

Spectral Library of Impervious Urban Materials

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Introduction

The London Urban Micromet Data Archive (LUMA) Spectral Library of impervious Urban Materials (SLUM) is organised by material class (**Table 1**). The methodologies used during the measurements and data processing are described by Kotthaus (2013) and Kotthaus et al. (2014). Here, information on all 74 material samples are presented in form of standardised data sheets (introduced on Page 2).

For terms and conditions on the usage of all data and information provided, please refer to

<http://LondonClimate.info/LUMA/Conditions.html>

Table 1: Content of the LUMA library of impervious urban materials.

Class	Class-ID	Page
Quartzite	X	4
Stone	S	7
Granite	G	12
Asphalt	A	17
Cement/Concrete	C	27
Brick	B	34
Roofing shingle	L	48
Roofing tile	R	52
Metal	M	64
PVC	V	72

References

Kotthaus, S, 2013: Implications of the dense city centre to surface-atmosphere exchanges, PhD Thesis, King's College London, pp. 297.

Kotthaus, S, TEL Smith, MJ Wooster, and CSB Grimmond, 2014: Derivation of an urban materials spectral library through emittance and reflectance spectroscopy, *in review*.

MATERIAL CLASS_{SAMPLE-ID}

For most material samples, a
zoomed
image is shown.

Picture of the sample

Class	
Material	
Colour	
Status	
Dimension [mm]	

VNIR/SWIR reflectance spectra

- Availability provided, all samples collected in the field and in the laboratory (lab) are shown together with the average across the respective samples. The latter depicts the final result.
- Spectra measured in the field do not provide data across the atmospheric absorption windows. Hence, laboratory spectra are used in the analysis.

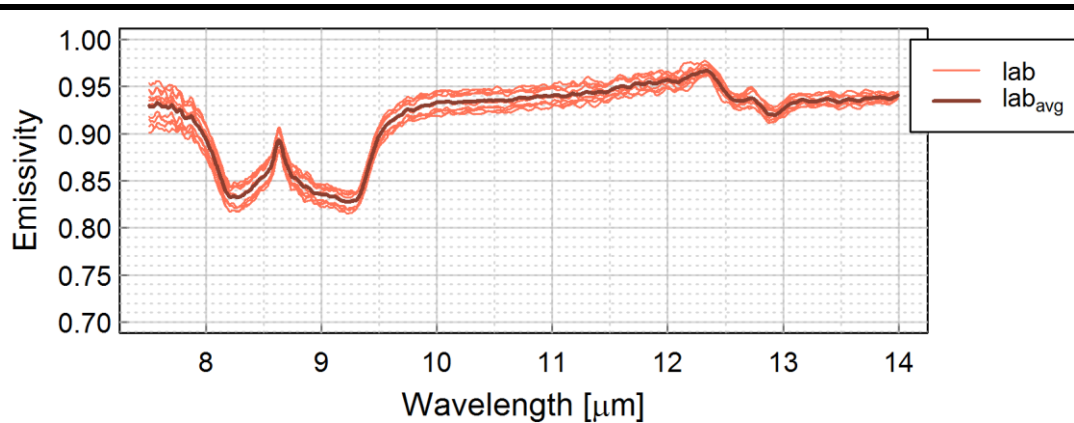
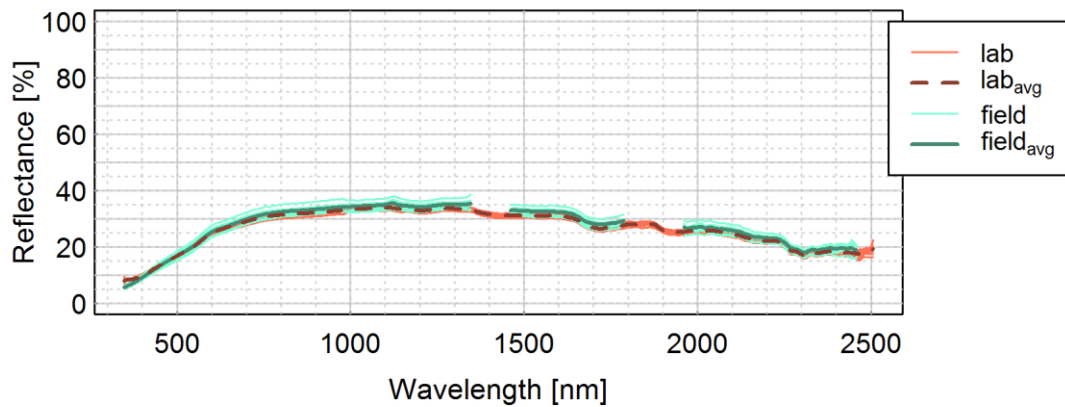
TIR emissivity spectra

- All samples collected in the laboratory (lab) are shown together with their average. The latter depicts the final result.

