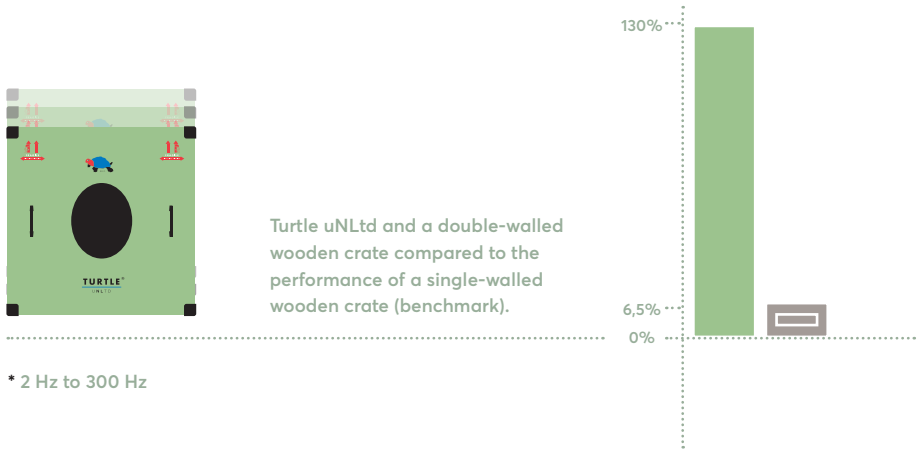


# Turtle Performance Overview

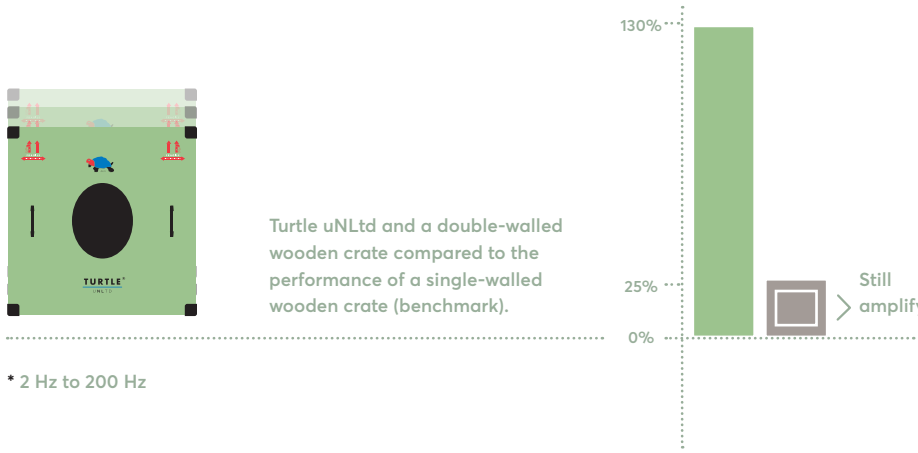
Turtle is the safe, most innovative and sustainable museum crate in the world. The claims illustrated below are founded in the results of research of Turtle uNLtd in comparison to a museum quality double-walled wooden crate.



