



### TAG PERFORMANCE TEST

Example



# Experimental setup

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## Basics

- Minimum five transponders per type
- Unique identification by tag-numbering

## Materials for the transponder performance test

- Carton
- Glass (thickness: 5mm)
- Polypropylene PP (thickness : 5mm)
- Plywood (thickness : 12mm)
- Polystyrene (thickness : 40mm)
- Aluminum (thickness : 1mm), including 10mm polystyrene between tag and aluminium as a distance material for labels

## Test setup

- Transponder performance tests by variation of the transmitted power
- Calibration of the test setup to calculate the expected read range:  
Determination of the setup parameters by measuring the total path loss between the measurement device and the measurement location with a special reference tag

# Experimental setup

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## Theoretical read range

- Distinction of read range forward and read range reverse

- Theoretical read range forward

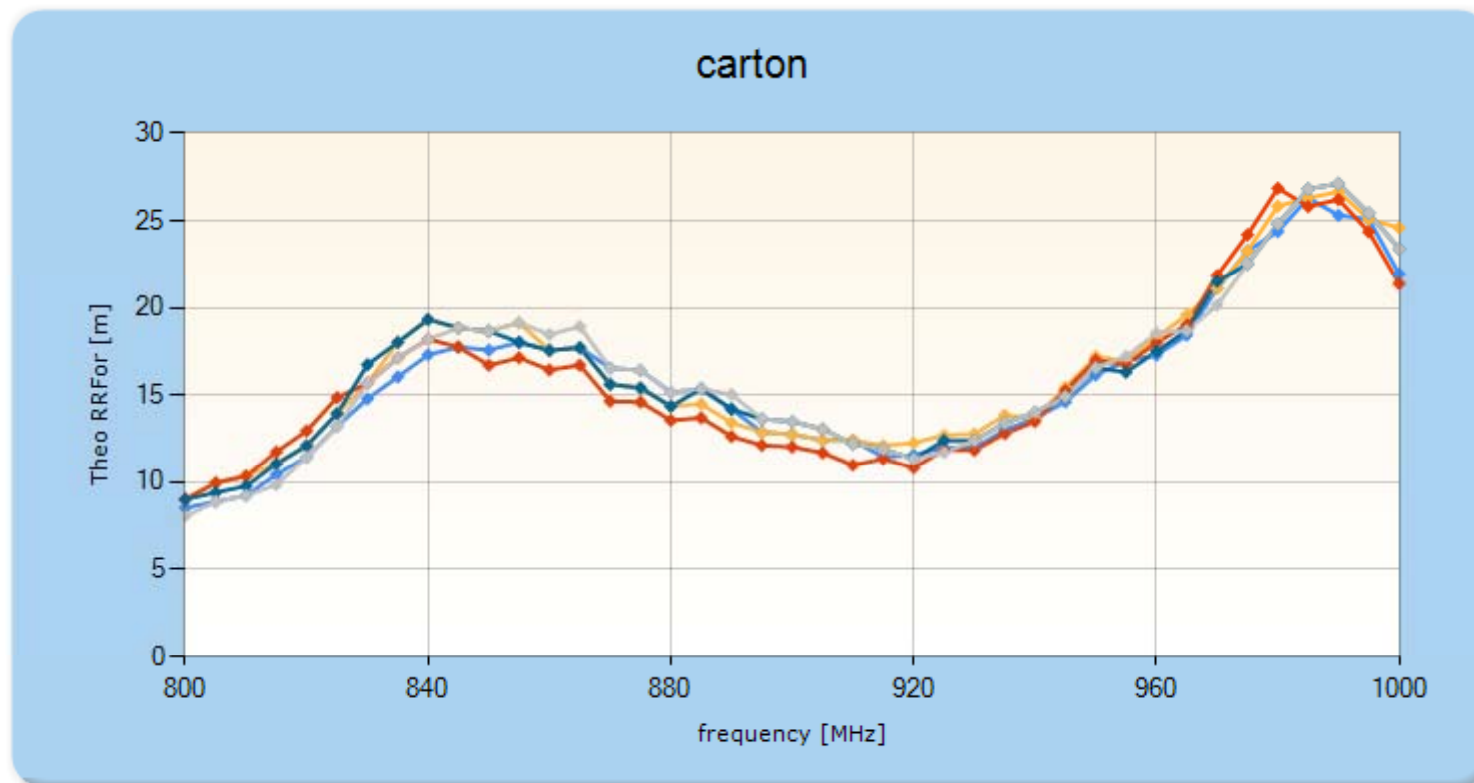
Theoretical read range forward is the read range that would be acquired with a reader transmitting at 33 dBm ERP assuming that the read range is limited by power transfer to the tag