QUARTZITE_{X001}



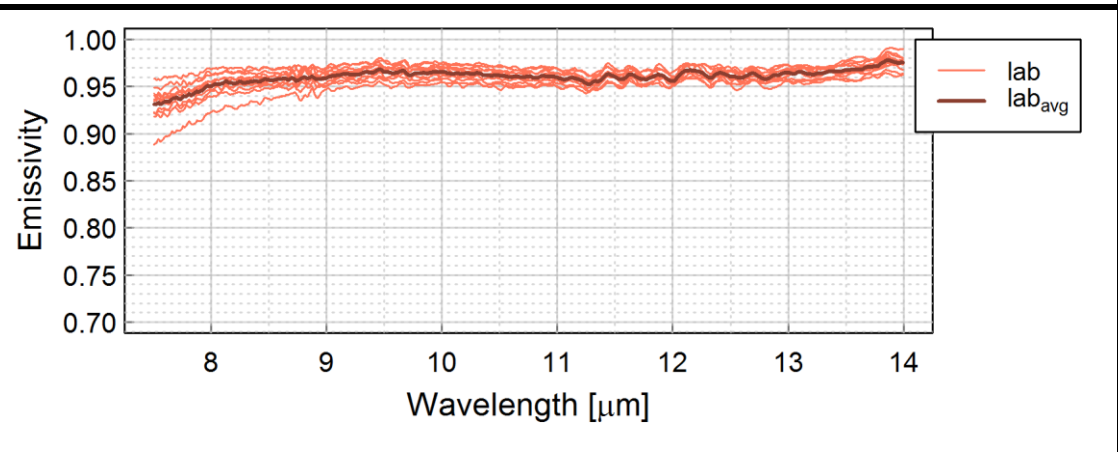
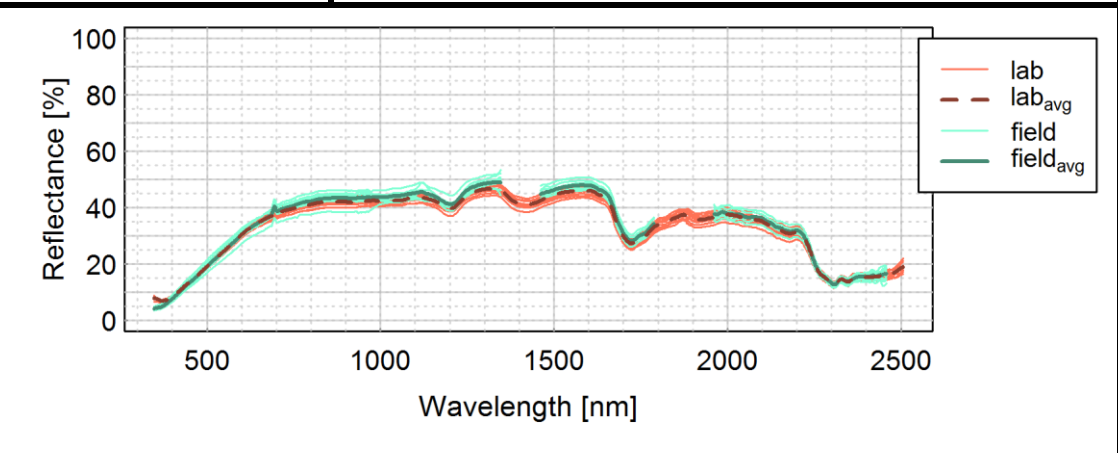
Class	Quartzite conglomerate
Material	Quartzite
Colour	Beige/brown/black/red
Status	New
Dimension [mm]	360 x 4 x 220



QUARTZITE_{x002}



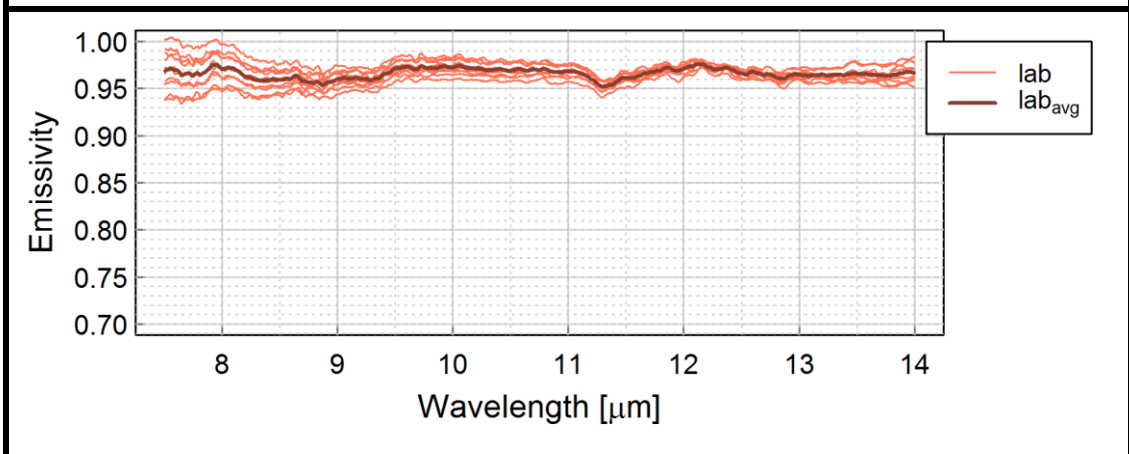
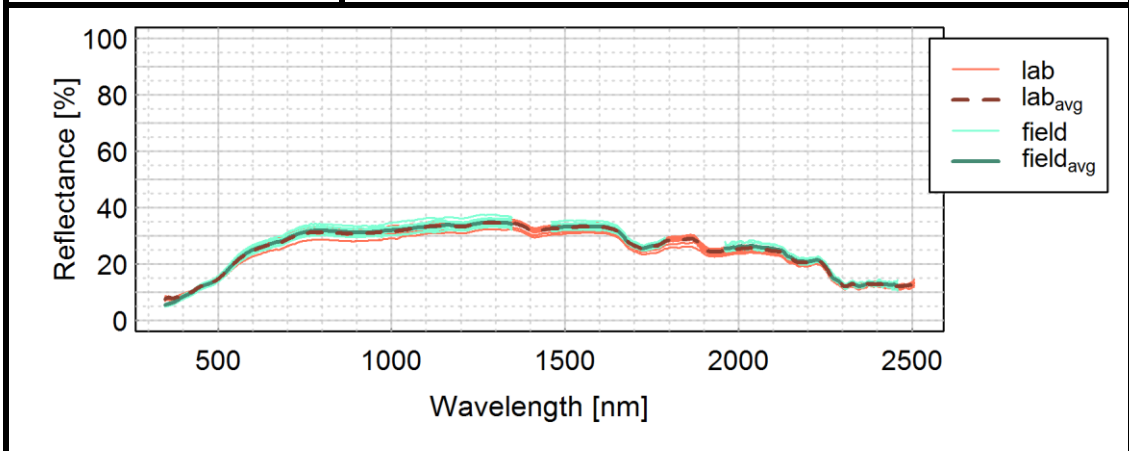
Class	Quartzite conglomerate
Material	Quartzite
Colour	Beige/brown/black
Status	New
Dimension [mm]	360 x 4 x 220



