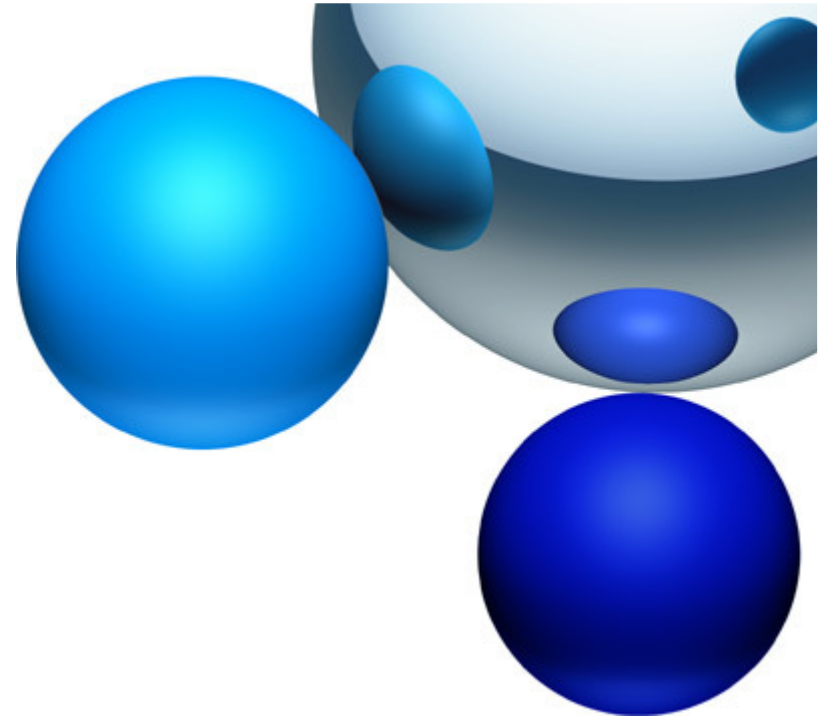


# ***LINPLAST® Plasticizers***



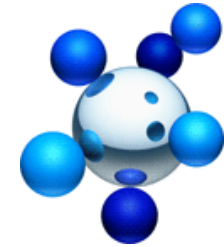
***General Application Profile of  
Plasticizers Based on Linear Even  
Numbered Alcohols***

