



# JIKAN

## Surface Nano-Engineering



# TTC-30

## Thermocycle Test Chamber

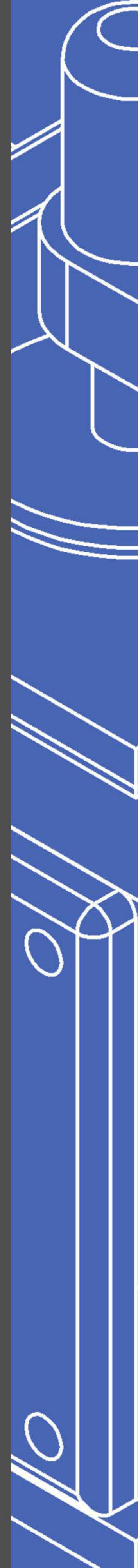
A spin off from







Jikan Surface Nano-Engineering Company is a knowledge-based company based in Tehran, Iran. Jikan was established as a spin-off from SNE Research Center, University of Tehran. In Jikan, we manufacture world-class measurement instruments and perform top-notch research in the field of surface nano-engineering. Jikan is also a service provider and is well-known for its accurate, customizable, and quick services. We are in the process of developing new standards and protocols for our products and procedures, to secure our share both in domestic and international markets.



# Thermocycle Test Chamber

This thermocycle test chamber provides the following tests:

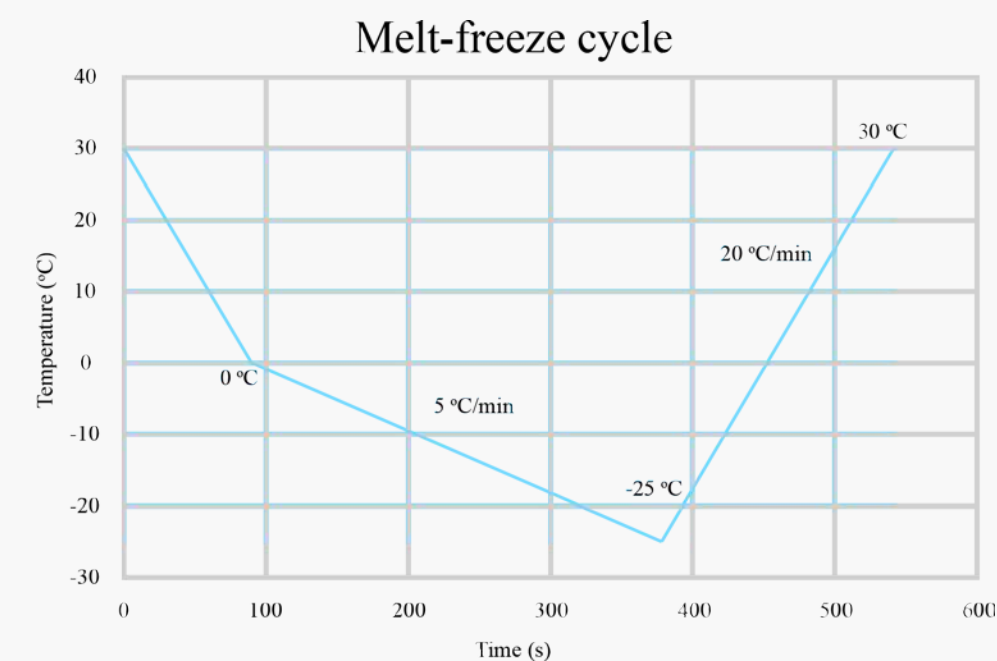
- 1. Melt-freeze-cycle test for estimating the durability of icephobic and superhydrophobic surfaces and coatings.
- 2. Freezing/Frosting delay test for studying the performance of icephobic surfaces in frost condition.
- 3. Drop impact tests for studying the impact of supercool rain drops on icephobic surfaces

## Melt-freeze-cycle test

To determine the durability of surfaces, a melt-freeze cycle is repeated for a number of cycles.

