

Como leer resultados de reometria y Viscosidad

Representaciones Gummy



Objetivos

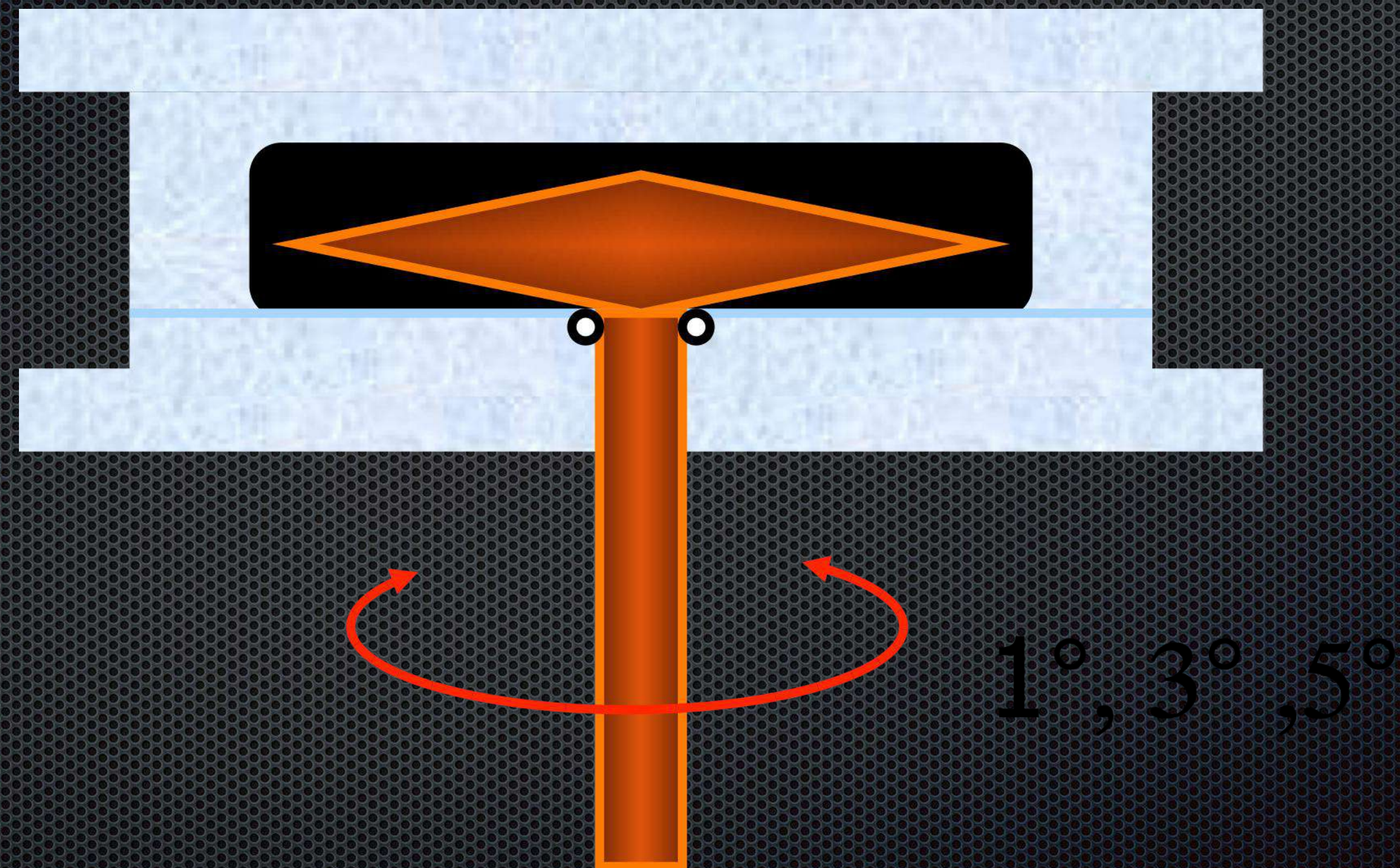


- Asegurar la producción de un mezclado conforme a lo especificado.
- Tratar de identificar variabilidad en el compuesto.
- Identificar a tiempo productos no conformes.



Reometría Viscosidad

COMO FUNCIONA?

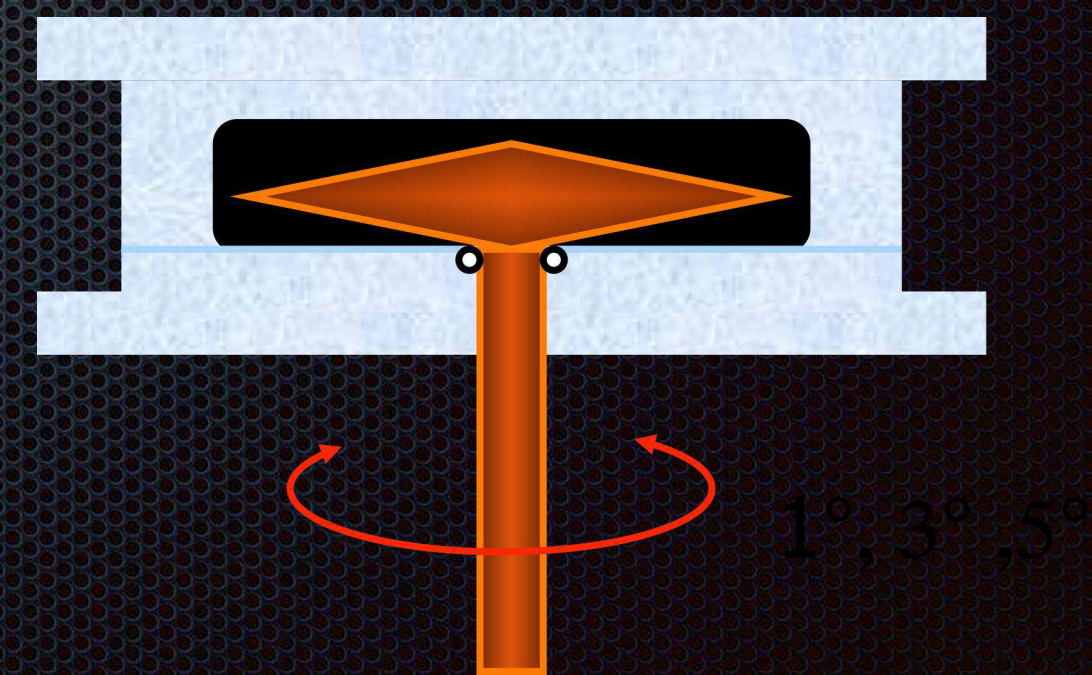
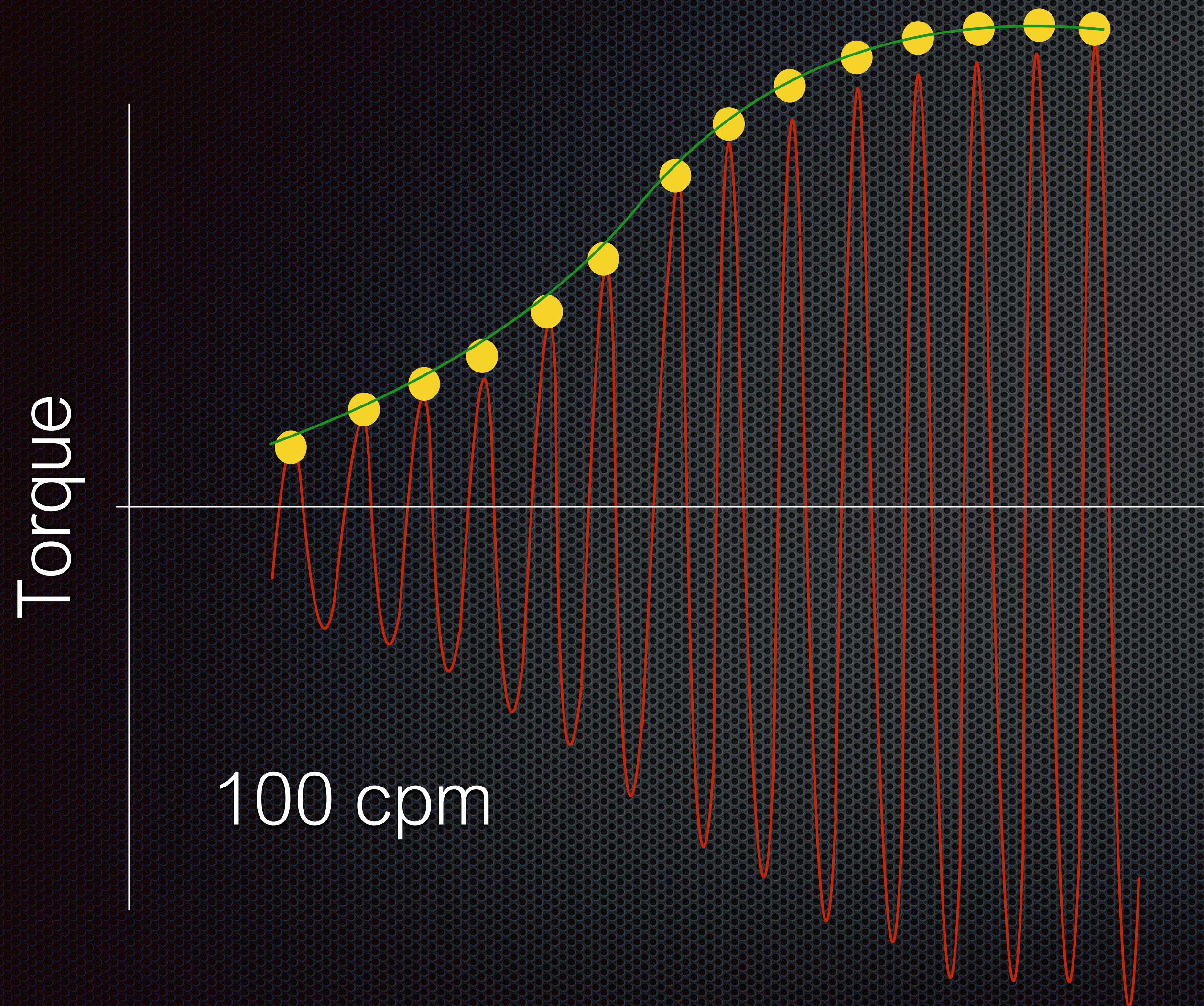


REÓMETROS DE DISCO OSCILANTE

“R100”



COMO FUNCIONA?





- Propiedades:

R100-ODR

- **Reometría:**

Normas:

ASTM D2084

Standard Test Method For Rubber

Property—Vulcanization Using

Oscillating Disk Cure Meter

- Viscosidad:

- Dispersión:

- Tensión Elongación

Normas:

