



PG Binder Selection

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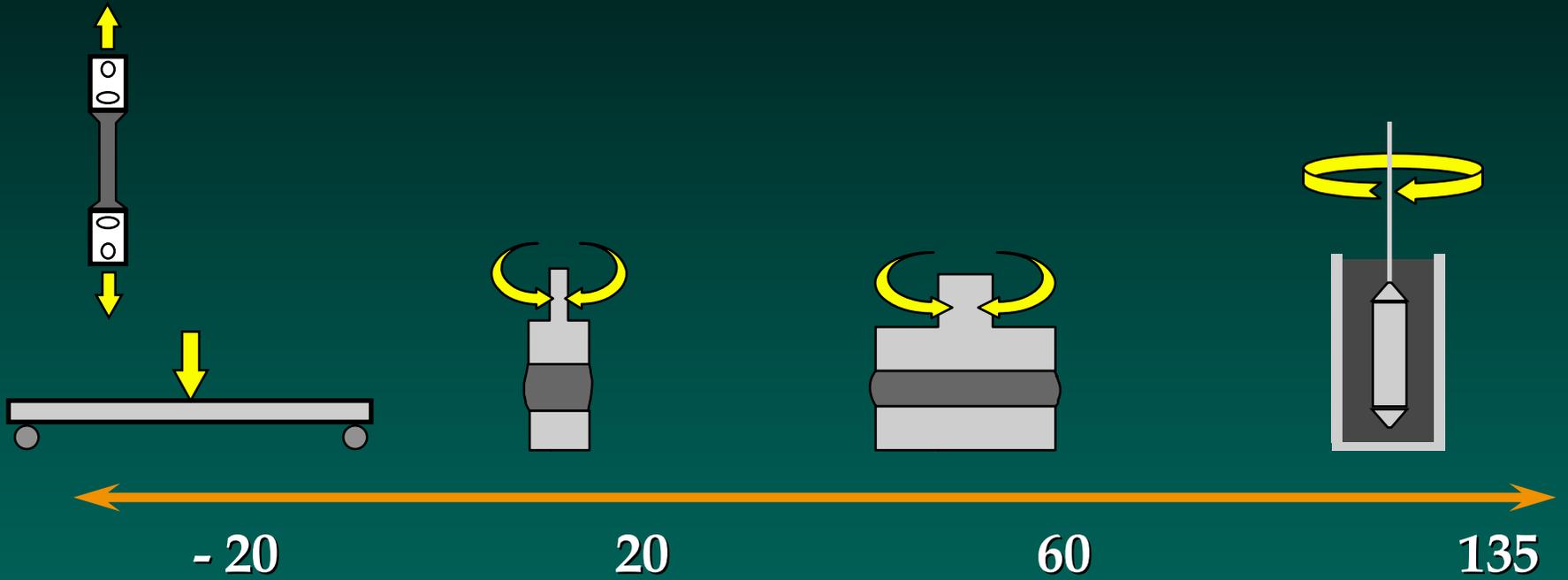
Superpave Asphalt Binder Spec

