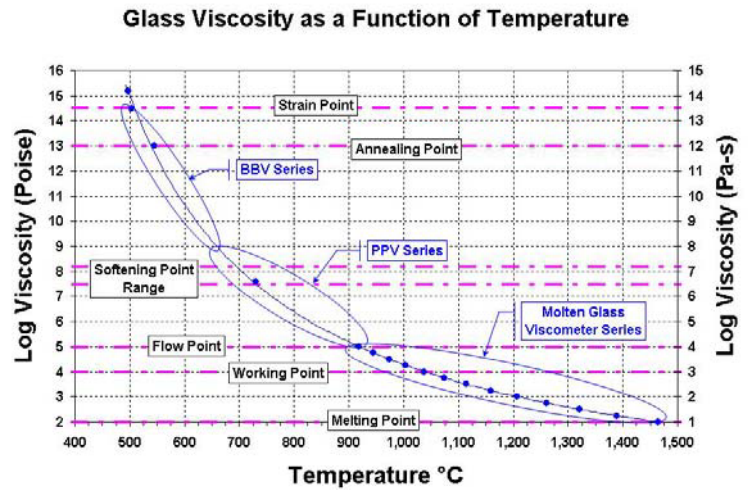


Glass manufacturers, researchers, and technologists are interested in specific temperature points, such as the softening point, annealing point, strain point, liquidus point, transition temperature, and are also interested in various temperature ranges of viscosities. Unfortunately, there is no single instrument that can generate data for all of these points or all of these viscosity ranges. Fortunately, Orton manufactures a series of instruments designed for determining specific temperature points or specific temperature / viscosity ranges. The graph to the right is a viscosity versus temperature curve for a standard glass composition and shows the various points and ranges of interest.



The following is a list of the various temperatures and viscosity ranges of interest along with the specific instrument used to determine the temperatures of those points and ranges:

<u>Temperature Points</u>	<u>Procedure</u>	<u>Model #'s</u>
<ul style="list-style-type: none"> Softening Point Littleton Fiber Elongation Method 	ASTM C-338 & Other	SP Series
<ul style="list-style-type: none"> Annealing and Strain Points Weighted Fiber Elongation Method Beam Bending Viscometer 	ASTM C-336 & Other ASTM C-598 & Other	ANS Series BBV Series
<u>Viscosity Ranges (Log Poise)</u>		
<ul style="list-style-type: none"> Log 14.0 to Log 9.0 Range Beam Bending Viscometer 	ASTM C-1350M & Other	BBV Series
<ul style="list-style-type: none"> Log 9.0 to Log 5.0 Range Parallel Plate Viscometer 	ASTM C-1351M & Other	PPV Series
<ul style="list-style-type: none"> Log 5.0 to Log 2.0 Range Molten Glass Viscometer (rotating spindle) 	ASTM C-965 (Proc. A)	RSV Series
<u>Other Glass Tests</u>		
<ul style="list-style-type: none"> Coefficient of Thermal Expansion (CTE) Glass Transition Point (T_g) Dilatometric Softening Point (T_s) Horizontal Dilatometer 	ASTM E-228 & ISO 9971	2010 STD Series
<ul style="list-style-type: none"> Liquidus Point Determinations Gradient Furnace 	ASTM C-829	Liquidus Furnace
<ul style="list-style-type: none"> Softening Point Approximations Penetration Viscometer Method 		Model SP-3A