- Theoretical read range reverse

Theoretical read range reverse is the read range that would be acquired with a reader with the sensitivity of -70 dBm and an antenna gain of 4 dBi assuming that the read range is limited by backscatter signal delivery to the reader

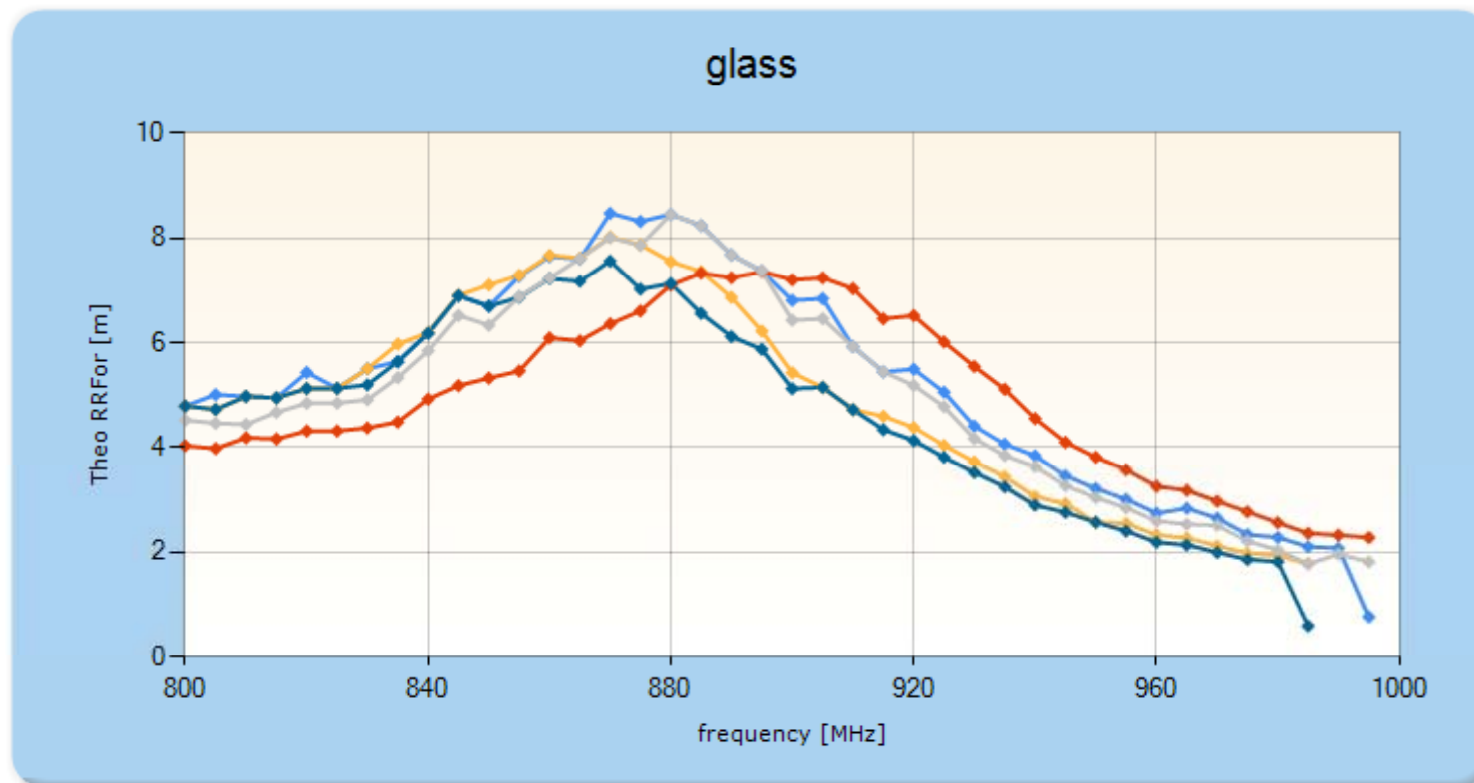
# Results – Theoretical read range forward

