

Asphalt Summit 2003

SE Region Update

by

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December 2003

Efforts to Make a Rut Resistant Pavement



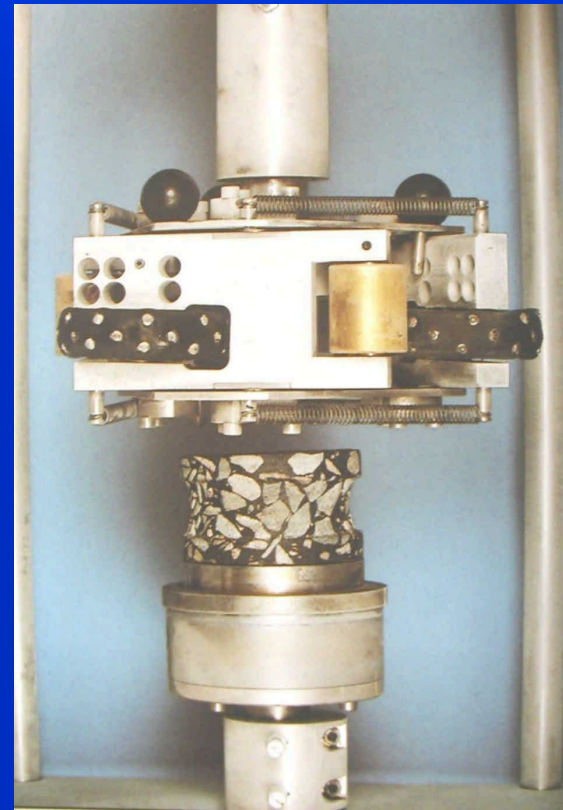
Nordic
Abrasion



Loaded Wheel Test



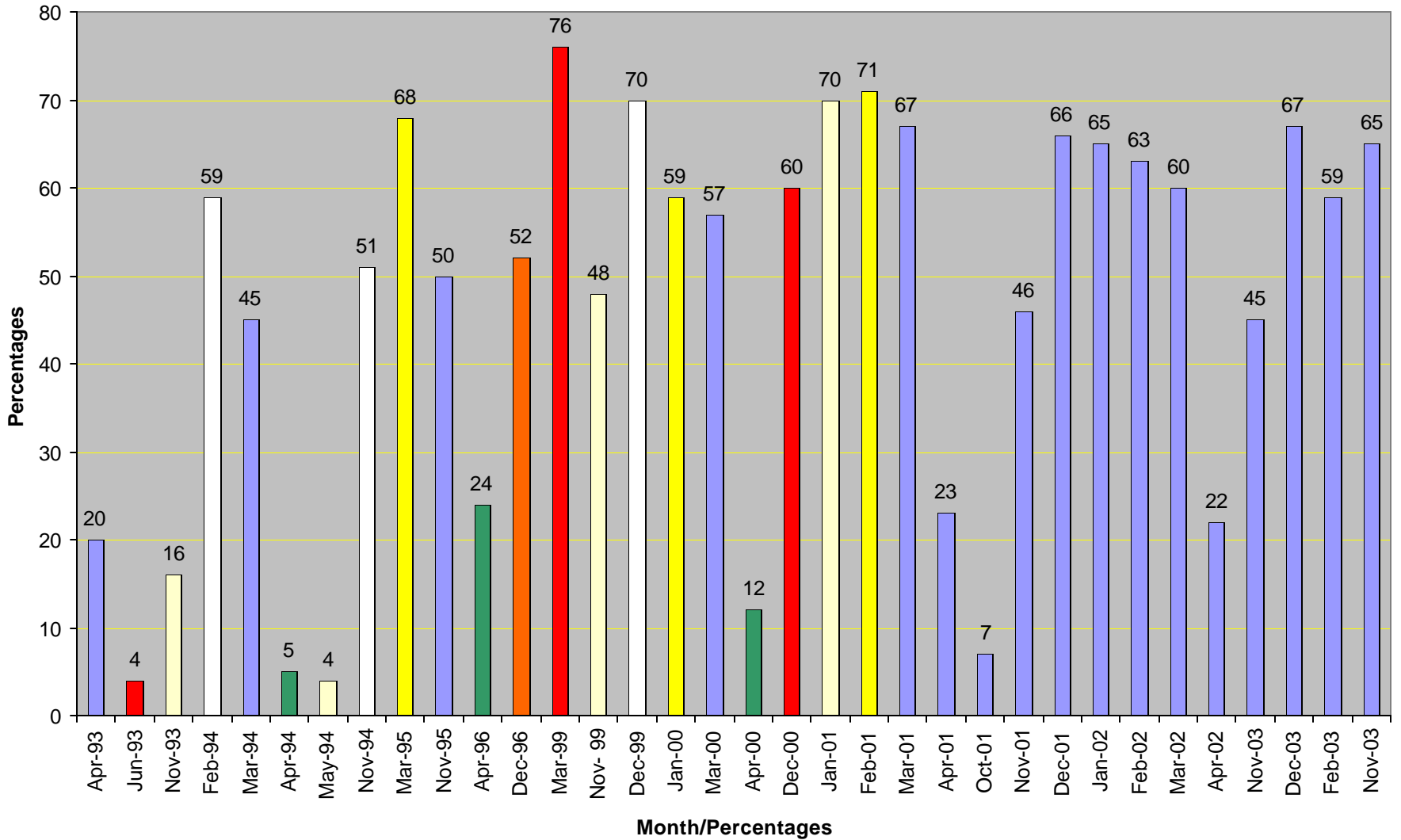
Prall



SRK

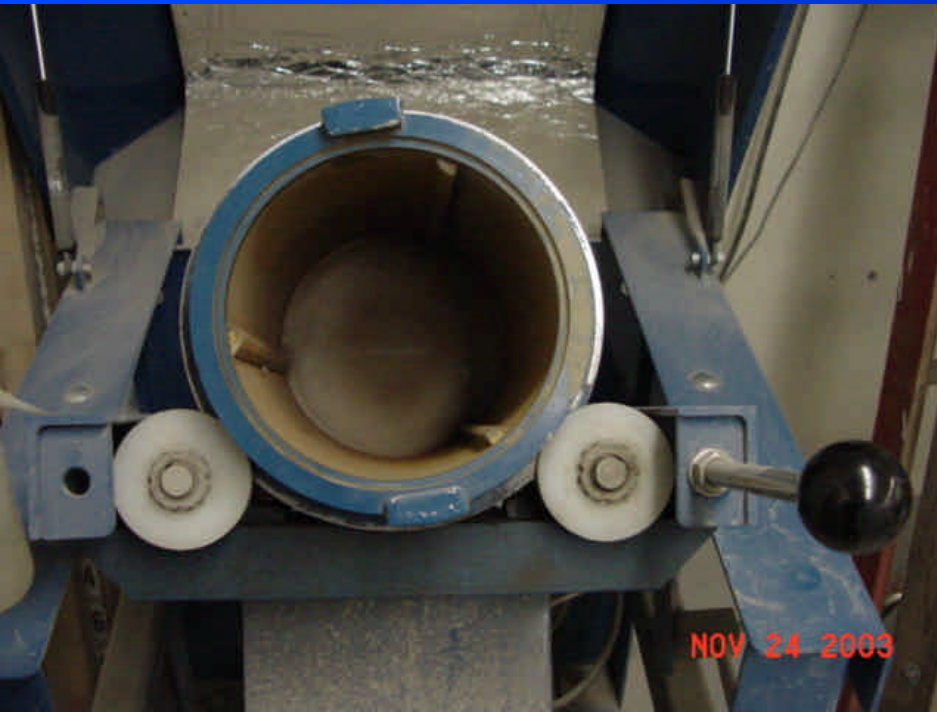
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Effective Studded Tire Use Rate In Juneau vs Time



Nordic Abrasion Ball Mill

- Ribbed Test Chamber
- Wet Test
- 5400 Revolutions
- More Rigorous than Micro Duvall



Nordic Abrasion



Northern European Aggregate Specifications Varies with Traffic

Class	Nordic Abrasion Value	Traffic
I	≤ 7	$>10k$
II	≤ 10	5k-10k
III	≤ 14	1.5k-5k
IV	≤ 17	$<1.5k$

SE Region Nordic Abrasion

Guide Specifications

- Basis:

-Traffic Volumes

-Previous Surface Wear Problem

Traffic (AADT)