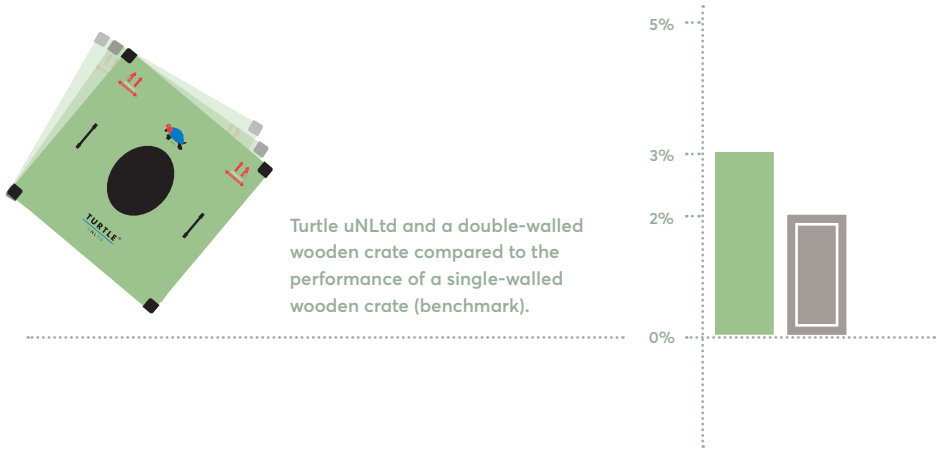
## Vibration Reduction Air Freight



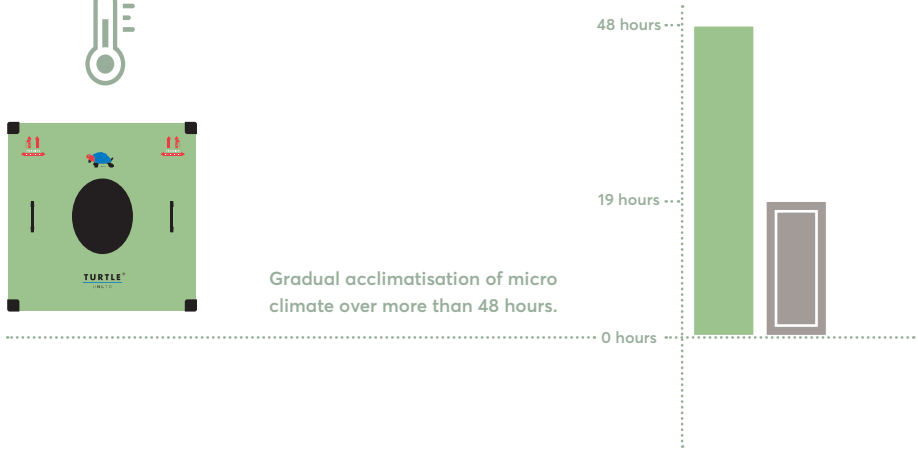
## Vibration Reduction Road Transport



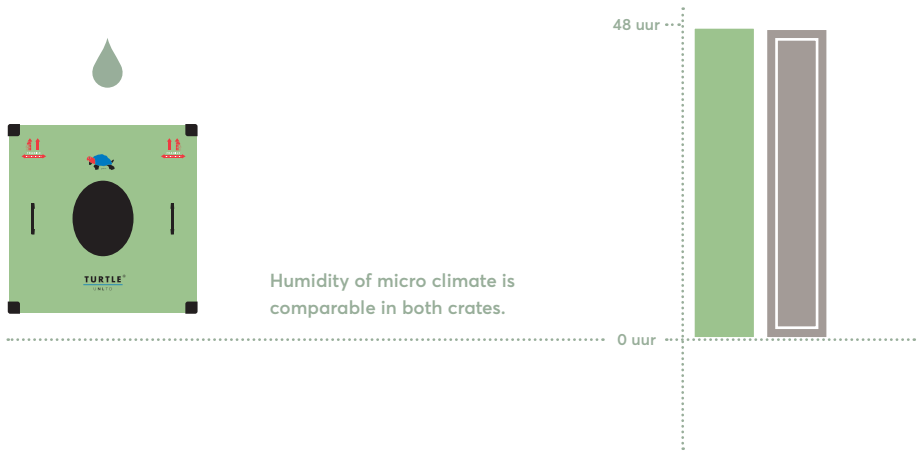
## Shock Reduction



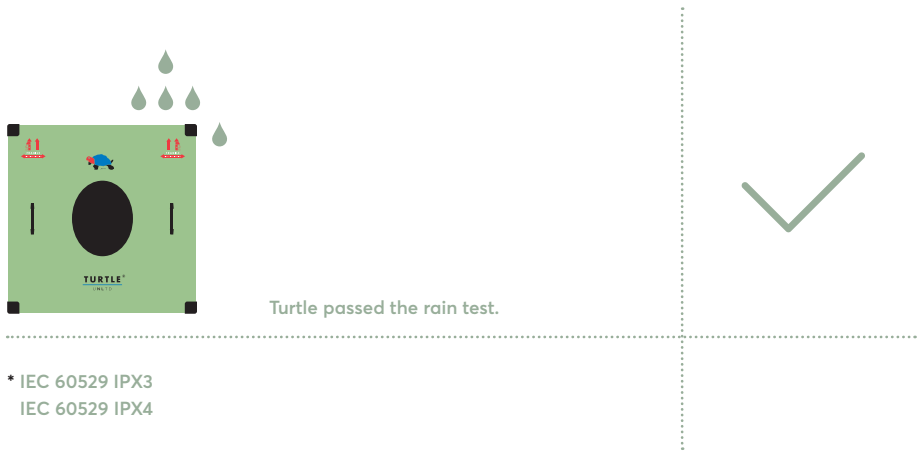
## Temperature Performance



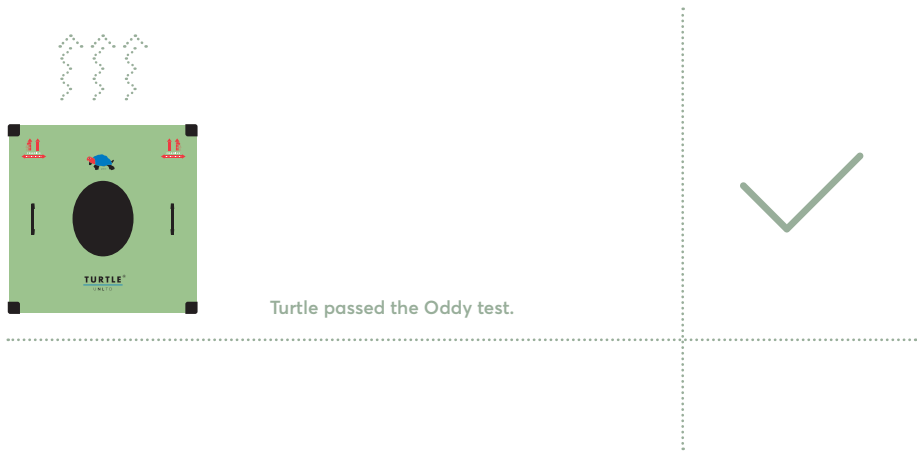
## Humidity Performance



## Water Resistance Performance



## Off-gassing Performance



## Legend



...

...

Testing facilities



Accreditation



Topa Institute & BFSV

BFSV

Topa Institute

Test series  
(mechanical)

Transport  
simulation  
standard ASTM  
D4728-15

Transport  
simulation  
standard ASTM  
ASTMD4169

Real transport  
in truck

Modal analysis  
of truck and  
Turtle

Modal analysis  
of both crates

3-d shaker  
testing of  
painting  
dummies

3-d shaker  
testing

Modal testing  
of crates

Testing equipment

Modal shaker  
with force cell  
TMS-2025E  
PCB-208C02

16-Channel-  
Siemens/LMS  
SCADAS Mobile  
1a

Accelerometer  
(triaxial) PCB-  
356A16

Geophon  
Geospace HS-1

Modal hammer  
