



# The Association of Modified Asphalt Producers

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NE Department of Roads

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# Flexible Pavements Section

## ◆ Central Laboratory

- Aggregate Laboratory
- Bituminous Laboratory
- Bituminous Aggregate Laboratory

## ◆ Field Branch Laboratories

- Omaha
- North Platte
- Norfolk
- Grand Island

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# Superpave and the PG Binder Grading System on Interstate 80

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- ◆ In 1999 the “plan” was to place an SMA overlay on a couple large overlay projects on Interstate 80! HMA Contractors had other ideas and bid quotes came in MUCH above estimates.
- ◆ SMA’s were very harsh mixes and contractor’s did not want to place them.

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# Superpave and the PG Binder Grading System on Interstate 80

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- ◆ What was our alternative?
- ◆ SUPERPAVE ??
  - We felt we had to put “faith” in the SHRP findings and recommendations.

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# Superpave and the PG Binder Grading System on Interstate 80

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- ◆ YES to Superpave on I-80
  - Eight projects Let in 1999!
  - 488,000 tons of HMA
  - 25,000 tons of PG 70-28

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# Superpave and the PG Binder Grading System on Interstate 80

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- ◆ YES, sleepless nights in 1999.
- ◆ Performance – so far is excellent!
- ◆ By 2005 all overlaid sections of I-80 will be Superpave with some type of “Modified” PG Binder!

# Modified PG Binder Tonnage (PG 70-28)

- ◆ 1999 – 41,750. tons
- ◆ 2000 – 10,000. tons
- ◆ 2001 – 27,950. tons
- ◆ 2002 – 23,200. tons
- ◆ 2003 – 20,000. tons (estimate)
- ◆ Future - ????

# Modifiers Used in PG 70-28(?)

- ◆ SBS
- ◆ SBR
- ◆ Acid
- ◆ Fillers and Extending Agents
- ◆ Waste Materials
- ◆ Combinations of above
- ◆ DO WE KNOW?

# What are our concerns?

- ◆ Expected Performance – We all know the Public says “Get in, get out, and Stay Out!”
- ◆ The first “failure” of an I-80 overlay? – Could the cause possibly be the PG Binder modification type?
- ◆ Can we prevent that first PG Binder “failure” from happening by way of a .....  
.....PG+ specification?

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# “Unique Asphalt Pavement Additives” – CE, December 2002

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- ◆ John Norton, Jr., an E.I.T., Doctoral student at University of Michigan, authored this article about what has been and what could be added to asphalt.
- ◆ Are we ready for or should we let **anything** that allows the PG Binder to meet specifications to be used to modify PG Binders?

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# “Unique Asphalt Pavement Additives” – CE, December 2002

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- ◆ “One has to be careful when modifying the asphalt to address one problem that the modification doesn’t cause another problem. ....” J. Collins, owner of Mr. Asphalt Co.

# What Should be Important to the PG Binders Used in NE?

- ◆ This is simple for us and others to answer:
  - Performance
  - Cost Effectiveness
  - Constructability
  - Safety