➤ Performance Based

- ◆ rutting
- ◆ fatigue cracking
- ◆ low temp cracking

➤ Physical Properties

- ◆ criteria same...temp changes
- ◆ measured on aged binders



Pavement Temperature, C

PG Binders

- Grading System Based on Climate

PG 52-40

**Performance
Grade**

**Average 7-day
max pavement
design temp**

**Min pavement
design temp**

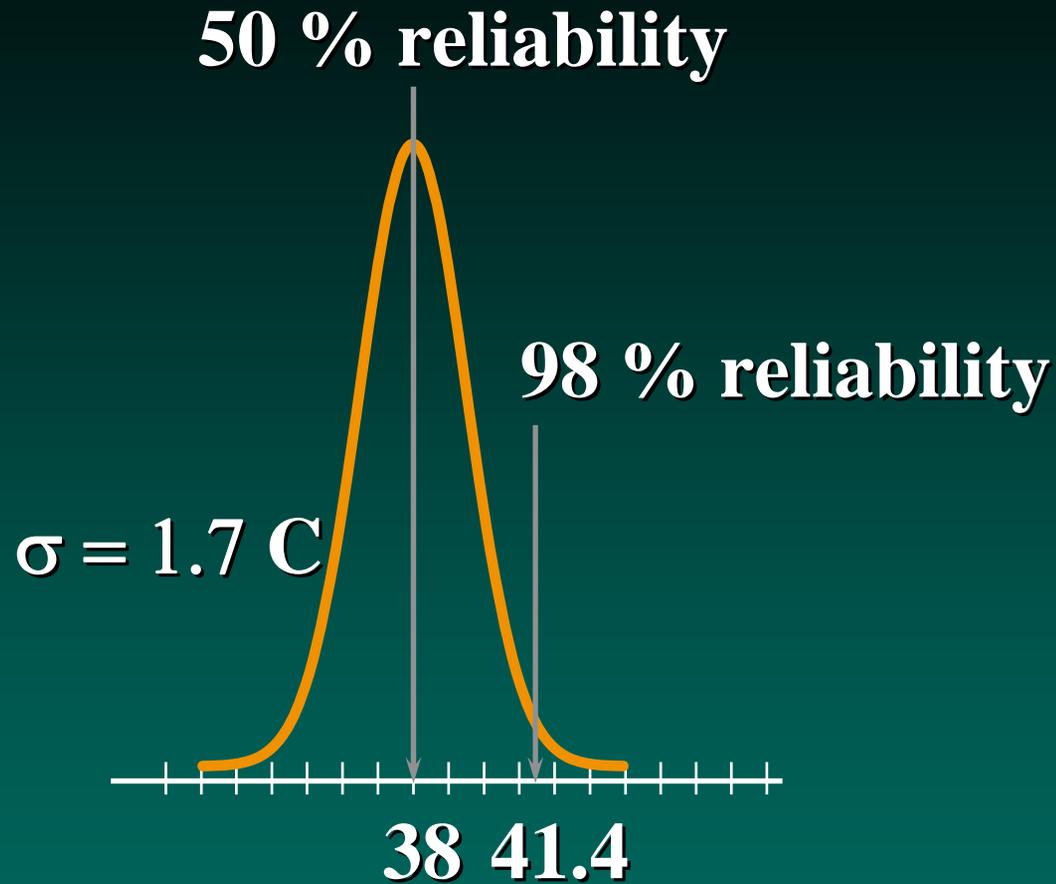
Selecting PG Binders

- ✓ Selection Based on Climate
- ✓ Computer Program- PGEXCEL3.XLS
- ✓ Maps
- ✓ Changes to (high) Temperature Designation – “grade bumping”
- ✓ Experience
- ✓ HMAC Specs