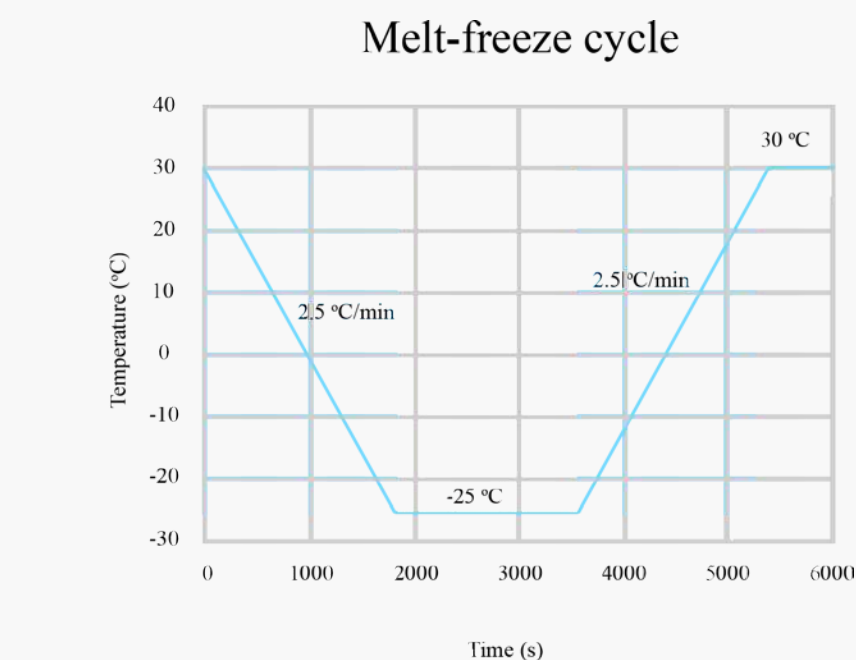
### Default # 1

Repeats the following cycle for 150 times.  
This test takes 23hrs.



### Default # 2

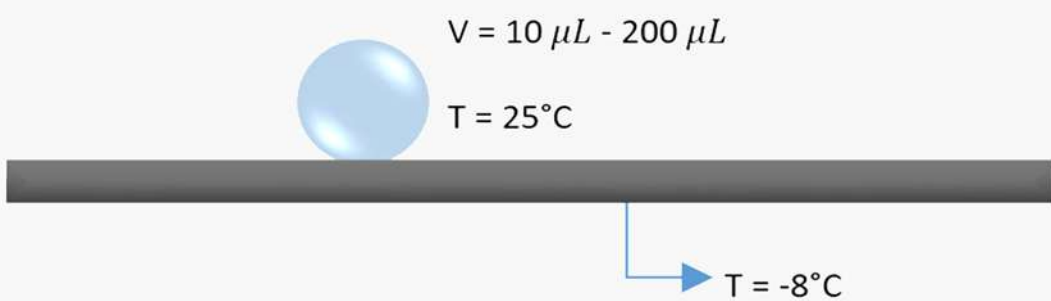
Repeats the following cycle for 100 times.  
This test takes 200hrs.



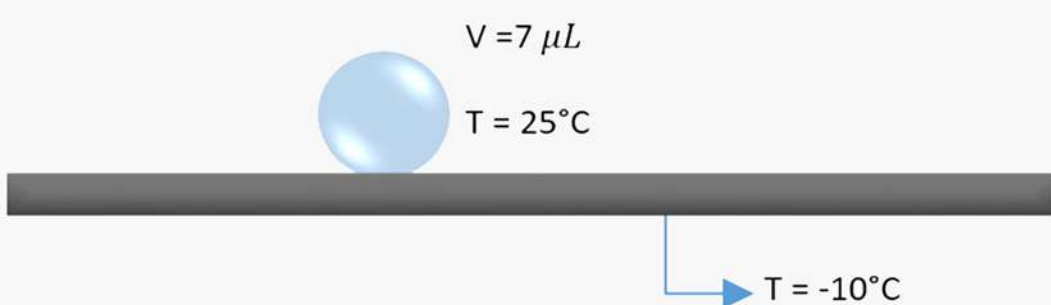
## Freezing/Frosting delay test

This test shows how long an icephobic surface may delay the frosting.

### Protocol (I)



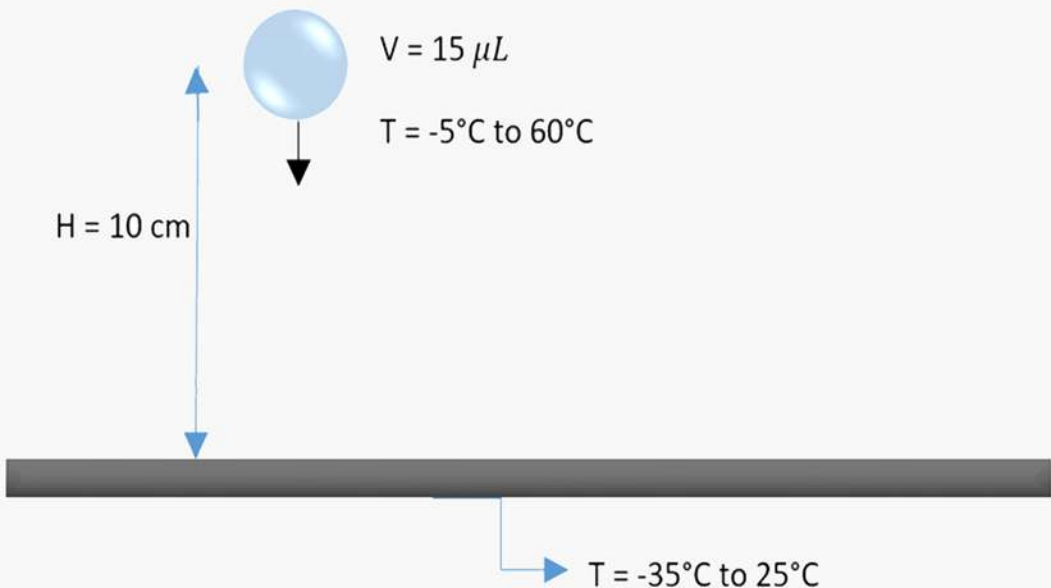
### Protocol (II)



