GECA-TAPES

Cable People for Cable Makers...

TEST METHOD

Maximum Processing Temperature of Superabsorbent Tapes and Yarns

1. PURPOSE OF TEST

The purpose of this test is to determine the maximum processing temperature of Geca Tapes water blocking tapes, yarns and binders (i.e. short term stability). The test is designed to simulate the thermal profile of a typical cable extrusion operation where the material is exposed to the melt temperature of the thermoplastic for a few seconds with a decaying temperature over time to simulate water-cooling of the extruded material.

2. TEST APPARATUS

- ✓ An oven capable of maintaining the desired test temperature with an accuracy of $\pm 2°C$
- ✓ Block of marble with dimensions 35 x 35 x 2 cm

3. TEST PREPARATION - TAPES

- ✓ Prepare 3 control samples for tensile strength & elongation tests
- ✓ Prepare 3 test samples for tensile strength & elongation tests
- ✓ Prepare 3 control samples for swelling speed and swelling height tests
- ✓ Prepare 3 test samples for swelling speed and swelling height tests
- ✓ Preheat the environmental chamber to the required test temperature, typically $230 \pm 2°C$.

4. TEST PREPARATION - YARNS

- ✓ Prepare 3 control samples for tensile strength & elongation tests
- ✓ Prepare 3 test samples for tensile strength & elongation tests
- ✓ Prepare 3 control samples for absorption speed and absorption capacity tests.
- ✓ Prepare 3 test samples for absorption speed and absorption capacity tests for yarns.
- ✓ Preheat the environmental chamber to the required test temperature, typically $230 \pm 2°C$.

5. TEST CONDITIONS

Ambient laboratory conditions, typically:

- ✓ Temperature of $23 \pm 2°C$
- ✓ Humidity of $50 \pm 5\%$

6. TEST PROCEDURE

- ✓ Store the control samples in a suitable manner
- ✓ Place the marble block in the oven and maintain the desired test temperature for one hour
- ✓ Remove the marble block from the oven and immediately place the test samples of yarn or tape onto the surface of the marble block
- ✓ Let the test samples remain on the marble block for a period of 5 seconds and remove the material
- ✓ Allow the material to stabilize at ambient temperature
- ✓ Perform tensile and elongation tests on the control samples
- ✓ Perform tensile and elongation tests on the heat aged samples
- ✓ Perform the swelling speed and swelling height tests on the control samples of tape or:
- ✓ Perform the absorption speed and absorption capacity tests on the control samples of yarns
- ✓ Perform the swelling speed and swelling height tests on the heat aged samples of tape or:
- ✓ Perform the absorption speed and absorption capacity tests on the heat aged samples of yarns

7. RESULTS

Complete the appropriate form below and compare the change in material performance against the customer detail specifications.

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APPENDIX 1: RESULTS FOR MAXIMUM PROCESSING TEMPERATURE TESTING OF TAPES

Test Date	
Test Temperature	
Tested By	
Material Tested	

Sample #	State	Property	Value	Unit	Δ *
1	Control	Tensile Strength			
1	Aged	Tensile Strength			
2	Control	Tensile Strength			
2	Aged	Tensile Strength			
3	Control	Tensile Strength			
3	Aged	Tensile Strength			
1	Control	Elongation			
1	Aged	Elongation			
2	Control	Elongation			
2	Aged	Elongation			
3	Control	Elongation			
3	Aged	Elongation			
1	Control	Swelling Speed			
1	Aged	Swelling Speed			
2	Control	Swelling Speed			
2	Aged	Swelling Speed			
3	Control	Swelling Speed			
3	Aged	Swelling Speed			
1	Control	Swelling Height			
1	Aged	Swelling Height			
2	Control	Swelling Height			
2	Aged	Swelling Height			
3	Control	Swelling Height			
3	Aged	Swelling Height			

*Calculate the change using the following formula

$$\Delta = \left[\frac{a-b}{a} \right] * 100$$

Where:

Δ = change in material property in %
a = control value
b = aged value

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APPENDIX 2: RESULTS FOR MAXIMUM PROCESSING TEMPERATURE TESTING OF YARNS

Test Date	
Test Temperature	
Tested By	
Material Tested	

Sample #	State	Property	Value	Unit	Δ *
1	Control	Tensile Strength			
1	Aged	Tensile Strength			
2	Control	Tensile Strength			
2	Aged	Tensile Strength			
3	Control	Tensile Strength			
3	Aged	Tensile Strength			
1	Control	Elongation			
1	Aged	Elongation			
2	Control	Elongation			
2	Aged	Elongation			
3	Control	Elongation			
3	Aged	Elongation			
1	Control	Absorption Speed			
1	Aged	Absorption Speed			
2	Control	Absorption Speed			
2	Aged	Absorption Speed			
3	Control	Absorption Speed			
3	Aged	Absorption Speed			
1	Control	Absorption Cap.			
1	Aged	Absorption Cap.			
2	Control	Absorption Cap.			
2	Aged	Absorption Cap.			
3	Control	Absorption Cap.			
3	Aged	Absorption Cap.			

*Calculate the change using the following formula

$$\Delta = \left[\frac{a-b}{a} \right] * 100$$

Where:

Δ = change in material property in %
a = control value
b = aged value

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