

## Nemko USA, Inc., San Diego Division

11696 Sorrento Valley Road, Suite F, San Diego, CA 92121

Phone (858) 755-5525 Fax (858) 259-7170

**11/06/2007 Testing for:**

**New Metro Design, Inc.**

The following tests were performed to determine if the "Beater Blade" instrument places more strain on the mixer motor than the manufacturer supplied Dough Hook. Two recipes were used. One using the dough hook, the other using "Beater Blade" and specific recipes according to the tasks of their purpose.

Using standard recipes, Temperatures (measured in Celsius and converted to Fahrenheit) and Peak Input Power (Voltage, Current and Wattage) were monitored on a KitchenAid® Professional 5 (5-quart Bowl-Lift mixer) for comparison of New Metro Design's attachment "Beater Blade" versus metal bread Dough Hook attachment, each mixing recipes found in typical cookbooks.



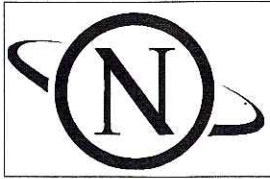
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*Manuel E. Ugalde*

Manuel E. Ugalde (Associate Engineer)

*11/15/2007*

Date



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The "Beater Blade" is made of clear Polycarbonate with TPE (Thermo Plastic Elastomer) rubber blades on the outer edge.

The "Beater Blade" is a patented mixer/scrapper attachment designated for batter/dough ingredient mixing with a viscosity similar to Peanut Butter Cookie Dough, which was the recipe used for testing the "Beater Blade".

The Dough Hook was tested with ingredients for "Rapid Mix Cool Rise White Bread" recipe. Both recipes were taken directly from KitchenAid's instruction booklet.

Both attachments were tested for the duration of 10 minutes each.

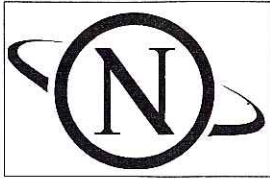


Test equipment used: Yokogawa Hybrid Recorder and Yokogawa Power Meter. Thermocouples were placed on the KitchenAid mixer. One on it's top enclosure and one internally on motor core also an extra thermocouple recorded ambient room temperatures. Voltage was regulated by hand through a variac to maintain 120V during test conditions (Test Equipment info on last page).

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### Mixing Results are as follows;

#### **Beater Blade:** Peanut Butter Cookies

1st 40 seconds.: Speed 2, Peanut butter and Butter; 120Volts, 1.34Amps, 92Watts

40 seconds to 1min 30 seconds: Speed 3, Egg & Vanilla; 120V, 1.63A, 112W

2 minutes: Speed 2, add Flour 120V, 2.12A, 160W

3 minutes: Speed 3, 120V, 2.26A, 192W (all ingredients to add completed)

#### **Start 10 minute countdown:**

7 minutes: Speed 3, 120V, 2.62A, 240W

10 minutes: Speed 3, 120V, 2A, 160W.

#### **Temperatures at Beginning of Test:**

Ambient 74.1°F, Motor core 71.6°F, Enclosure top 71.96°F

#### **Temperatures at End of Test:**

Ambient 74.48°F, Motor core 105.8°F, Enclosure top 114.8°F

#### **Dough Hook:** White Bread

1st 20 seconds: Speed "stir", 120Volts, 1 Amp, 47Watts (flour not completely added yet)

20 seconds: Speed "stir", slowly adding water, 120V, 1.4A, 70W

2 minutes: Speed 2, all water in, 120V, 1.3, 73W

2 minutes 20 seconds: Speed 2, slowly adding flour, 120V, 2A, 145W

4 minutes: Speed 2, slowly adding flour, 120V, 3.36-4A, 370-400W (recipe completed)

#### **Start 10 minute countdown:**

2 minutes 30 seconds: 120V, 3.8A, 262W

5 minutes: Speed 2, 120V, 2.8A, 300W

8 minutes: Speed 2, 120V, 3.8W, 388W

10 minutes: Speed 2, 120V, 4A, 403W

#### **Temperatures at Beginning of Test:**

Ambient 73.9°F, Motor core 78.2°F, Enclosure top 78.0°F

#### **Temperatures at End of Test:**

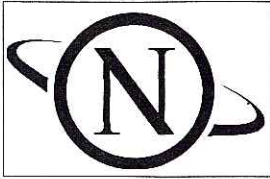
Ambient 73.9°F, Motor core 134.6°F, Enclosure top 126.1°F