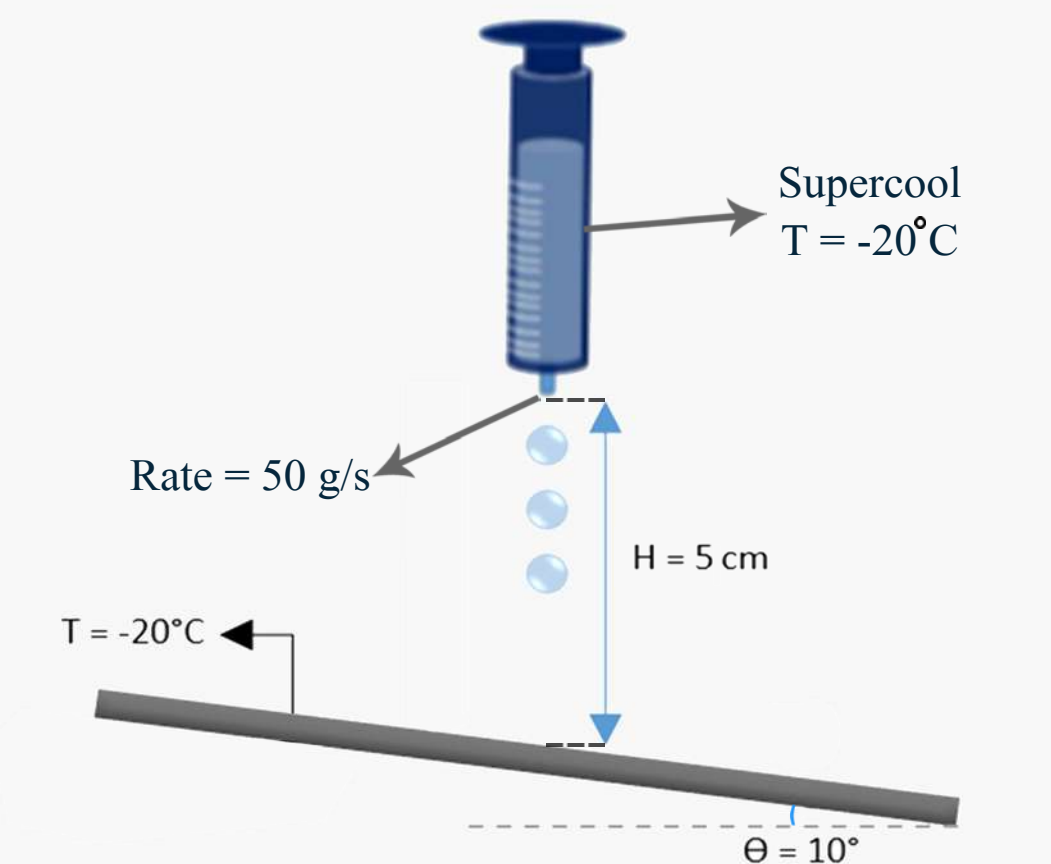
## Drop impact tests

This test is designed to simulate the rainfall of supercool drops on freezing surfaces.

### Protocol (I)



### Protocol (II)

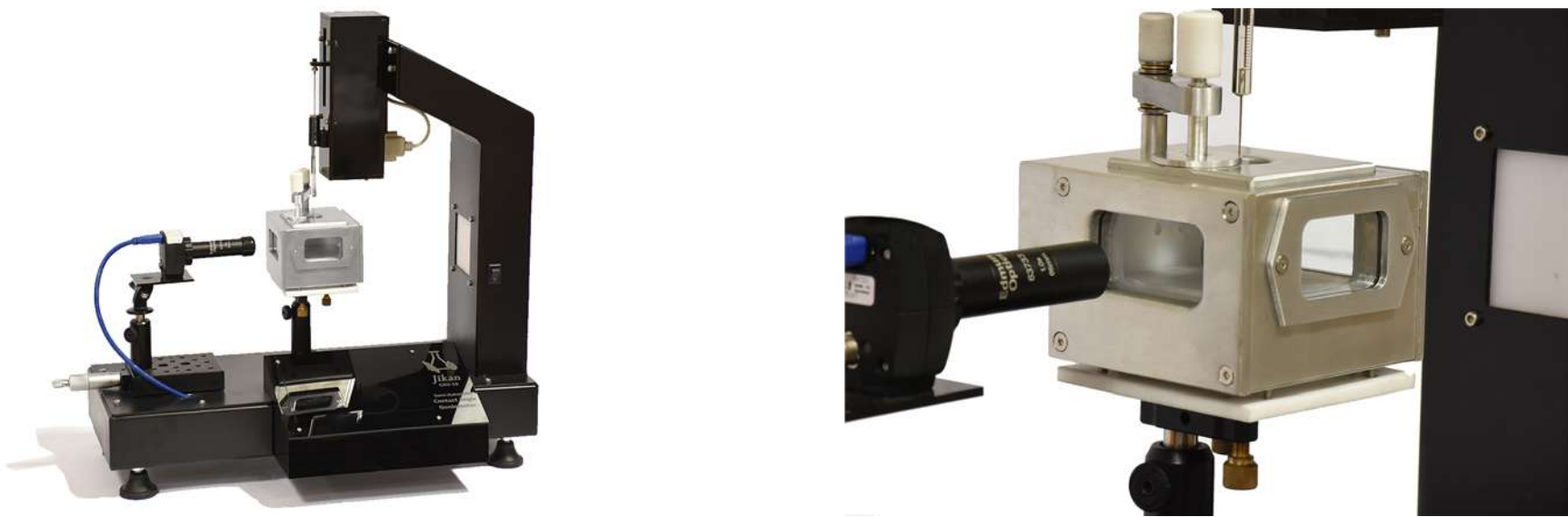


After these tests the superhydrophobic/icephobic proportion of the surface are evaluated using any of CAG or IAT devices.