Results for each of the five copies of the transponder, **mounted on carton**



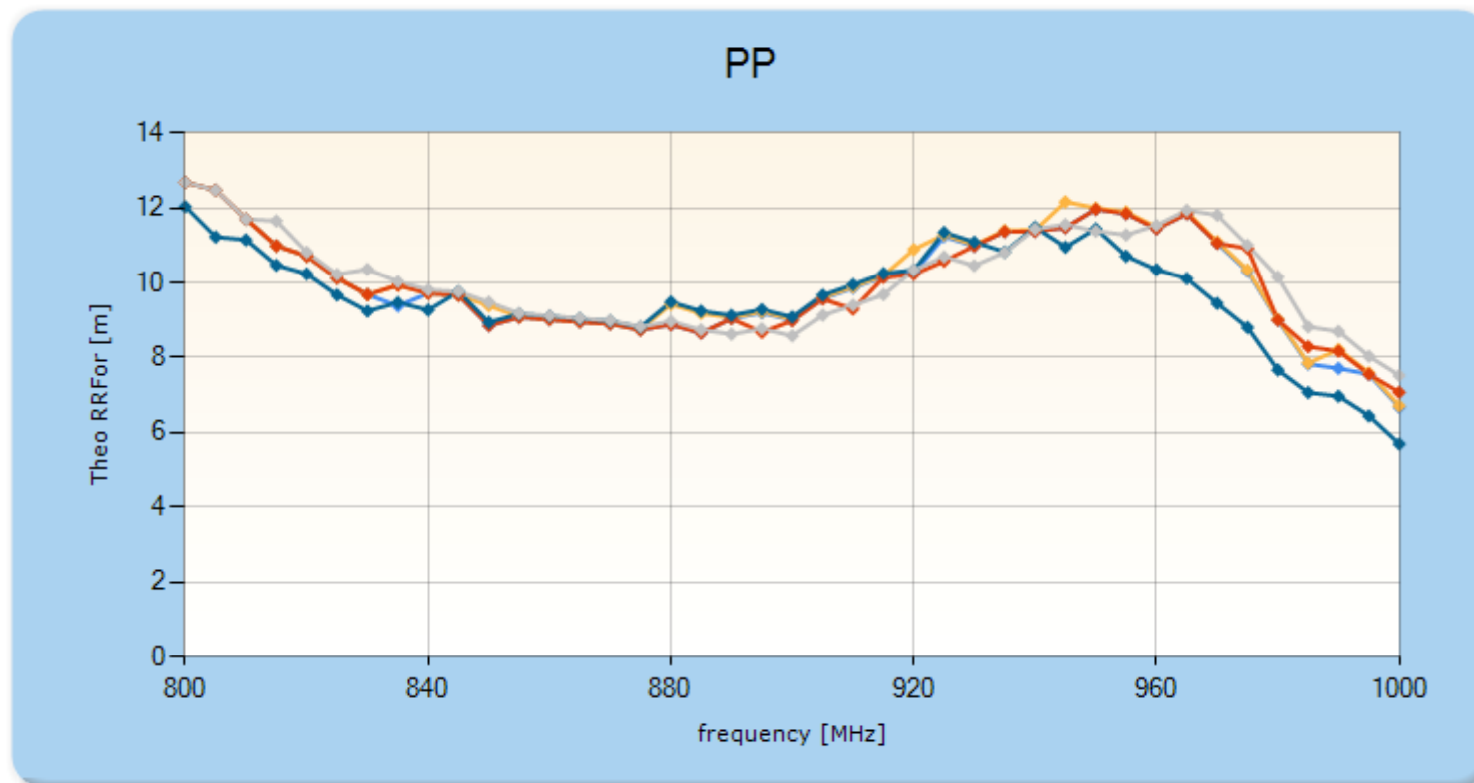
# Results – Theoretical read range forward