QUARTZITE_{X003}



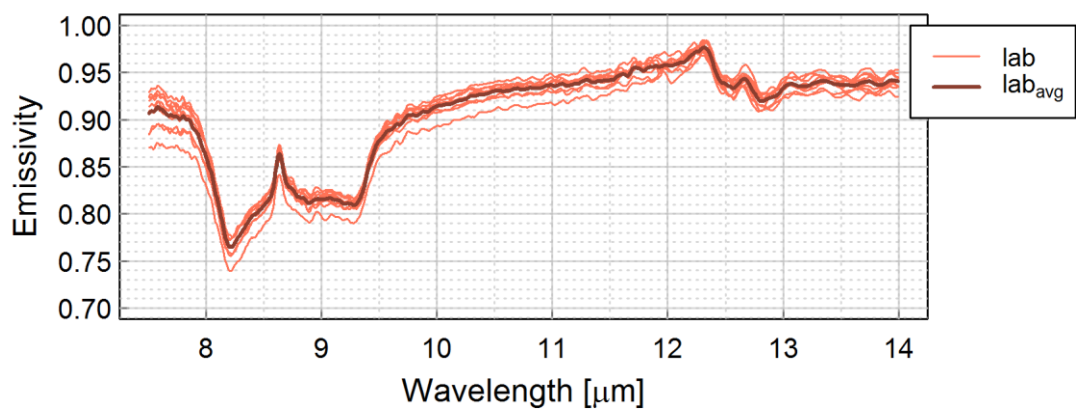
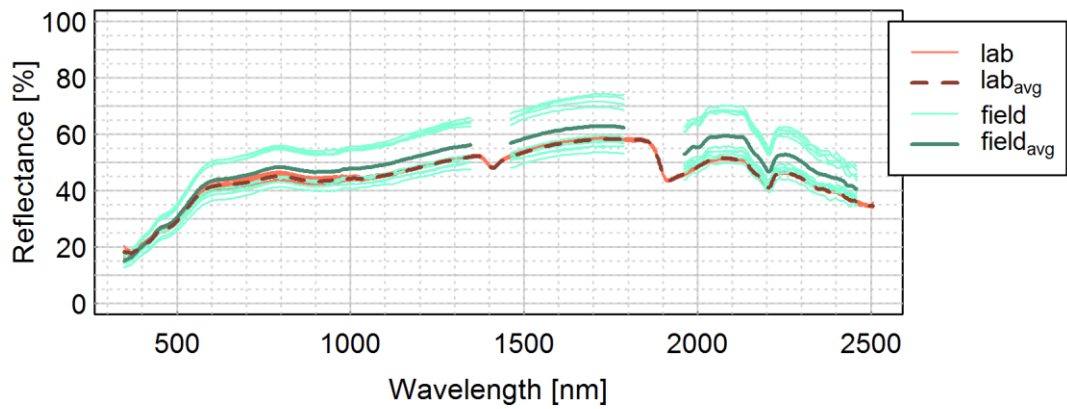
Class	Quartzite conglomerate
Material	Quartzite
Colour	Beige/brown/black/red
Status	New
Dimension [mm]	360 x 4 x 220