# Analysis of Contact Angle at Different Temperatures

To characterize the wettability of solid surfaces, contact angle is used. Sessile drop is typically used to measure the contact angle, i.e. the angle between tangent to the drop and solid surface at the contact line. On smooth and homogeneous surfaces, contact angle is equal to the Young contact angle. On real surfaces, contact angle is within a range, i.e. between advancing and receding contact angles. The difference between advancing and receding contact angle (contact angle hysteresis) shows the adhesion between drop and surface. The contact angle hysteresis is also a function of contact angle.



Contact angle is a function of interfacial tensions. Therefore, contact angle is temperature dependent.

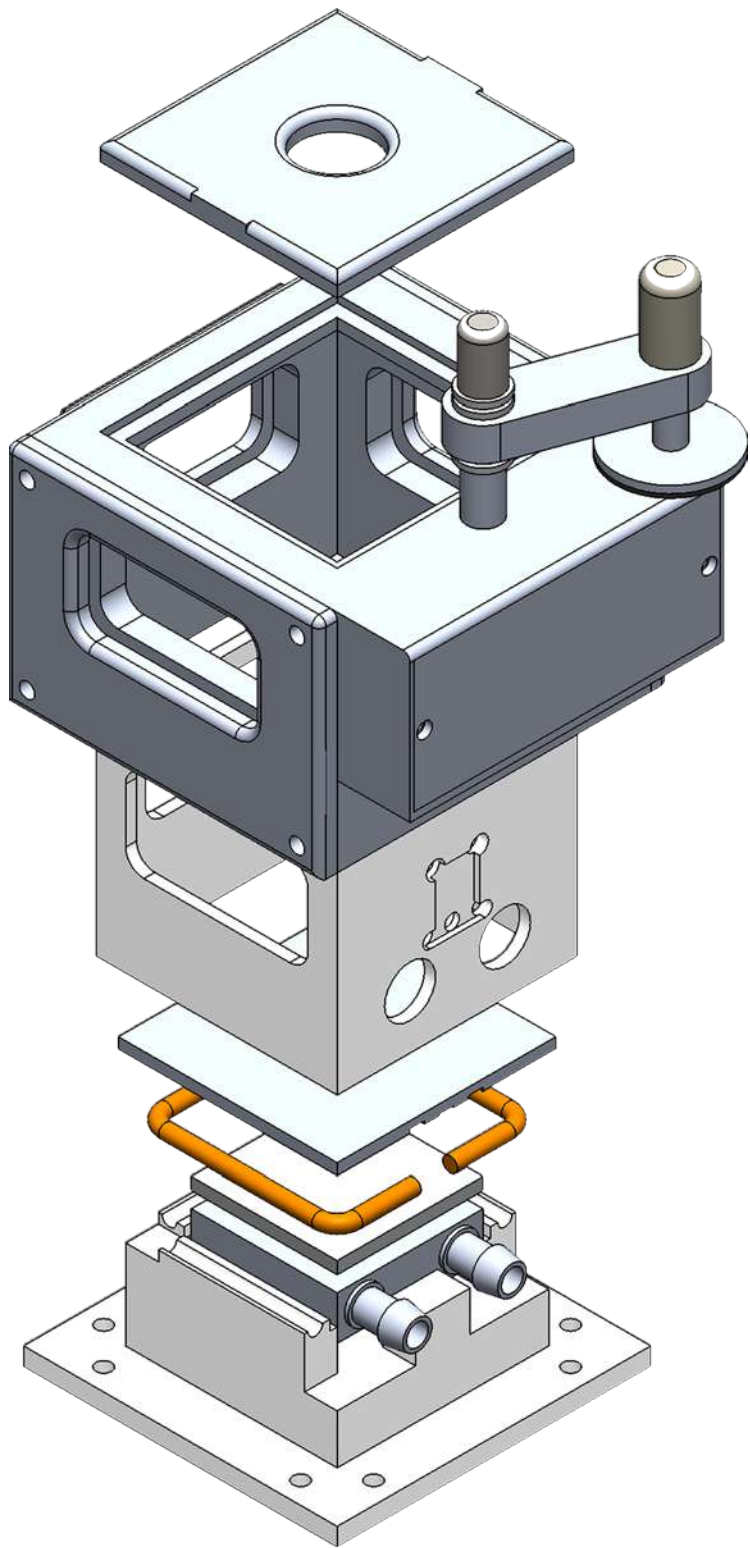


The TTC-30 along with CAG-10 is able to measure the contact angle at different temperatures. This thermocycle chamber can fix the temperature from -30°C to 90°C with an accuracy of 0.1°C.