ASTM D5289

ISO 6502

Standard Test Method For Rubber

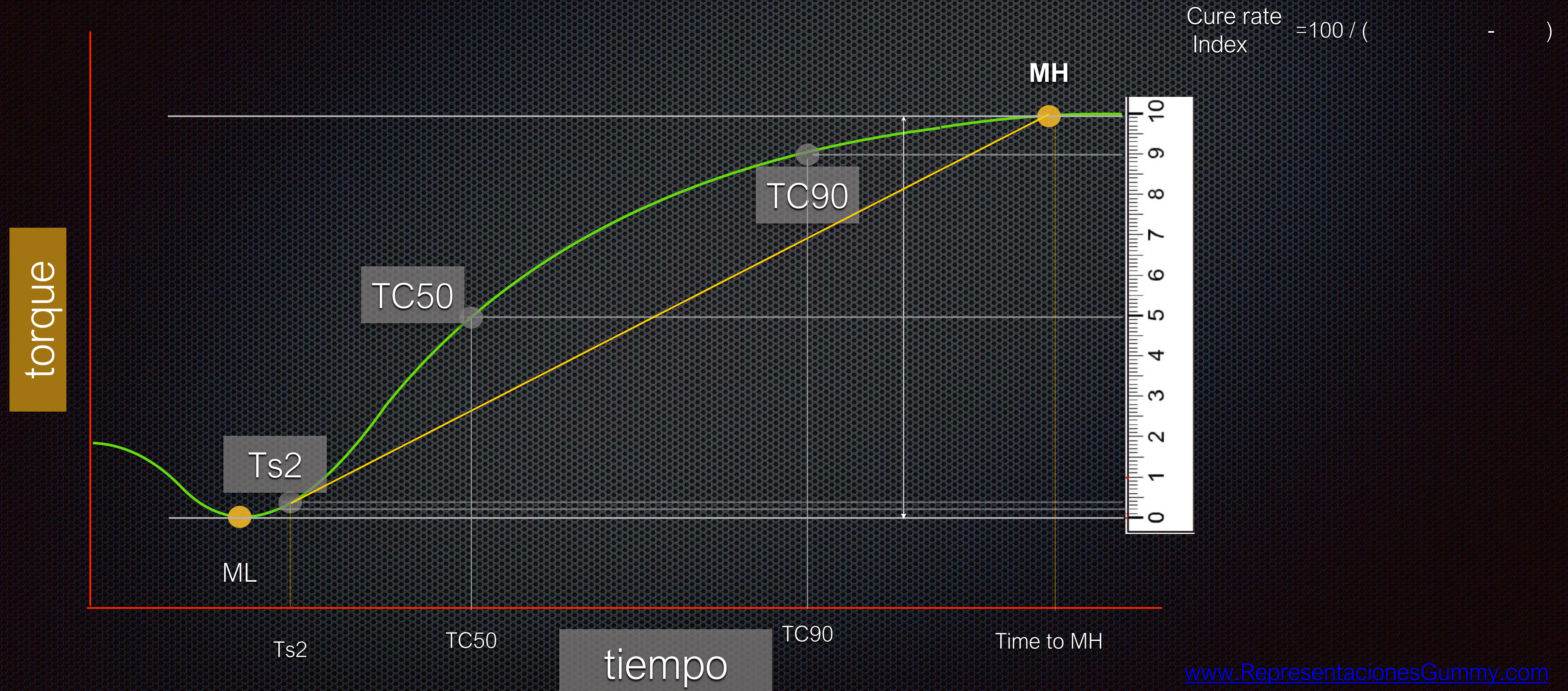
Property - Vulcanization Using

Rotorless Cure Meters
Measurement Of

Vulcanization Characteristics

Using Curemeters

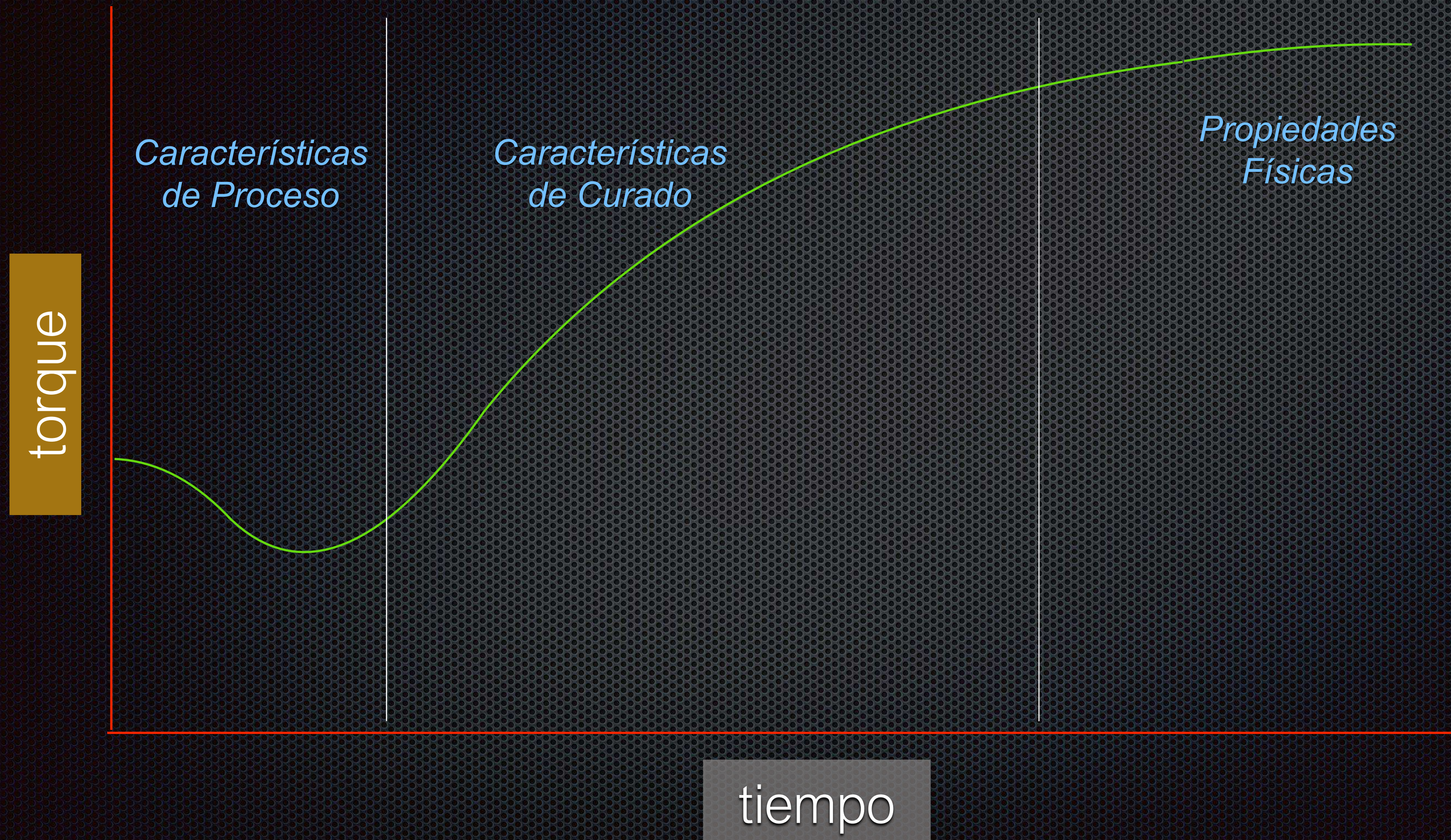
PUNTOS ASTM D2084



Tipos de curva Reometrica

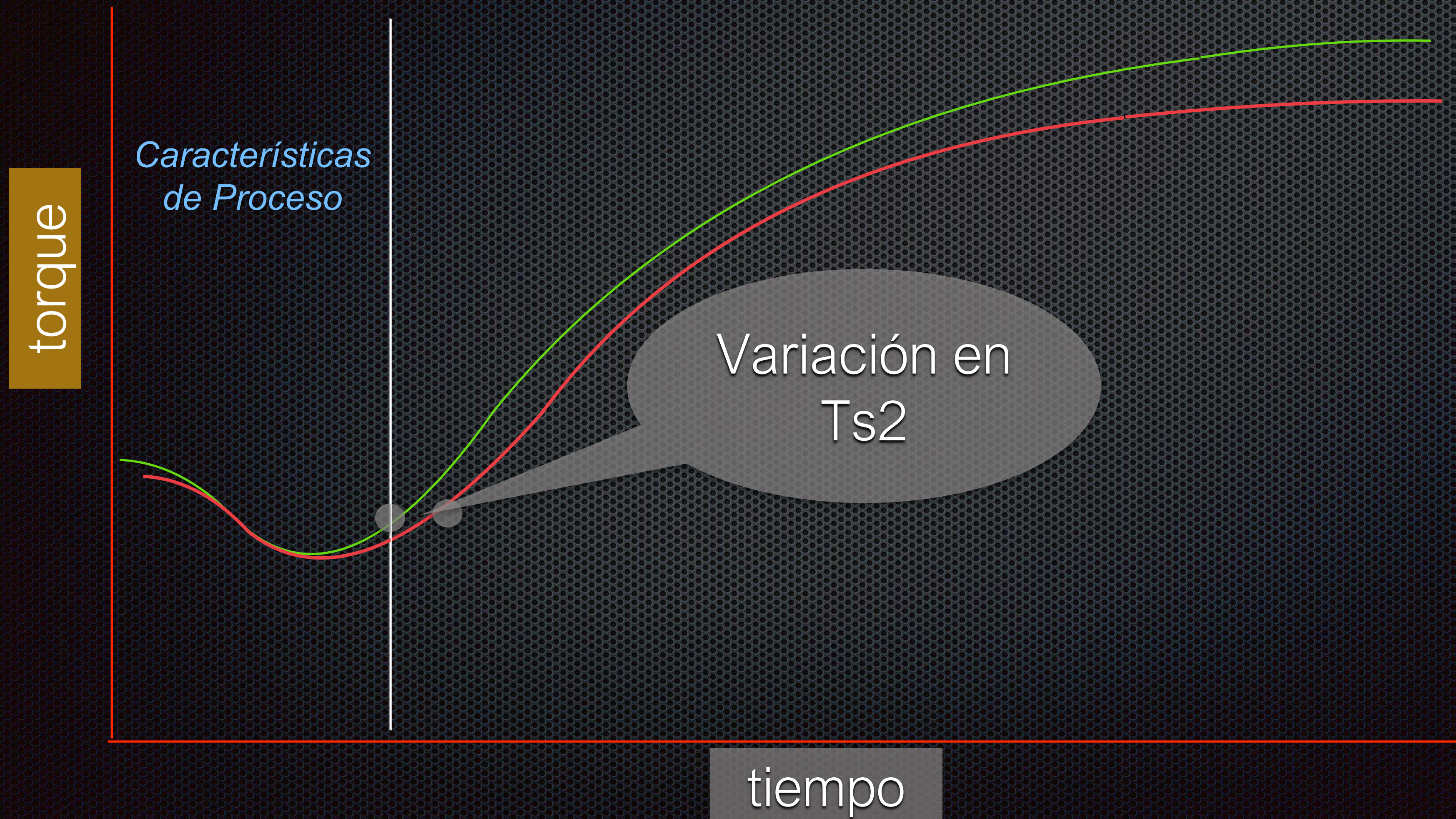


Curva Reómetro



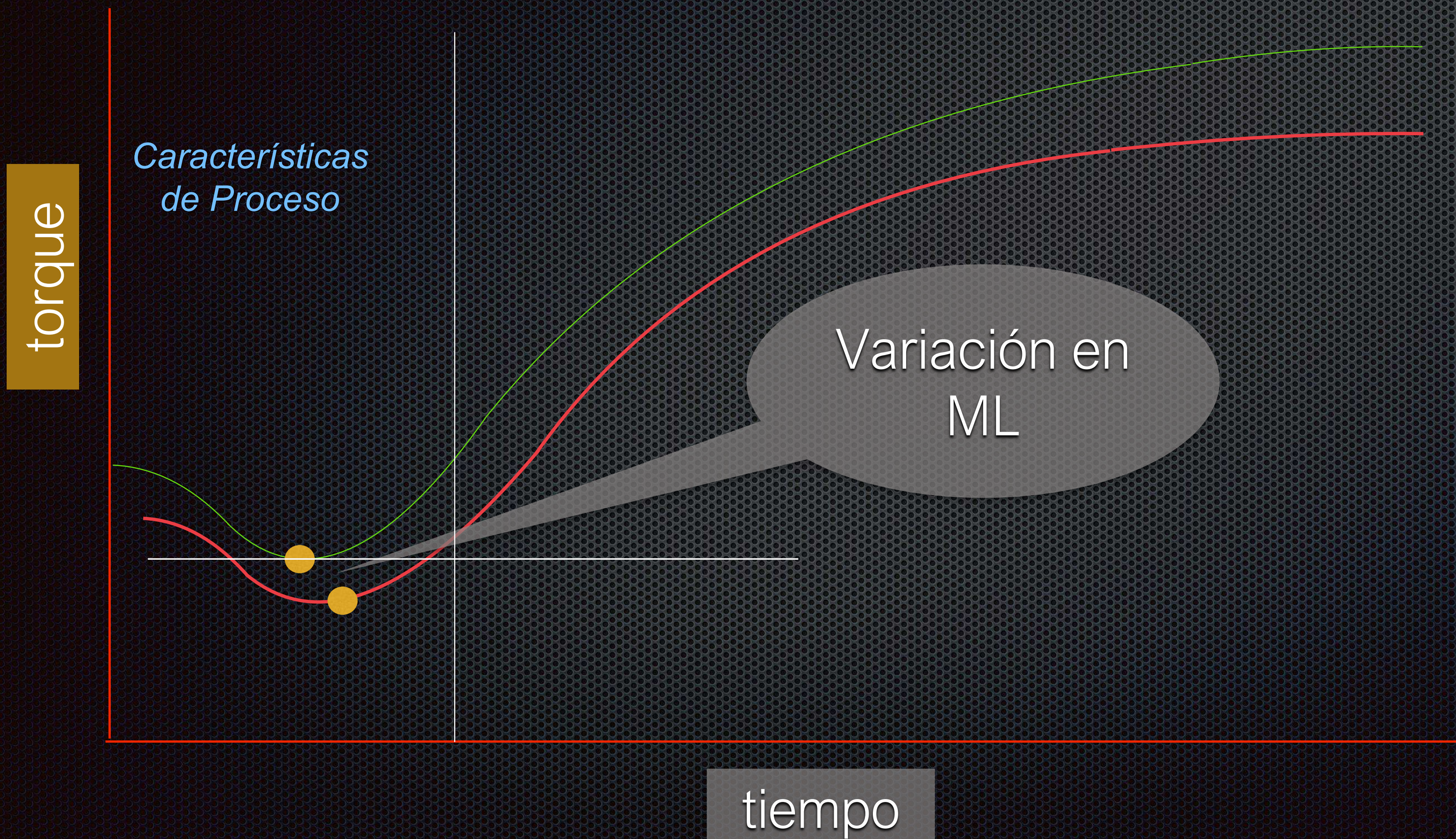
Características de Proceso

Variación en T_{s2}



Características de Proceso

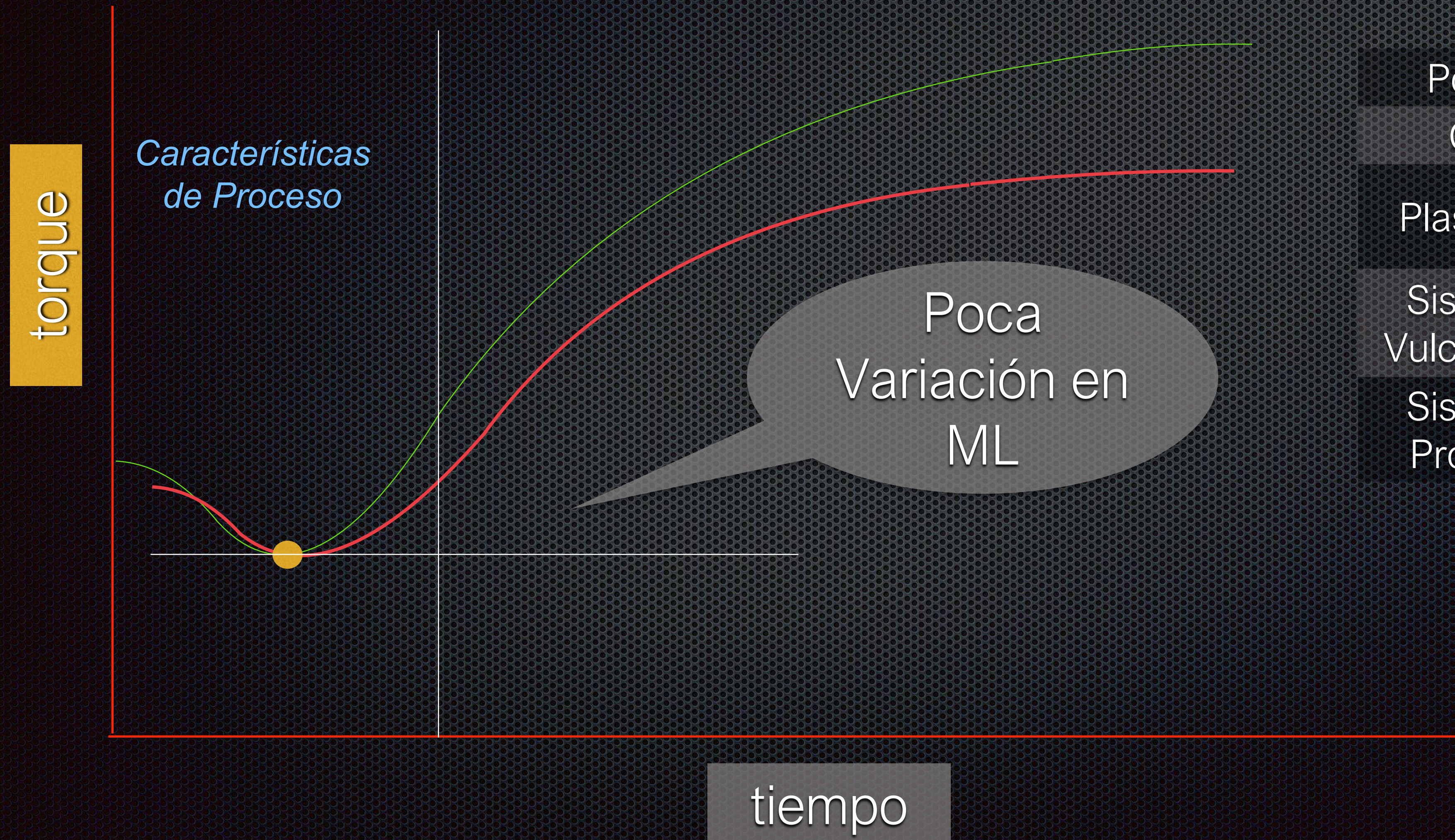
Variación en ML



Polimero	100	100
Carga	50	50
Plastificante	10	15
Sistema de Vulcanización	3.5	3.5
Sistema de Protección	5	5

