

Gel-Pac®

Effects of Concentration and Temperature on the Viscosity of Gel-Pac

PROJECT OBJECTIVE

To determine the effects of concentration and temperature on the viscosity of **Gel-Pac**®.

COMMERCIAL SUMMARY

Animal Science Products' **Gel-Pac**® is the dominant gel delivery system for poultry hatcheries to apply edible vaccines, probiotics, and supportive additives. Rapid world-wide adoption by hatcheries also means **Gel-Pac**® must function properly in a variety of existing or locally manufactured spray equipment types, in different hatchery tap water temperatures, and with varying additive concentrations. To support hatcheries making sound decisions in preparing gels with optimum viscosity, researchers documented a range of viscosities at different water temperatures and **Gel-Pac**® concentrations.

EXPERIMENTAL PROCEDURE AND OBSERVATIONS

Three concentrations of **Gel-Pac**® were added to tap water: 12.5 g/L, 25 g/L, and 37.5 g/L. These three concentrations were also added to three temperatures of water: 10°C, 24°C, and 38°C.



Procedure

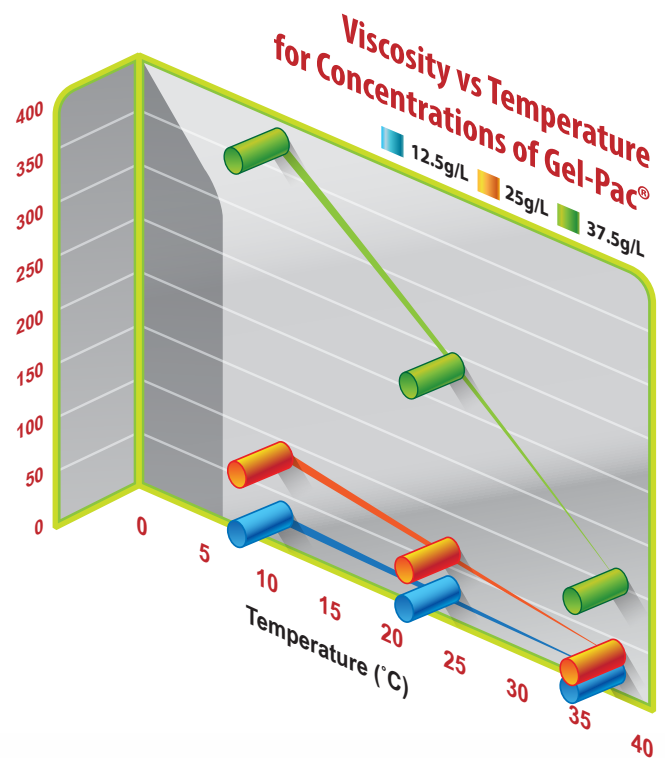
1. Heat or cool water to desired temperature using a hot/ cold water bath.
2. Start mixing with enough shear to maintain a vortex.
3. Start timer for at least one minute, and continuously mix while adding **Gel-Pac**[®] powder over the timespan.
4. Allow at least 5 minutes for entrained air to resolve from the gel.
5. Test dynamic viscosity using a Brookfield falling ball viscometer.

Gel-Pac[®] Viscosity

Usage Level g/L	SAMPLE	TEMPERATURE (°C)	VISCOSITY (mPa-s)
12.5	A	10	33.0
	B	10	31.7
	C	24	18.2
	D	24	18.4
	E	38	12.3
	F	38	11.6
25	A	10	84.4
	B	10	83.1
	C	24	57.5
	D	24	54.4
	E	38	31.3
	F	38	30.0
37.5	A	10	379.8
	B	10	374.8
	C	24	219.9
	D	24	249.9
	E	38	99.6
	F	38	98.3

CONCLUSIONS

The raw data collected for each viscosity measurement is listed in the table. As evident in the graph, the viscosity of a **Gel-Pac**[®] solution decreases when added to warmer water. This is evident across all usage levels, however it is a more pronounced effect at the higher concentrations of **Gel-Pac**[®] in the solution.



Scan to view the Gel-Pac Gel Delivery System for Poultry Video