## Features

Here is a better look

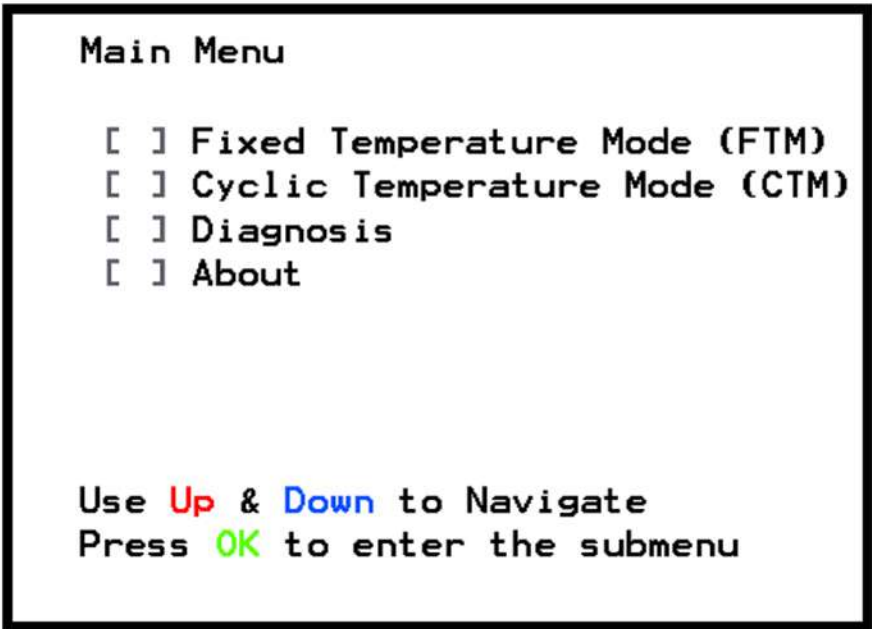
Min Temperature	-30°C
Max Temperature	90°C
Cooling Rate	2°C/s
Heating Rate	5°C/s
Max Sample Size	60 mm × 60 mm × 30 mm
External Dimensions	109 mm × 96 mm × 118 mm
Temperature Resolution	0.1°C
Display Size	3.5"
Operating Voltage	200 ~ 240 V 50 ~ 60 Hz
Thermoelectric power	72 Watt
Maximum Power	120 Watt





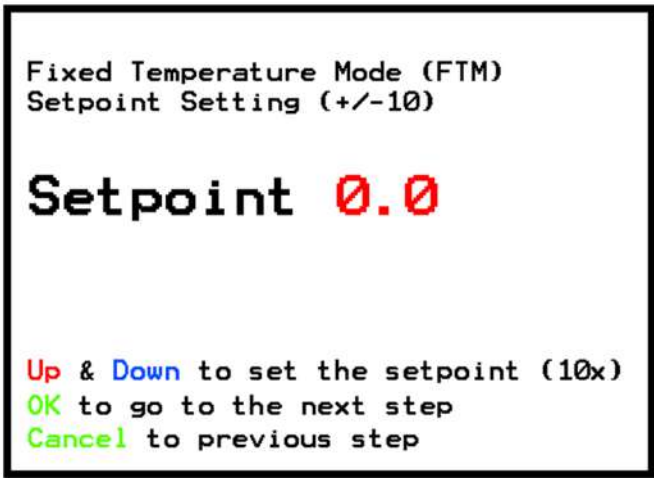
TTC-30 has two types of tests:

- 1- Fixed Temperature Mode (FTM)
- 2- Cyclic Temperature Mode (CTM)