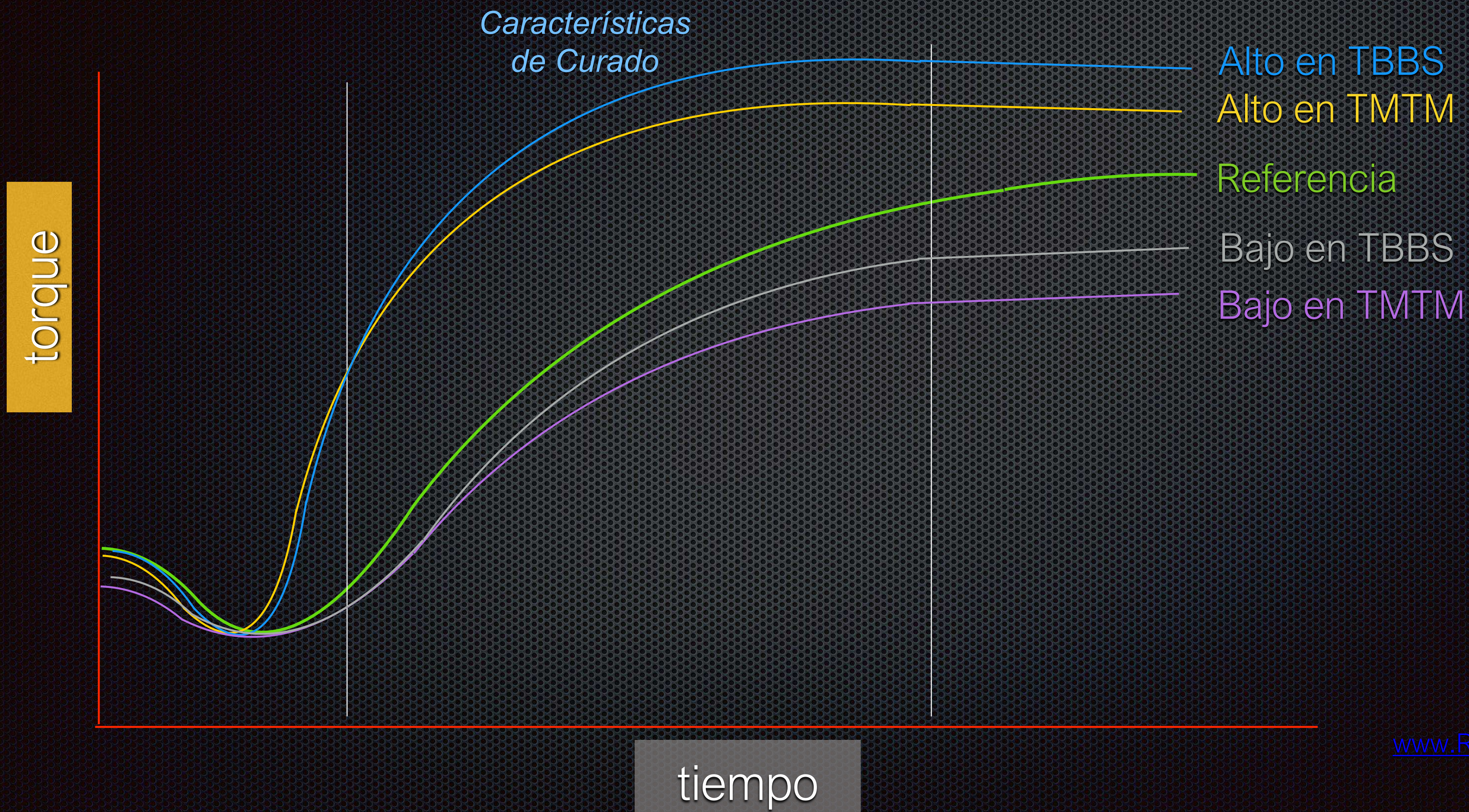
Características de Proceso

Variación en cantidad

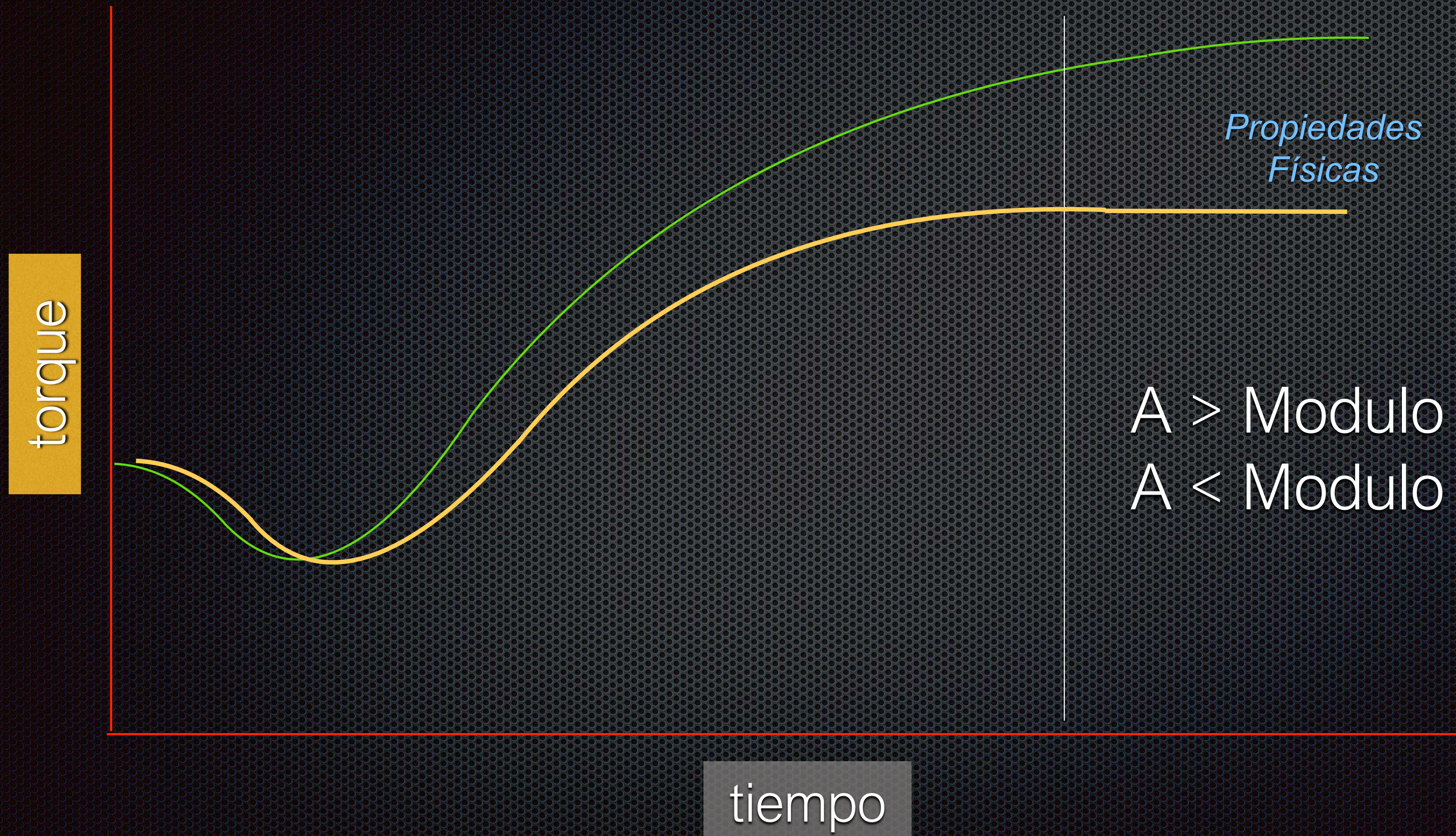


Polimero	100	100
Carga	50	50
Plastificante	10	10
Sistema de Vulcanización	4.5	3.5
Sistema de Protección	5	5

Características de Proceso



Características de Proceso



$A > \text{Modulo} < \text{Elongacion}$
 $A < \text{Modulo} > \text{Elongacion}$

Proceso bajo control



Efecto de la Temperatura

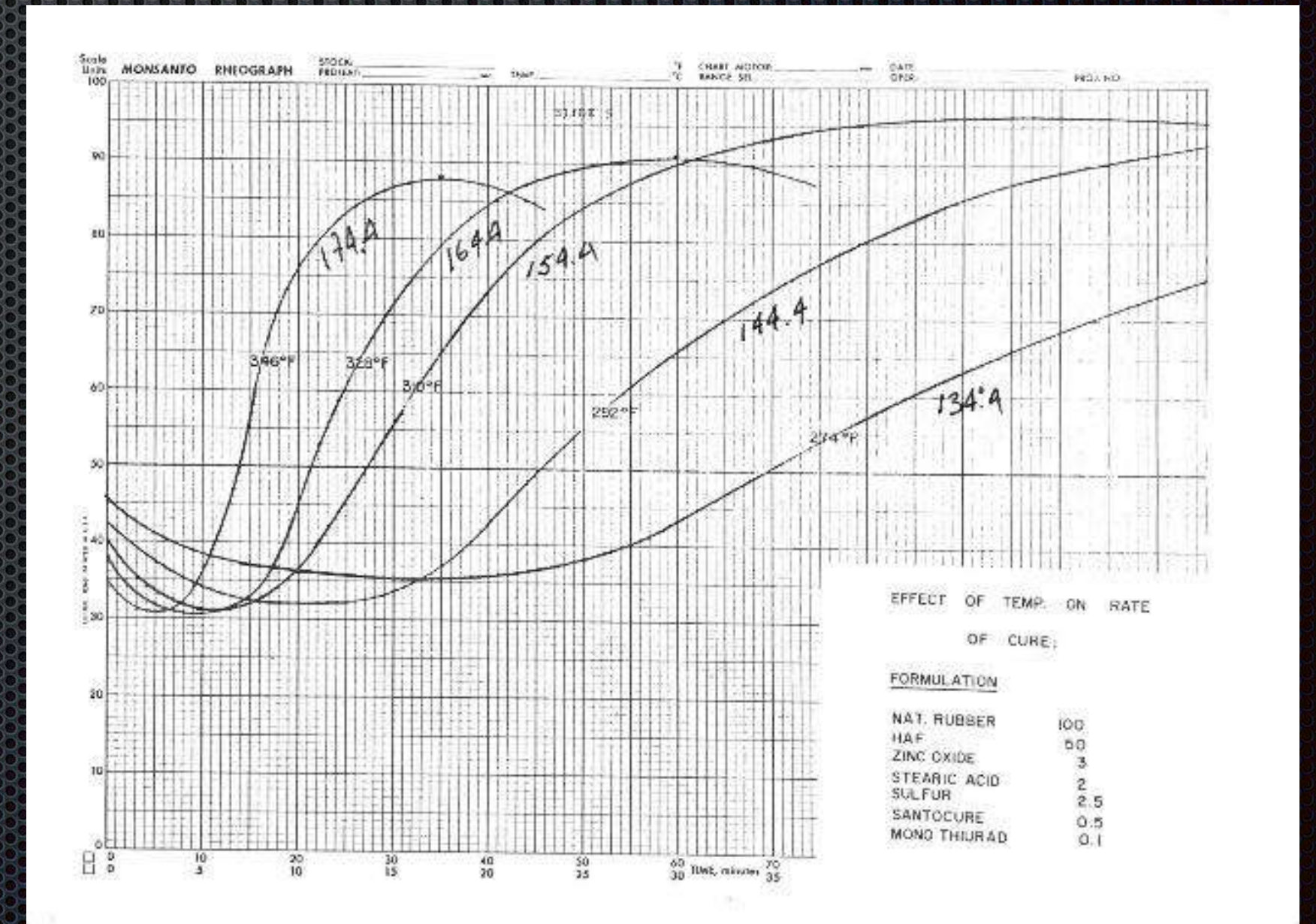
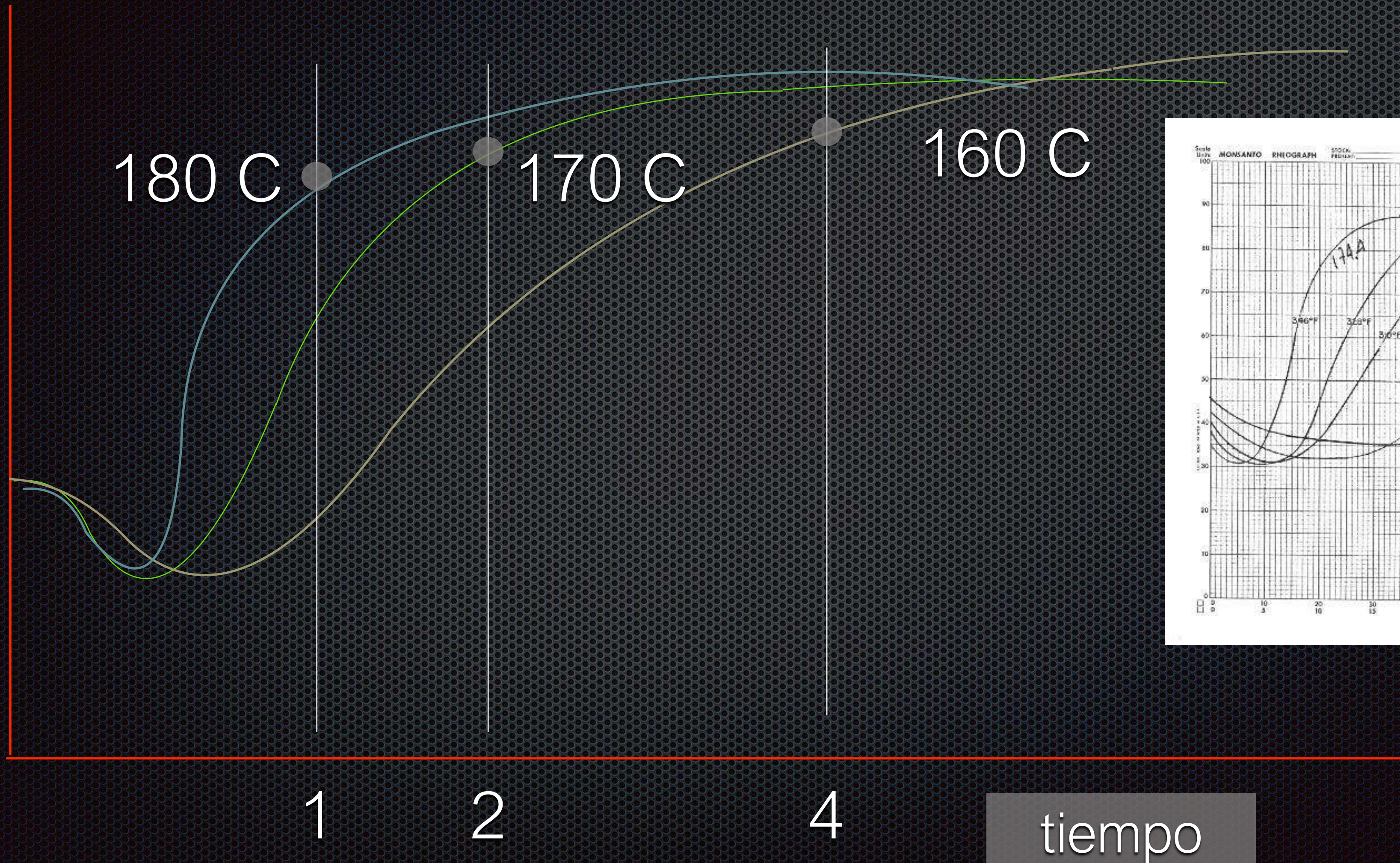
en T_{s2} , T_{c50} , T_{C90}



