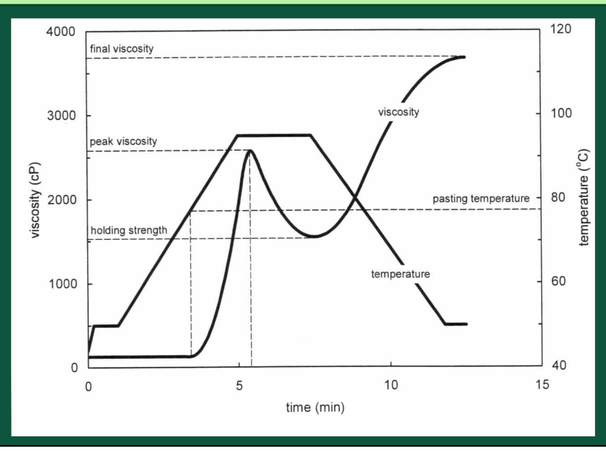
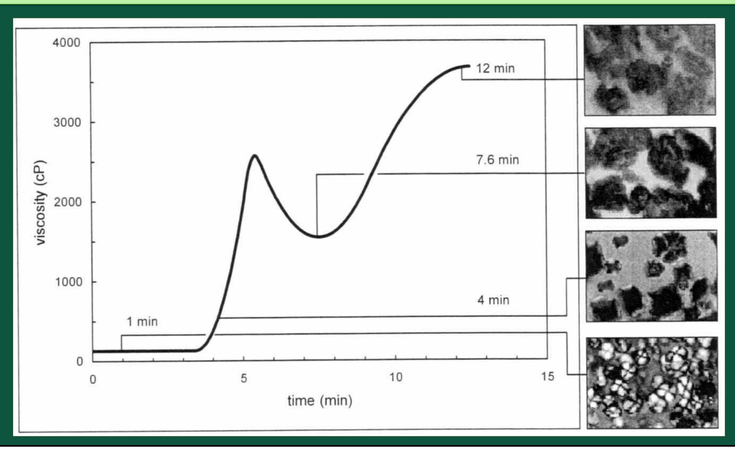
Rapid Visco Analyzer: AACCI Method 76-21.01

Typical Pasting Curve



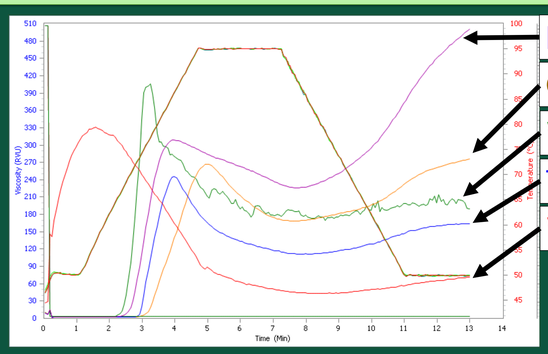
- The point at which the viscosity rapidly changes is the pasting temperature.
- As the slurry is heated the viscosity increases to the peak which is referred to as the hot paste viscosity (HPV).
- During heating the viscosity drops. The viscosity at this drop is known as the setback and the difference in viscosity between the HPV and setback is the breakdown.
- When the slurry is cooled the viscosity generally increases. This final viscosity is the cold paste viscosity (CPV).

Physical Changes in Starch Granules



- As the slurry is heated the starch granules go through several changes.
- They begin to absorb water and swell.
- As the swelling increases the amylose is leached and upon further swelling the granules begin to collapse.
- During the gelatinization process the granules loose their crystalline structure. The loss of crystallinity can be seen by the fading of the Maltese cross in the polarized light micrographs above.

Starch Pasting Curves

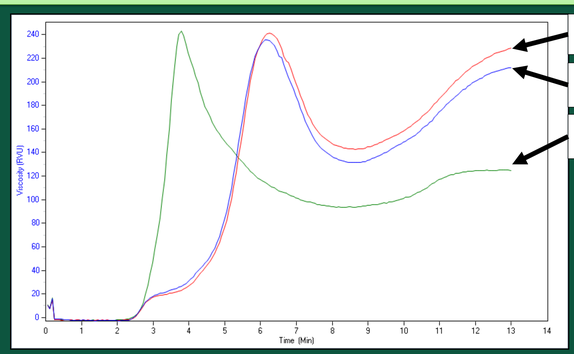


Pasting Profiles of Starches from Various Botanical Sources

	Peak Viscosity (RVU)	Hot Paste Viscosity (RVU)	Breakdown (RVU)	Cold Paste Viscosity (RVU)	Setback (RVU)	Peak Time (min)	Pasting Temp (°C)
Wheat	331.79	44.13	287.67	73.63	29.50	1.58	50.40
Corn	269.38	168.38	101.00	277.54	109.17	4.98	73.43
Tapioca	292.17	132.84	159.33	191.21	58.38	3.92	73.90
Pea	315.29	231.75	83.54	508.75	277.00	3.98	71.08
Waxy Durum	406.21	166.63	239.58	196.96	30.34	3.25	67.75

- The graph and table above show the pasting profile of starches from different botanical sources.
- The source of the starch affects the pasting temperature and peak time as well the other pasting properties of the starch.

Flour Pasting Curves



Pasting Profiles of Starches from Various Botanical Sources

	Peak Viscosity (RVU)	Hot Paste Viscosity (RVU)	Breakdown (RVU)	Cold Paste Viscosity (RVU)	Setback (RVU)	Peak Time (min)	Pasting Temp (°C)
Parshall	235.83	131.50	104.33	211.92	80.42	6.18	66.10
Glenn	241.25	142.83	98.42	228.67	85.83	6.25	67.75
Waxy	243.25	93.42	149.83	124.83	31.42	3.78	67.85

- The pasting profiles of flour with different amylose contents are shown above. Glenn is a wild type flour with the traditional amylose content. Parshall is a partial waxy flour with 2-3% less amylose and NDSW0481 is fully waxy with only about 2-5% amylose.
- The amount of amylose in the starch most greatly effects the peak time, setback and cold paste viscosity.