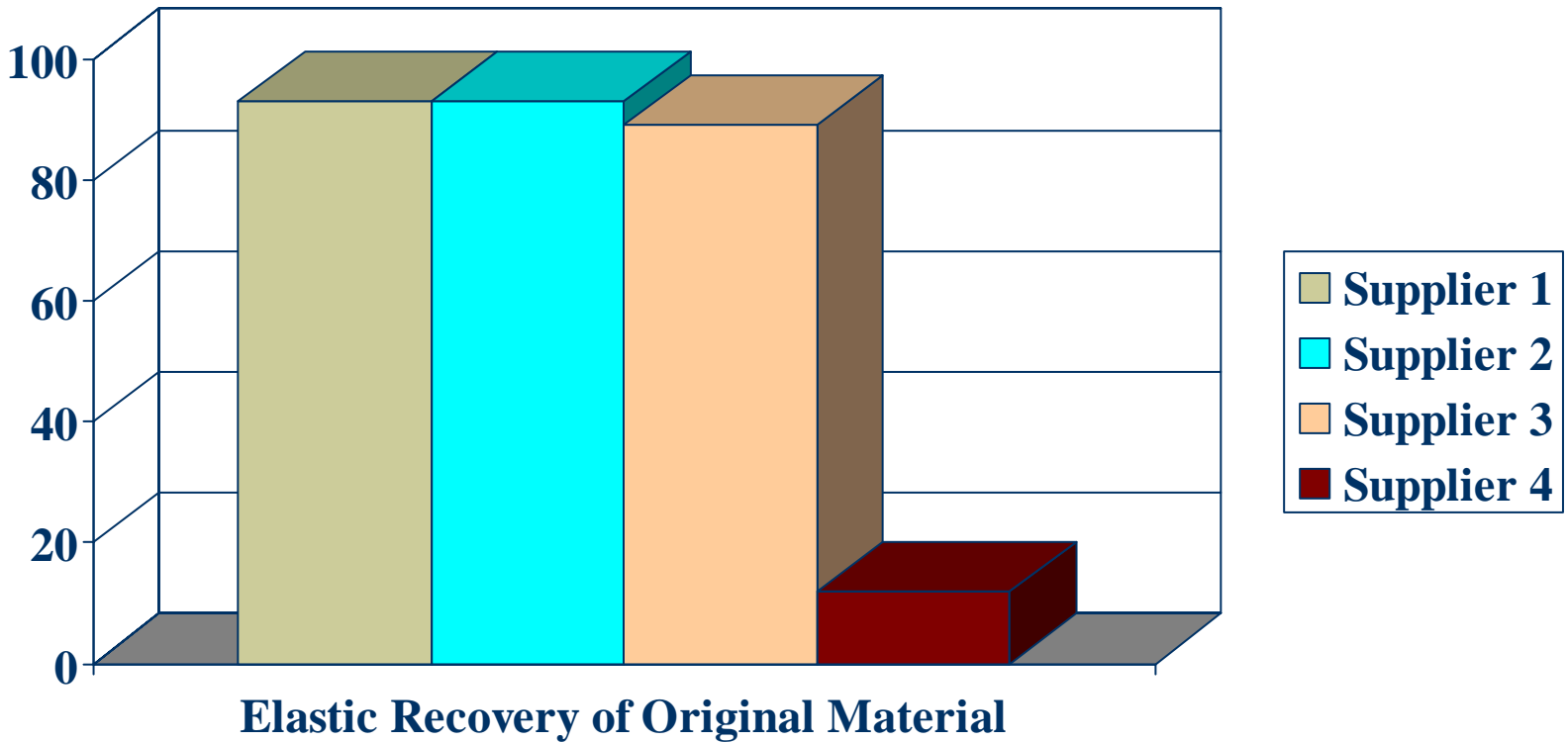
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# What Should be Important to the PG Binders Used in NE?