***Comparison of LINPLAST® 610 P,  
LINPLAST® 810P and DOP***



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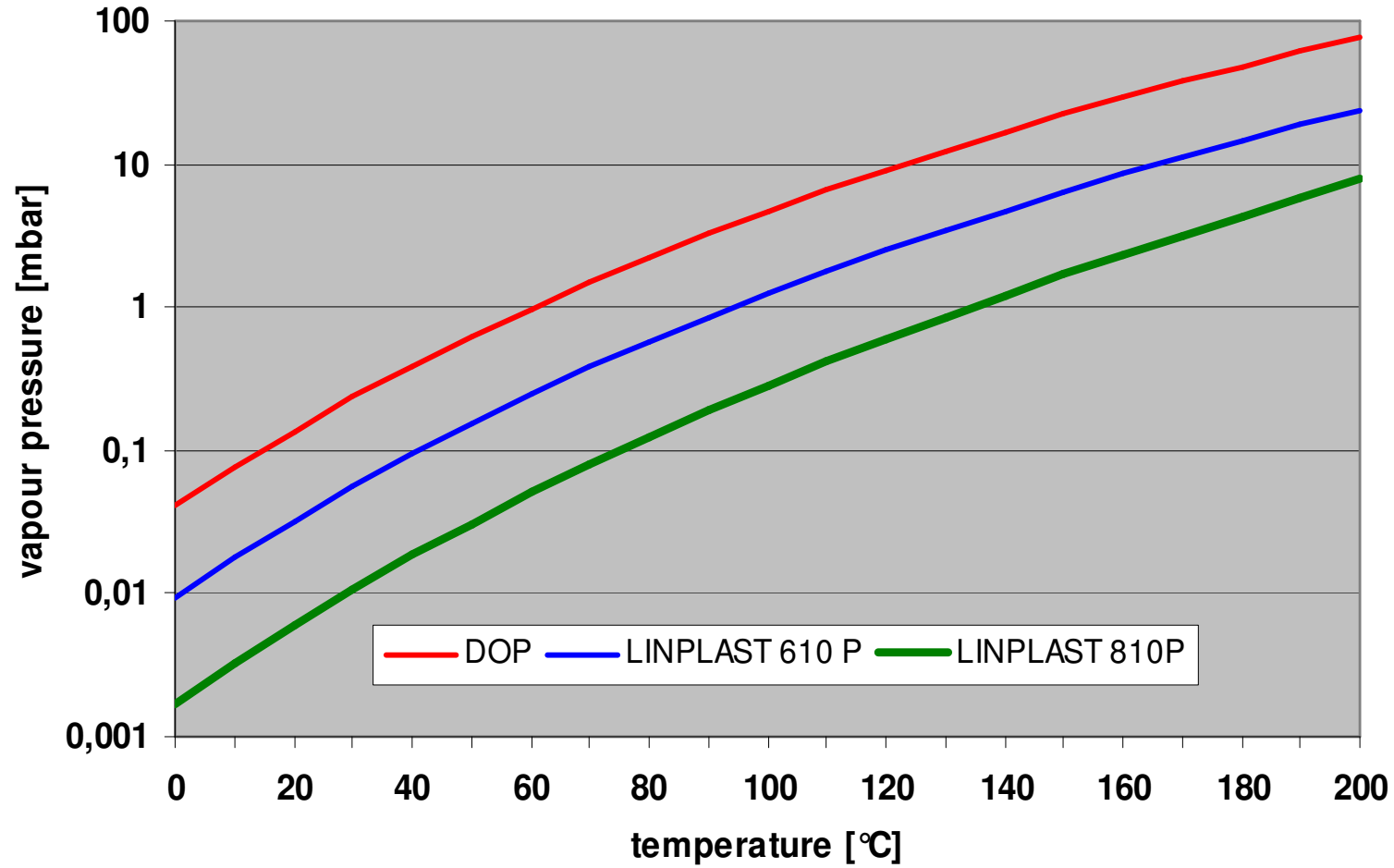
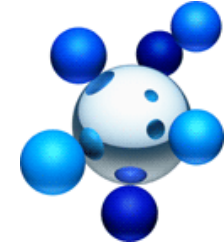
# ***Ester Comparison Data***

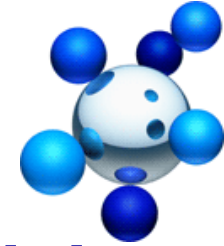


	<i><b>DOP</b></i>	<i><b>LINPLAST 610 P</b></i>	<i><b>LINPLAST 810 P</b></i>
<i><b>Average chain length</b></i>	<i><b>8</b></i>	<i><b>8.3</b></i>	<i><b>8.8</b></i>
<i><b>Density [g/ml]</b></i>	<i><b>0.984</b></i>	<i><b>0.977</b></i>	<i><b>0.968</b></i>
<i><b>Refractive Index [nD20]</b></i>	<i><b>1,4870</b></i>	<i><b>1,4843</b></i>	<i><b>1,4822</b></i>
<i><b>Dynam. Viscosity [mPa*s]</b></i>	<i><b>72</b></i>	<i><b>40</b></i>	<i><b>45</b></i>
<i><b>Pour Point [°C]</b></i>	<i><b>-51</b></i>	<i><b>-44</b></i>	<i><b>-30</b></i>
<i><b>Solution Temperature [°C]</b></i>	<i><b>120</b></i>	<i><b>121</b></i>	<i><b>127</b></i>