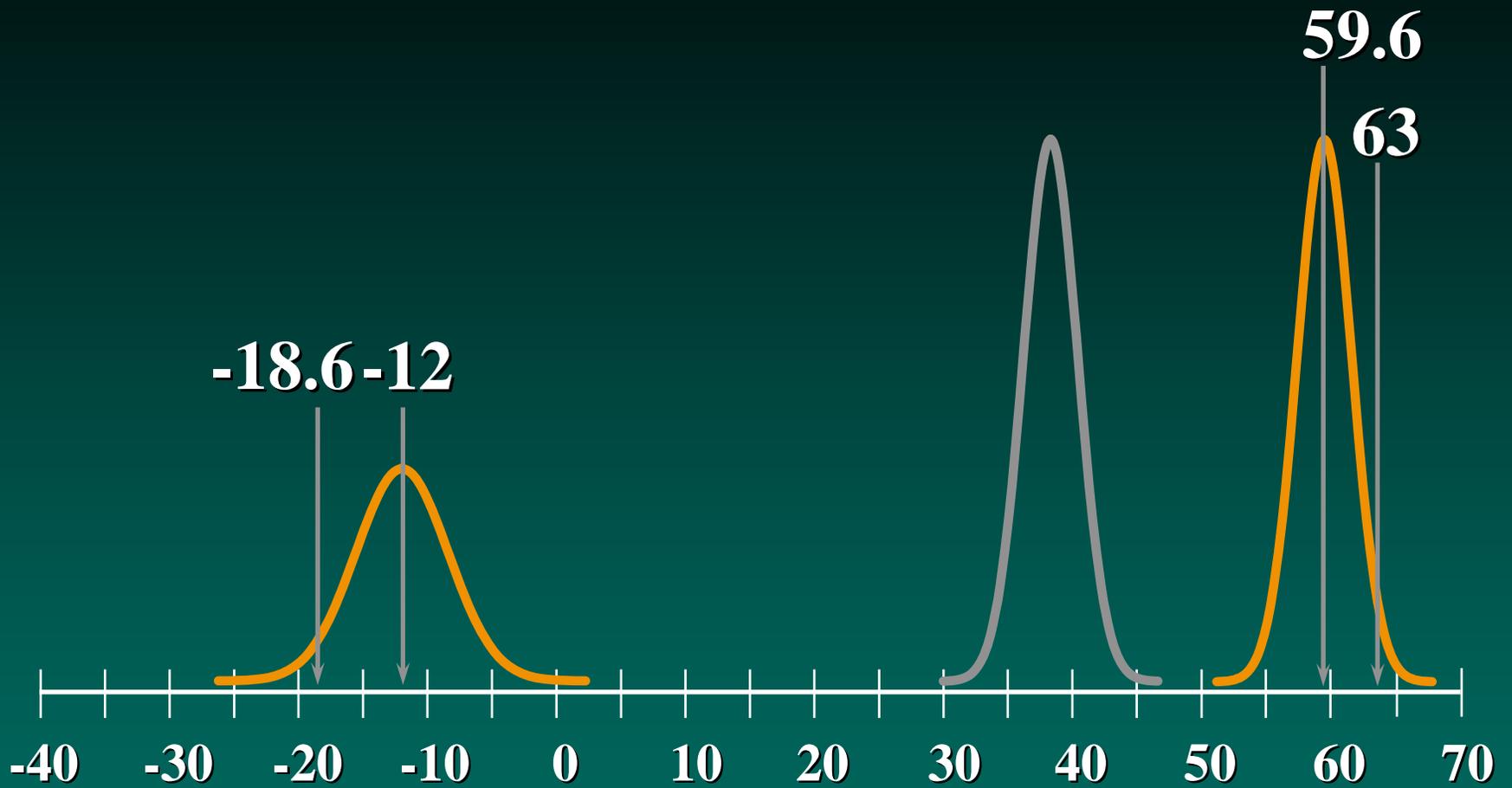
Selection by Air Temp

- **Superpave Weather Database**
 - ◆ 6500 NOAA weather stations
- **For Each Year**
 - ◆ hottest 7-day temp (avg and std dev)