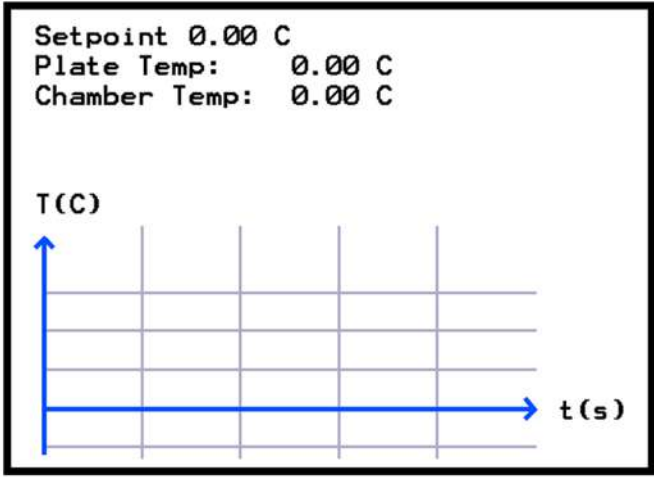


## Fixed Temperature Mode (FTM)

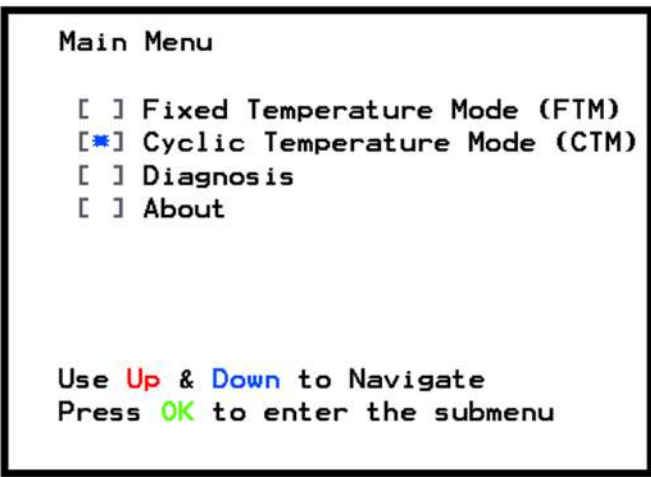
1- Setting the Temperature.



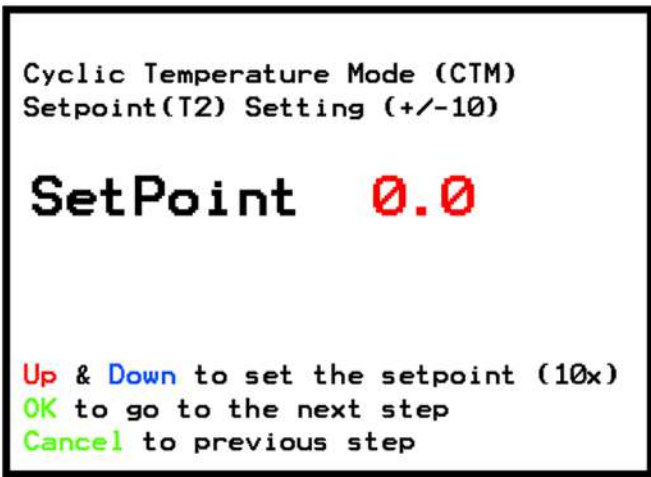
2- Starting the (FTM) test.



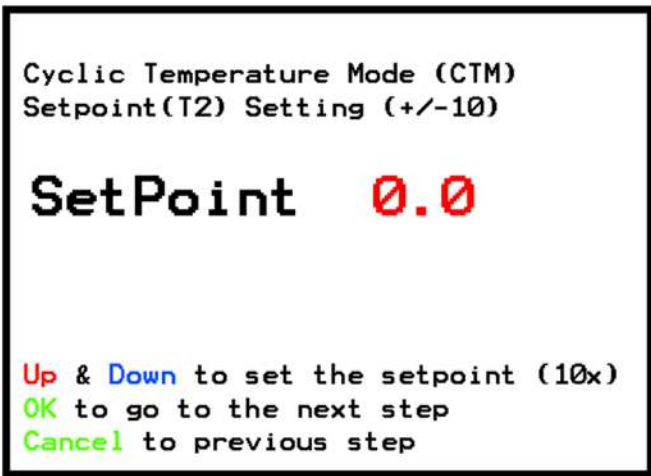
## Cyclic Temperature Mode (CTM)



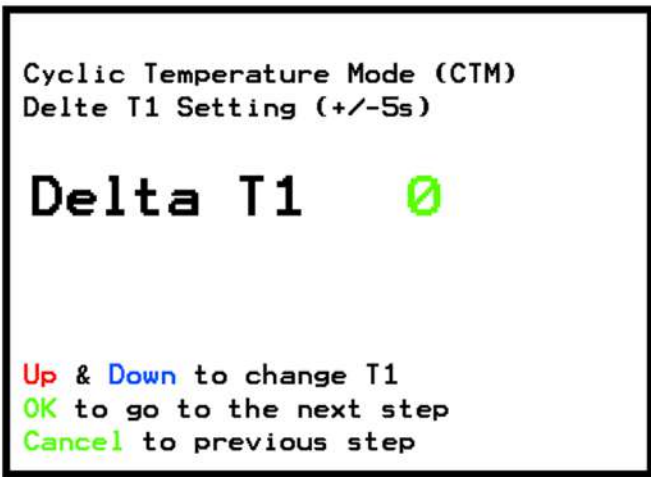
1- Setting the first temperature.



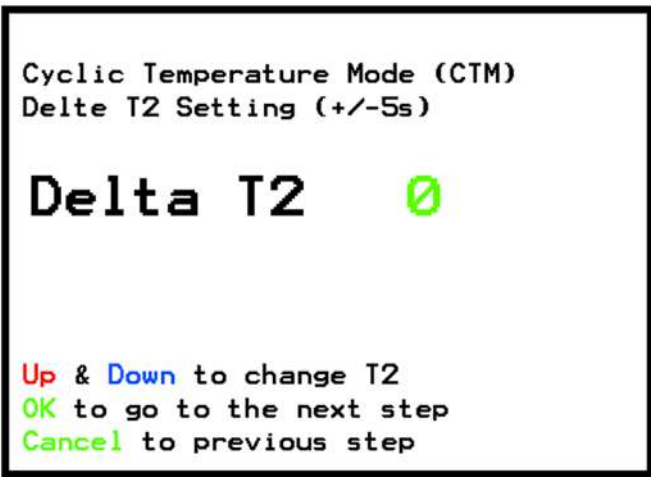
2- Setting the second temperature.