Nordic Abrasion

>10K

7.5 max

5k-10k

10 max

< 5k

optional

- **SE Region is Importing Aggregate to Provide a Wear Resistant Pavement**

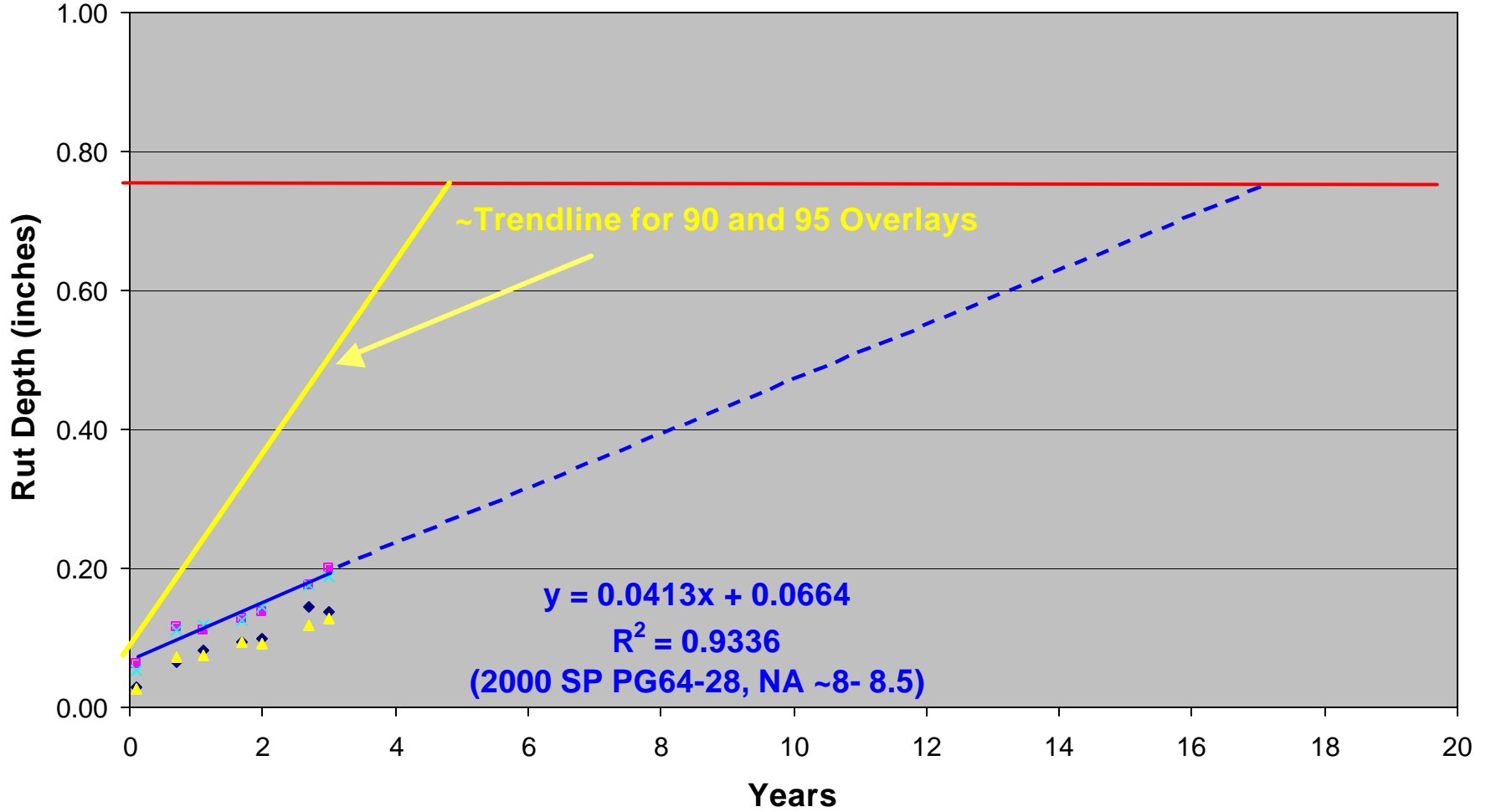
- **Minor Cost Impacts**

- Barging (~ 10%)