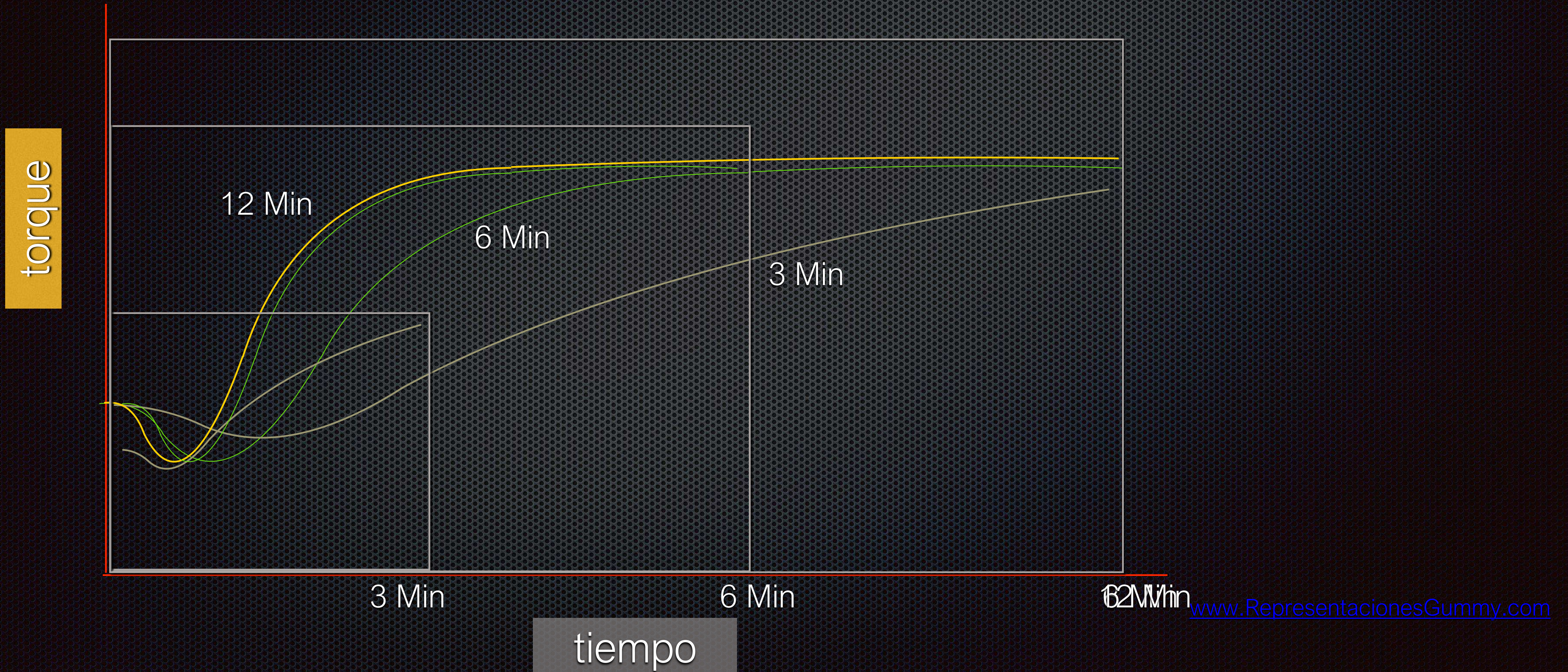
Efecto de la Temperatura en TC90



torque

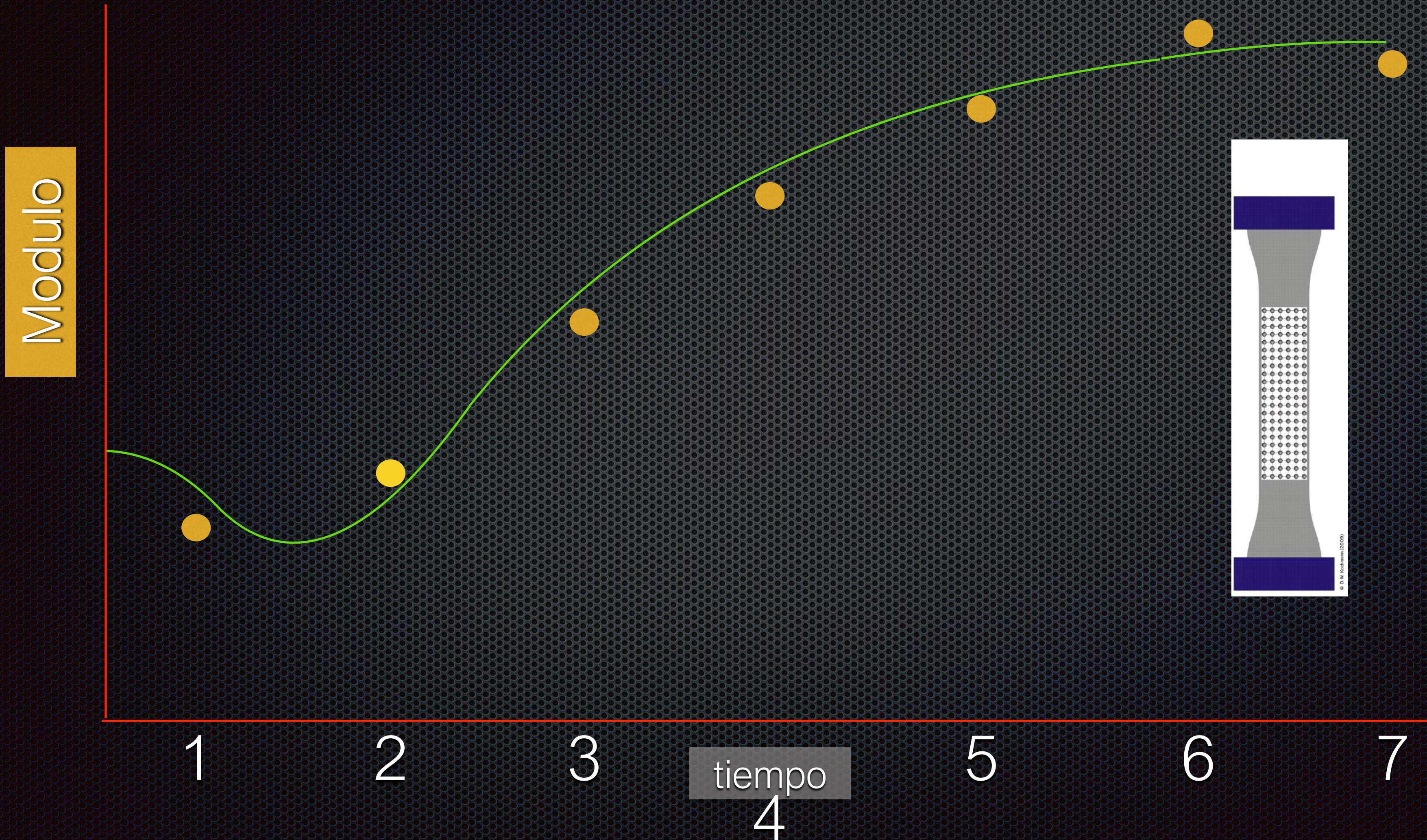


Efecto del tiempo del test



Correlación

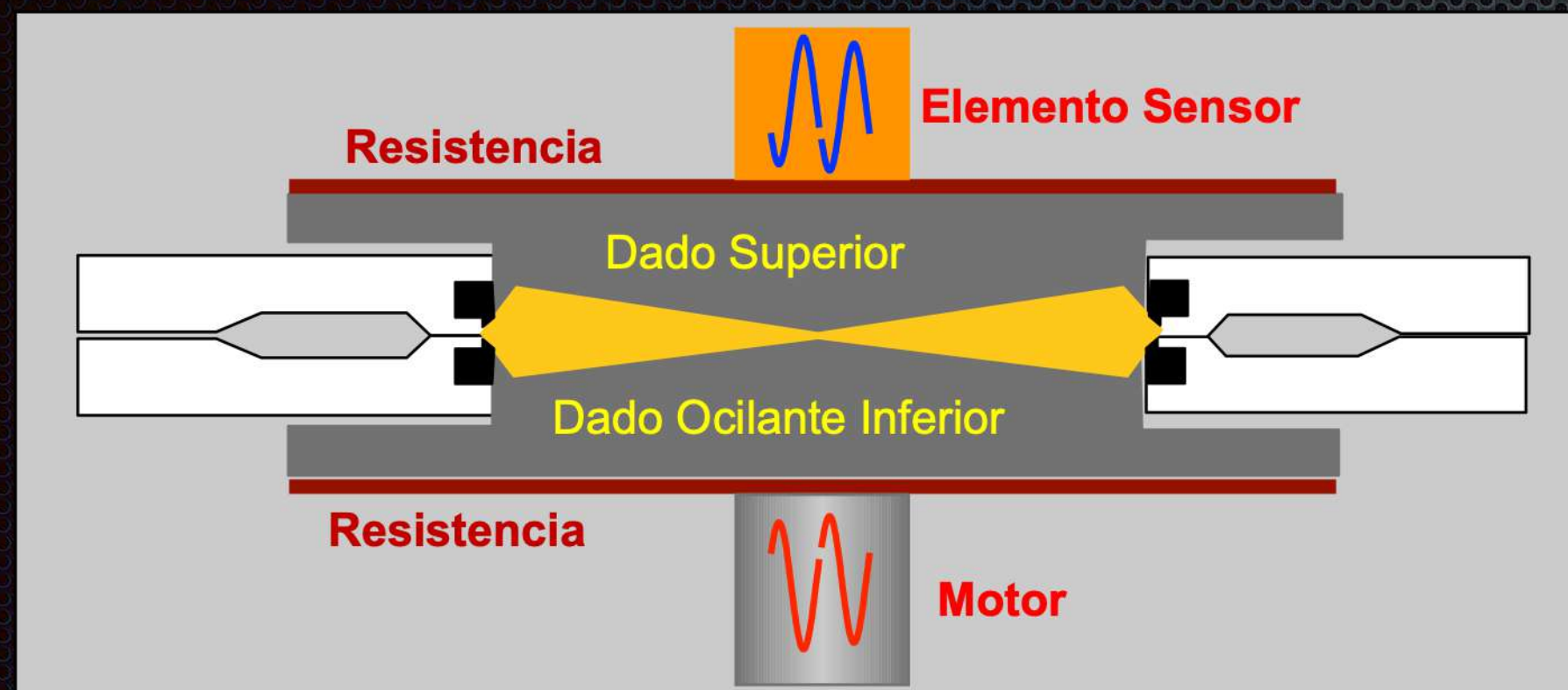
el Modulo al 300%



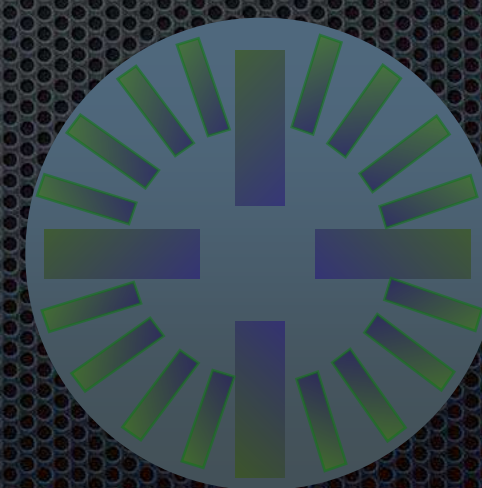
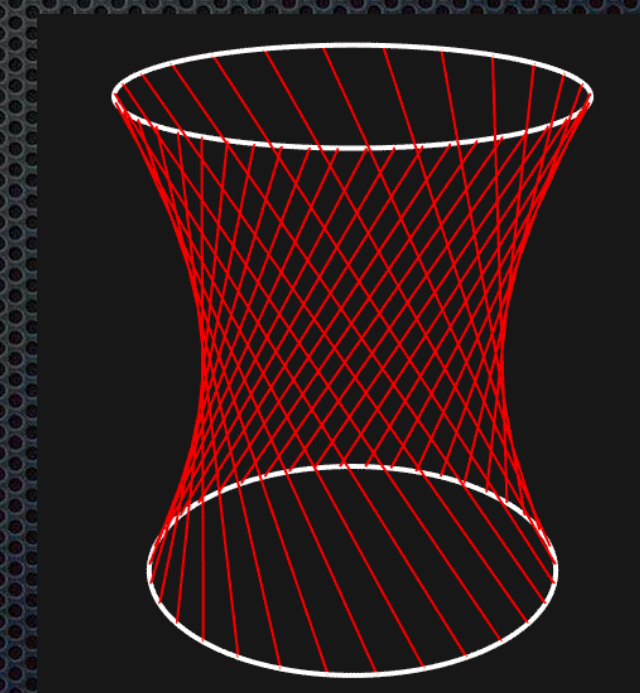
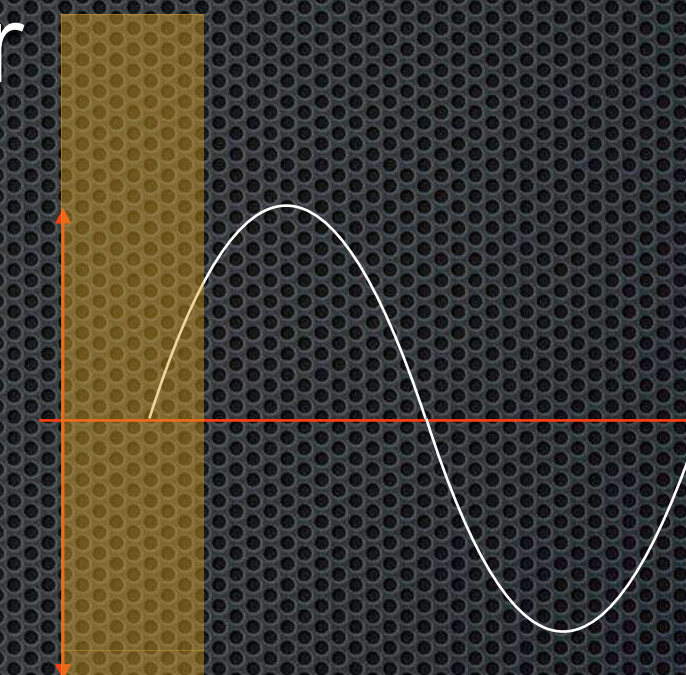
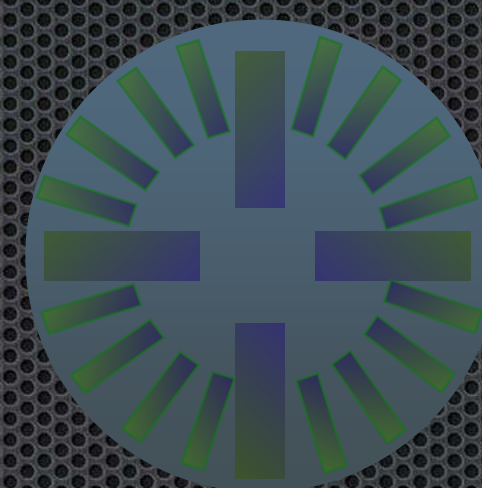
Reómetros de dado oscilante “MDR2000”



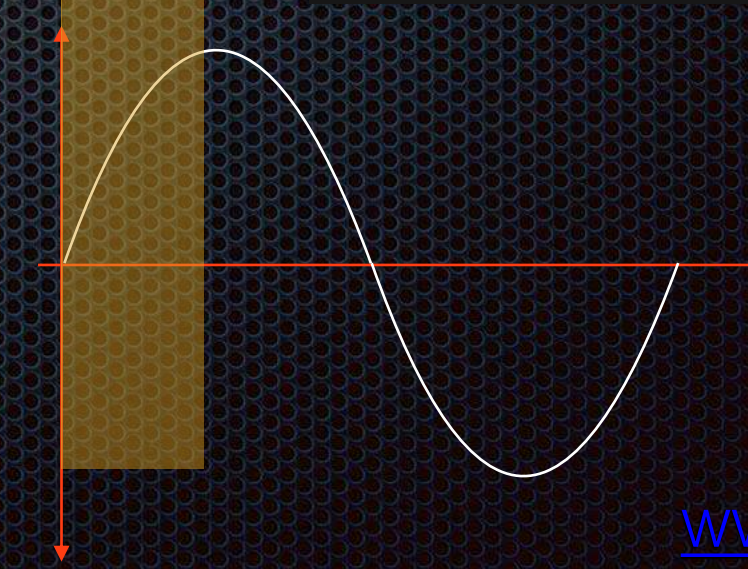
Como funciona



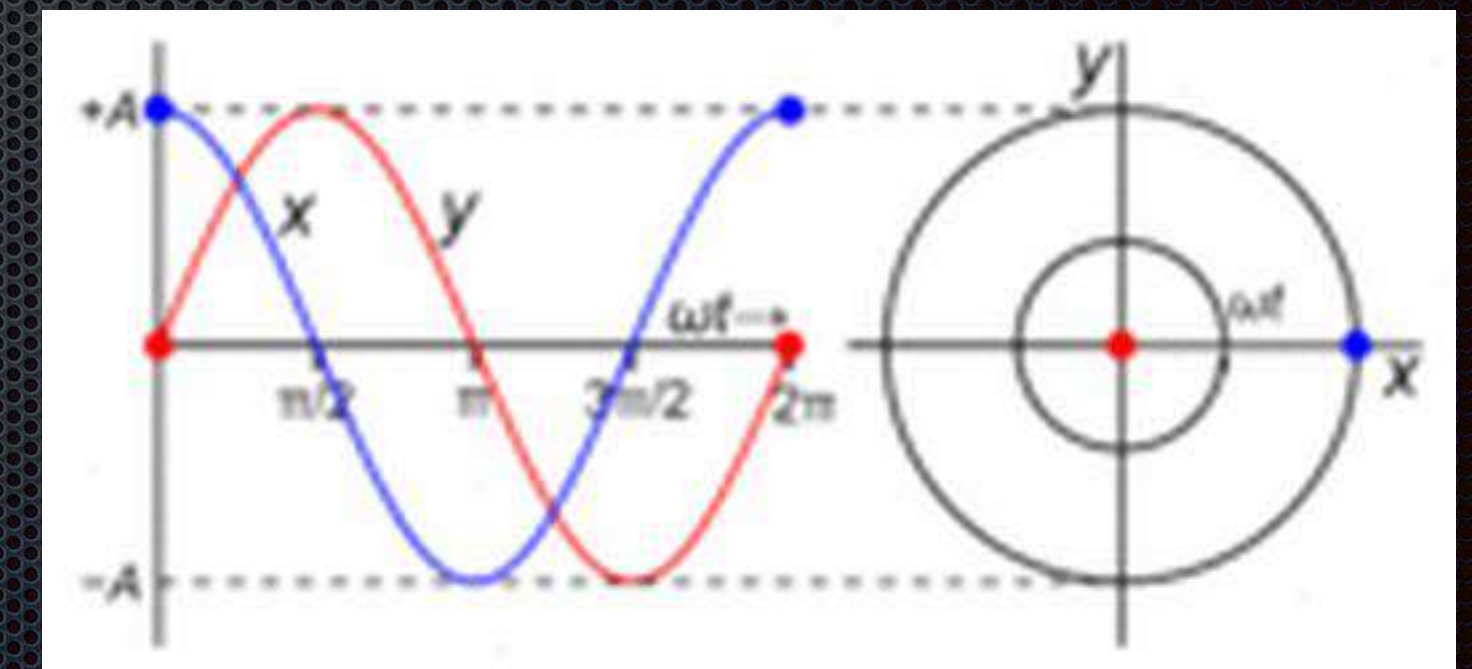
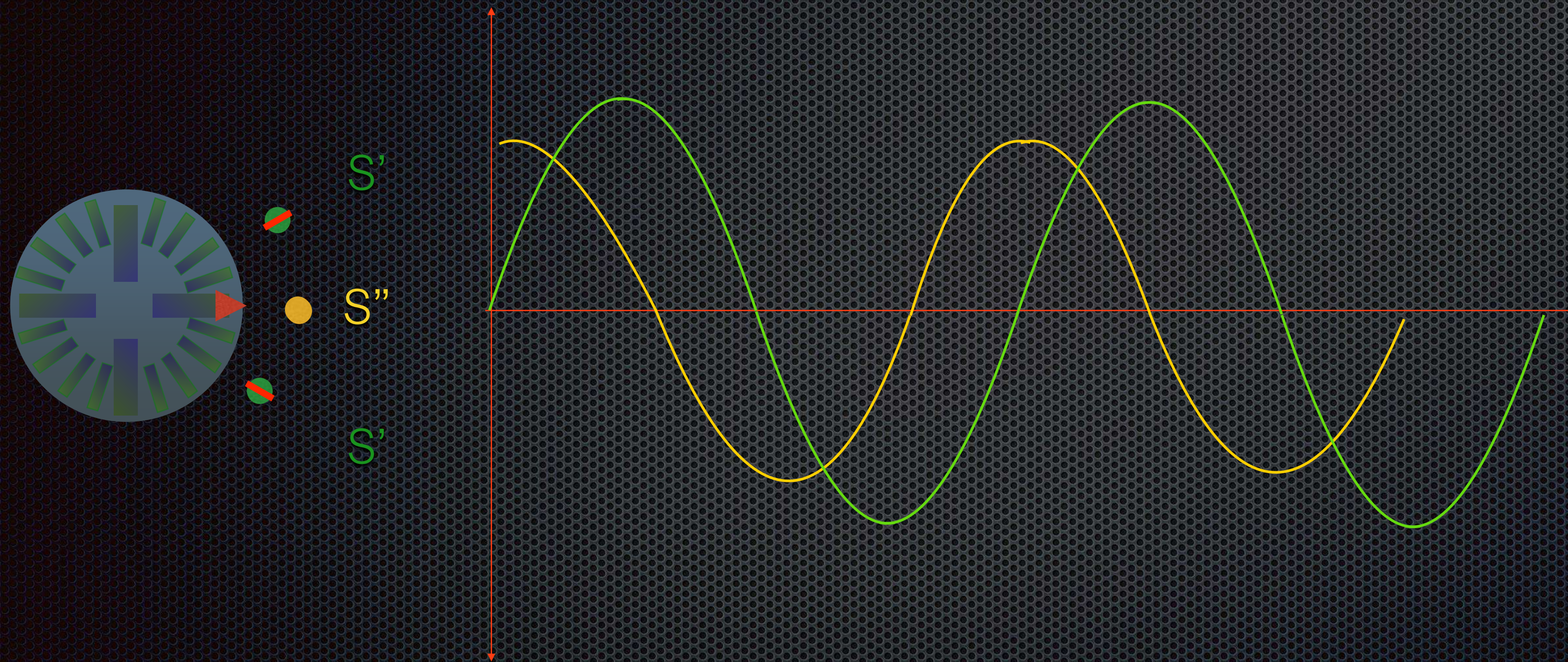
Dado Superior