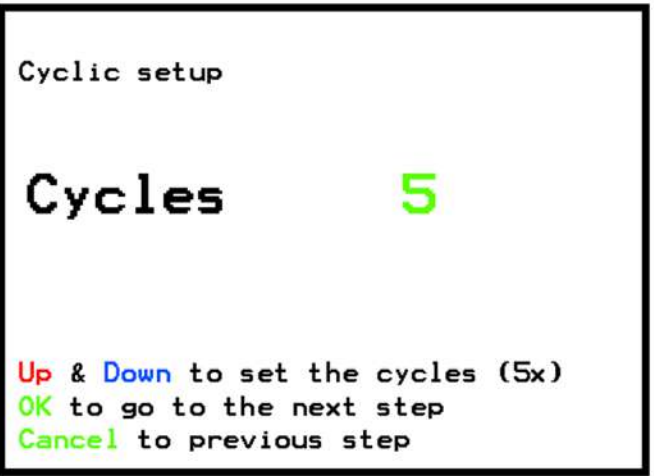
3- Setting the time which device will stay at first temperature.



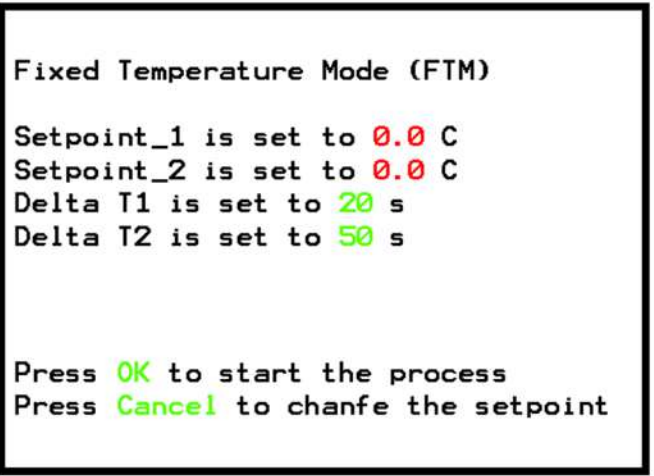
4- Setting the time which device will stay at second temperature.



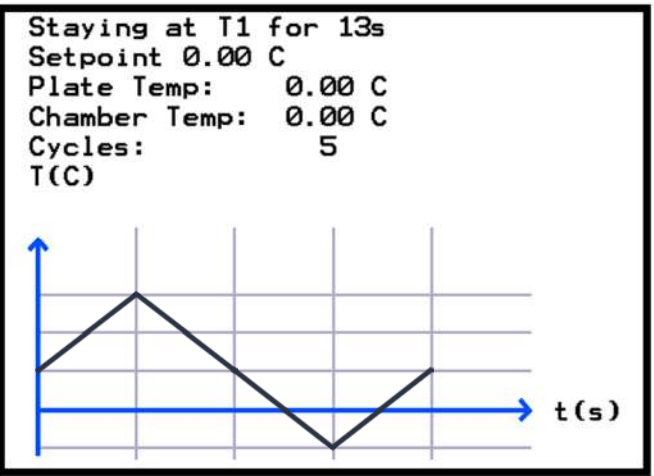
5- Setting the number of cycles.