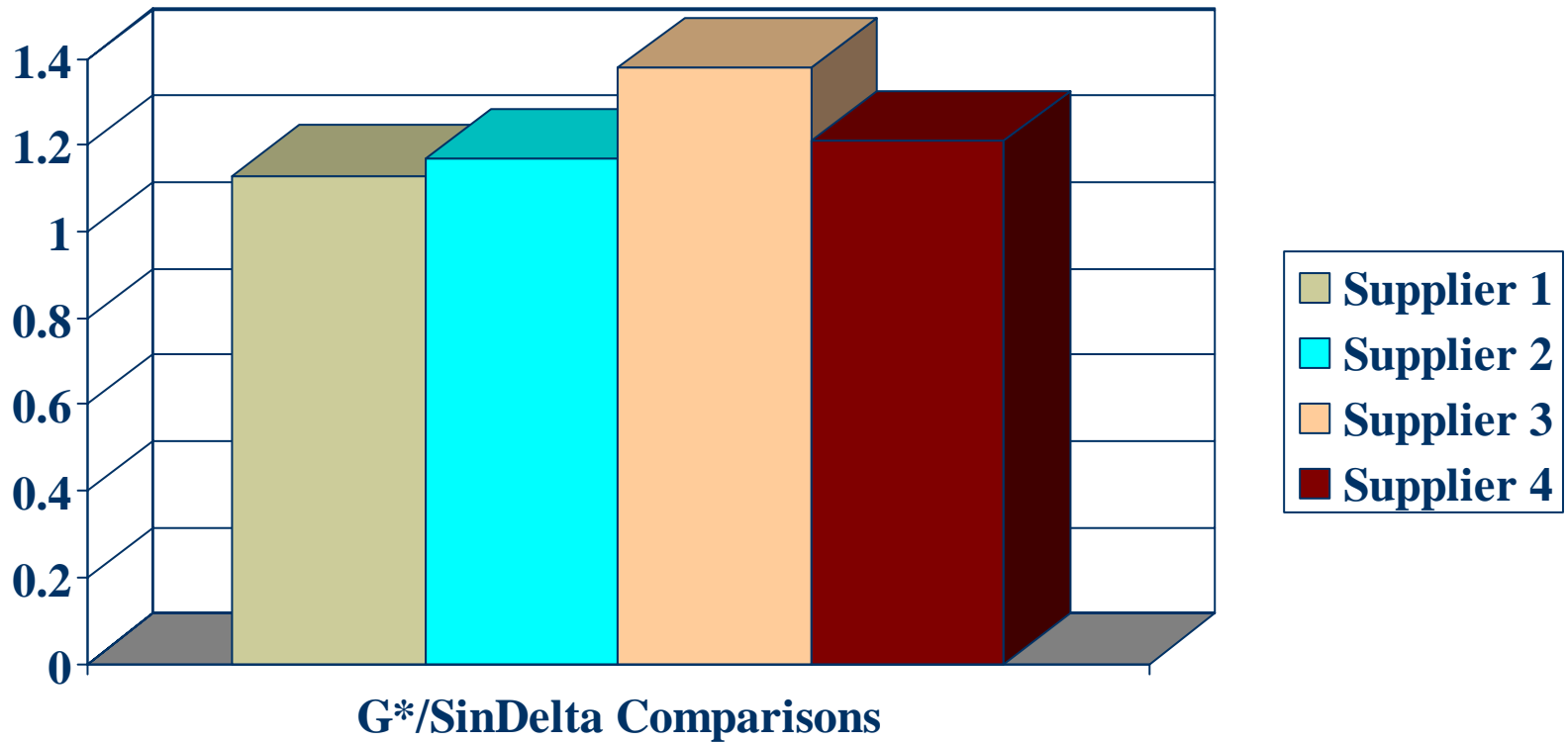
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Let's look at some of the results of tests  
completed on PG 70-28 used in NE in 2002.