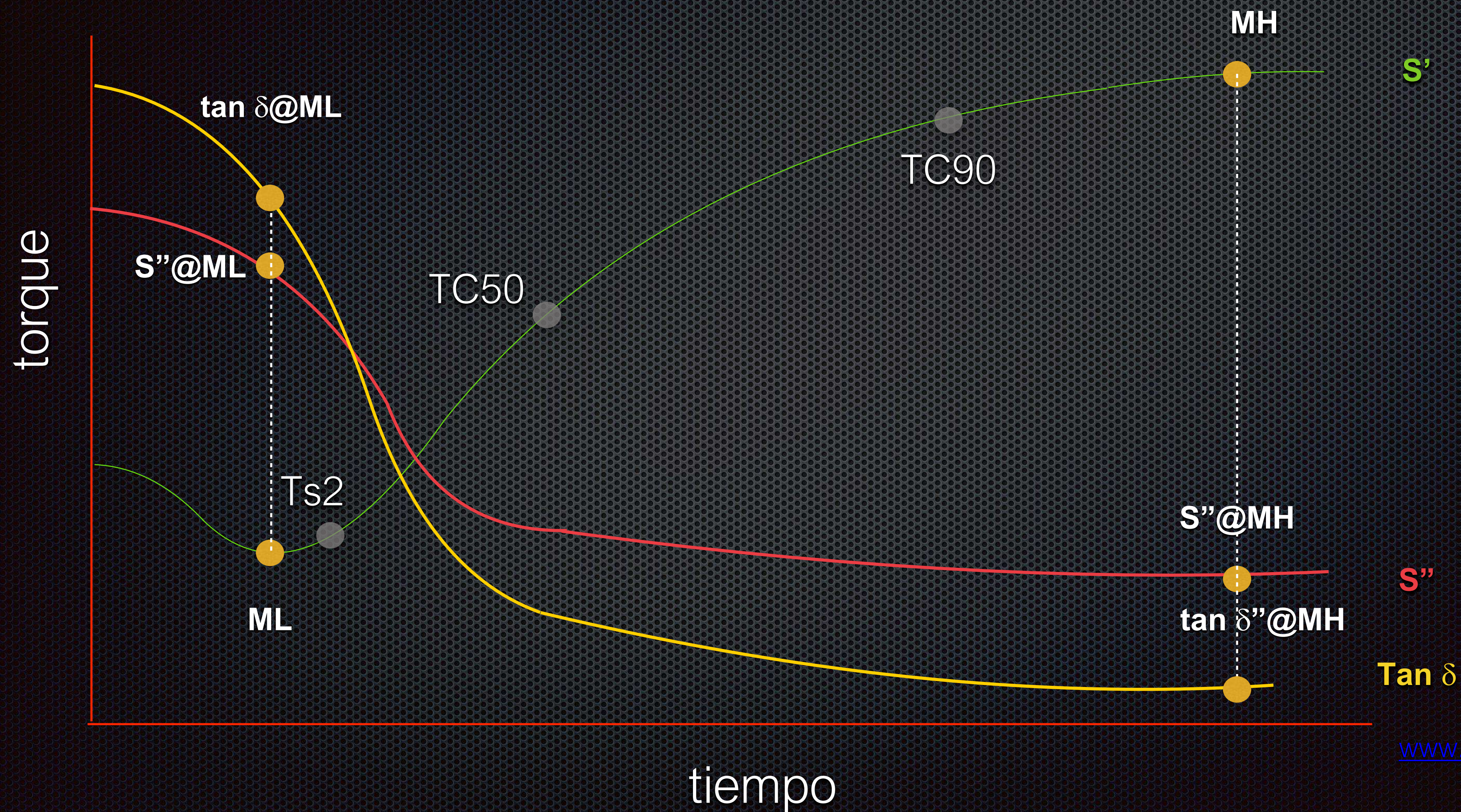
Dado Inferior



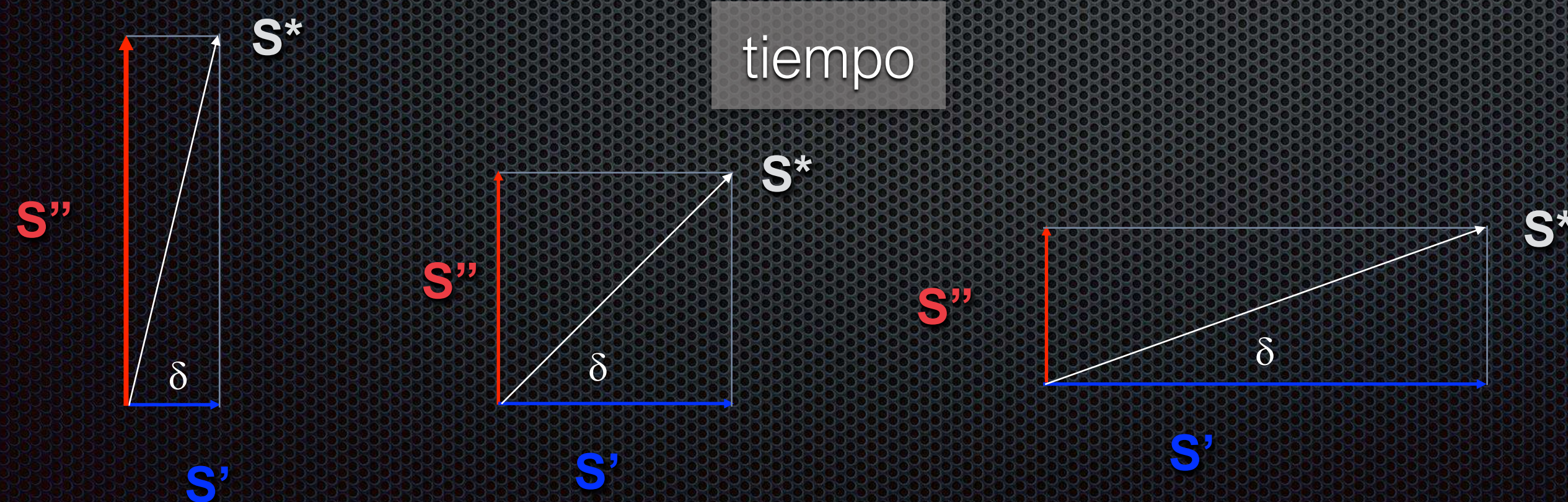
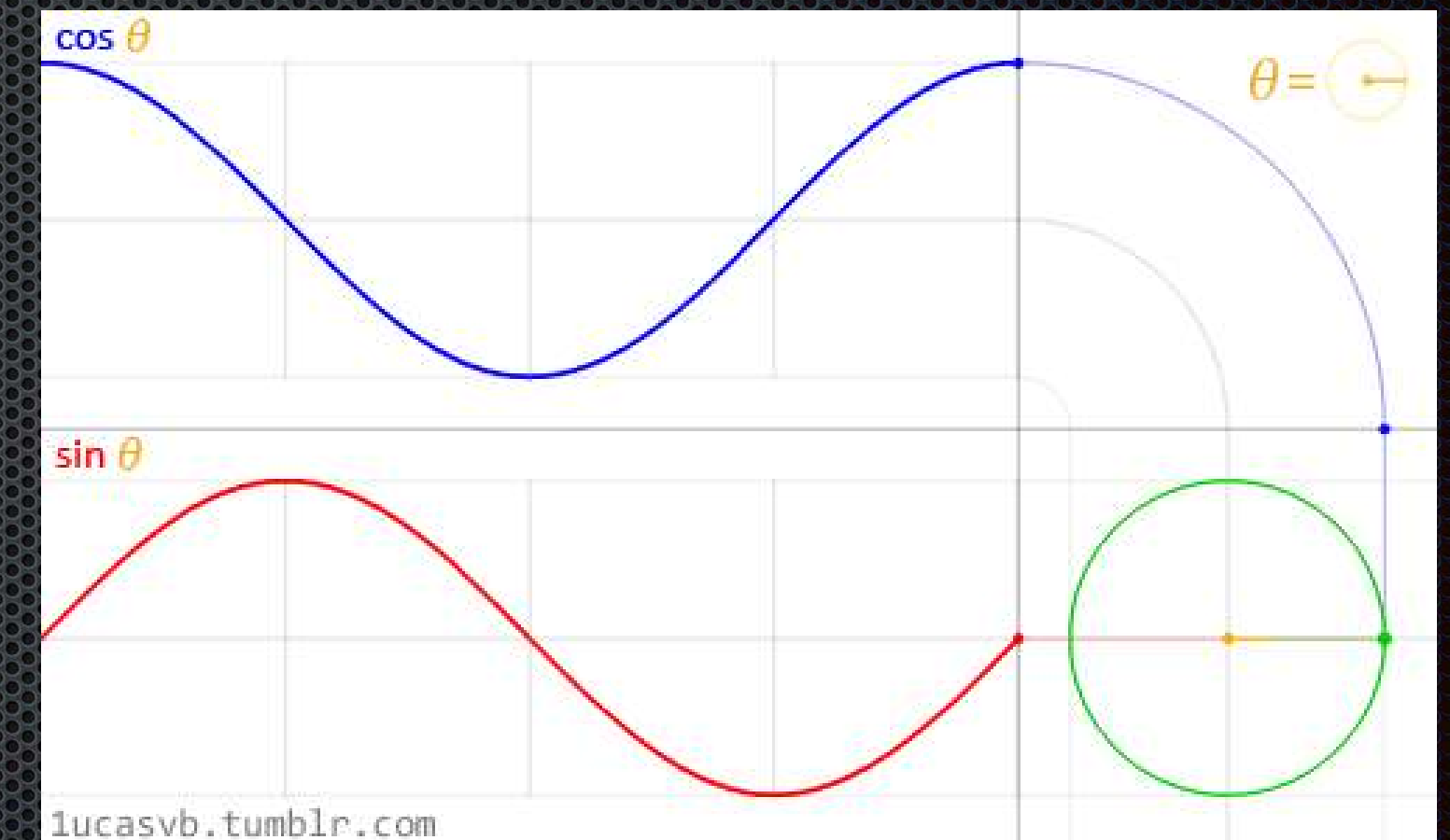
Como Funciona MDR



Curva Reométrica en MDR



Análisis Vectorial



$$\tan \delta = S''/S'$$



- Propiedades:
- **Reometría:**
- Viscosidad:
- Dispersión:
- Tensión Elongación

MDR

Normas:

ASTM D2084

Standard Test Method For Rubber

Property—Vulcanization Using

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Normas:

