

**PRELIMINARY APPLICATION NOTE  
For Use In North America**

**FOR EXPERIMENTAL USE ONLY**

**DISPERSION/HYDRATION AND FUNCTIONALITY EXERCISES  
Using KELTROL® T630 xanthan gum**

The objective of these exercises is to provide a basic understanding of principles required for dispersing and hydrating xanthan gum in various systems as well as demonstrating some of the functional properties of this hydrocolloid.

**Xanthan Gum Lab #1.1: KELTROL® T630 (xanthan gum) – low shear without dispersant**

<b>Ingredients</b>	<b>Weight (g)</b>	<b>% (weight)</b>
Water	997.50	99.75
Keltrol® T630	2.50	0.25
Total	1000.00	100.00

**Process/Procedure**

1. Add KELTROL® T630 xanthan gum to tap water while stirring with wire whisk (low shear).

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**Xanthan Gum Lab #1.2:** KELTROL® T630 (xanthan gum) – low shear with sugar dispersant

<b>Ingredients</b>	<b>Weight (g)</b>	<b>% (weight)</b>
Water	972.50	97.25
Sugar	25.00	2.50
Keltrol® T630	2.50	0.25
Total	1000.00	100.00

**Process/Procedure**

1. Dry blend KELTROL® T630 xanthan gum with sugar.
2. Add dry blend to tap water while stirring with wire whisk (low shear).

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**Xanthan Gum Lab #1.3:** KELTROL<sup>®</sup> T630 (xanthan gum) – low shear with oil dispersant

<b>Ingredients</b>	<b>Weight (g)</b>	<b>% (weight)</b>
Water	972.50	97.25
Vegetable oil	25.00	2.50
Keltrol <sup>®</sup> T630	2.50	0.25
Total	1000.00	100.00

**Process/Procedure**

1. Slurry KELTROL<sup>®</sup> T630 xanthan gum with vegetable oil.
2. Add oil slurry to tap water while stirring with wire whisk (low shear).

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**Xanthan Gum Lab #1.4: KELTROL® T630 (xanthan gum) – low shear with salt dispersant**

<b>Ingredients</b>	<b>Weight (g)</b>	<b>% (weight)</b>
Water	972.50	97.25
Salt	25.00	2.50
Keltrol® T630	2.50	0.25
Total	1000.00	100.00

**Process/Procedure**

1. Dry blend KELTROL® T630 xanthan gum with salt.
2. Add dry blend to tap water while stirring with wire whisk (low shear).

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**Xanthan Gum Lab #1.5:** KELTROL<sup>®</sup> T630 (xanthan gum) – low shear with spice dispersant

<b>Ingredients</b>	<b>Weight (g)</b>	<b>% (weight)</b>
Water	972.50	97.25
Spice (Paprika)	25.00	2.50
Keltrol <sup>®</sup> T630	2.50	0.25
Total	1000.00	100.00

**Process/Procedure**

1. Dry blend KELTROL<sup>®</sup> T630 xanthan gum with spice.
2. Add dry blend to tap water while stirring with wire whisk (low shear).

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**Xanthan Gum Lab #1.6:** KELTROL<sup>®</sup> T630 (xanthan gum) – high shear without dispersant

<b>Ingredients</b>	<b>Weight (g)</b>	<b>% (weight)</b>
Water	997.50	99.75
Keltrol <sup>®</sup> T630	2.50	0.25
Total	1000.00	100.00

**Process/Procedure**

1. Add KELTROL<sup>®</sup> T630 xanthan gum to tap water while stirring with immersion blender (high shear).

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**Xanthan Gum Lab #2.1: Emulsion stabilization using KELTROL® T630 (xanthan gum)**

<b>Ingredients</b>	<b>Weight (g)</b>	<b>% (weight)</b>
Oil	250.00	50.00
Tap water	236.25	47.25
Sugar	12.50	2.50
Keltrol® T630	1.25	0.25
Total	500.00	100.00

**Process/Procedure**

1. Dry blend KELTROL® T630 xanthan gum and sugar.
2. Add dry blend to tap water while stirring with immersion blender (high shear); shear until xanthan gum is hydrated.
3. Add oil to gum solution; stir with immersion blender.

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**Xanthan Gum Lab #2.2:** Emulsion stabilization using KELTROL® T630 (xanthan gum)

<b>Ingredients</b>	<b>Weight (g)</b>	<b>% (weight)</b>
Oil	250.00	50.00
Tap water	237.50	47.50
Sugar	12.50	2.50
Total	500.00	100.00

**Process/Procedure**

1. Add sugar to tap water while stirring with immersion blender (high shear); shear until sugar is dissolved.
2. Add oil to sugar solution; stir with immersion blender.

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**DISPERSION HYDRATION EXERCISES  
Using KELCOGEL<sup>®</sup> F (low acyl gellan gum)  
and KELCOGEL<sup>®</sup> LT100 (high acyl gellan gum)**

The objective of these exercises is to provide a basic understanding of principles required for dispersing and hydrating low acyl and high acyl gellan gums.