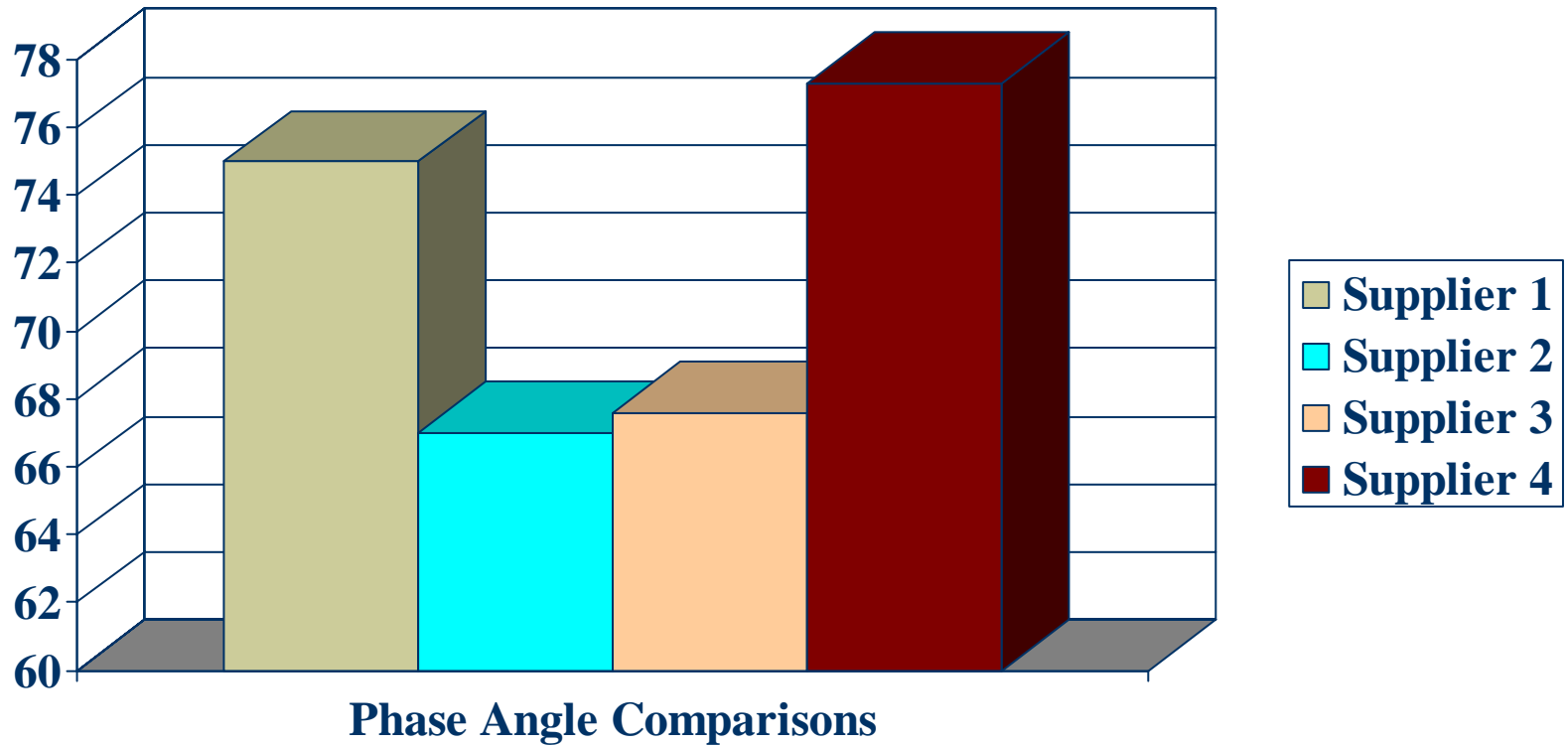
# PG 70-28 Test Results, 2002



# PG 70-28 Test Results, 2002



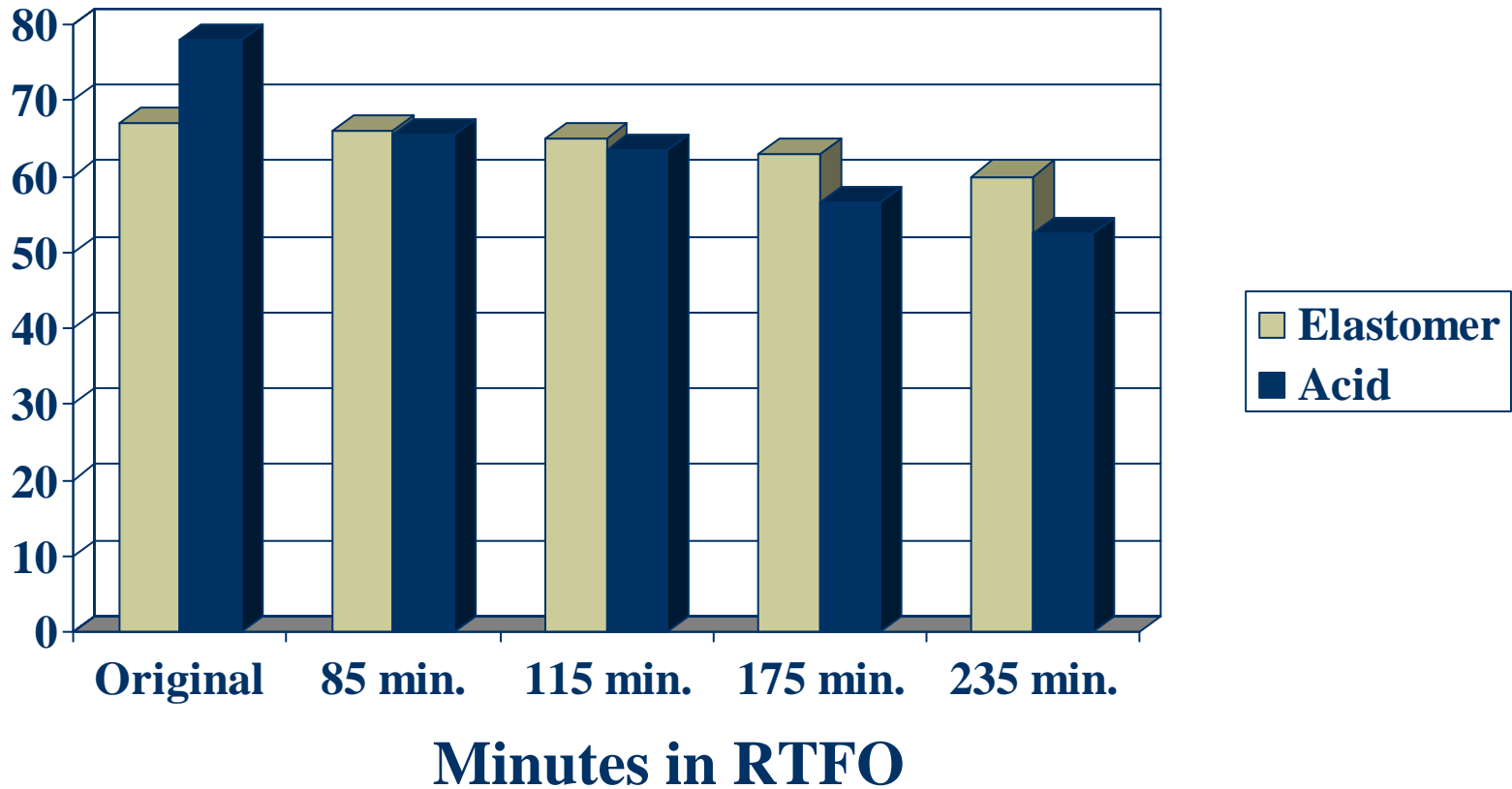
# PG 70-28 Test Results, 2002



# Current Investigative “Research” in NE

- ◆ Elastomer vs. Acid Modification of PG70-28
  - Phase Angle
  - $G^*$
  - $G^*/\sin \delta$