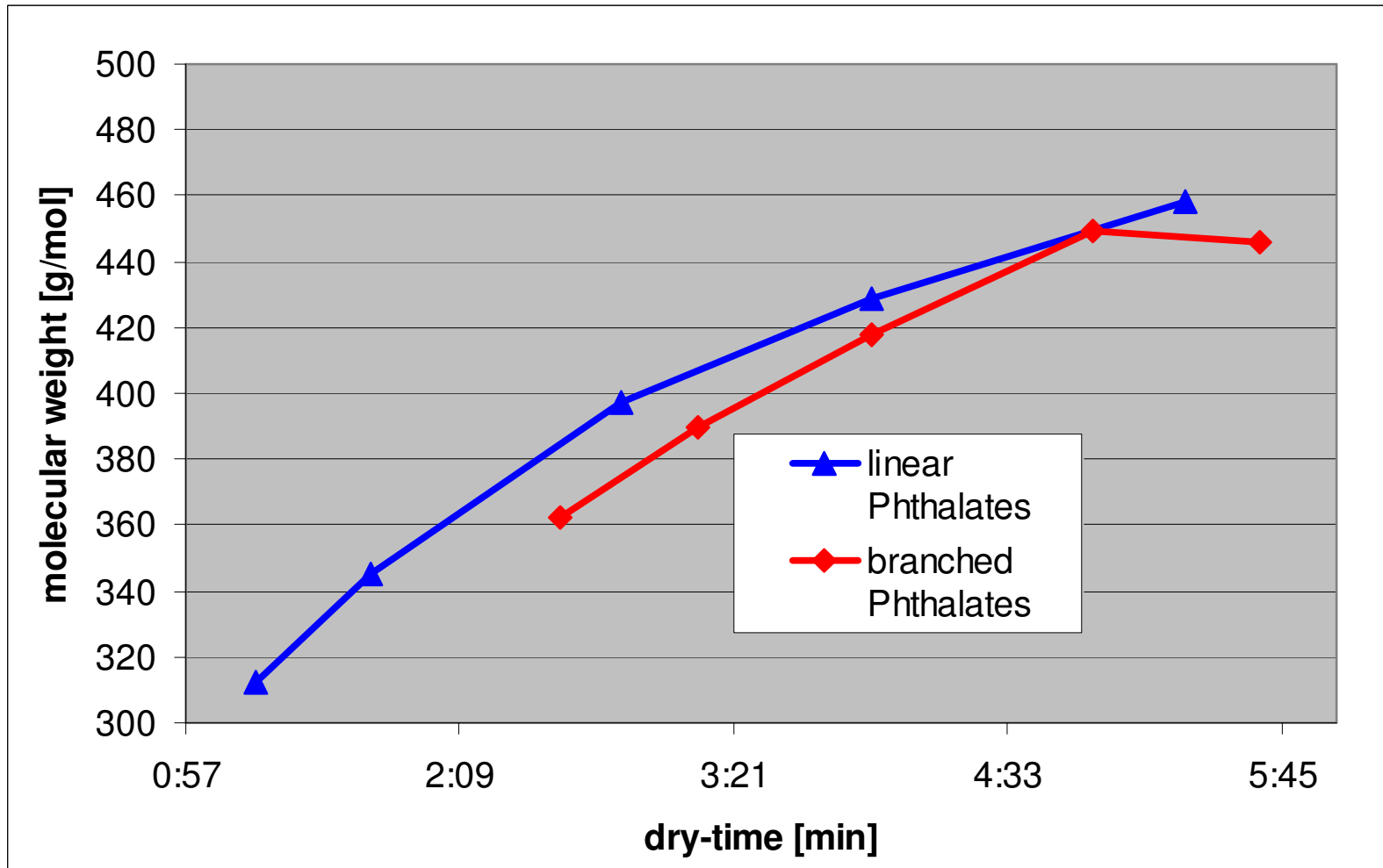
# Vapour Pressure

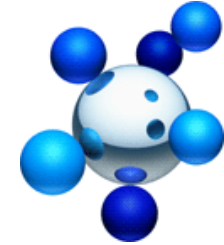




# Dry-Time

## Correlation of Dry-Time vs. Molecular Weight





## ***Standard formulation***

***Following data are based on PVC test sheets prepared under standard conditions using following formulation:***

<b><i>100</i></b>	<b><i>phr S PVC K70</i></b>
<b><i>50</i></b>	<b><i>phr plasticizer</i></b>
<b><i>1.5</i></b>	<b><i>phr Ba/Zn stabilizer (liquid)</i></b>
<b><i>0.3</i></b>	<b><i>phr lubricant (stearic acid)</i></b>