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ISO 6502

Standard Test Method For Rubber

Property - Vulcanization Using

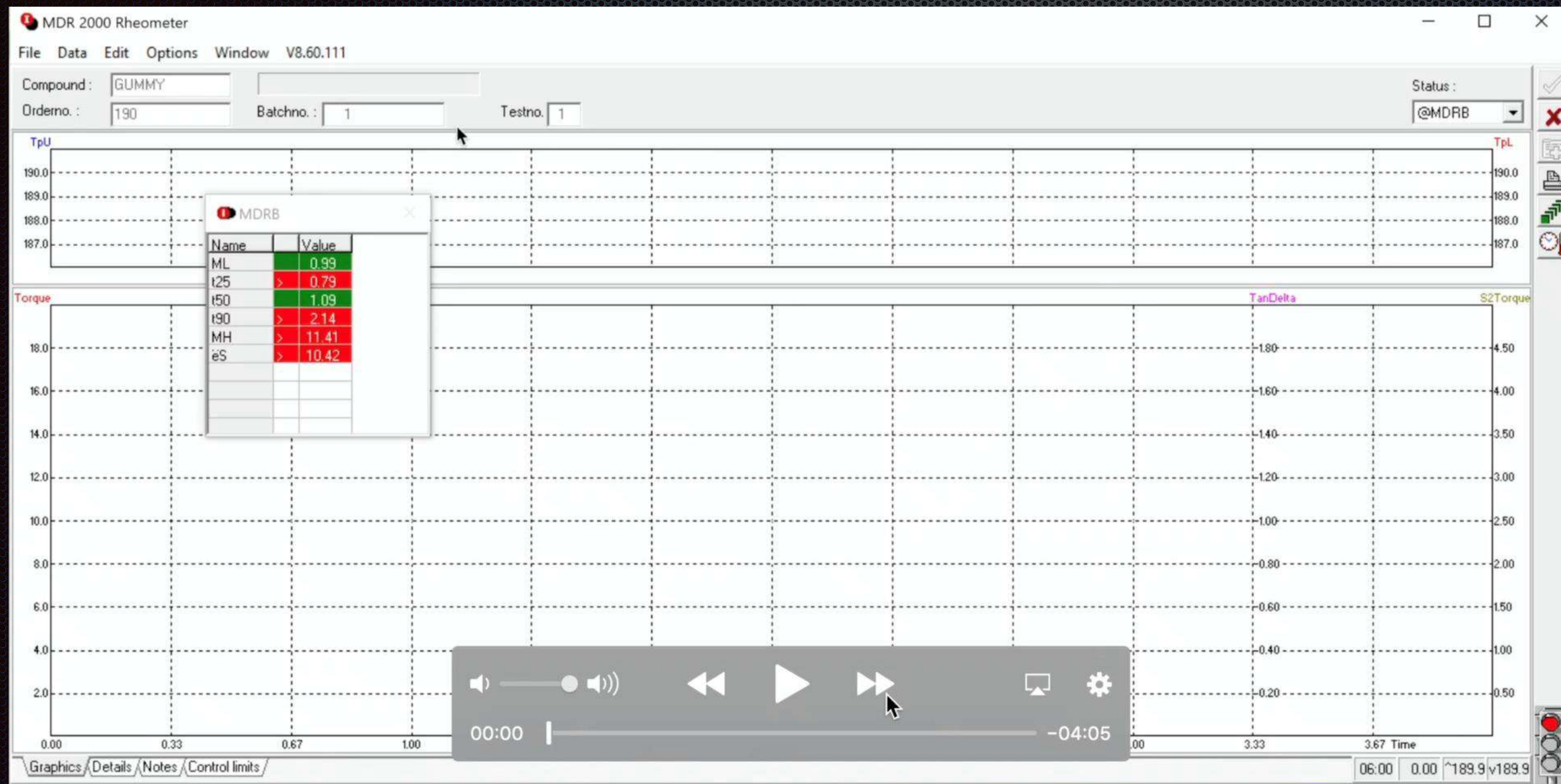
Rotorless Cure Meters

Measurement Of

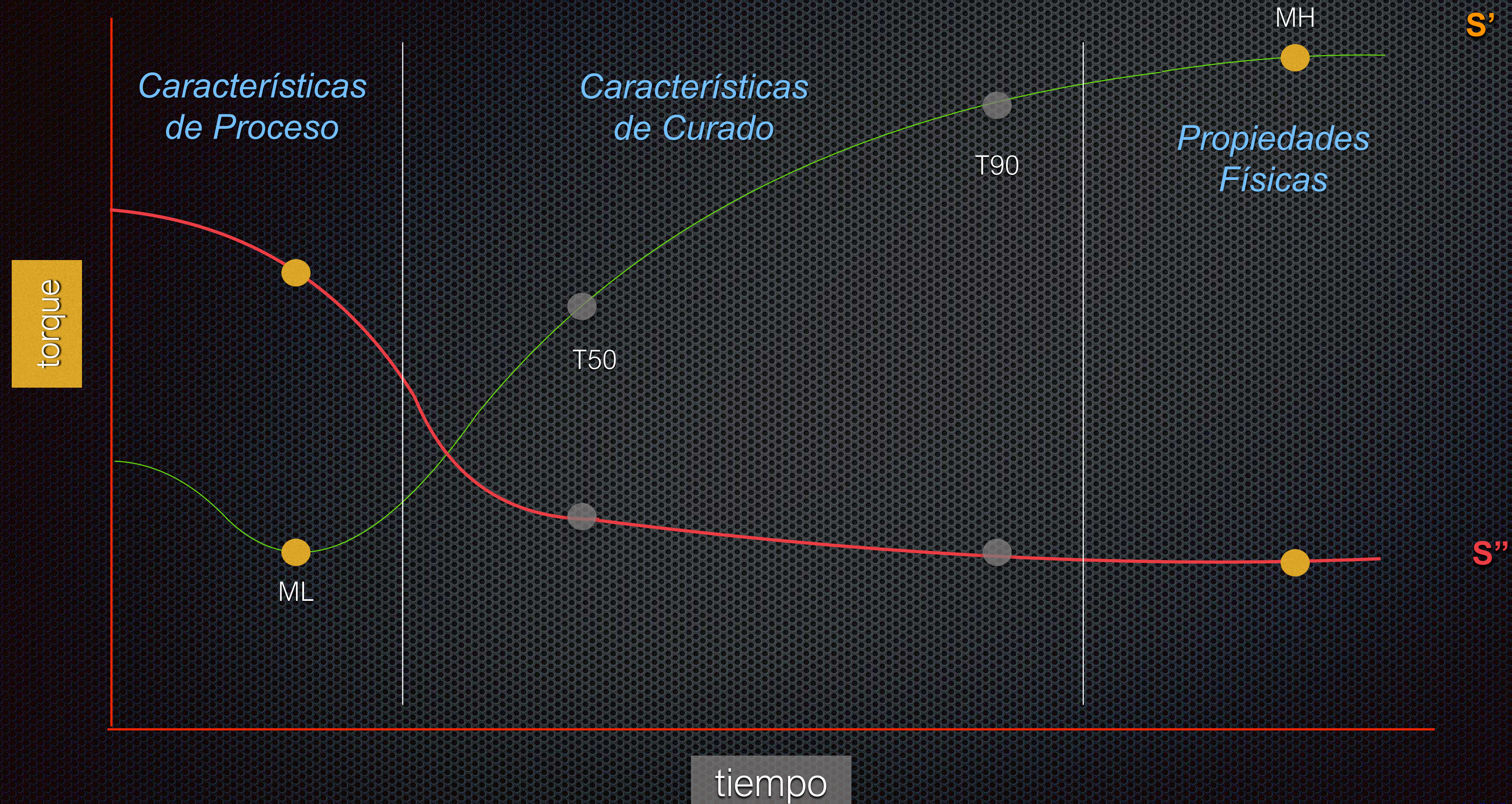
Vulcanization Characteristics

Using Curemeters

Test real 10X

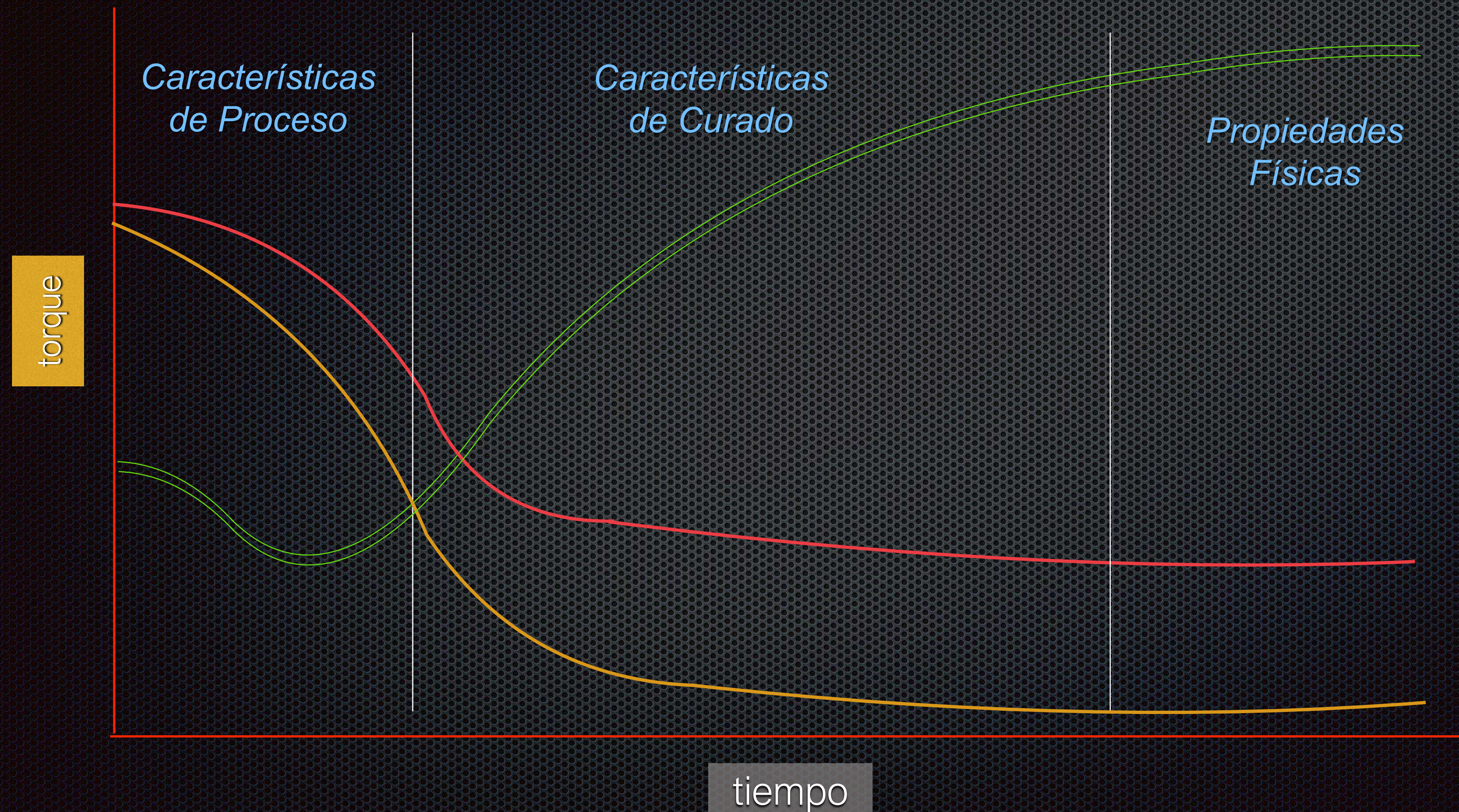


Zonas Reométricas



Ejemplo variación

en el Tipo de N. de H.