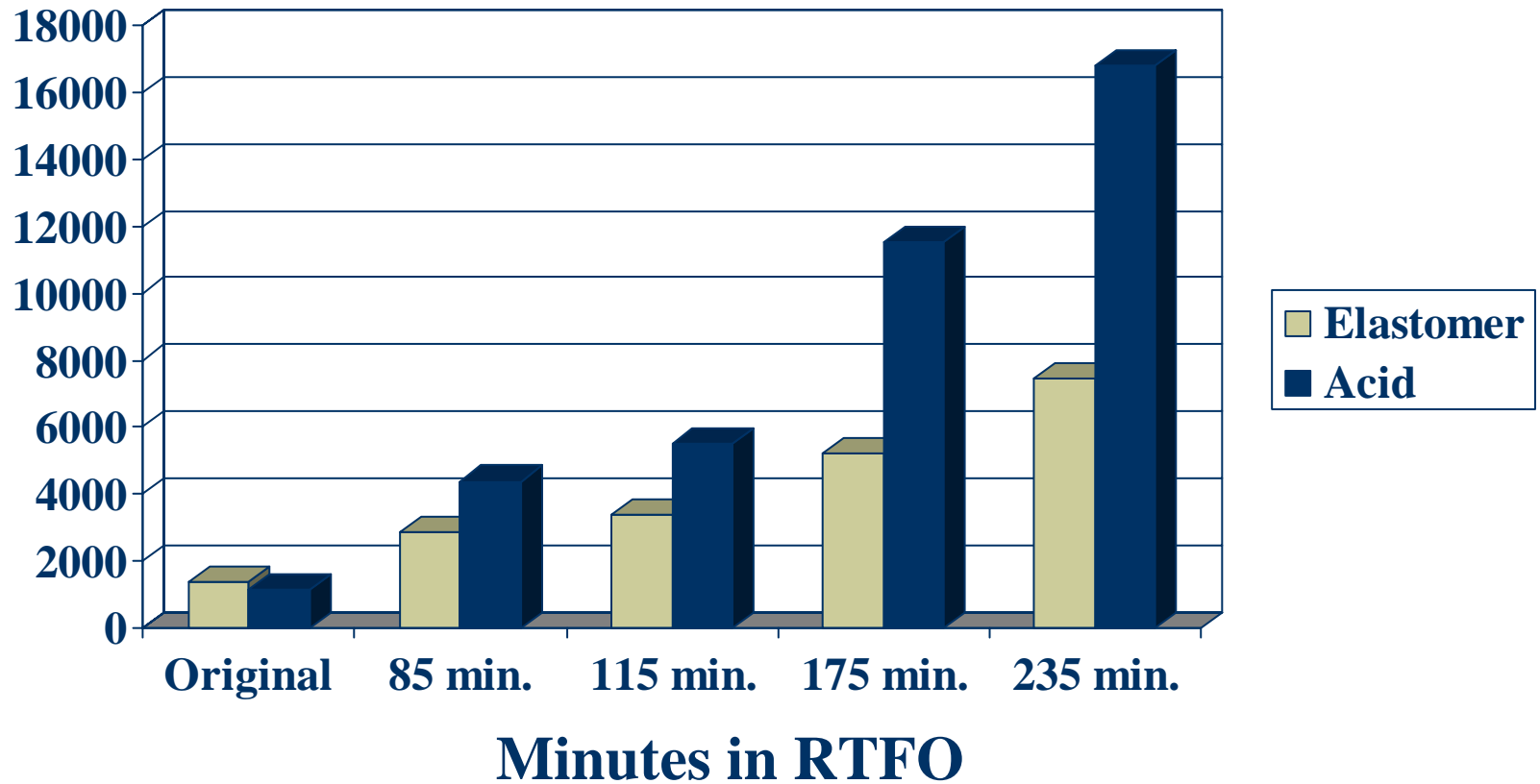
# Phase Angle Acid vs. Elastomer Modified PG 70-28