# Test Sheet Data



	<i>DOP</i>	<i>LINPLAST 610P</i>	<i>LINPLAST 810P</i>
<i>100% Modulus [N/mm<sup>2</sup>]</i>	<i>10.4</i>	<i>9.7</i>	<i>10.0</i>
<i>Tensile strength [N/mm<sup>2</sup>]</i>	<i>21.6</i>	<i>21.0</i>	<i>21.5</i>
<i>Elongation at break [%]</i>	<i>300</i>	<i>300</i>	<i>305</i>
<i>Cold flexibility according to Clash&amp;Berg</i>			
<i>334.5 N/mm<sup>2</sup></i>	<i>-23</i>	<i>-32</i>	<i>-34</i>
<i>669.0 N/mm<sup>2</sup></i>	<i>-36</i>	<i>-43</i>	<i>-46</i>
<i>Volatile loss after 7 days at 90°C</i>	<i>6.5</i>	<i>2.4</i>	<i>1.5</i>





# **Test Sheet Data After Ageing** **(168 hrs/90 °C) [changes in Paranthesis in%]**

	<b>DOP</b>	<b>LINPLAST 610P</b>	<b>LINPLAST 810P</b>
<b>100% Modulus [N/mm<sup>2</sup>]</b>	<b>14.4 (+38)</b>	<b>11.2 (+15)</b>	<b>11.5 (+15)</b>
<b>Tensile strength [N/mm<sup>2</sup>]</b>	<b>22.0 (+2)</b>	<b>21.4 (+2)</b>	<b>21.8 (+1)</b>
<b>Elongation at break [%]</b>	<b>246 (-18)</b>	<b>284 (-5)</b>	<b>289 (-5)</b>
<b>Cold flexibility according to Clash&amp;Berg</b>			
<b>334.5 N/mm<sup>2</sup></b>	<b>-14 (-40)</b>	<b>-29 (-10)</b>	<b>-32 (-6)</b>
<b>669.0 N/mm<sup>2</sup></b>	<b>-26 (-28)</b>	<b>-41 (-5)</b>	<b>-44 (-4)</b>





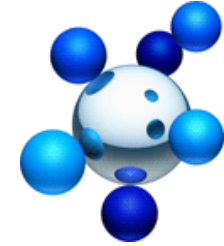
# Test Sheet Data After Ageing (168 hrs / 90°C)

	<i>LINPLAST 610P</i>	<i>LINPLAST 810P</i>	<i>DOP:DOA 60:40</i>
<i>100% Modulus [N/mm<sup>2</sup>]</i>	11.8	11.6	15.1
<i>Tensile strength [N/mm<sup>2</sup>]</i>	19.7	20.6	19.9
<i>Elongation at break [%]</i>	260	286	220
<i>Cold flexibility according to Clash&amp;Berg</i>			
334.5 N/mm <sup>2</sup>	-30	-32	-10
669.0 N/mm <sup>2</sup>	-42	-45	--- *)