 - ◆ coldest temp (avg and std dev)
- **Use Principles of “Engineering Reliability”**

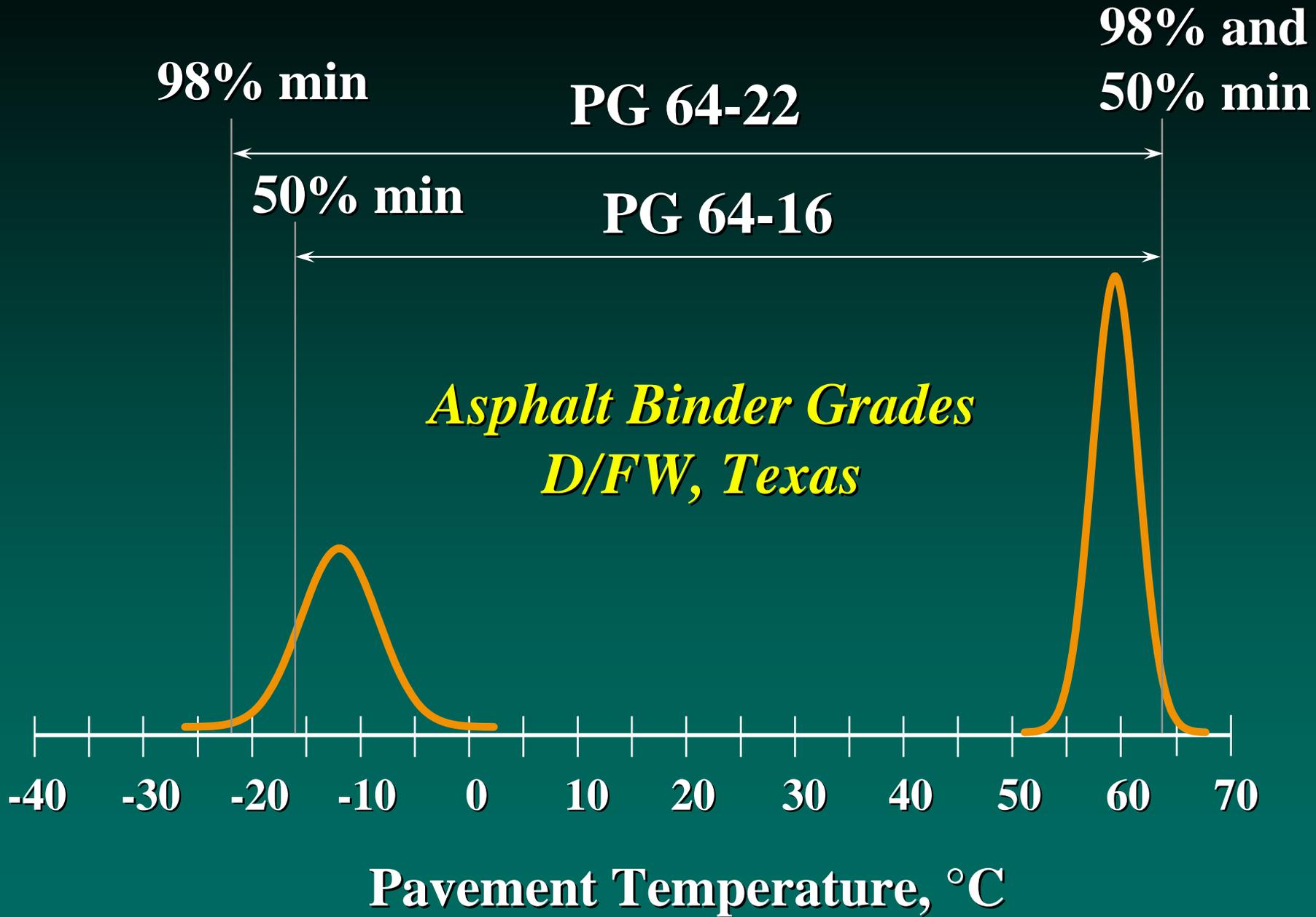
WARNING: BORING DISCUSSION AHEAD!