- Encouraging Results

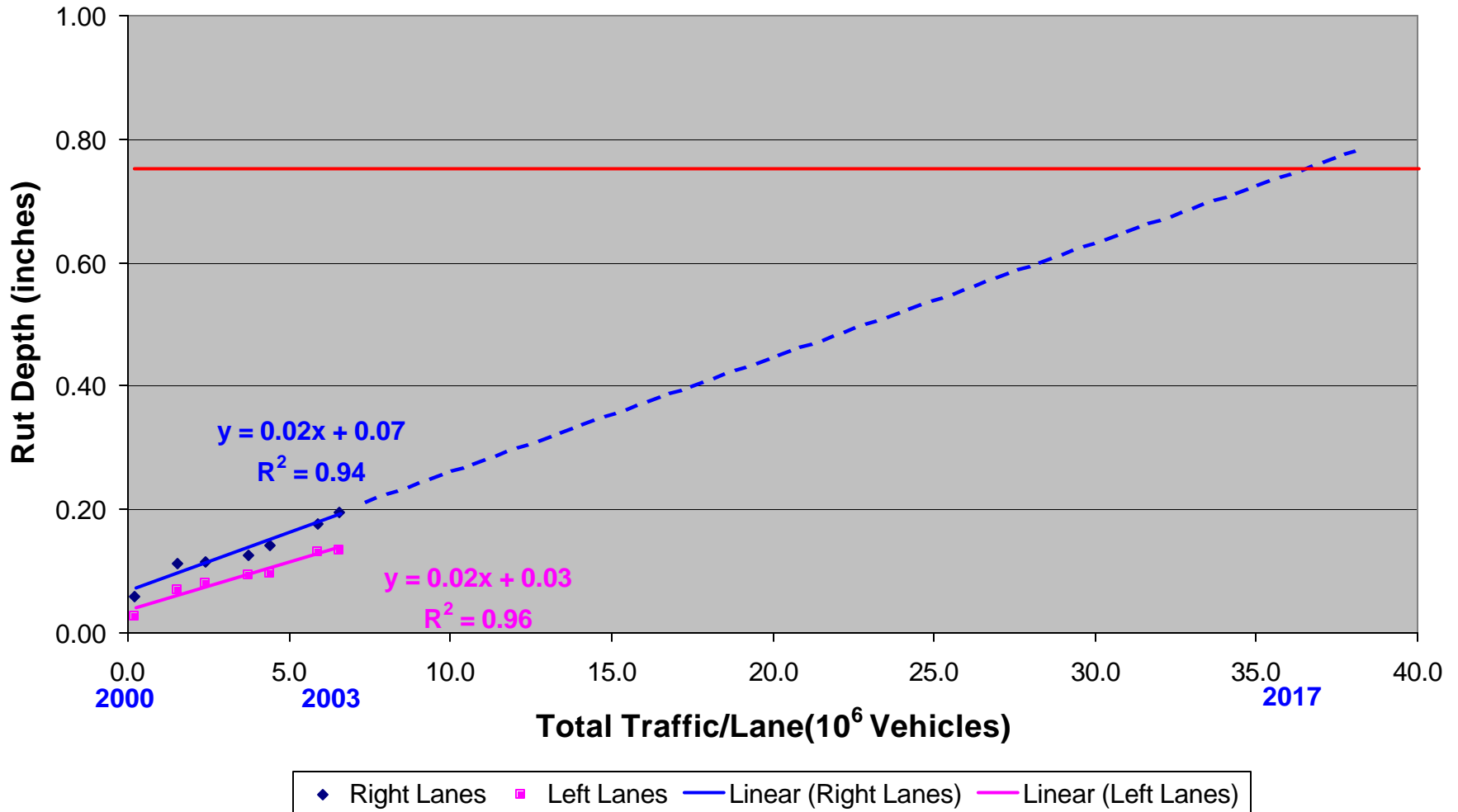
- Life More than Doubled

Egan Wear Model Average Rut Depth vs Age

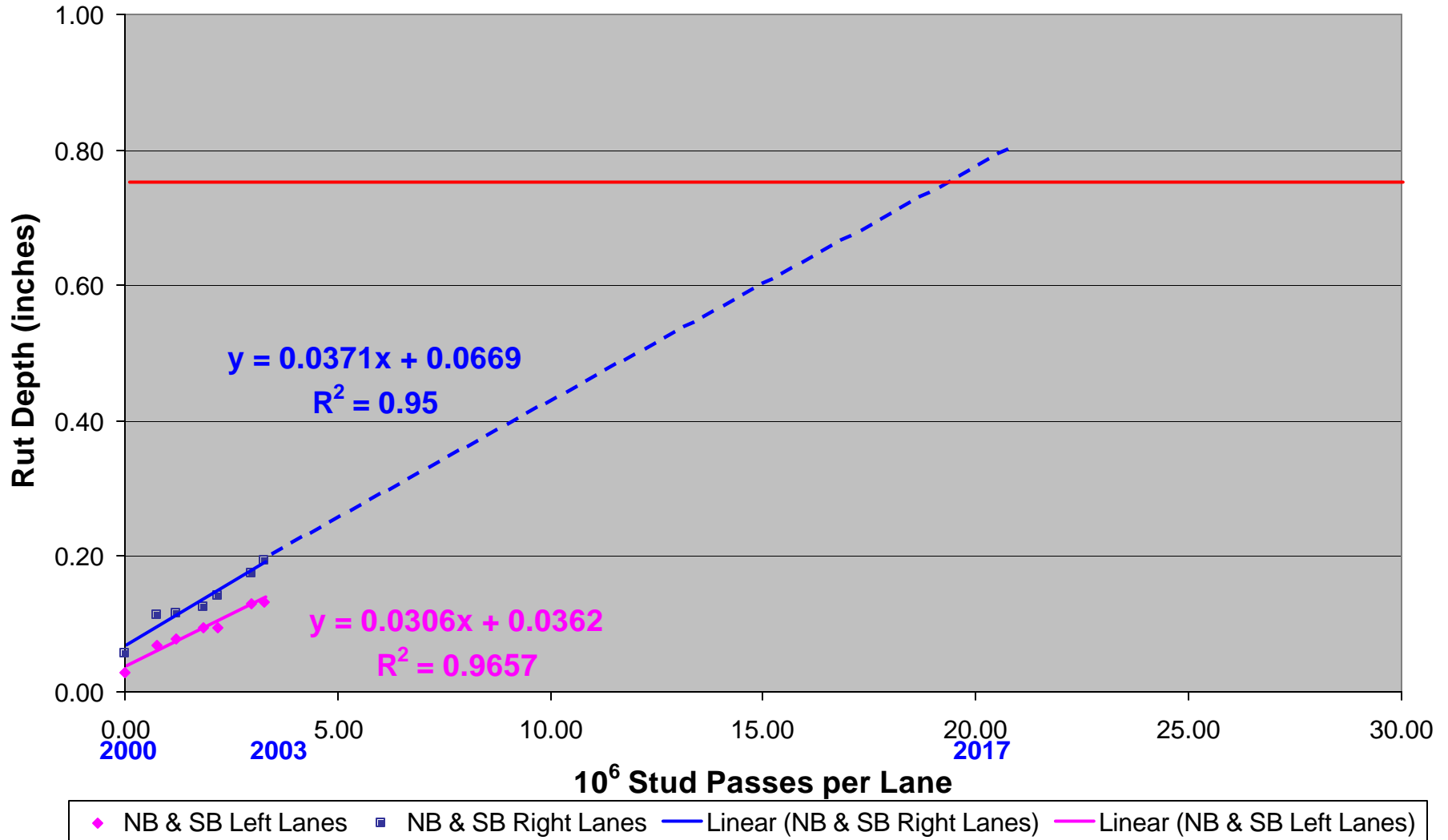


Egan Wear Model

Rut Depth vs Total Traffic



Egan Rut Depth vs Studded Tire Traffic



**CEN WG1 BITUMINOUS
MATERIALS**

**EUROPEAN STANDARD ·
WORKING DRAFT
TESTING BITUMINOUS
MATERIALS**

TEST: ABRASION BY STUDS

**TG2 Reference Number : 1.14
TC 227 Work Item 00227122
Second draft**

March 97

DETERMINATION OF ABRASION CAUSED BY STUDS

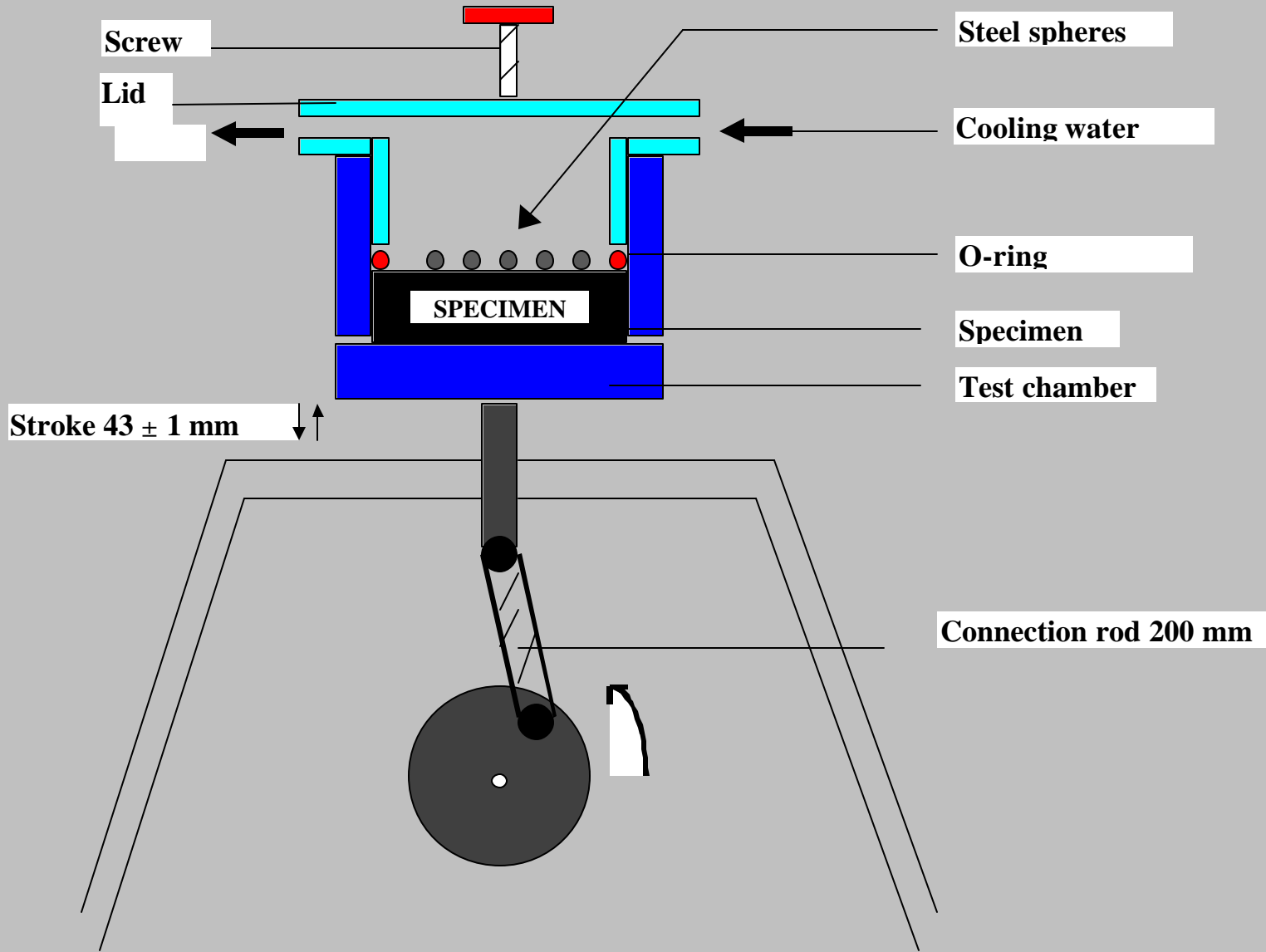
Method A and Method B

Method A the *Prall-method*, but improved by comprehensive research work to meet an adequate design. Swedish research correlates with abrasion in the field.

Method B originated from Finnish research and experience and correlates with abrasion in the field.(SRK)

Prall Test Equipment