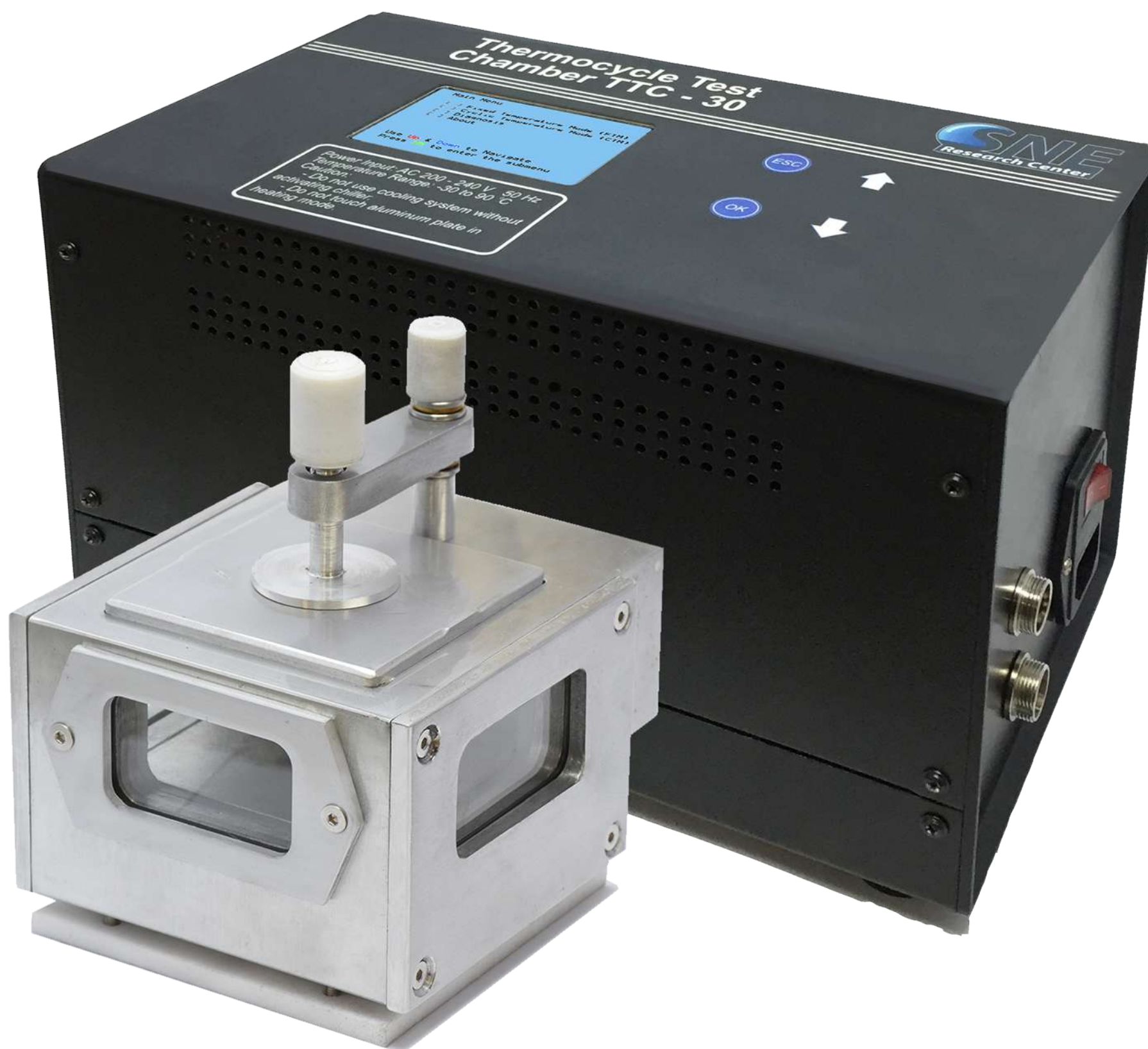


6- Finalizing the test.



7- Starting the (CTM) test.





TTC-30  
Thermocycle Test Chamber



#### Other Products:

Jikan provides you with accurate laboratory devices and services used for measurement and enhancement of mechanical, physical and chemical properties of materials.

Jikan concentrates on surface thermodynamics, surface engineering and surface nano engineering. Our products include for application and evaluation of coatings and nano-engineered surfaces. Some of the coatings are self-cleaning, corrosion resilient, icephobic and heat transfer enhancement coatings.

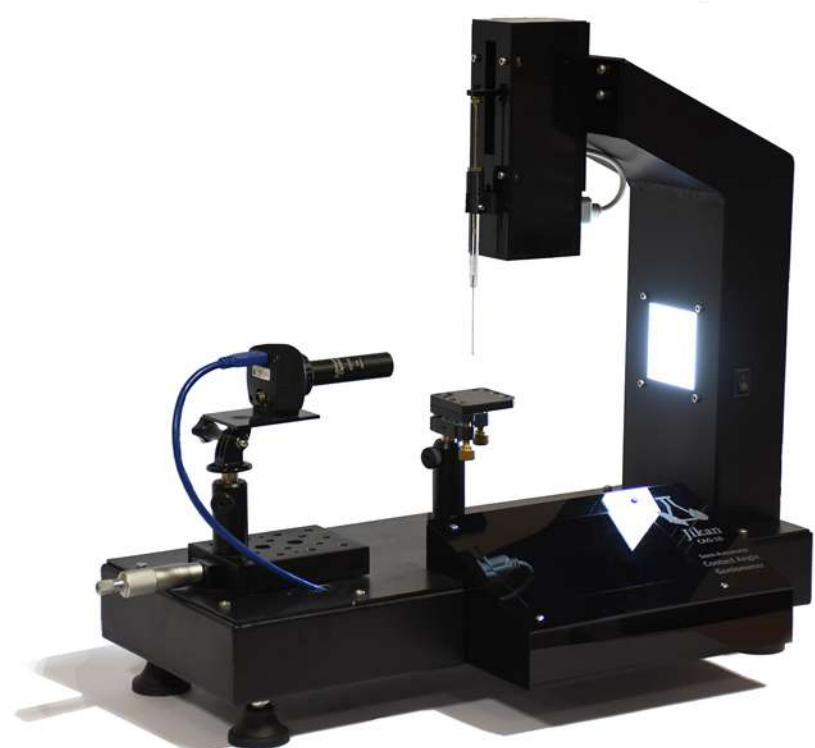
At Jikan, we are open to new ideas and produce customized devices and coating based on your engineering requirements and applications.

#### Laboratory Services:

Jikan provides fast and accurate services and consulting in all fields of surface nano-engineering.



Ice Adhesion Test Machine IAT-40



Contact Angle Goniometer CAG-10





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