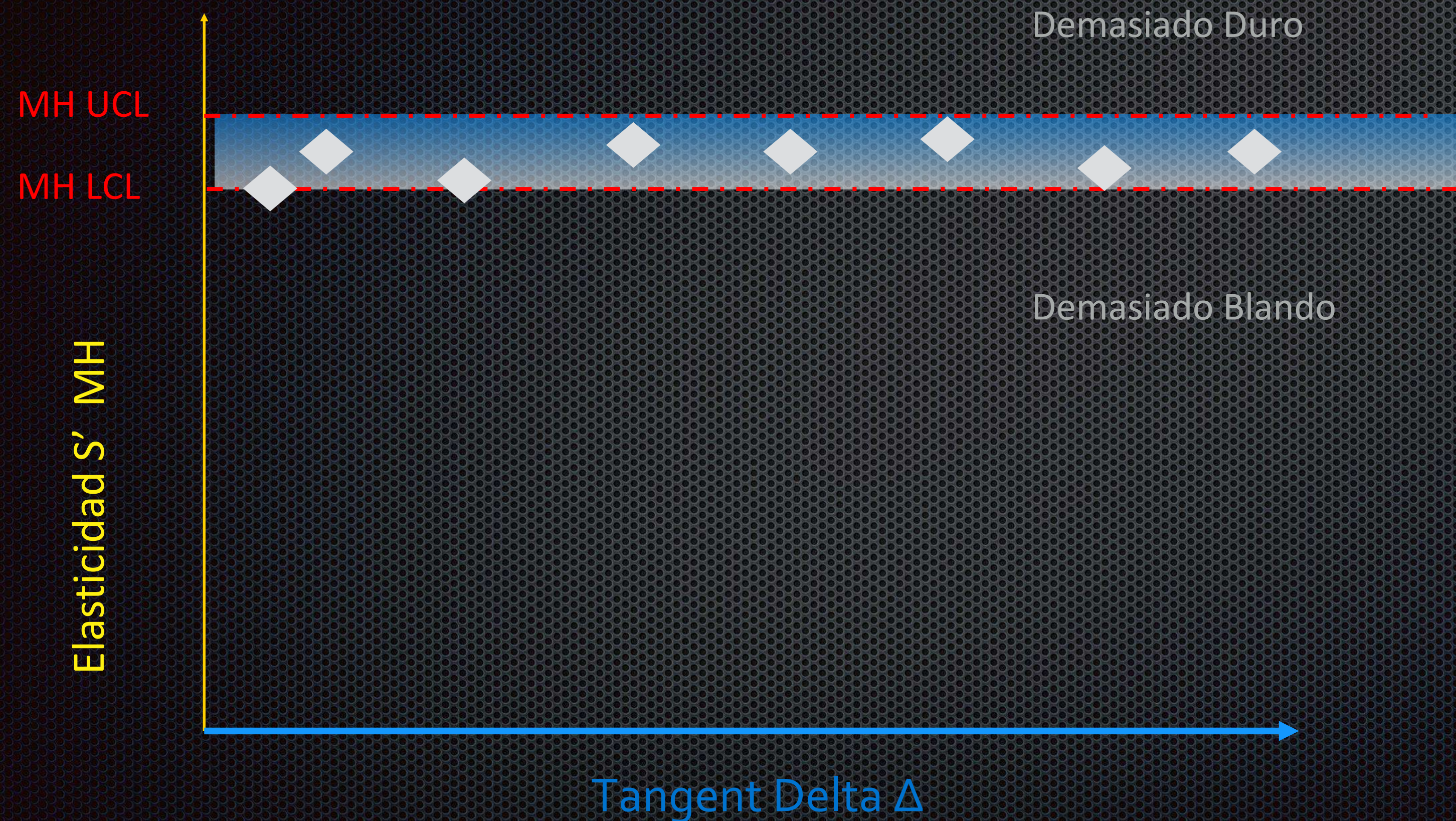
N550 30

N330 30

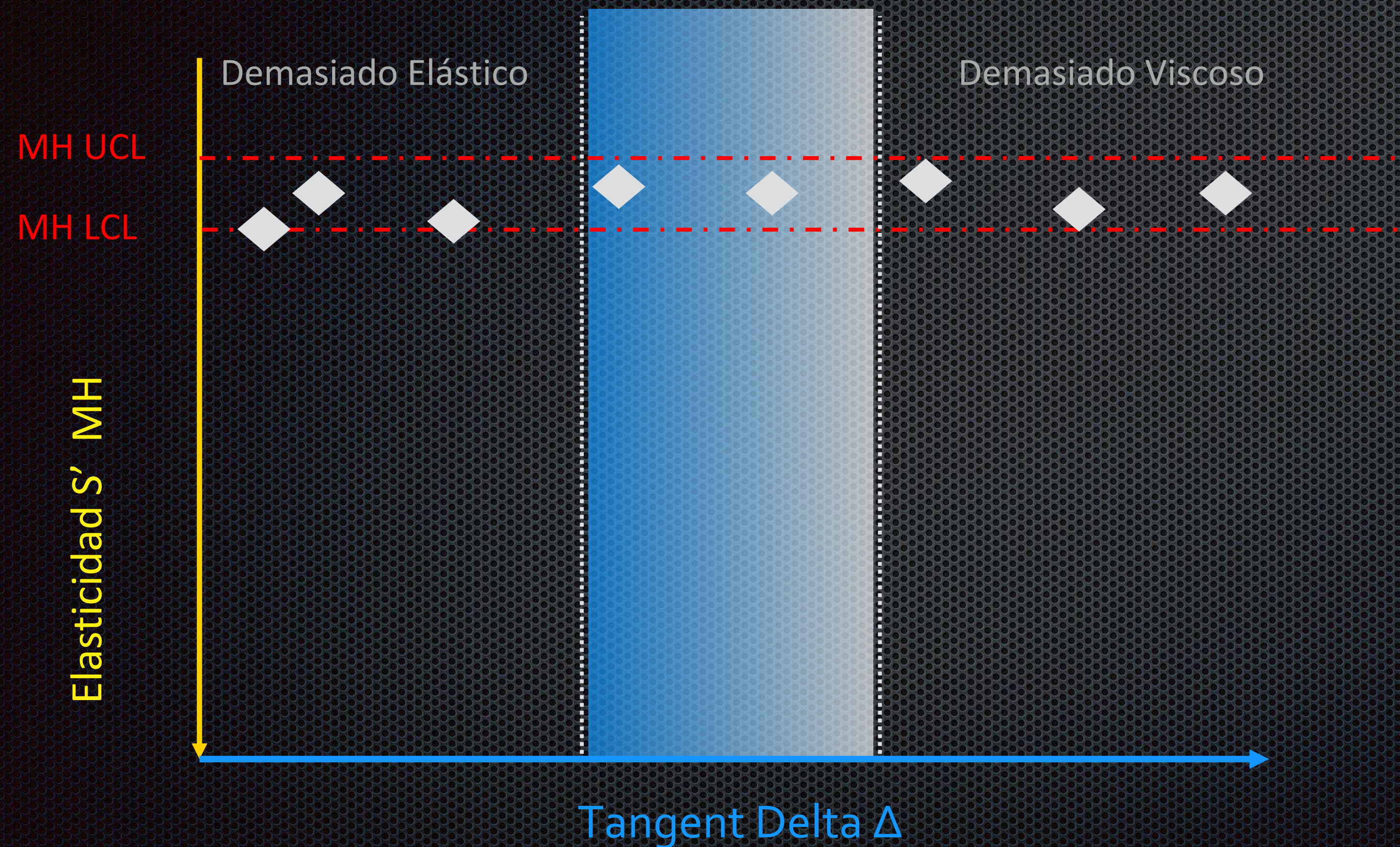
Ej: Influencia del contenido CIS



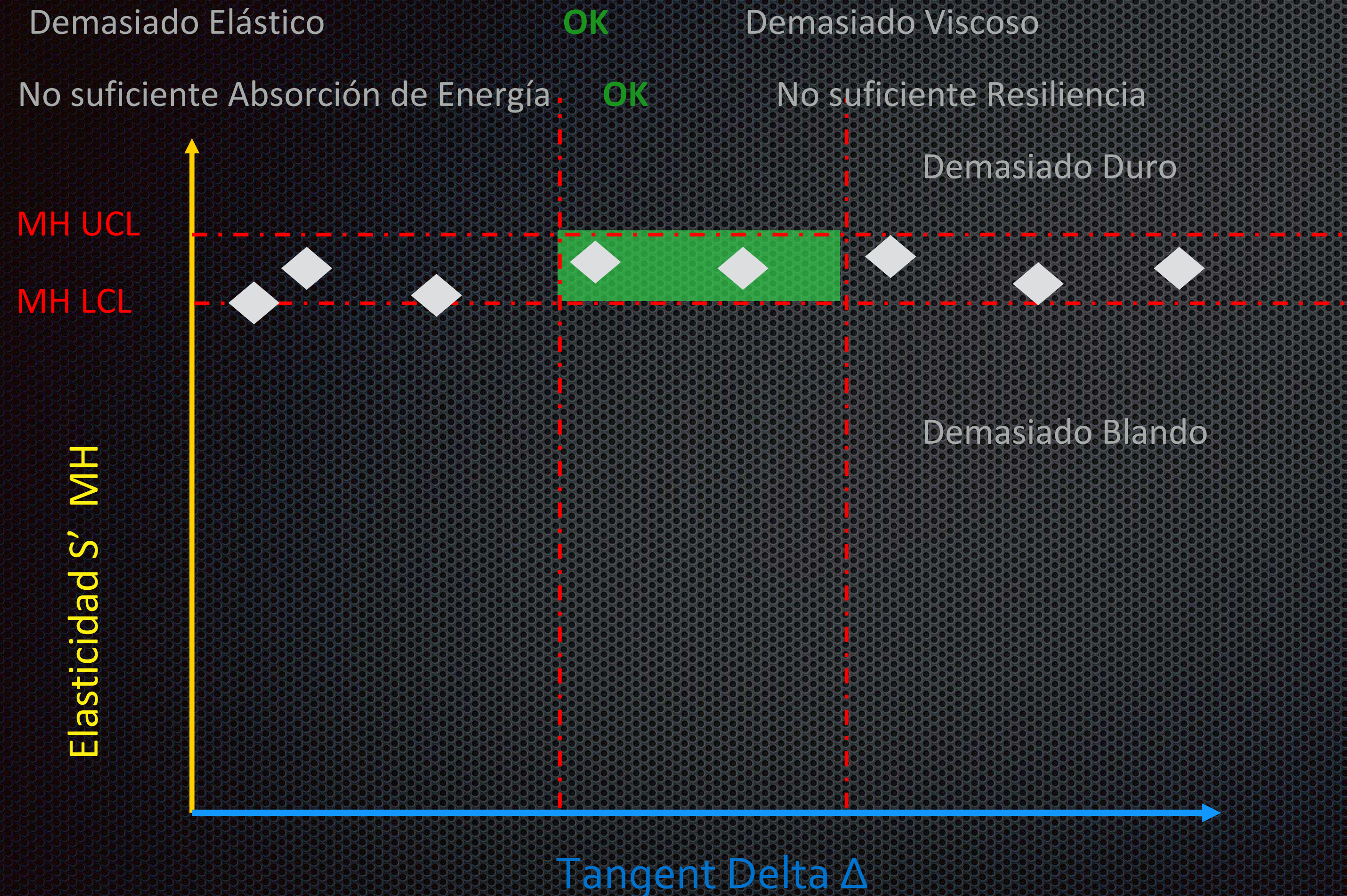
Area de confort Visco-Elastico



Area de confort Visco-Elastico



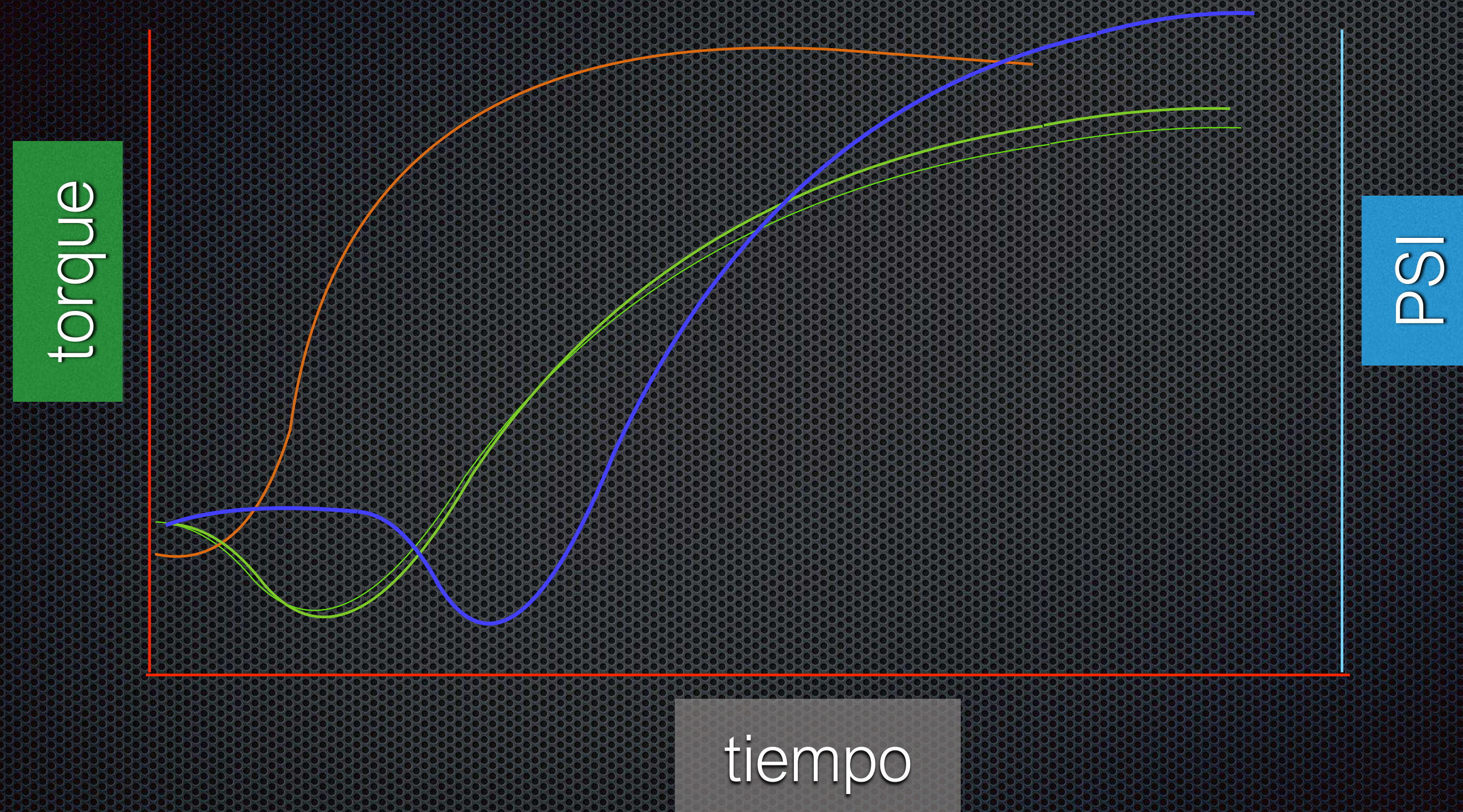
Area de confort Visco-Elastico



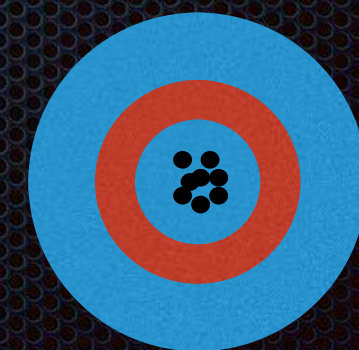
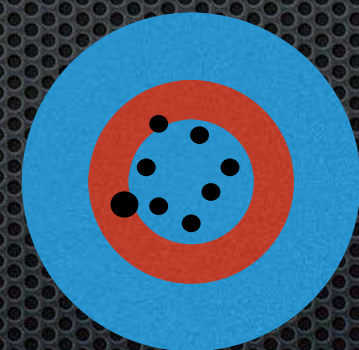
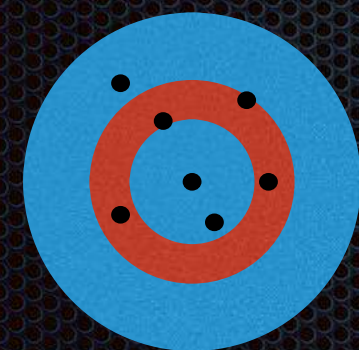
Reometria en caucho esponjoso



Torque & Presión



Reómetros evolución

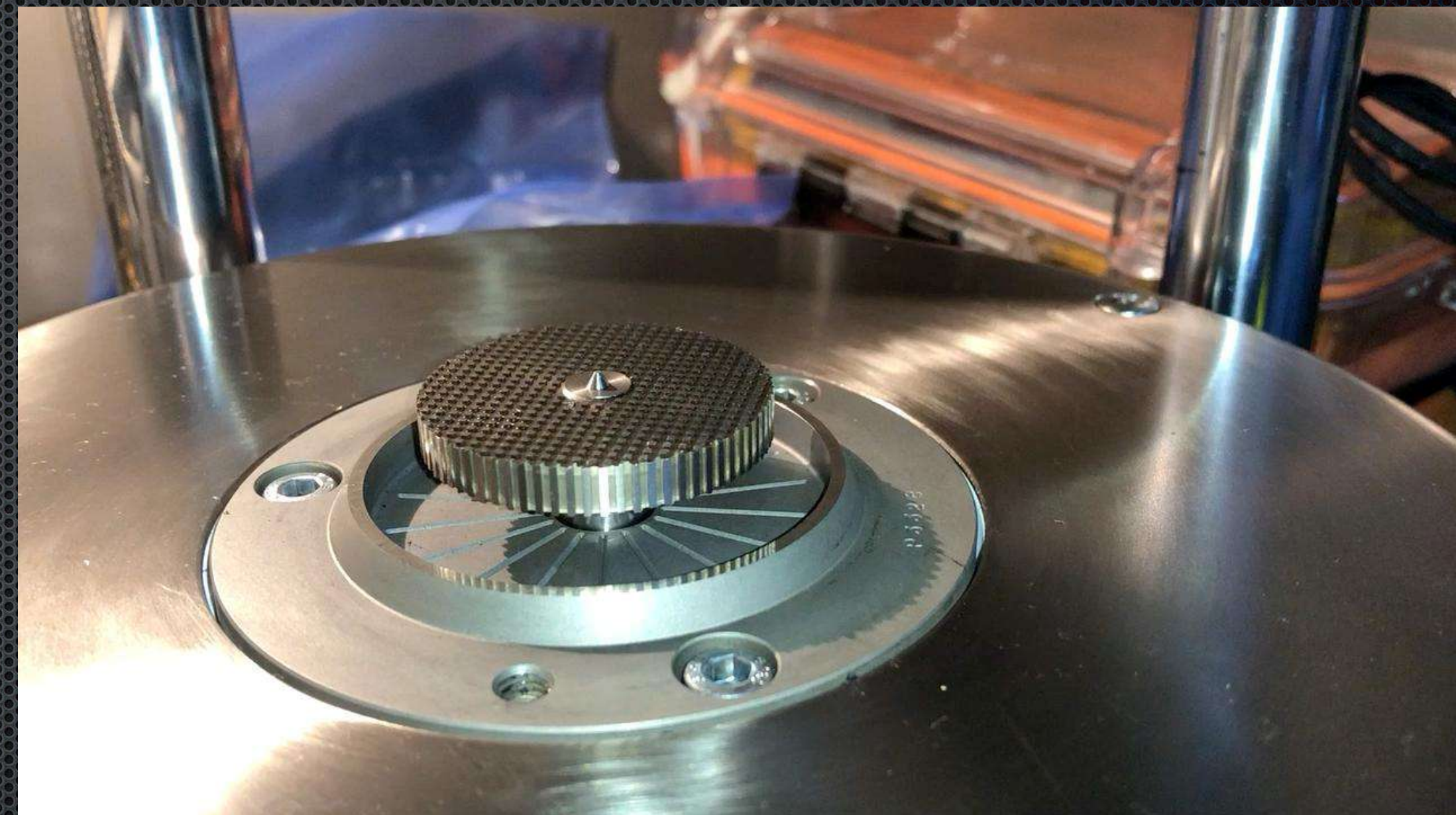
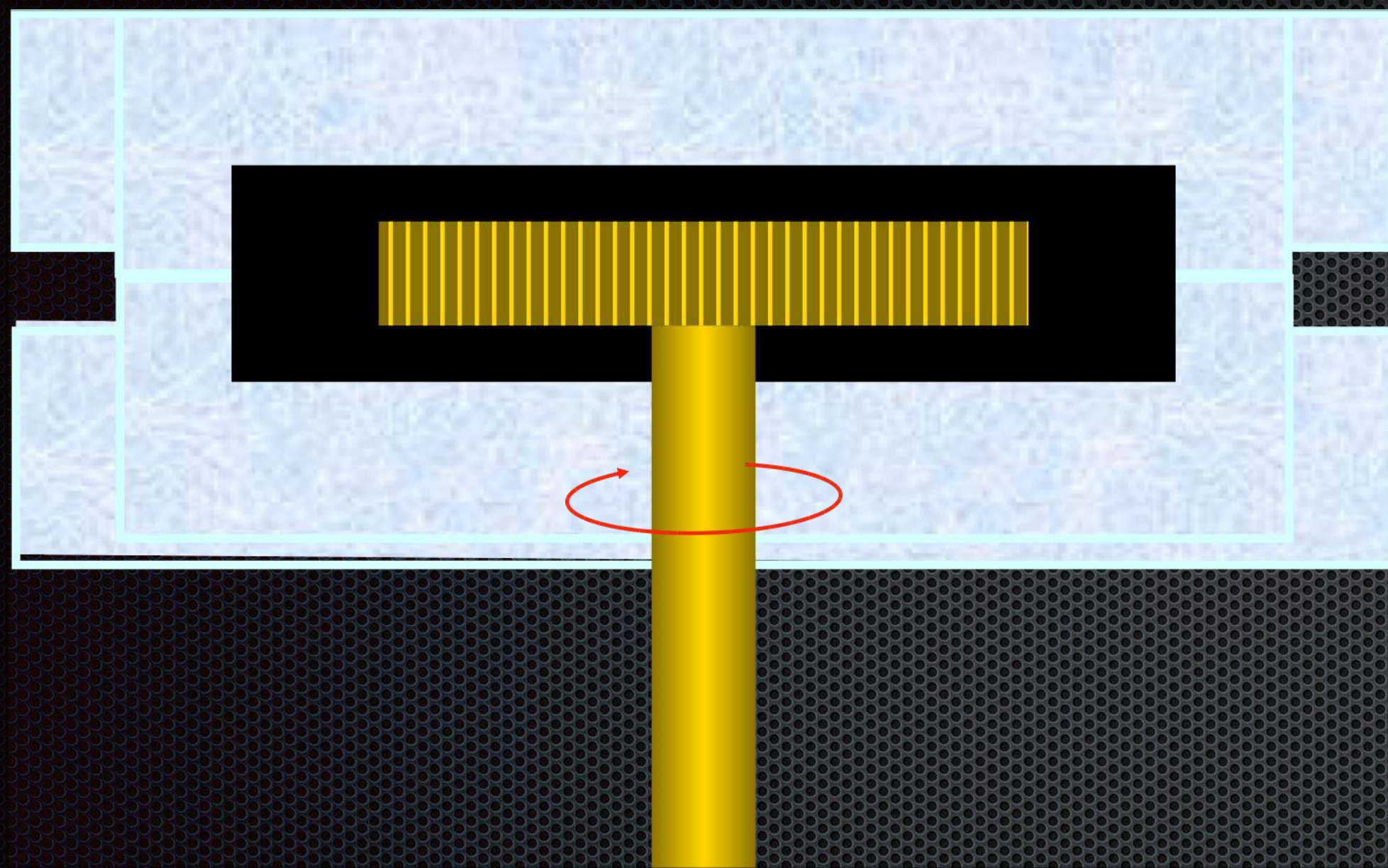


Reómetros de dado oscilante

“Familia MDR”