Results for each of the five copies of the transponder, **mounted on glass**



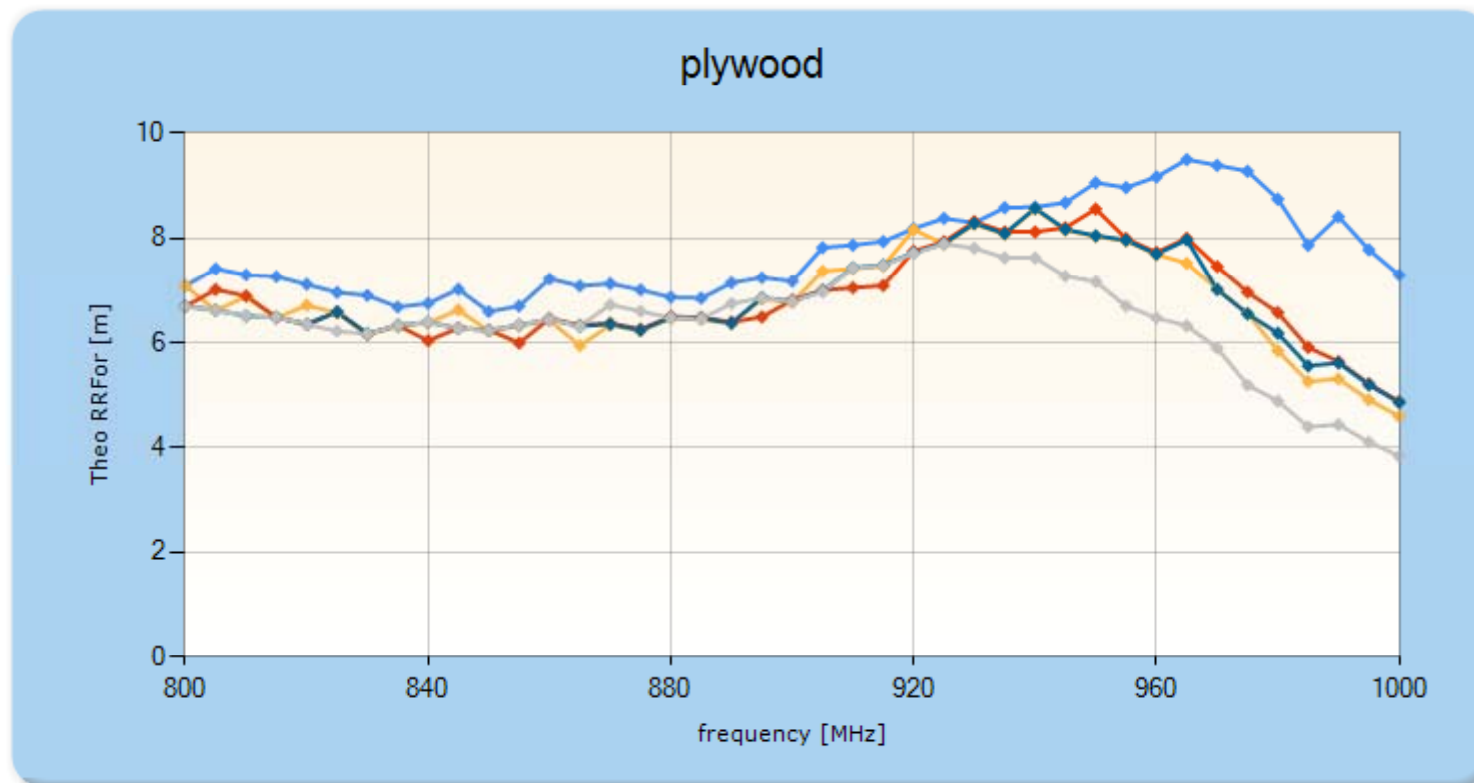
# Results – Theoretical read range forward

