

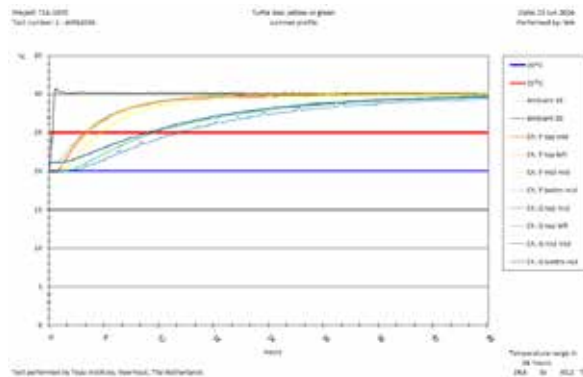
# Turtle uNLtd test results on temperature and humidity



## 5. Test results

### 5.1 Temperature test +20°C to +30°C

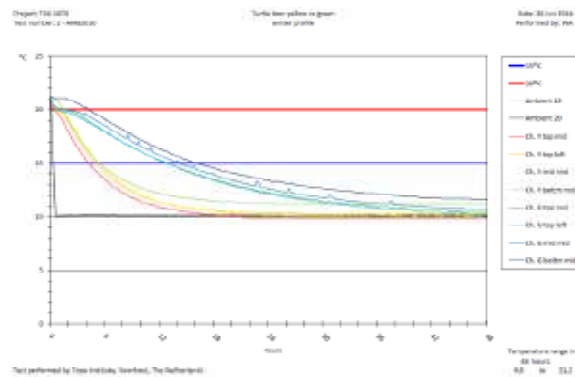
To simulate the packing of the Turtle boxes in the museum (conditioned room temperature of 20°C and 50% RH) and then shipping of the Turtle boxes worldwide (controlled conditions, but short spikes are possible), a temperature test starting at +20°C up to +30°C is performed.



Reached	Turtle box yellow	Turtle box green
	After ... hours	After ... hours
20°C	0,0	0,0
22°C	1,5	3,5
24°C	3,0	8,0
26°C	5,0	13,5
28°C	8,0	23,0
30°C	21,5	>48,0

### 5.2 Temperature test +20°C to +10°C

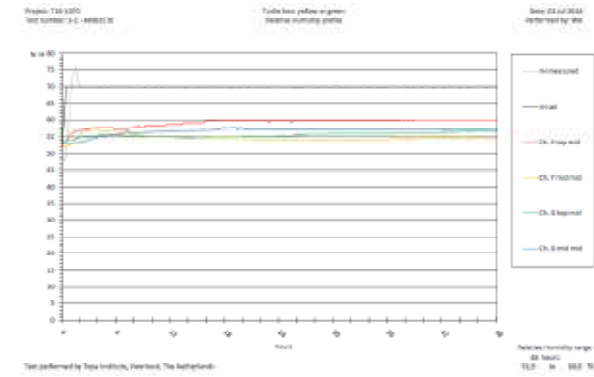
To simulate the packing of the Turtle boxes in the museum (conditioned room temperature of 20°C and 50% RH) and then shipping of the Turtle boxes worldwide (controlled conditions, but short spikes are possible), a temperature test starting at +20°C down to +10°C is performed.



Reached	Turtle box yellow	Turtle box green
	After ... hours	After ... hours
20°C	0,0	0,0
18°C	1,5	5,5
16°C	3,3	10,0
14°C	5,0	15,5
12°C	8,5	25,0
10°C	20,0	>48,0

### 5.3 Climate test 50% RH to 70% RH

During worldwide transport the relative humidity conditions differ. To research the influence of changing humidity conditions on the Turtle box, more specific, the painting inside the Turtle box, a climate test with increasing relative humidity (from 50% RH up to 70% RH) is performed.



Reached	Turtle box yellow	Turtle box green
	After ... hours	After ... hours
50% RH	0,0	0,0
52% RH	0,0	0,0
54% RH	0,5	0,5
56% RH	1,0	6,5
58% RH	5,5	>48,0
60% RH	37,5	>48,0

### Vibration

To investigate the influence of vibration on the Turtle boxes, a sine sweep from 3 Hz to 200 Hz at 0,5 G is performed. These frequencies are chosen because they are most likely to occur during regular truck and air transport.

Turtle box yellow	Turtle box, green, standard corners	Turtle box, green, thicker corners
2,35 G @ 31 Hz	1,13 G @ 49 Hz	1,19 G @ 24,5 Hz
Amplification of 5	Amplification of 2	Amplification of 2

The amplification of the Turtle box green is 2, against the amplification of 5 of the Turtle box yellow. The Turtle box green performed much better on the vibration.

### Temperature conditions

To simulate the packing of the Turtle boxes in the museum (conditioned room temperature of 20°C and 50% RH) and then shipping of the Turtle boxes worldwide (controlled conditions, but short spikes are possible), two temperature tests are performed: one up to 30°C and one down to 10°C.

Reached	Turtle box yellow	Turtle box green
+30°C	After 21,5 hours	After >48 hours
+10°C	After 20,0 hours	After >48 hours

The Turtle box green performed twice as good as the Turtle box yellow.

### Humidity conditions

During worldwide transport the relative humidity conditions differ. To research the influence of changing humidity conditions on the Turtle box, more specific, the painting inside the Turtle box, a climate test with increasing relative humidity (from 50% RH to 70% RH) is performed.

Reached	Turtle box yellow	Turtle box green
60% RH	After 37,5 hours	After >48 hours

The Turtle box green performed better than the Turtle box yellow.