**\*) Test specimen could not be tested because of huge loss of plasticizer**

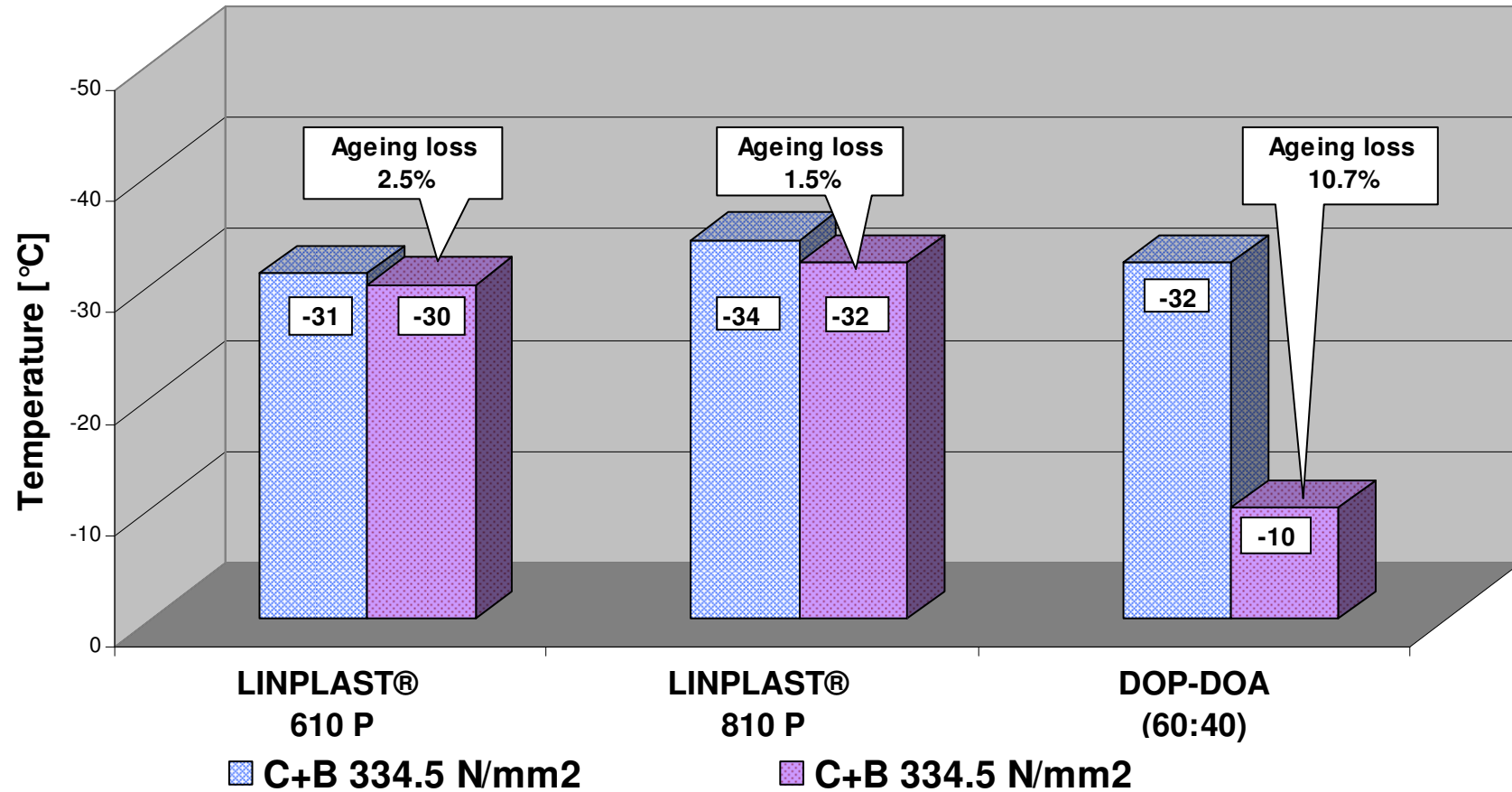


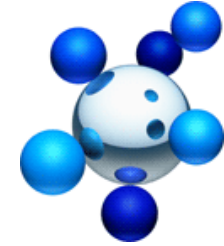