Results for each of the five copies of the transponder, mounted on polypropylene



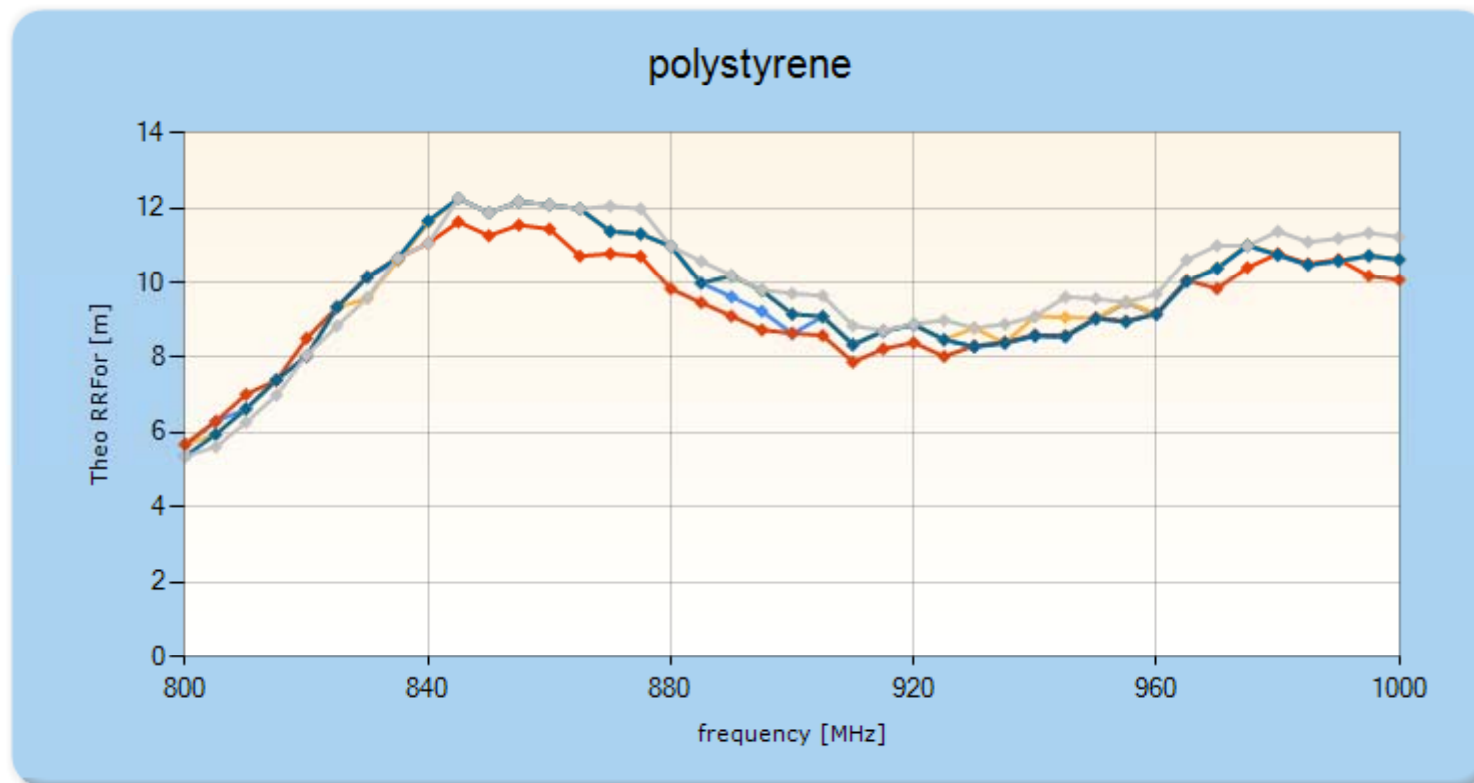
# Results – Theoretical read range forward