STONE_{S001}



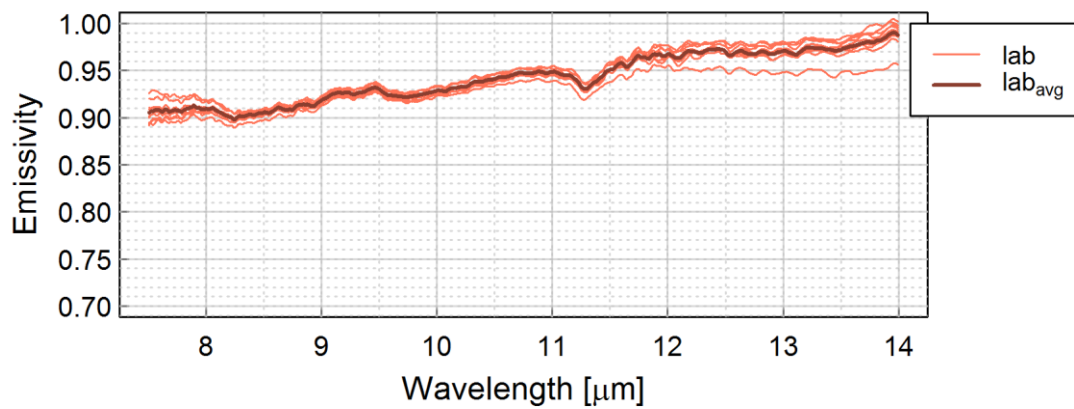
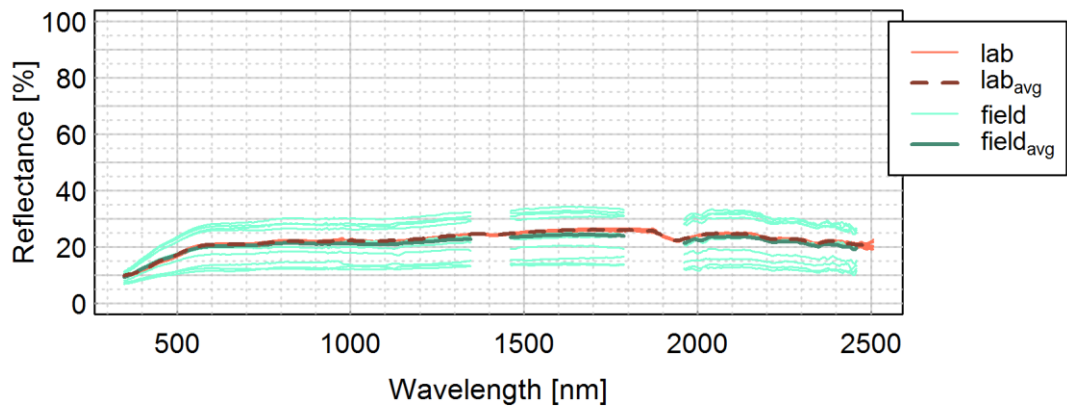
Class	Stone
Material	Sandstone
Colour	Beige
Status	Weathered
Dimension [mm]	215 x 35 x 105



STONE_{S002}



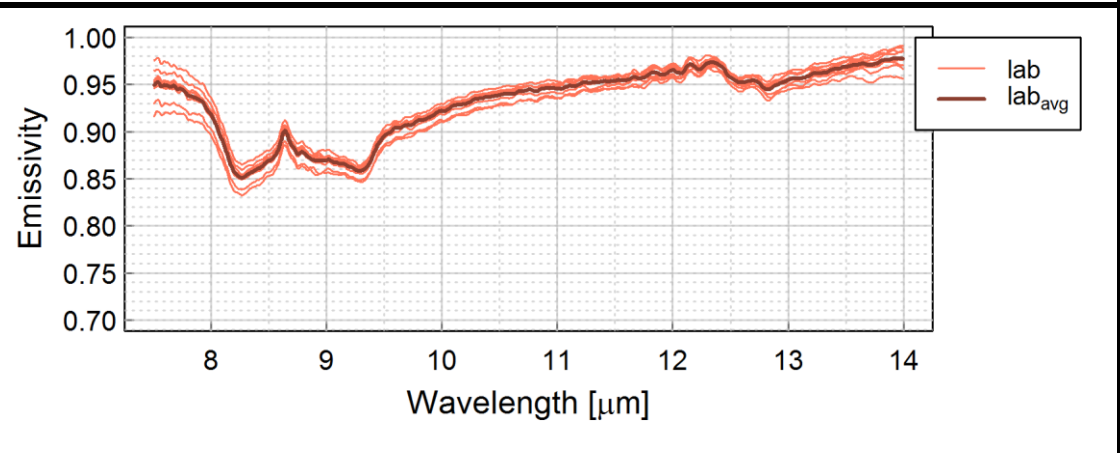
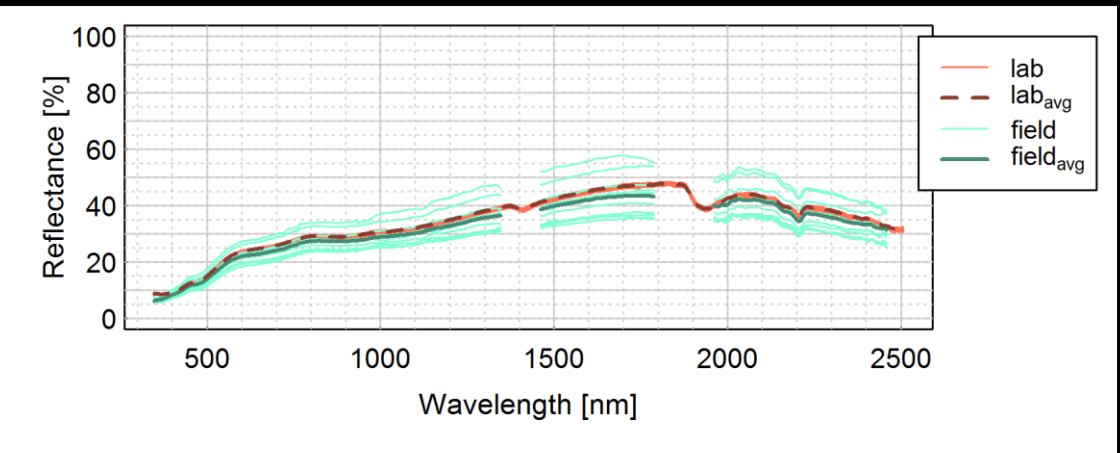
Class	Stone
Material	Carboniferous coral limestone
Colour	Grey
Status	Weathered
Dimension [mm]	210 x 19 x 90



