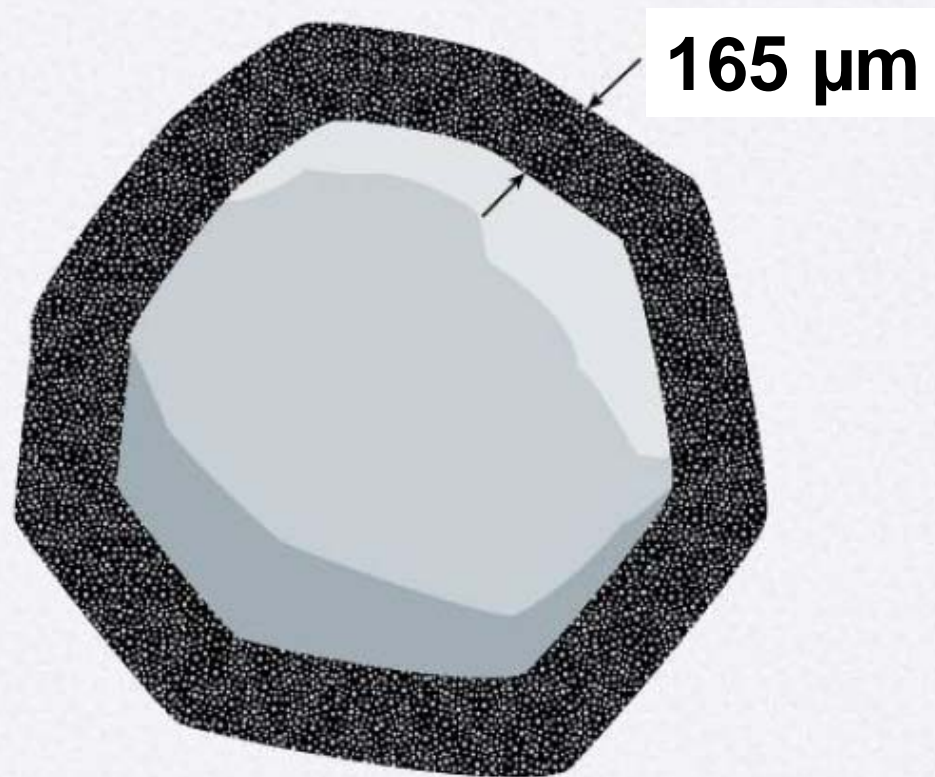
0.051m<sup>3</sup> Bitumen / ton asphalt