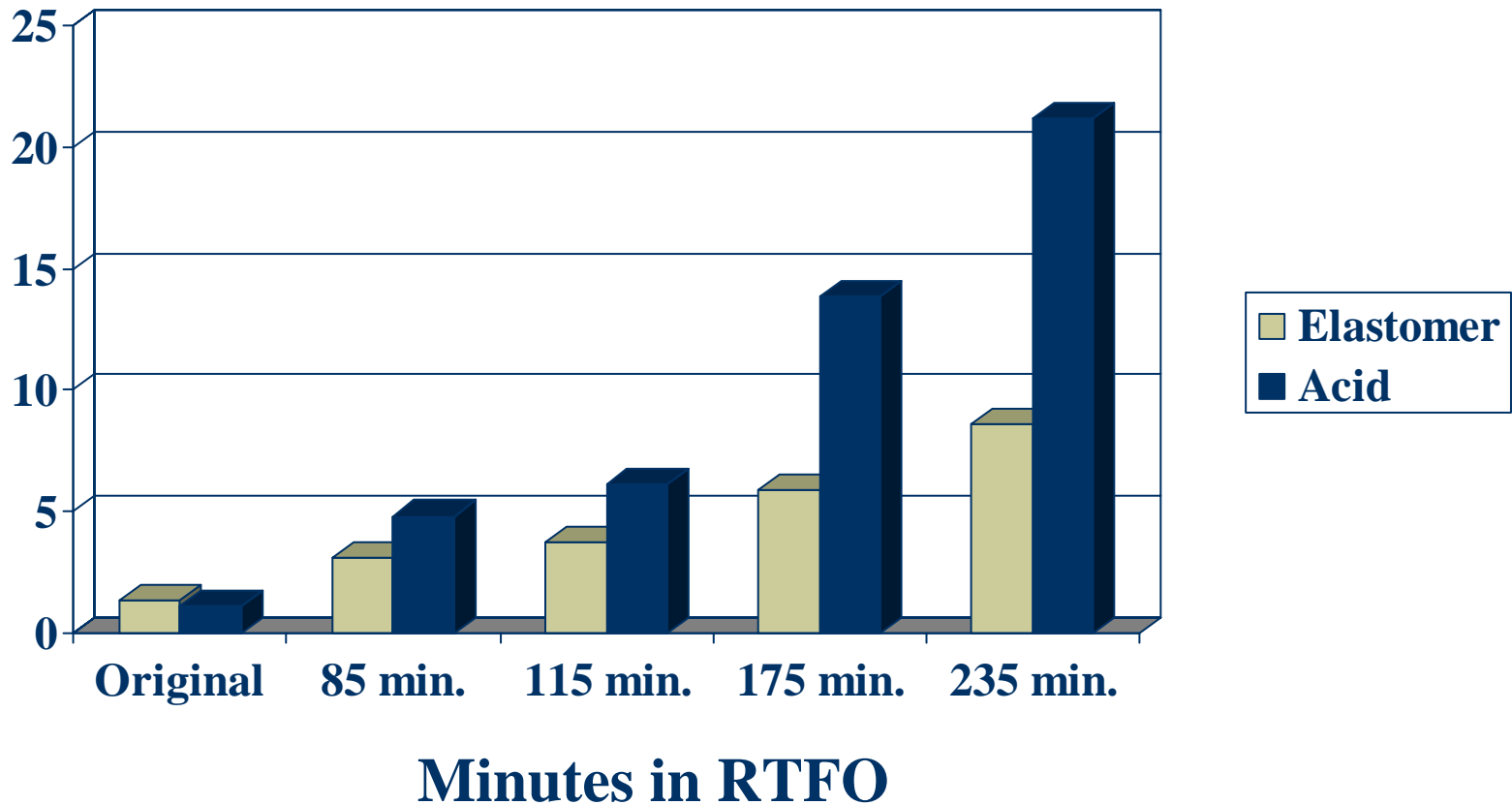
$G^*$

# Acid vs. Elastomer

## Modified PG 70-28



# $G^*/\sin \delta$ Acid vs. Elastomer Modified PG 70-28



# Past “Investigative” Research on Modified Binders

- ◆ Started with PG 58-28
  - Mill in Crumb Rubber @ 5%, 10%, and 20%
  - Mill in SBS Modifiers @ 1% and 2%
  - Add Polyoctenamer @ 1% and 2%
  - And other “Snake Oils” in various percentages!
- ◆ Were able to create up to a PG 82-34.

# Overlays in NE rather than Full Depth Designs

- ◆ How or should this influence a PG+ specification?
  - Reflective Cracks will appear.
  - Concentrate on High Temperature properties?
  - The aging properties of different modifiers.

# What Does the Future Hold?

- ◆ For now we know.....
  - We have to make do, with less personnel.
  - Industry already has more Chemists than I have and they're paid better.
  - We hear profit margins are dwindling, therefore meet specifications with less expensive material.
- ◆ But, what must we have in the Future?.....



The answer must be:



- ◆ The Future of HMA  
must be “SUCCESS”!  
Let’s achieve this  
together?

# PG+ Specification

We're going to get there, even though we've been talking about it for a few years.

We will end up with a specification that benefits NE.

# The next Speaker



Hwy. Materials Course, Purdue Univ., Spring 1988

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  - NDOR Bituminous Laboratory Supervisor
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# THANKS FOR YOUR ATTENTION



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