Results for each of the five copies of the transponder, **mounted on plywood**



# Results – Theoretical read range forward

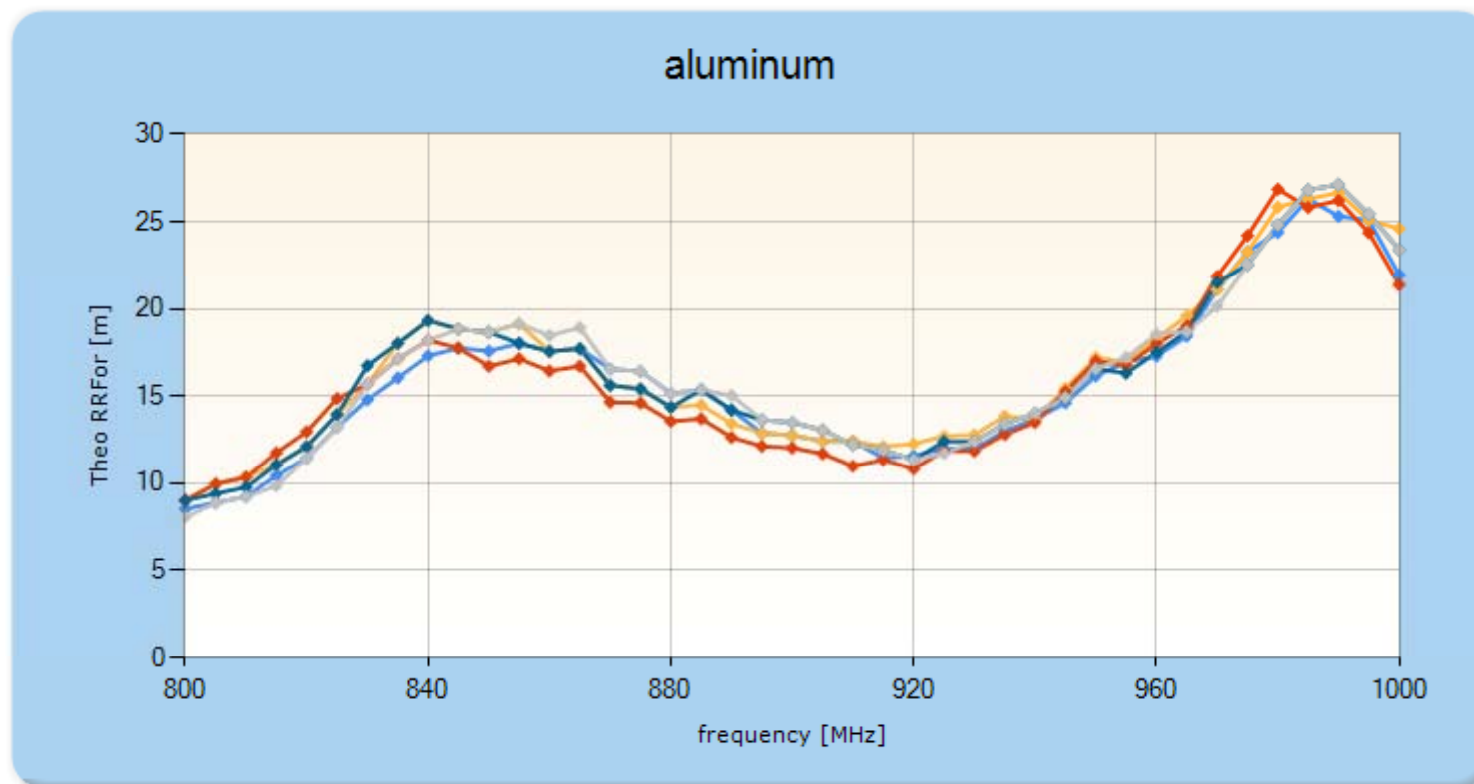
Results for each of the five copies of the transponder, **mounted on polystyrene**