STONE_{S003}



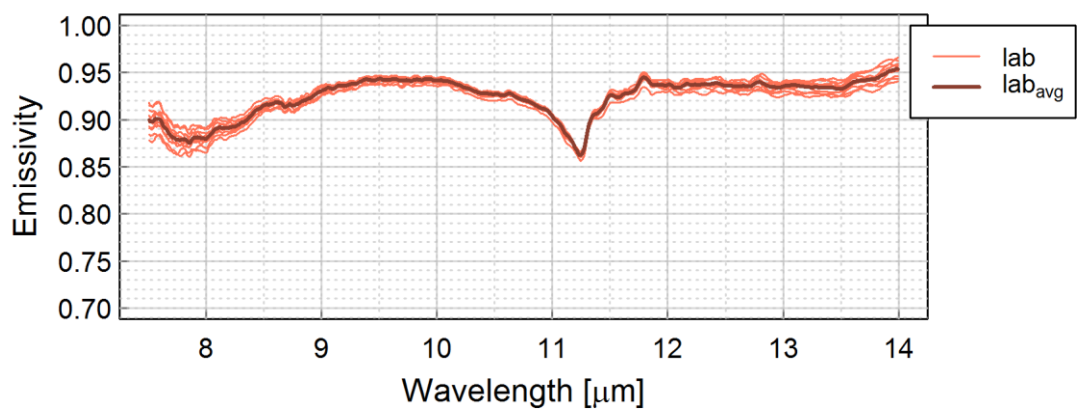
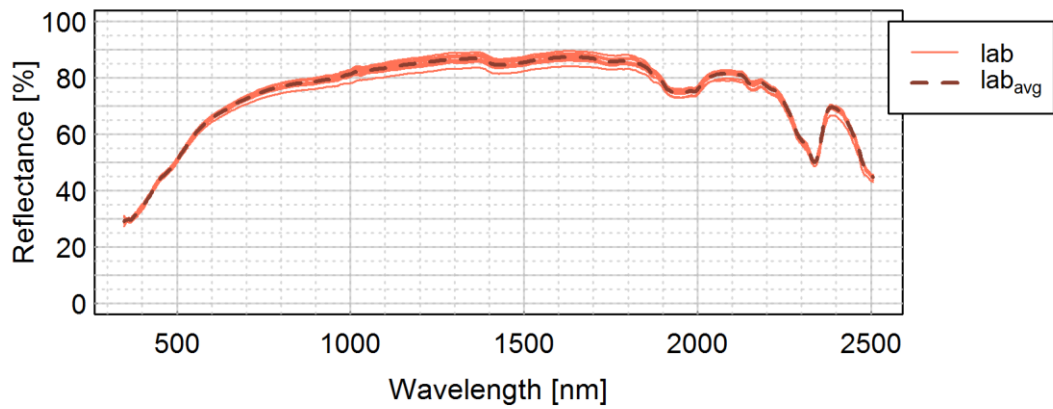
Class	Stone
Material	Sandstone
Colour	Ochre
Status	Weathered
Dimension [mm]	70 x 55 x 25