Nordic Countries Classification of wear resistance of asphalt mixtures using Prall results

Class	Prall-loss, cm ³	Wear resistance
1	< 20	Very good
2	20 – 29	Good
3	30 – 39	Satisfactory
4	40 – 50	Less satisfactory
5	> 50	Poor



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OFF ON

WATER TEMP

A blue control panel for water temperature. On the left is a rotary switch with 'OFF' and 'ON' markings. To its right is a digital display showing '18.5 °C'. The display has '°C' at the top right and '°F' at the bottom right. There are also left and right arrow buttons on the display.

PRALL SPEED

A black rotary knob with a white scale and a central button, labeled 'PRALL SPEED'.

PRALL
ON/OFF

A vertical indicator light with a green top half and a red bottom half. The red section contains a white circle. A vertical line is visible in the green section.

PRALL RUNNING TIME

A circular analog gauge with a white face and black markings. It has a black needle pointing to approximately 10 and a red needle pointing to approximately 2. The gauge is labeled 'PRALL RUNNING TIME'.

PRALL HOUR METER

A black digital display showing '00015.4 h'. Below the display is the brand name 'Revatico'.

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Motor Speed Control

Temperature Controls
For
Conditioning/Chilling
Sample



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Prall Test

- Core Samples Conditioned 20hrs @ 20°C
- Exposed to Impact of 40 Steel Bearings for 15 minutes @ 950 rpm
- Cooling Water (5°C) Flows over Sample During Testing
- Results are Reported in Volume Loss (cm³)



Prall Results

SMA Old (46) vs New (30)



Prall Results

SMA (30) vs Plus Ride (14)



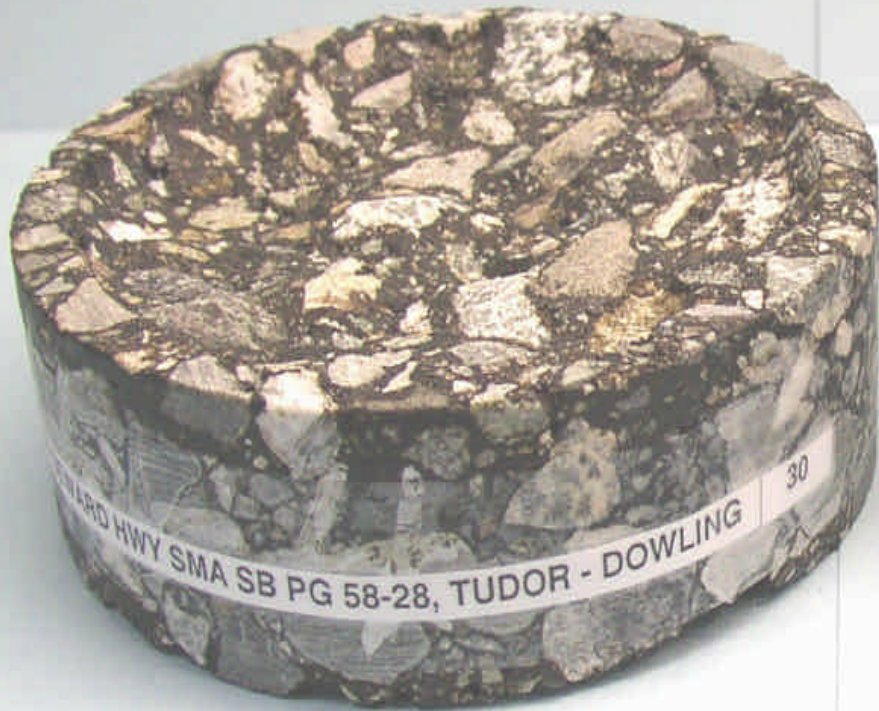
Pral Results

New Egan (20) vs Old Egan (56)