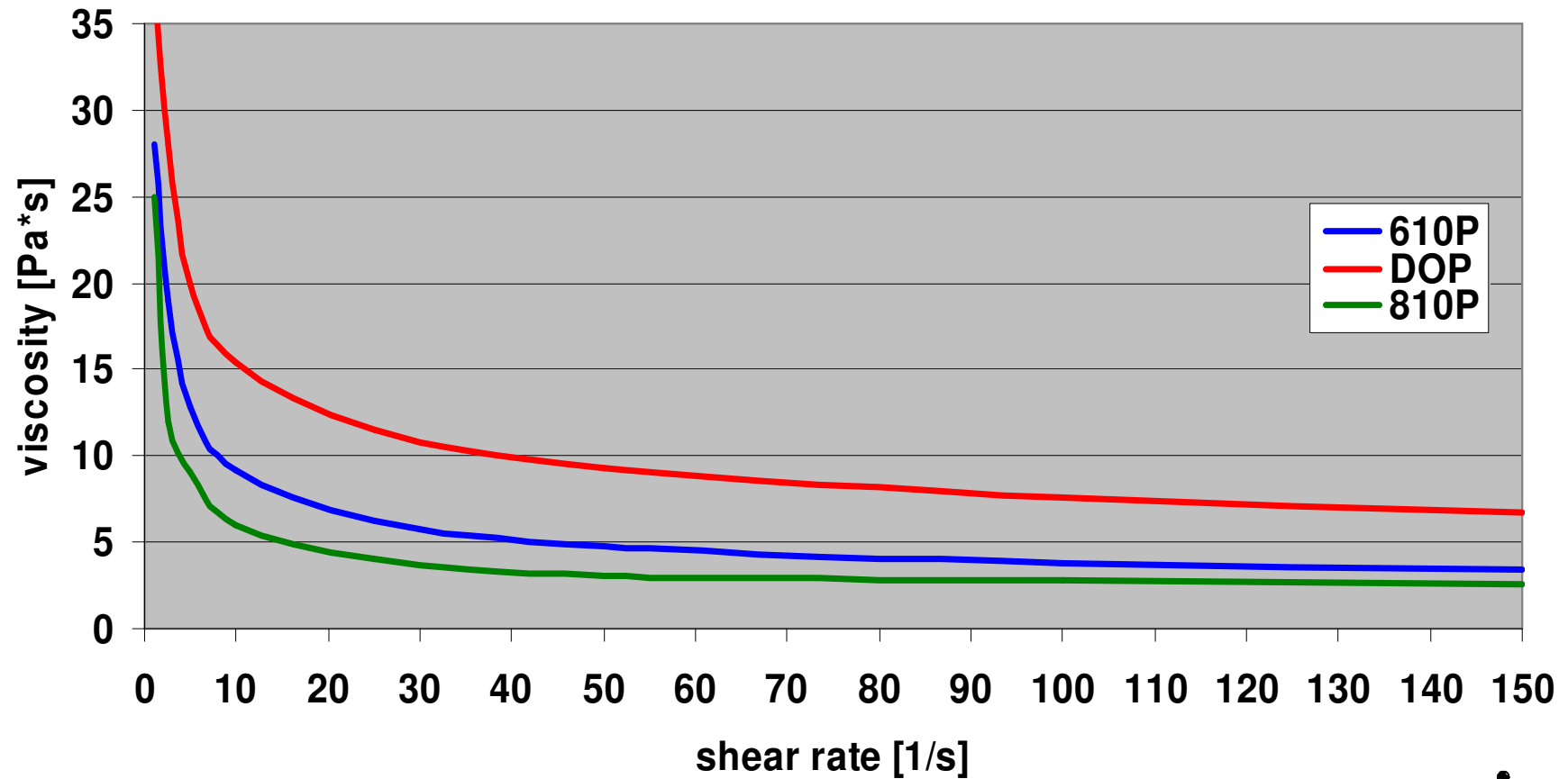
# Test Sheet Cold Flex Data

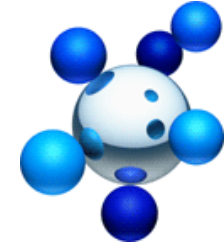
Cold Flex Clash&Berg **Before** and **After** Ageing (7d at 90 °C)