**Gellan Gum Lab # 1.1: KELCOGEL<sup>®</sup> F (low acyl gellan gum)**

<b>Ingredients</b>	<b>Weight (g)</b>	<b>% (weight)</b>
Water	993.0	99.30
KELCOGEL <sup>®</sup> F low acyl gellan gum	2.0	0.20
Sodium hexametaphosphate	2.0	0.20
Calcium gluconate	3.0	0.30
<b>Total</b>	<b>1000</b>	<b>100.00</b>

**Process/Procedure**

1. Combine KELCOGEL<sup>®</sup> F gellan gum with sodium hexametaphosphate and calcium gluconate.
2. Add gellan gum sodium hexametaphosphate/calcium gluconate mixture to tap water while stirring with wire whisk.
3. Heat to a boil.
4. Pour into sample cups while hot.
2. Allow to cool at ambient temperature or in ice bath or refrigerator. Gel should begin to form at room temperature (22C/72 F).

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**Gellan Gum Lab #1.2: KELCOGEL<sup>®</sup> F (low acyl gellan gum)**

<b>Ingredients</b>	<b>Weight (g)</b>	<b>% (weight)</b>
Water	993.0	99.30
KELCOGEL <sup>®</sup> F low acyl gellan gum	2.0	0.20
Sodium hexametaphosphate	2.0	0.20
Calcium gluconate	3.0	0.30
Total	1000	100.00

**Process/Procedure**

1. Combine KELCOGEL<sup>®</sup> F gellan gum with sodium hexametaphosphate.
2. Add gellan gum/sodium hexametaphosphate mixture to tap water while stirring with wire whisk.
3. Heat to a boil.
4. On the side, dissolve calcium gluconate with a little bit of water; stir calcium gluconate solution into hot gum solution.
5. Pour into sample cups while hot.
6. Allow to cool at ambient temperature or in ice bath or refrigerator. Gel should begin to form at room temperature (22C/72 F).

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**Gellan Gum Lab #2:** Preparing fluid gels with KELCOGEL<sup>®</sup> F (low acyl gellan gum)

<b>Ingredients</b>	<b>Weight (g)</b>	<b>% (weight)</b>
Water	856.5	85.65
KELCOGEL <sup>®</sup> F low acyl gellan gum	0.5	0.05
Sodium hexametaphosphate	1.0	0.10
Calcium gluconate	2.0	0.20
Sugar	140.0	14.00
Total	1,000.00	100.00

**Process/Procedure**

1. Combine KELCOGEL<sup>®</sup> F low acyl gellan gum with sugar and sodium hexametaphosphate.
2. Add to tap water while stirring with wire whisk.
3. Heat to a boil.
4. On the side, dissolve calcium gluconate with a little bit of water; stir calcium gluconate solution into hot gum solution.
5. Cool to room temperature over ice bath with slow stirring.

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**Gellan Gum Lab #3: Forming beads using KELCOGEL® F (low acyl gellan gum)**

<b>Part A</b>		
<b>Ingredients</b>	<b>Weight (g)</b>	<b>% (weight)</b>
Water	841.3	84.13
Sugar	70.0	7.00
KELCOGEL® F low acyl gellan gum	5.5	0.55
KELTROL® T630	2.0	0.20
Sodium hexametaphosphate	1.3	0.13
<b>Total</b>	<b>920.0</b>	<b>92.00</b>
<b>Part B</b>		
Sugar	70.0	7.00
Color	10.0	1.00
<b>Total A + B</b>	<b>1000.0</b>	<b>100.00</b>
<b>Part C (Calcium Solution)</b>		
Water	810.0	81.00
Sugar	140.0	14.00
Calcium gluconate	50.0	5.00
<b>Total C</b>	<b>1000.0</b>	<b>100.00</b>
<b>Part D Citric Acid Solution</b>		
Citric Acid	50.0	50.00
Water	50.0	50.00
<b>Total D</b>	<b>100.0</b>	<b>100.00</b>

**Culinary lab #3 Process/Procedure**

1. Combine all dry ingredients in Part A.
2. Add to tap water while stirring with wire whisk.
3. Mix solution A for 30 minutes or until xanthan gum (KELTROL® T630) is hydrated.
4. Add sugar and color from section B.
5. Prepare calcium solution (part C) by adding sugar and calcium gluconate to water and mixing until dissolved. Then adjust acidity by slowly adding just enough citric acid solution (part D) until pH 4.0 is reached.
6. Drip solution into calcium gluconate bath to form spheres.

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**Gellan Gum Lab #4:** Dispersion/Hydration Demo using KELCOGEL<sup>®</sup> LT100 (high acyl gellan gum)

<b>Ingredients</b>	<b>Weight (g)</b>	<b>% (weight)</b>
Water	996.0	99.60
KELCOGEL <sup>®</sup> LT100 high acyl gellan gum	4.0	0.40
Total	1000	100.00

**Process/Procedure**

1. Add KELCOGEL<sup>®</sup> LT100 gellan gum to tap water using high shear (ex. Immersion blender); divide into 2 portions.
2. Pour 1 portion into sample cups; set aside for evaluation later.
3. Heat the other portion to a boil.
4. Pour into sample cups while hot. Gels will set hot (around 85C/185F).

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**Gellan Gum Lab #5:** Heat stability of KELCOGEL<sup>®</sup> F (low acyl gellan gum) versus KELCOGEL<sup>®</sup> LT100 high acyl gellan gum gels

**Process/Procedure**

1. Place 1 low acyl gellan gum gel onto a sauce pan; heat.
2. Place 1 high acyl gellan gum gel onto another saucepan; heat.
3. Evaluate for heat stability.

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