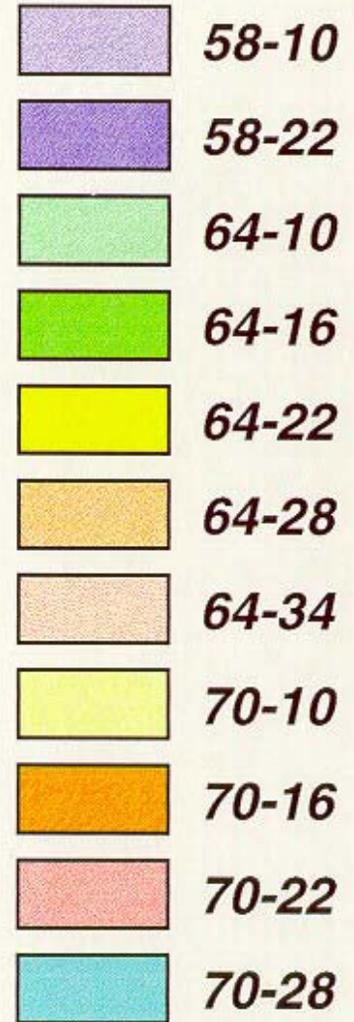
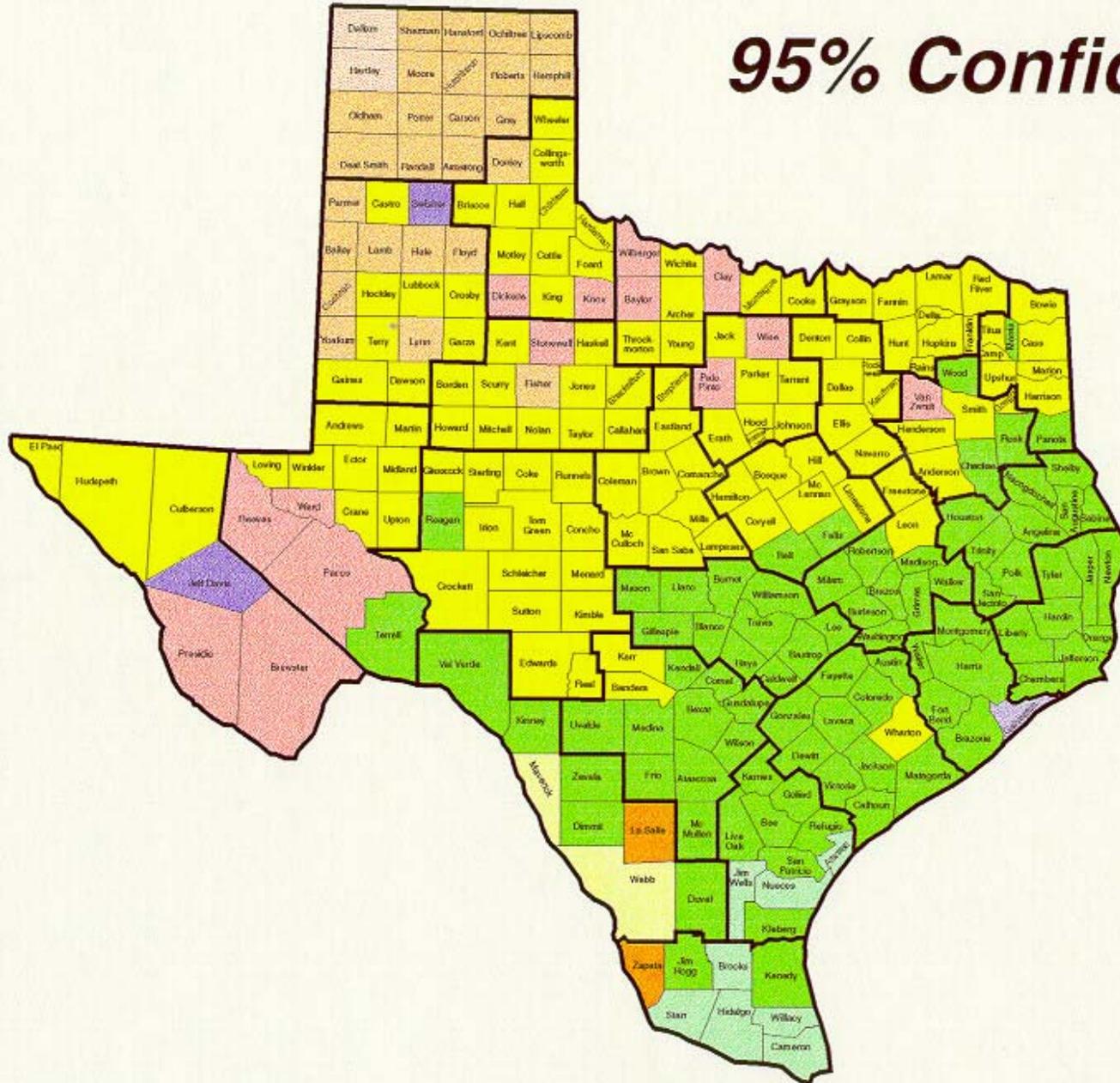
**7-Day Maximum Air Temperature ($^{\circ}\text{C}$)
D/FW, Texas**