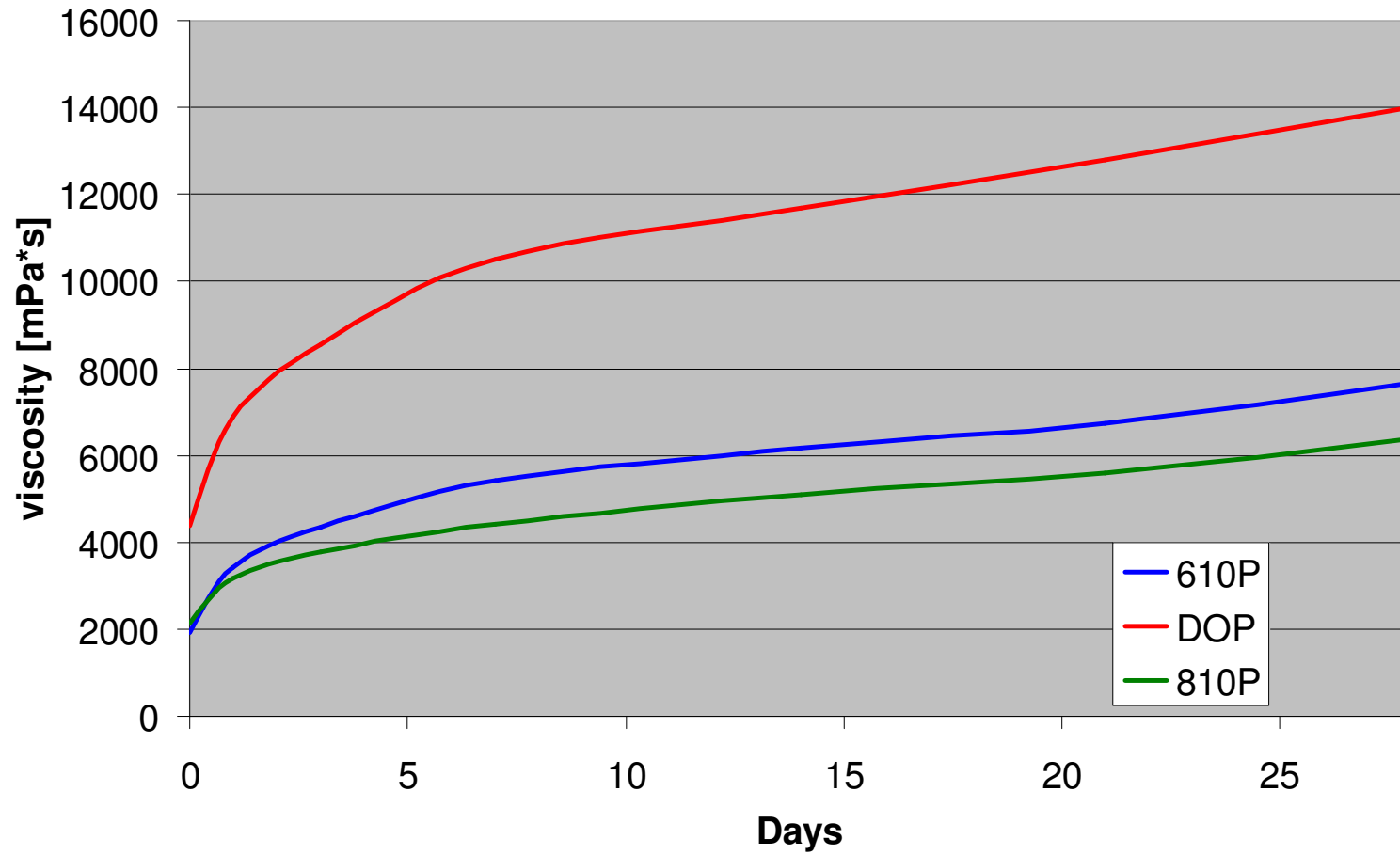


# *Plastisol Viscosity (40/60)* *Dependence on Shear Rate*

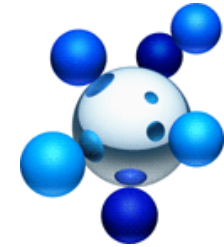




# ***Plastisol Viscosity (40/60) Dependence on Storage Time***



## **Conclusion**



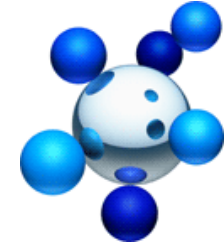
*Plasticizers based on linear alcohols prove to have advantages at high and low temperatures*

- *reduced dry-time*
- *high plasticizing efficiency and good cold flexibility regarding linear alkyl chains*
- *low volatile loss regarding reduced ester volatility*
- *better retention of mechanical properties after ageing regarding high plasticizing efficiency*
- *low plastisol viscosity and simhigher plastisol stability*
- *excellent light, UV and thermal stability reg. linear alkyl chains*

**→ Lower plasticizer content of 10% compared to DOP/DOA formulation possible without change of performance**



# ***Applications***



## ***LINPLAST® 610P***

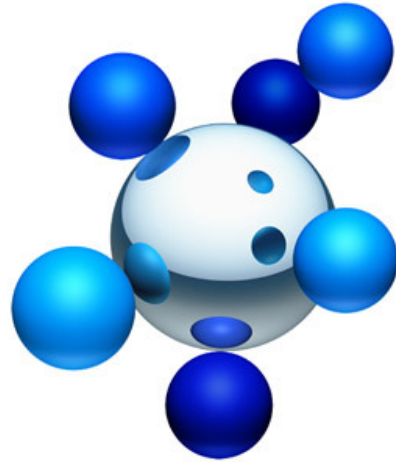
- *Low temperature cable applications*
- *Sealants for refrigerators*

## ***LINPLAST® 810P***

- *Low temperature cable applications*
- *Use in cable sheetings*
- *Roofing films*
- *Coated fabrics*
- *Tarpaulins*



***THANK YOU***



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