1 PCB-086C03

Modal hammer  
2 PCB-086D20

Software  
Siemens Testlab  
Impactesting  
and MIMO FRF  
Testing

Shaker2018  
RMS TGD  
6000-000.00,  
Shaker2020  
L.A.B. – HV  
60X60

3-D shaker IMV  
TS-3000-3.2H-  
CE

Vibration  
measurement  
System  
16-Channel-  
Siemens/LMS  
SCADAS Mobile  
1a

High speed  
camera  
measurement  
software  
LIMESS Istra 4.0

Test series  
(climate)

ASTM-standard  
D4332-14



Wooden crates  
benchmark museum  
specification

Single-walled wooden crate

- Panels: 18mm ply ISPM 15
- Structure: 25mm x 27mm batons ISPM 15
- Foam: 50mm Museum Art Foam 3010 / 50 mm Museum Art Foam 241 on bottom of the crate
- Seal: Stainless steel capture bolts. Neoprene gasket
  - Feet: 100mm x 500mm timber ISPM 15
- Finish: Varnished

Double-walled wooden crate

- Panels: 18mm ply ISPM 15
- Structure: 25mm x 27mm batons ISPM 15
- Foam: 50mm Museum Art Foam 241 PE
  - Inside box: 15 mm ply ISPM15
  - Foam: 50mm polyether MAF3010
- Seal: Stainless steel capture bolts. Neoprene gasket
- Feet: 100mm x 500mm timber ISPM 15
  - Finish: Varnished