Prall Results

SMA (30) vs SP (26)



Prall Sensitive to Mix Voids

(50)



Prall Results to Date

Anchorage Cores:	Prall Loss cm³	Aggregate Source
1993 Muldoon Rd SMA AC-5	50	Mat-Su
2003 New Seward SMA 64-28 (Fireweed to Benson)	23	Mat-Su Mat-Su
2003 New Seward SMA 64-28 (36th to Benson)	32	Mat-Su Mat-Su
2003 New Seward SMA 58-28 (Tudor to Dowling)	30	Mat-Su Mat-Su
2003 New Seward SP 58-28	26	Mat-Su
1996 New Seward AC-5	46	Mat-Su
1982 New Seward AC-5	45	Mat-Su
1985 A St. Plus Ride	14	Mat-Su
1985 A St. Plus Ride	16	Mat-Su

Prall Results to Date

Juneau Cores:	Prall Loss cm ³	Aggregate Source
2000 Egan Dr. SP 64-28	20	Haines
2000 Leveling Mix PBA 2 (Similar to 95 Egan Mix)	56	Lena Pt.
2001 Lemon Rd SP 64-28	20	Haines
2002 N. Tongass SP 64-28		Glacier NW
2001 Glacier Hwy SP 64-28		Glacier NW

More to be tested in 2004

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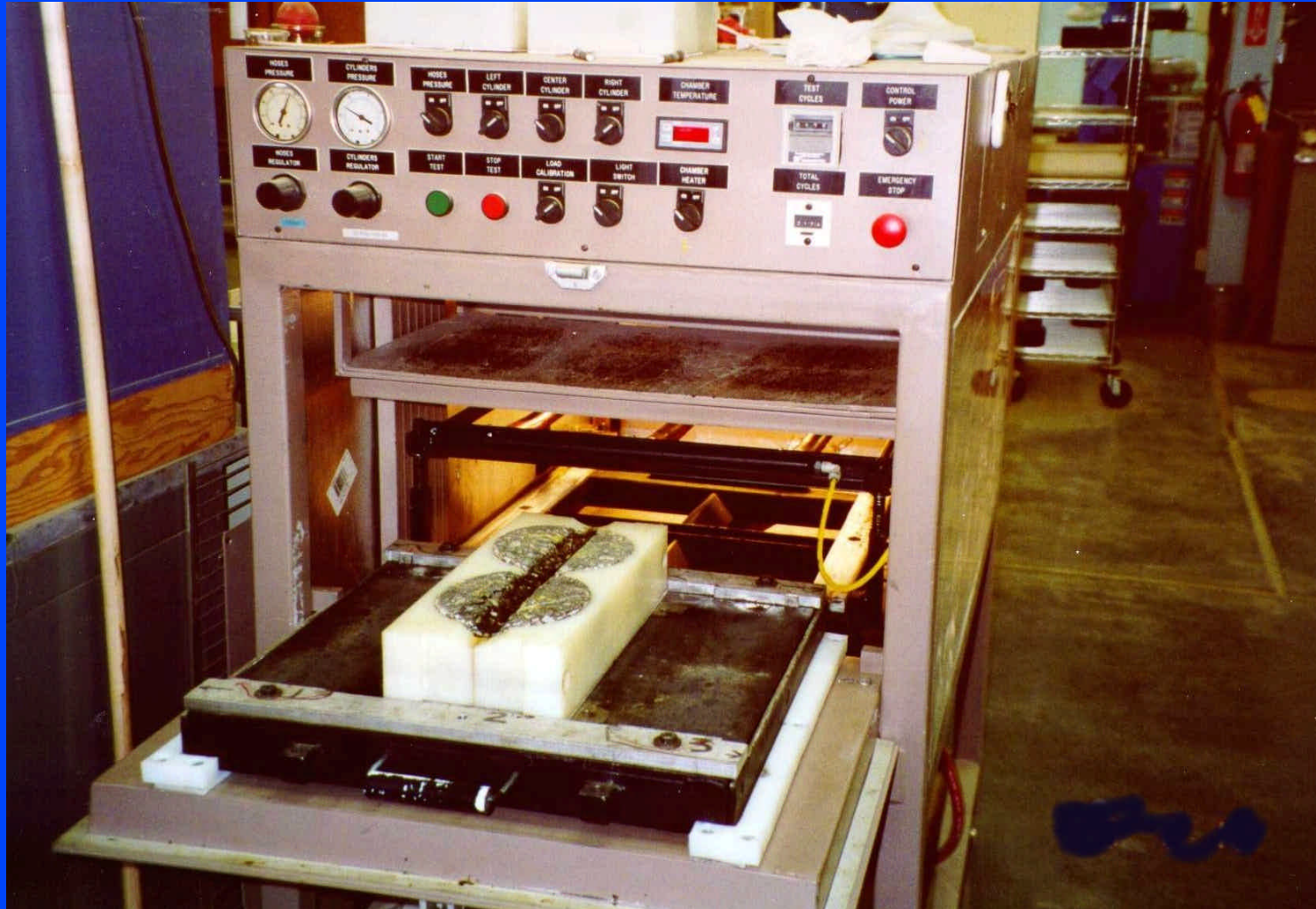
Nordic SRK Wear Test