STONE_{S004}



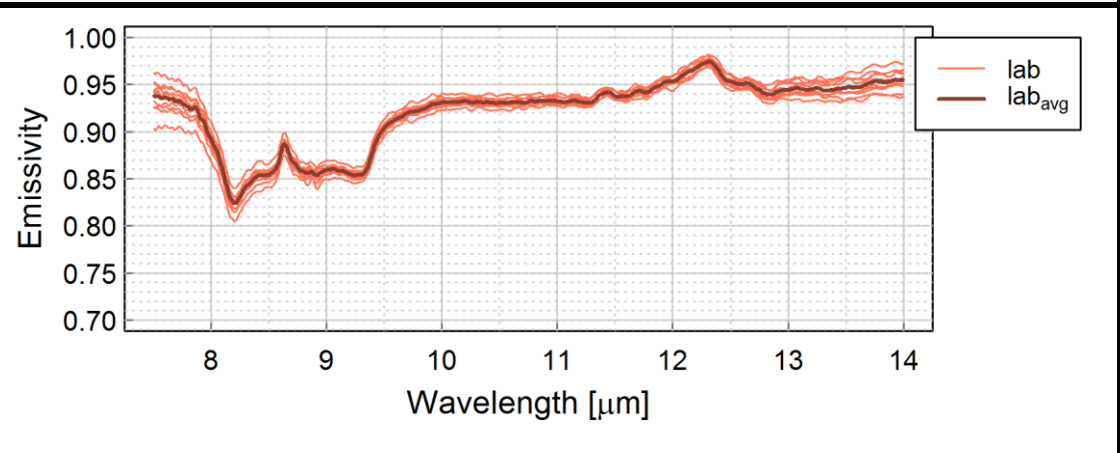
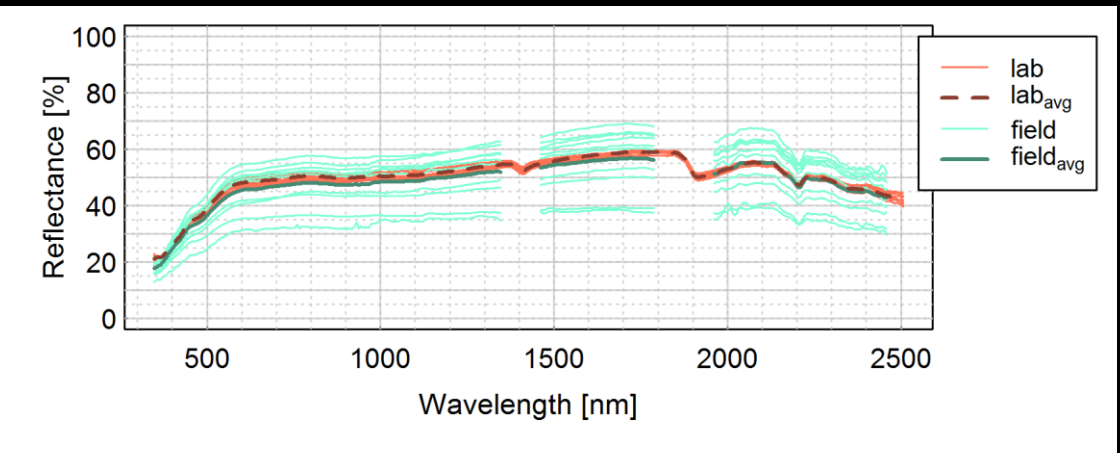
Class	Stone
Material	Limestone
Colour	Beige
Status	Weathered
Dimension [mm]	70 x 55 x 25



STONE_{S005}



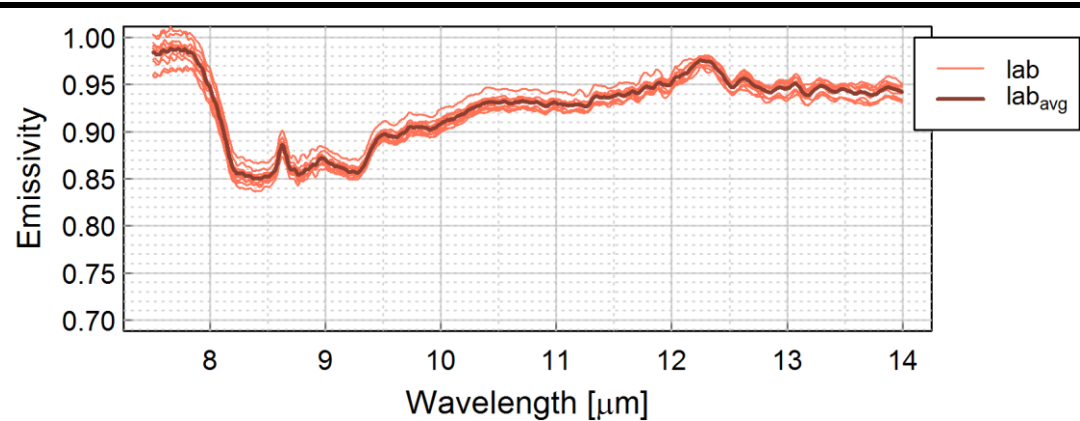
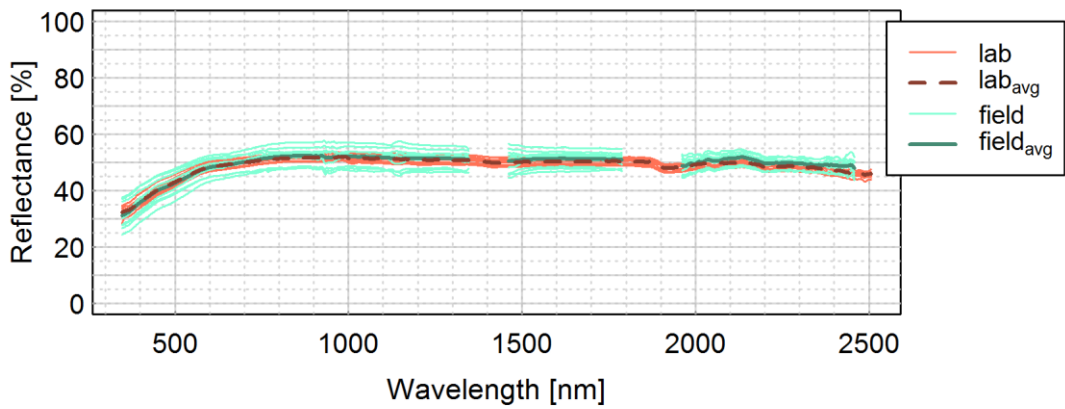
Class	Stone
Material	Sandstone
Colour	Light grey
Status	Weathered
Dimension [mm]	28 x 75 x 180



