

## Viscosity of Cook-up Dent Food Starches Method

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### Scope

- Assess cooked viscosity of unmodified/modified dent corn starch.
- Differentiate starches with different degrees of modification.
- Quality control of the starch modification process.
- Quality control of starch used in food manufacture.

### Rapid Visco Analyser

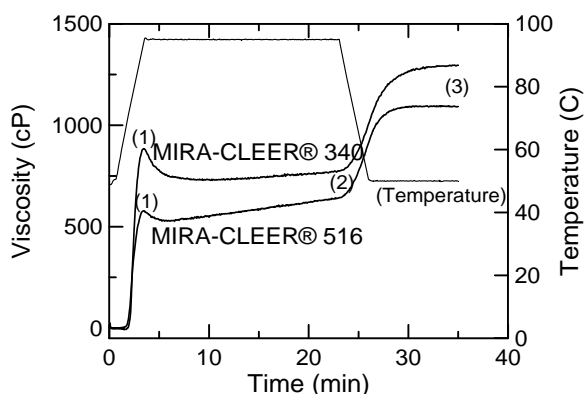
The Rapid Visco Analyser (RVA) is a cooking stirring viscometer with ramped temperature and variable shear profiles optimized for testing viscous properties. The instrument includes international standard methods as well as full flexibility for customer tailor-made profiles. Combining speed, precision, flexibility and automation, the RVA is a unique tool for product development, quality and process control and quality assurance.



### Description

This method is applicable to substituted (acetyl or hydroxypropyl), crosslinked, and both substituted and crosslinked dent corn starch. These cook-up food starches are used as thickeners, stabilizers and clarifiers in products such as soups, puddings, pie fillings and retorted foods. An extended hold time at 95°C (203°F) is used to assist in swelling the crosslinked starches and to better differentiate these products.

### Example



Analysis	Starch Type
(1) Viscosity at 3.00 min. (cP)*	All
(2) Viscosity at 23.00 min. (cP)*	✓
(3) Viscosity at end of test (cP)*	✓
(4) Delta (cP) [(2)-(1)]	✓

\*Subtract viscosity at 0.50 minutes from value to give final result.

**Fig. 1.** Pasting curve of modified and unmodified dent corn starches using the ST-02 Method, showing the commonly measured parameters.

## Method

Thirty-five-minute pasting profile.

## Sample Preparation

Select starch concentration (in pH 6.5 buffer) based on starch viscosity from the relative viscosity table below, to give an end viscosity of 800-1500 cP.

Relative Viscosity	Starch Concentration (dry solids, % w/w)	Example of Starch
High	5.0	MIRA-CLEER <sup>®</sup> 187
Medium	5.5	MIRA-CLEER <sup>®</sup> 340
Low	6.0	MIRA-CLEER <sup>®</sup> 516

### Preparation of Buffer

Add 0.8 g methyl p-hydroxybenzoate and 0.2 g propyl p-hydroxybenzoate to 150 ml distilled water. Heat to boiling to dissolve solids, and make up to 1 L with distilled water. Add 10.0 g anhydrous dibasic sodium phosphate, 2.0 g sodium benzoate, and 2.7 g granular citric acid ( $C_6H_8O_7 \cdot H_2O$ ). When solids are all dissolved, adjust pH to 6.5 using citric acid or dibasic sodium phosphate.

## Profile

Time	Type	Value
00:00:00	Temp	50°C
00:00:00	Speed	960 rpm
00:00:10	Speed	160 rpm
00:00:30	Temp	50°C
00:03:00	Temp	95°C
00:23:00	Temp	95°C
00:26:00	Temp	50°C
00:35:00	End	
Idle Temperature: 50 ± 1°C Time Between Readings: 4 s		

## Measure

V3: Viscosity at 3 minutes (cP)\*

V23: Viscosity at 23 minutes (cP)\*

FV: Final viscosity (cP)\*

Delta: V23 – V3 (cP)

\*Subtract viscosity at 0.50 minutes from value to give final result.