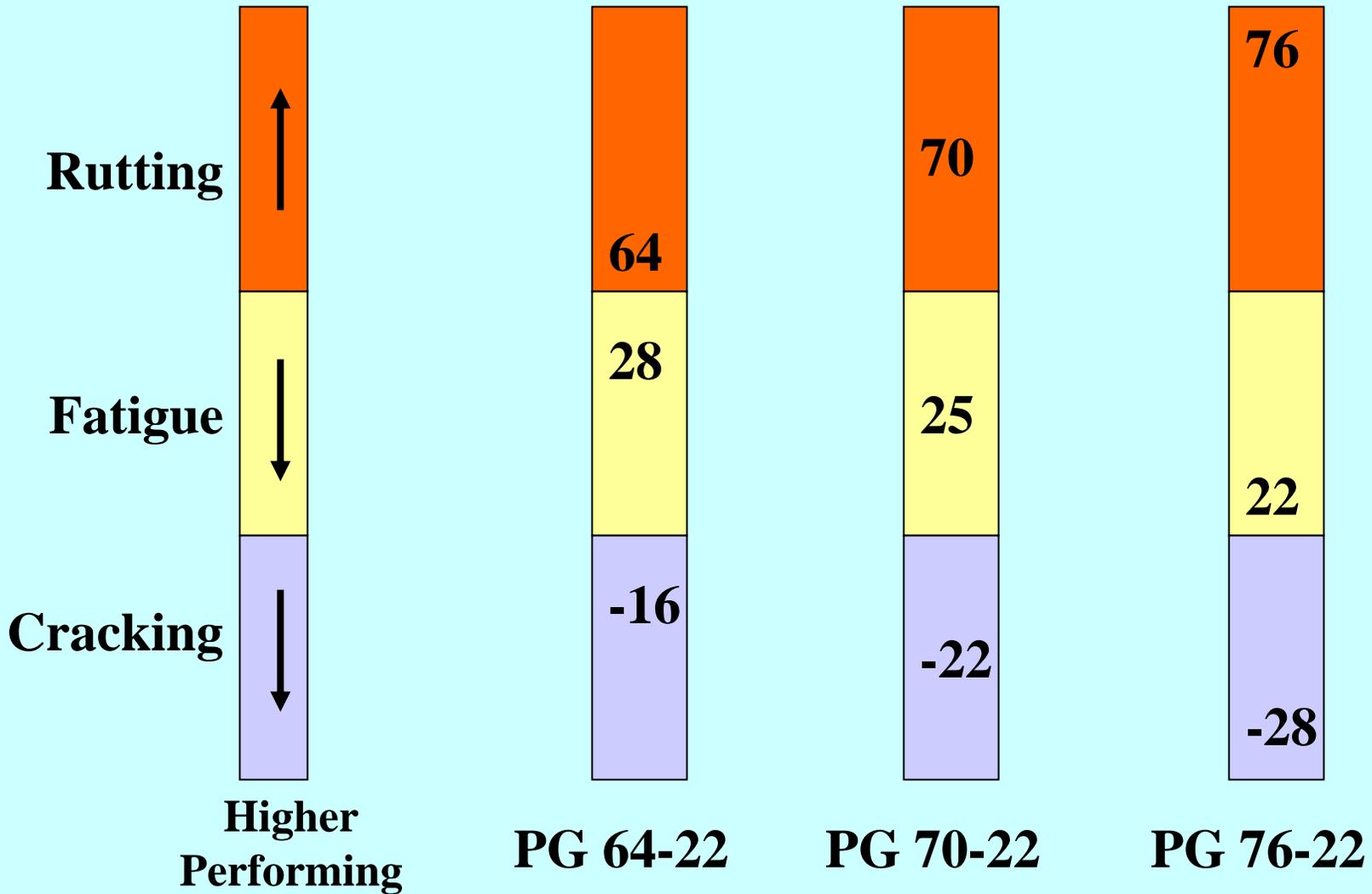
Pavement Temperature (°C), D/FW, Texas



95% Confidence Data



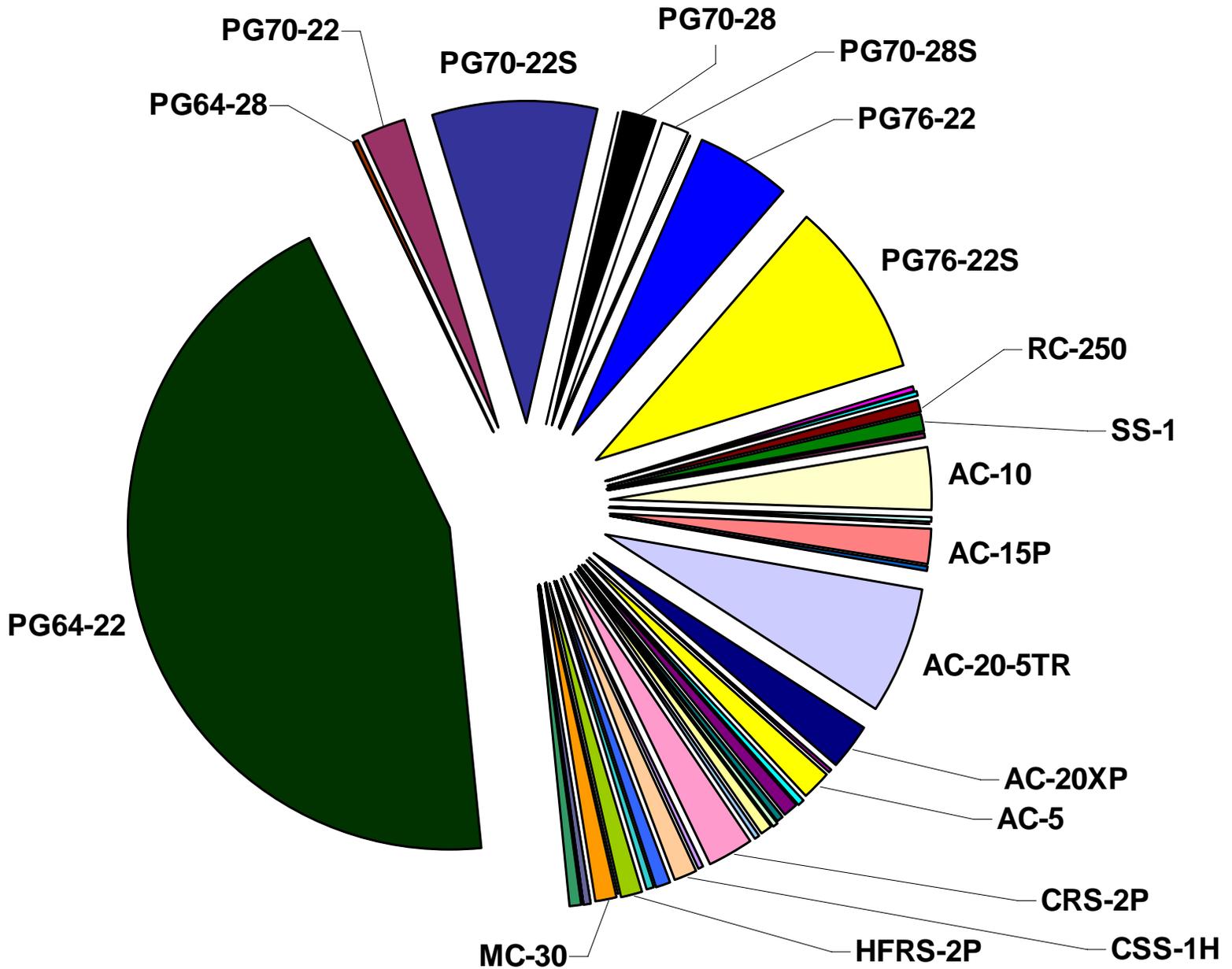
PG Binders and Grade Bumping for Rut Resistance