GRANITE_{G001}



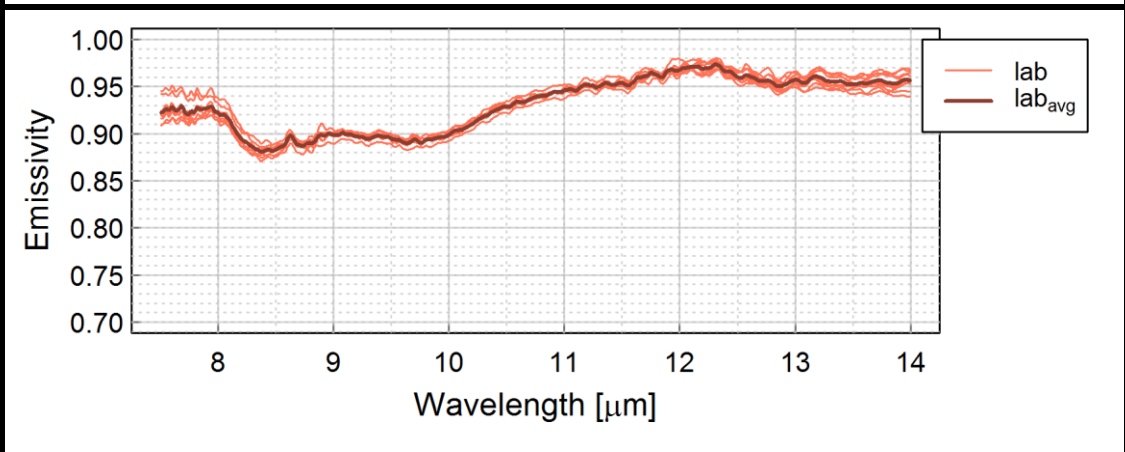
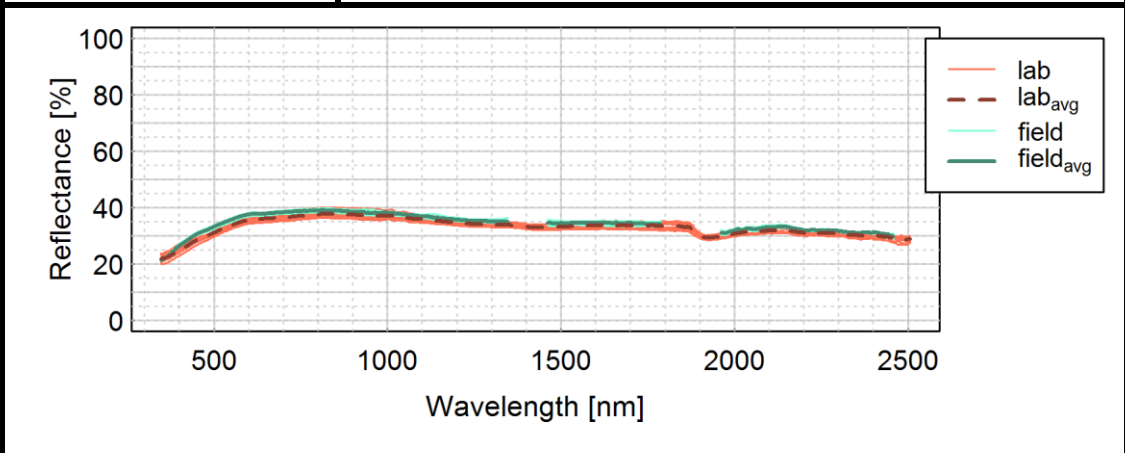
Class	Granite
Material	Granite
Colour	White/black
Status	New, rough
Dimension [mm]	142 x 56 x 52



