Application manual No. 047

Production: CHEWING GUM

Objective: Comparison of tensile properties of chewing gum strip tested at different temperatures

Type of action: Tension test

Test mode settings:

| Speed	Test mode	Trigger	Target	Hold
2 mm/s	Distance (t)	5 gf	20 mm	0 sec

Accessory:
Dough extensibility rig, Platform

Sample Preparation:
Cut the chewing gum into strips of the same dimensions. Equilibrate the pieces at a chosen storage temperature for a minimum of 4 hours, taking care to avoid moisture loss.

Test Set-Up:
Position the Kieffer rig on the machine base. Move the extension hook down so that it is below the sample platform. After equilibrating, remove each test piece from its respective storage temperature and place it centrally on the sample platform. Care should be taken to avoid touching the test portion of the sample with the hook or when transferring from the storage place.

Typical plots:
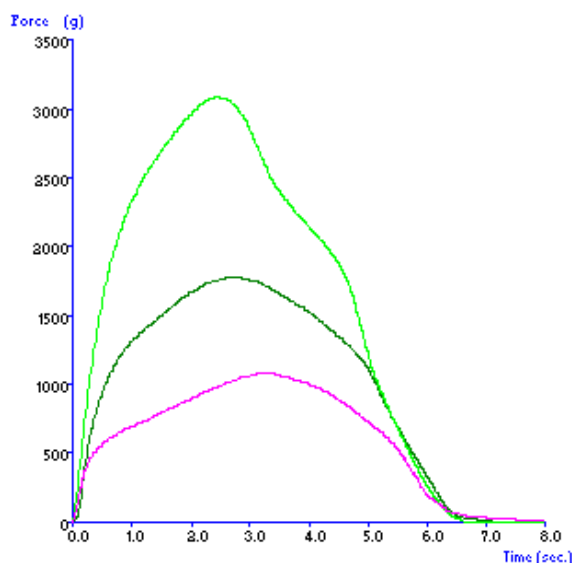
The above curves were produced from testing chewing gum strips (15mm x 40mm) at 10C, 20C and 30C.

Observations:

Once a trigger force of 5g has been attained the hook then proceeds to extend the chewing gum sample until its elastic limit (at the maximum force) is exceeded and the sample breaks. At this point the force and distance are noted and used as an indication of chewing gum extensibility.

Data Analysis:

☒Max Force

Results

Storage/Testing Temperature(C)	Mean Maximum Force 'Resistance to Extension' (+/- S.D.) (g)	Mean Distance at Break 'Extensibility' (+/- S.D.) (mm)
10	1729.3 +/- 163.1	6.4 +/- 0.3
20	2606.1 +/- 241.3	3.9 +/- 0.1
30	1155.8 +/- 42.9	6.6 +/- 0.1

Notes:

● When selecting the chewing gum pieces it is important to select those pieces which do not appear to have surface cracks which are potential weak regions and would hence produce highly variable results. This is also true of sections where the width is variable. In order to make comparisons between tests it is important that the sample width is a constant value.

● When attempting to optimize test settings it is suggested that the first tests are performed on the hardest samples to anticipate the maximum testing range required and ensure that the force capacity allows testing of all future samples.