Modified Binders

- 'PG-Plus' binders
- Elastic recovery requirement
 - For all PGs with grade span above 90
 - Requirement is tougher for bigger spans
- L, S, E, or TR not included
 - May be shown on the tickets that way
 - Material codes for plain PG only

2006 Asphalt Usage by Volume

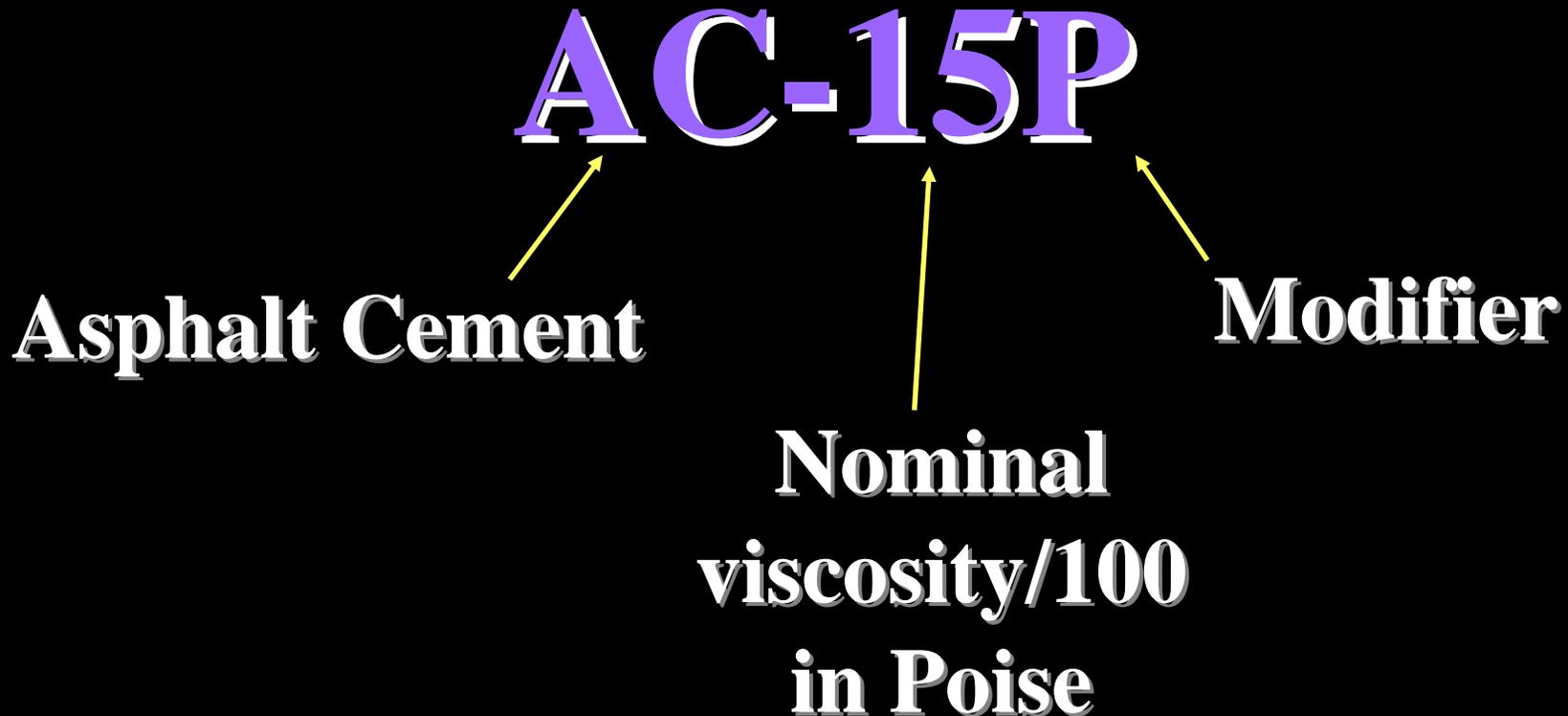




Other Binder Types

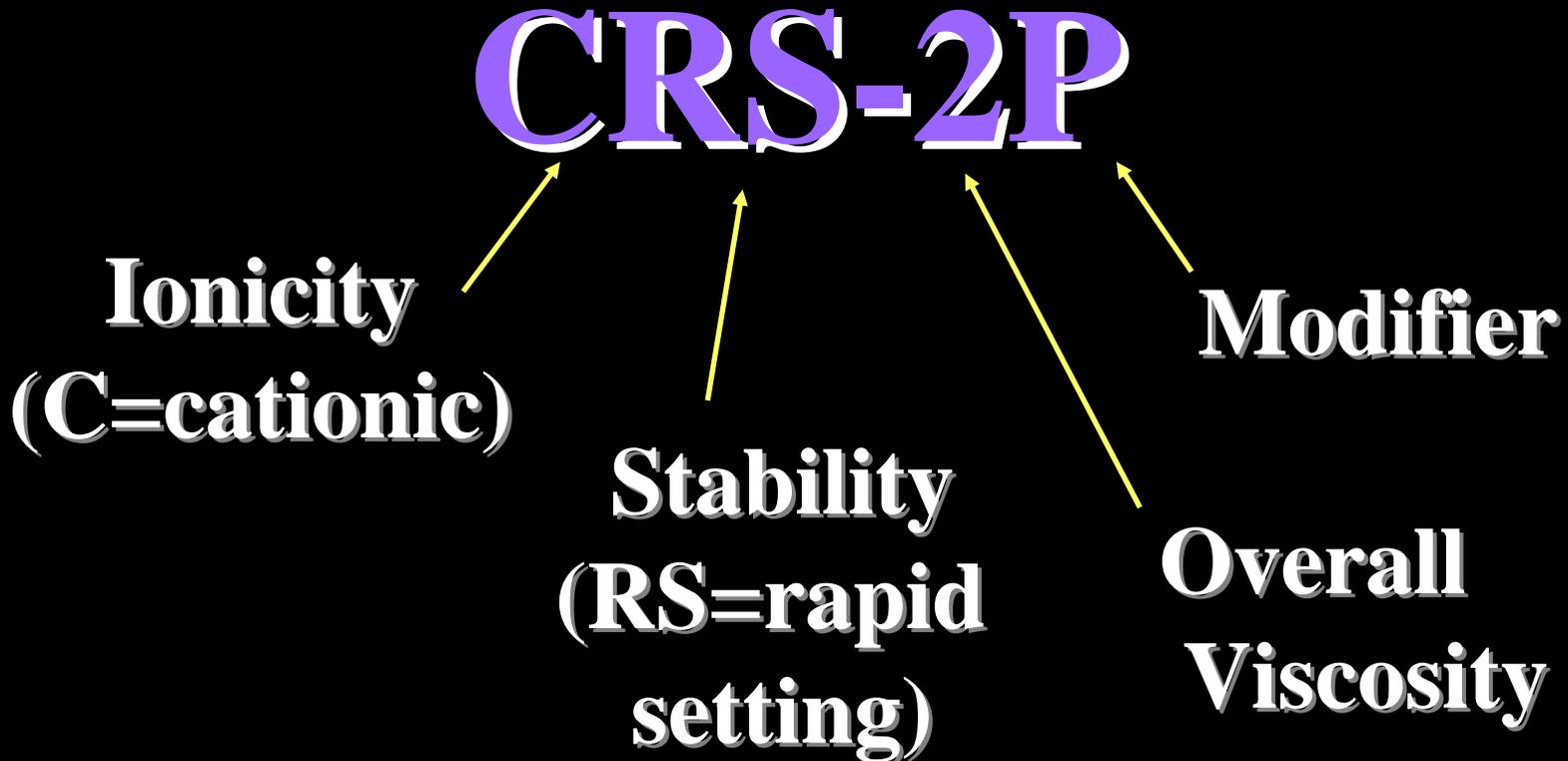
Asphalt Cements

- Grade Based on Viscosity



Emulsions

- Grade contains lots of information



Cutbacks

- Grade Based on Cutback Viscosity

MC-2400L

Volatility

**(MC=Medium
Curing)**

**Nominal
Viscosity
in cSt**

Modifier

Surface Treatments

- AC's, rapid setting emulsions, high-vis cutbacks (for cool weather)
- Higher Viscosity = Less workability, more durability
- Modifiers can add stiffness and give performance benefits
- Cationic can give better adhesion

Tack Coats, Fog Seals, Erosion Control

- Slow setting emulsions
- Slower setting time is intended to promote adhesion
- Specialty products
- Note HMAC Spec Items for tack coats

Prime Coat

- MC-30, AE-P, Emulsions
- MC-30 is historically the most popular
- MC-30 and AE-P best for spray primes
- Emulsions work better when worked in

Binder QA

Getting a good material on the job

Pre-Approved Binder

- Tested by CSTM&P before it gets to the project
 - Must have a lab number (“C” number)
 - Basic report should be available on S.M. or mainframe
- QM materials
 - Joint sealants and other misc
 - May have C number, or may need to look at pre-approved list

Pre-approval process

- Many schemes for supplier sampling
 - Tank by tank
 - Batch sampling
 - Time period sampling with QC
- Suppliers can circumvent
 - We can't inspect everything
 - Verification on receipt of material is critical!