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### Summary:

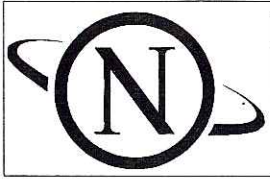
The "Beater Blade" by New Metro Design, Inc. did not exercise the KitchenAid Professional 5 mixer more than the already supplied bread Dough Hook attachment. In comparison, Peak Input Power and Temperatures were significantly lower, when using the KA-5L, during the mixing of ingredients and during the 10 minute duration of mixing after all ingredients were added. When the "Beater Blade" is used in accordance to New Metro Design's guidelines, there is no strain on mixer near the worst-case condition of which it is intended for.



X

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## Test Equipment and Recipes used:

Asset: N117, Yokogawa, DR130, Hybrid Recorder, Cal on 1/23/07, Due on 1/23/08

Asset: N017, Yokogawa, 2534, Digital Power Meter, Cal on 12/28/07, Due on 12/28/08

Asset: N194, Spalding, 88-082 V12, Stopwatch, Cal on 10/25/07, Due on 10/25/08

### Peanut Butter Cookies

- 1/2 cup peanut butter
- 1/2 cup butter or margarine, softened
- 1/2 cup granulated sugar
- 1/2 cup brown sugar
- 1 egg
- 1/2 teaspoon vanilla
- 1/2 teaspoon baking soda
- 1/4 teaspoon salt
- 1 1/4 cups all-purpose flour

Place peanut butter and butter in mixer bowl. Attach bowl and flat beater to mixer. Turn to Speed 6 and beat about 1 minute, or until mixture is smooth. Stop and scrape bowl. Add sugars, egg, and vanilla. Turn to Speed 4 and beat about 1 minute. Stop and scrape bowl.

Turn to Stir Speed. Gradually add all remaining ingredients to sugar mixture and mix about 30 seconds. Turn to Speed 2 and mix about 30 seconds.

Roll dough into 1-inch balls. Place about 2 inches apart on ungreased baking sheets. Press flat with fork in a criss-cross pattern to 1/4-inch thickness.

Bake at 375°F for 10 to 12 minutes, or until golden brown. Remove from baking sheets immediately and cool on wire racks.

Yield: 36 servings (1 cookie per serving).

Per serving: About 83 cal, 2 g pro, 10 g carb, 4 g fat, 6 mg chol, 81 mg sod.

### Rapid Mix Cool Rise White Bread

- 6-7 cups all-purpose flour
- 2 tablespoons sugar
- 3 1/2 teaspoons salt
- 3 packages active dry yeast
- 1/2 cup butter or margarine, softened
- 2 cups very warm water (120°F to 130°F)

Place 5 1/2 cups flour, sugar, salt, yeast, and butter in mixer bowl. Attach bowl and dough hook to mixer. Turn to Speed 2 and mix about 20 seconds. Gradually add warm water and mix about 1 1/2 minutes longer.

Continuing on Speed 2, add remaining flour, 2 cups at a time, and mix about 2 minutes, or until dough clings to hook and cleans sides of bowl. Knead on Speed 2 about 2 minutes longer.

Cover dough with plastic wrap and a towel. Let rest 20 minutes.

Divide dough in half. Shape each half into a loaf as directed on page 55. Place in greased 8 1/2 x 4 1/2 x 2 1/2-inch baking pans. Brush each loaf with oil and cover loosely with plastic wrap. Refrigerate 2 to 12 hours.

When ready to bake, uncover dough carefully. Let stand at room temperature 10 minutes. Puncture any gas bubbles which may have formed.

Bake at 400°F for 35 to 40 minutes. Remove from pans immediately and cool on wire racks.

Yield: 32 servings (16 slices per loaf).

Per serving: About 110 cal, 3 g pro, 21 g carb, 2 g fat, 0 mg chol, 251 mg sod.

X

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