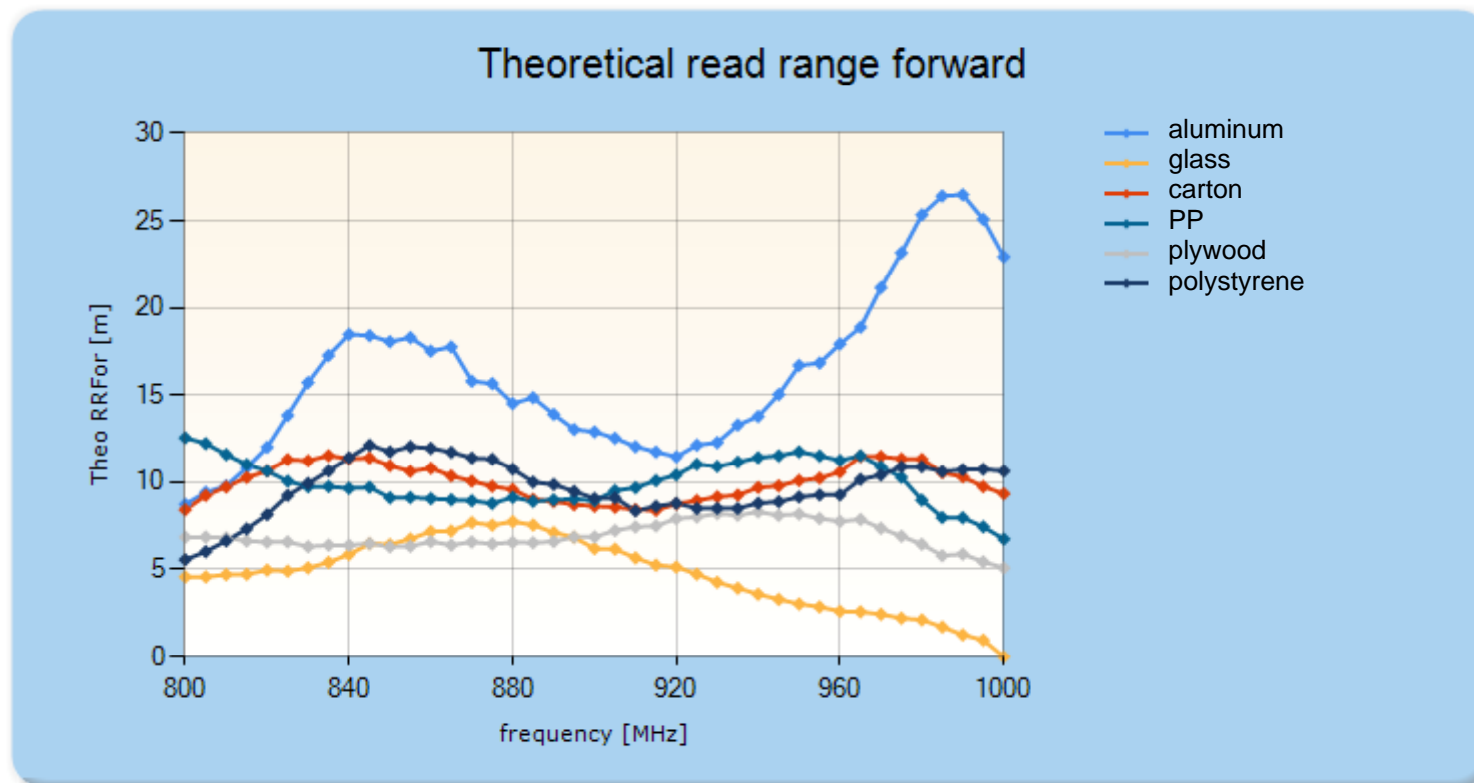
# Results – Theoretical read range forward

Results for each of the five copies of the transponder, **mounted on aluminum**



# Results – Theoretical read range forward

**Average value** of the five copies of the transponder for each material



# Results – Theoretical read range reverse

**Average value** of the five copies of the transponder for each material