Alaskan Mix SRK Values

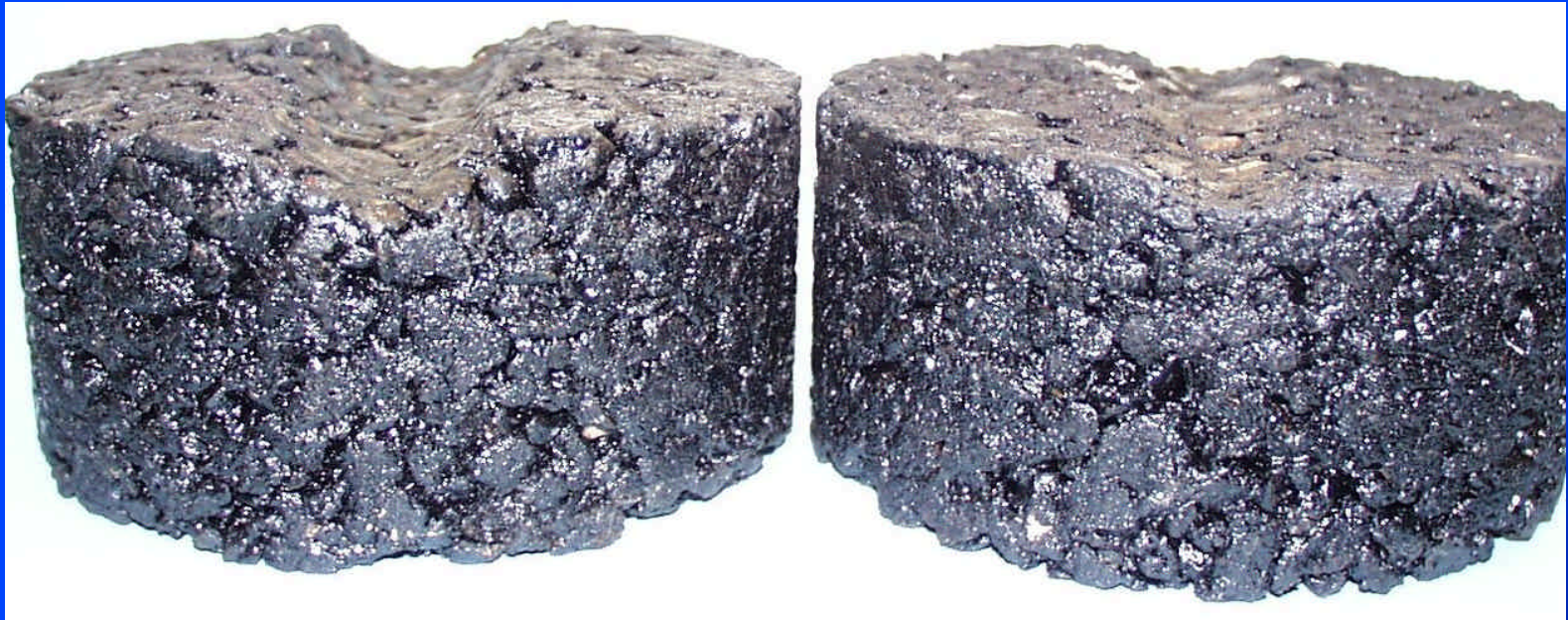
Mix Type	SRK	Nordic SRK Stds
• Type II (3/4" Dense)	51	< 25 Class 1
• Type I (1" Dense)	50	< 35 Class 2
• SMA (Gap Graded)	45	< 45 Class 3
• SP Juneau	34	< 60 Class 4
• Lemon Rd SP	32	
• Plus-Ride (Rubber)	30	

Loaded Wheel Tester



PG 52-28
Rut Index = 10.7

PG 58-28
Rut Index = 4.7



PG 64-28
Rut Index = 1

A photograph of a two-lane asphalt road curving through a dense forest. The road has a white edge line on the right and double yellow lines in the center. The forest is composed of tall evergreen trees. In the background, a misty or foggy mountain range is visible. On the left side of the road, there are utility poles and a guardrail. The word "Questions?" is written in a yellow, serif font in the center of the image.

Questions?