0.5kg water = 0.936m<sup>3</sup> steam

$0.936/0.051 = 18$  times the original volume

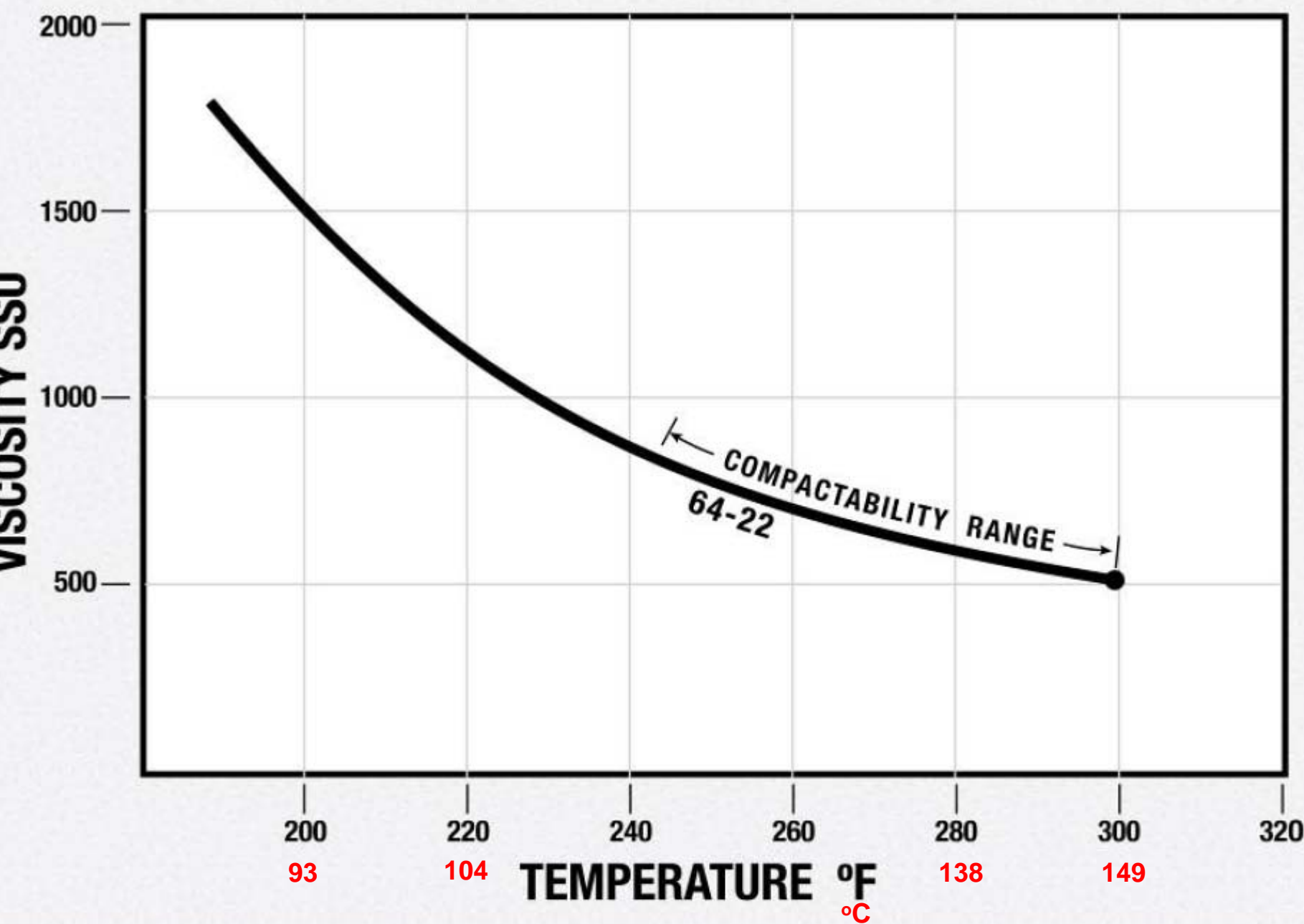


**NORMAL  
COATING**

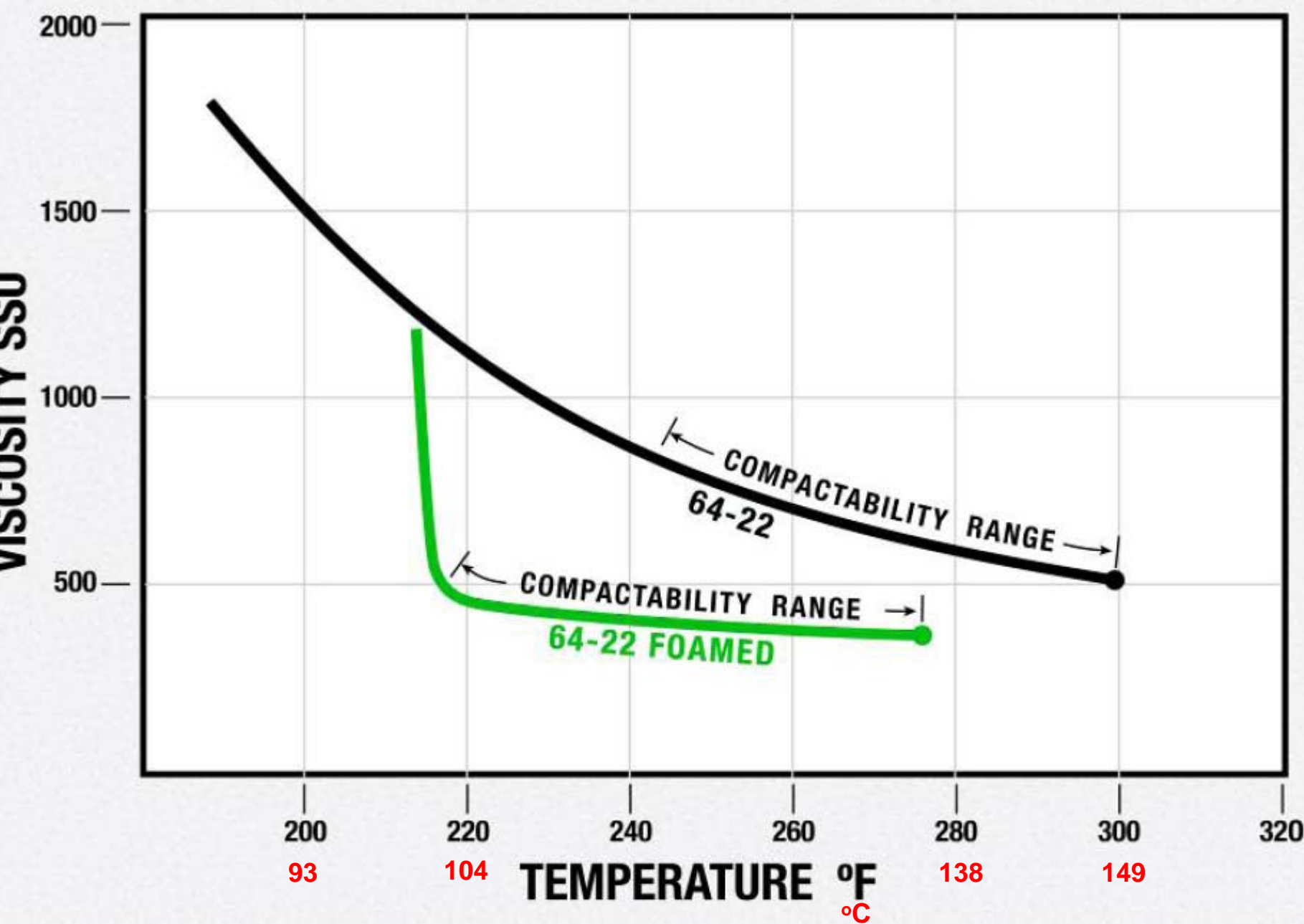


**DB GREEN FOAM  
COATING**

**COATING THICKNESS**



**VISCOSITY / TEMPERATURE PG 64 -22 (Approx.)**



**VISCOSITY / TEMPERATURE PG 64 -22 (Approx.)**

# How the Foam System Work

## Summary

- **Increased volume of binder**
- **Reduced viscosity of binder**
- **Improved coating of aggregate**
- **Improved workability and compaction**



# Planned Trials

- ACSA - OR Tambo International Airport
  - Reducing their Carbon Footprint
    - WMA
    - High RA content mixes
  - Engineering Properties
    - Night Work (Low ambient temperatures)
    - Early traffic
    - Improved compactibility of harsh airport mixes