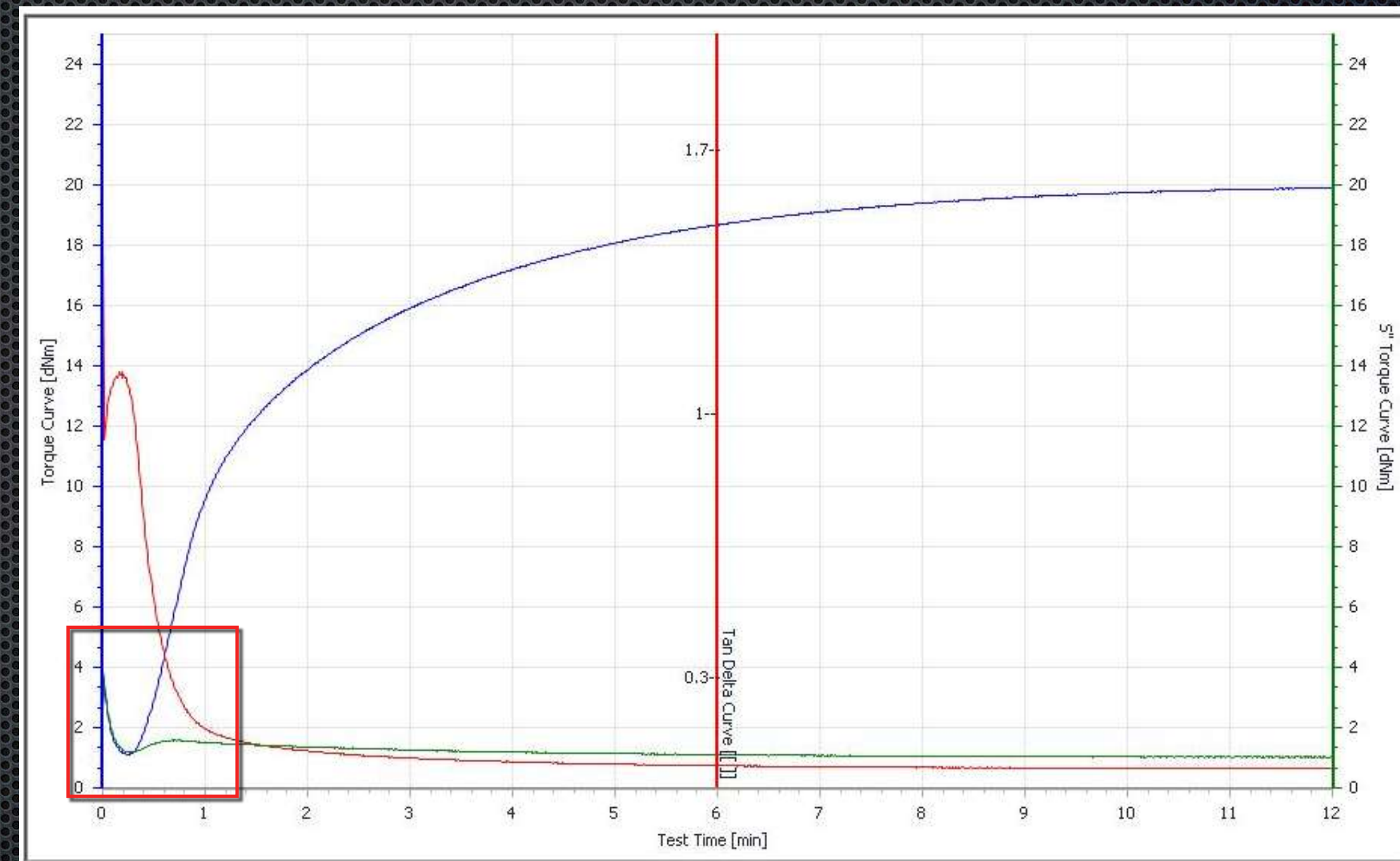
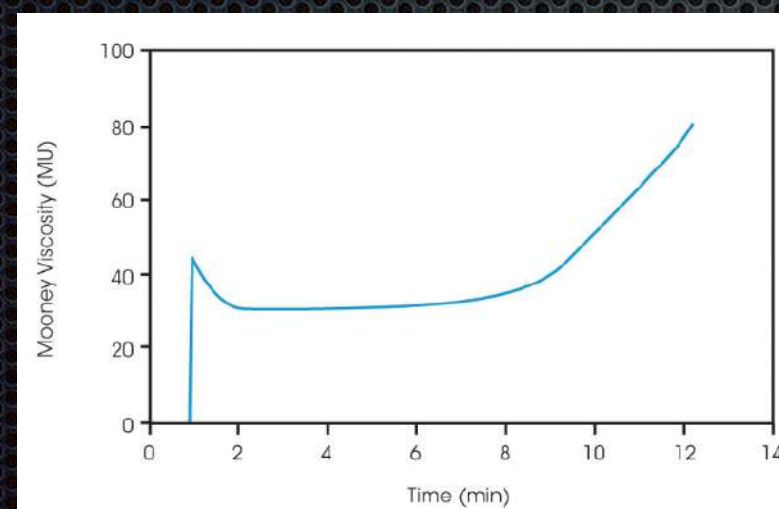


Viscosimetro

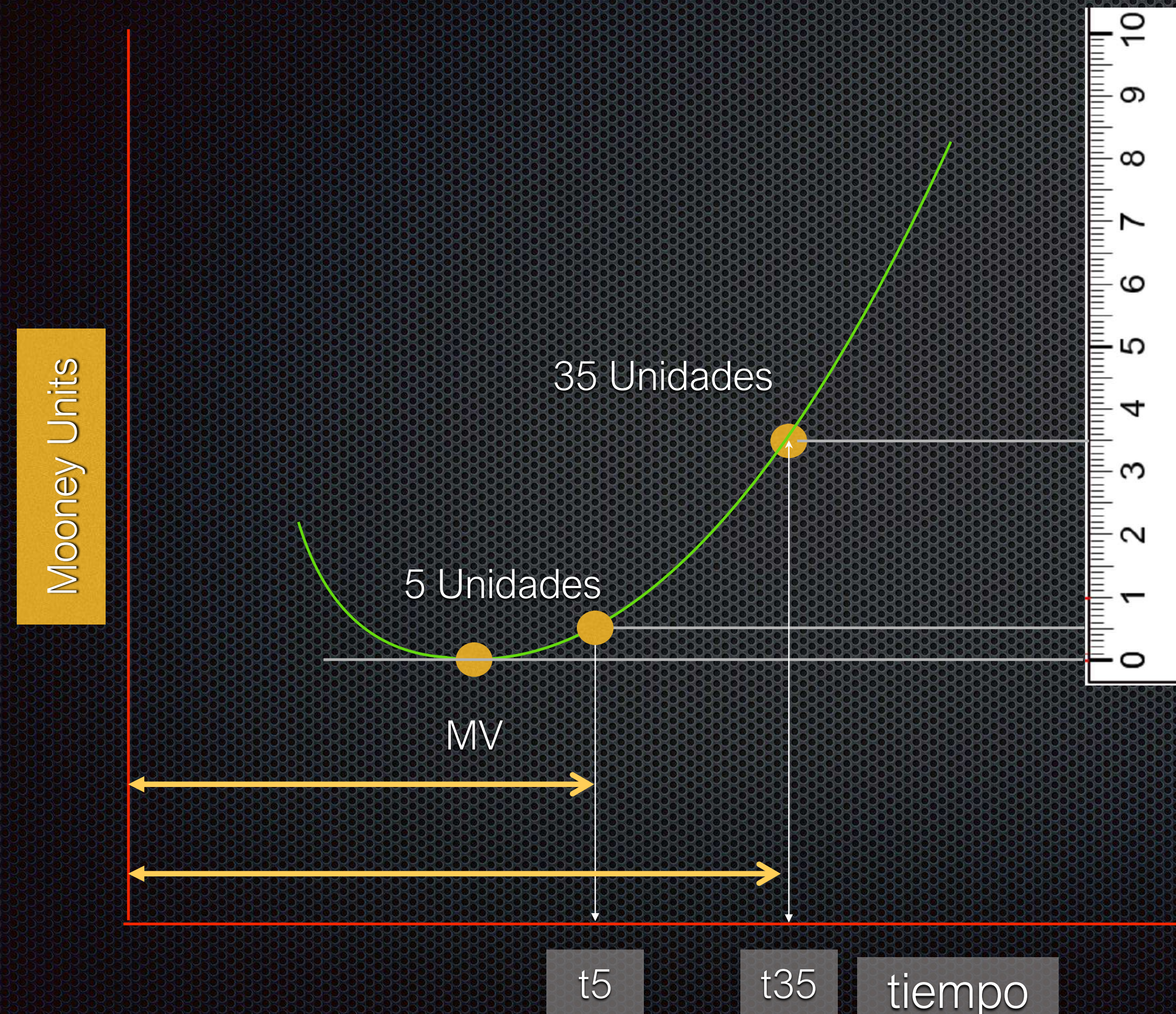


En sentido Horario a 2 RPM

Scorch Test



Scotch Test



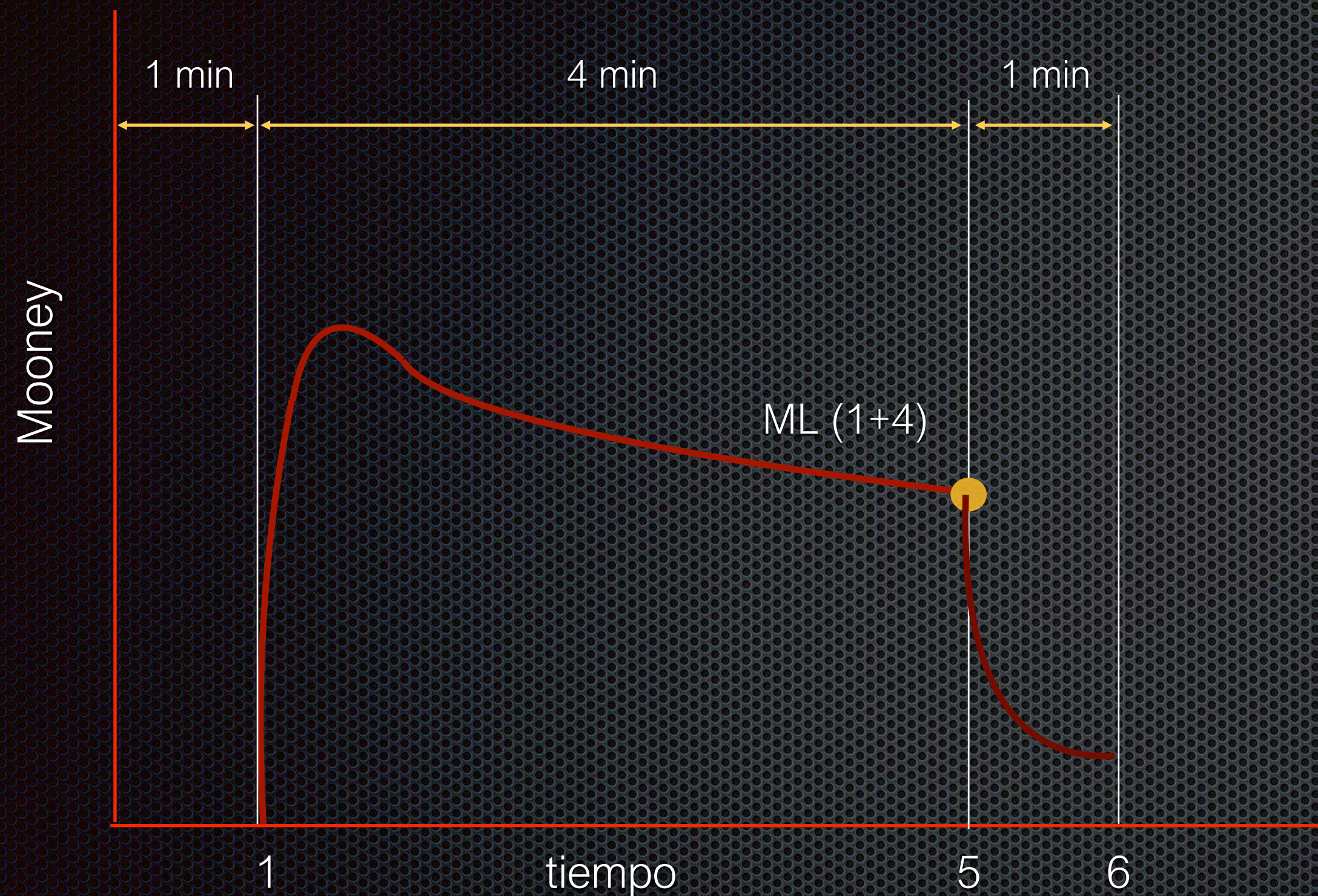
MV = Minimum Viscosity

T5 = Time to Scorch

T35 = Time to Cure

$\Delta TL = \text{Cure Index} = (t_{35} - t_5)$

Test de viscosidad ML (1+4) y relajación del esfuerzo



57-UML 1+4 (100°C)

T_x = Time to decay x% of MU)

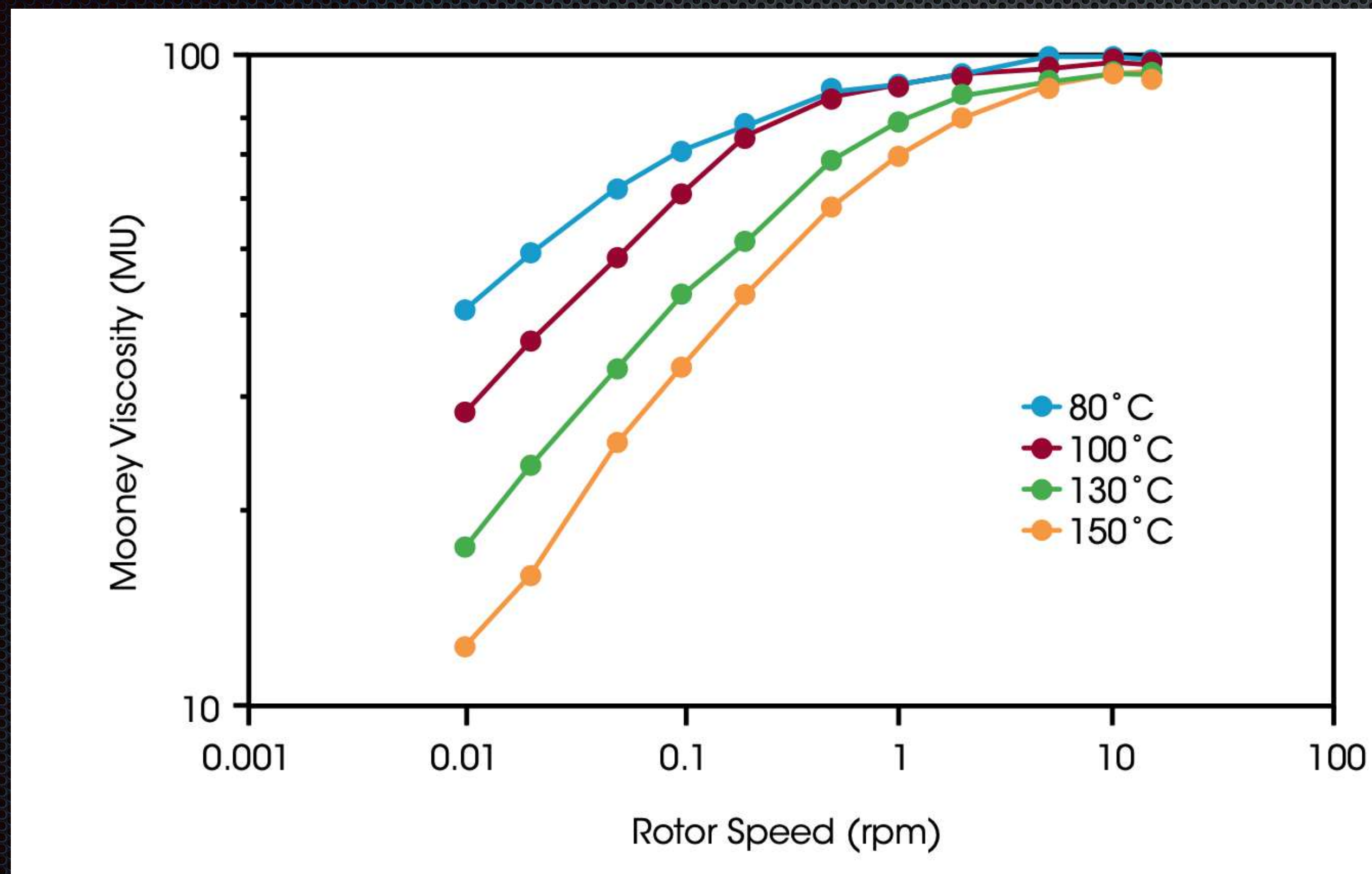
T_{80} = 16 Seg. Para perder el 80% de MU

X_y = % to decay x seg)

X_{30} = 86% de perdida de MU en 30 Seg

Test de viscosidad ML (1+4)

A diferentes RPM



Viscosímetros



Premiere MV



MV2000