GRANITE_{G002}



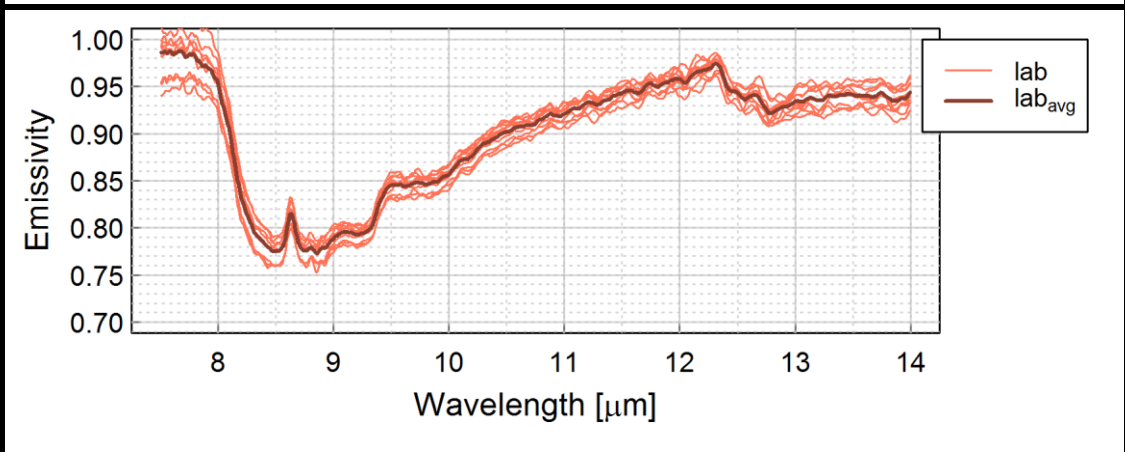
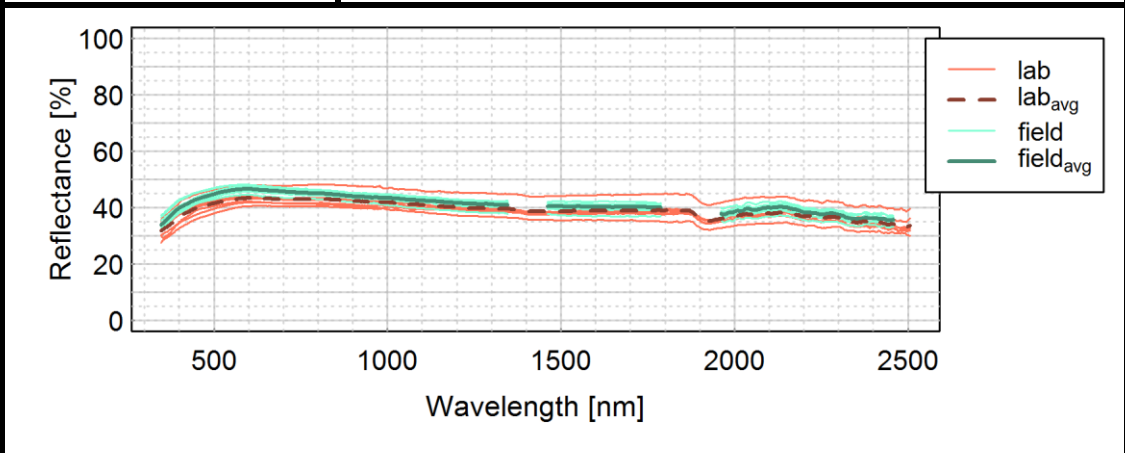
Class	Granite
Material	Granite with cement
Colour	White/red
Status	Weathered
Dimension [mm]	101 x 95 x 88



GRANITE_{G003}



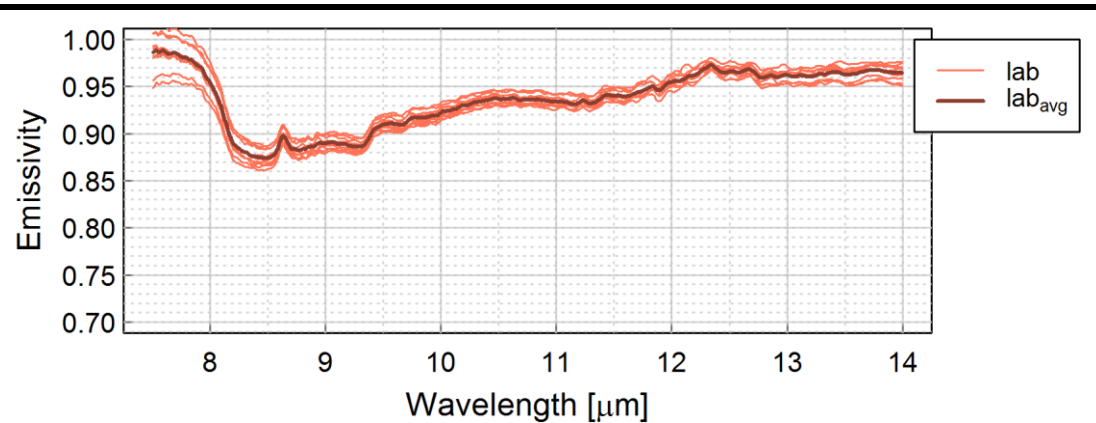
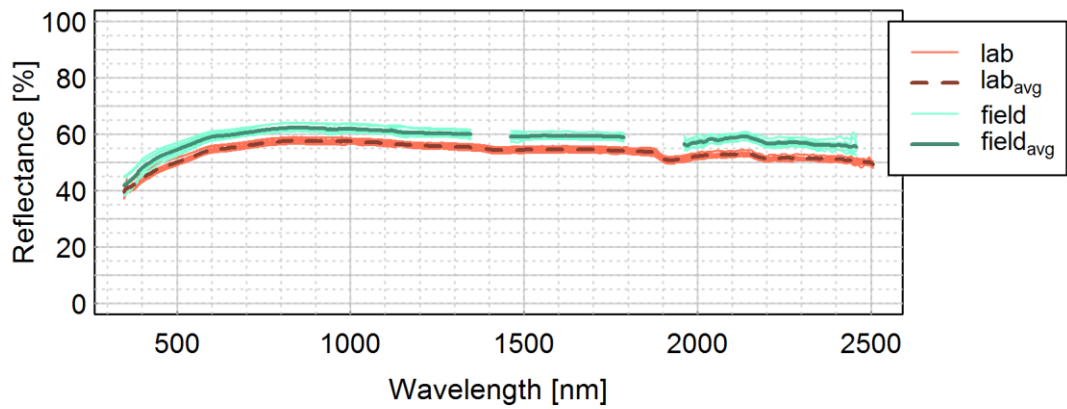
Class	Granite
Material	Granite with cement
Colour	White/black
Status	Weathered
Dimension [mm]	215 x 57 x 105



GRANITE_{G004}



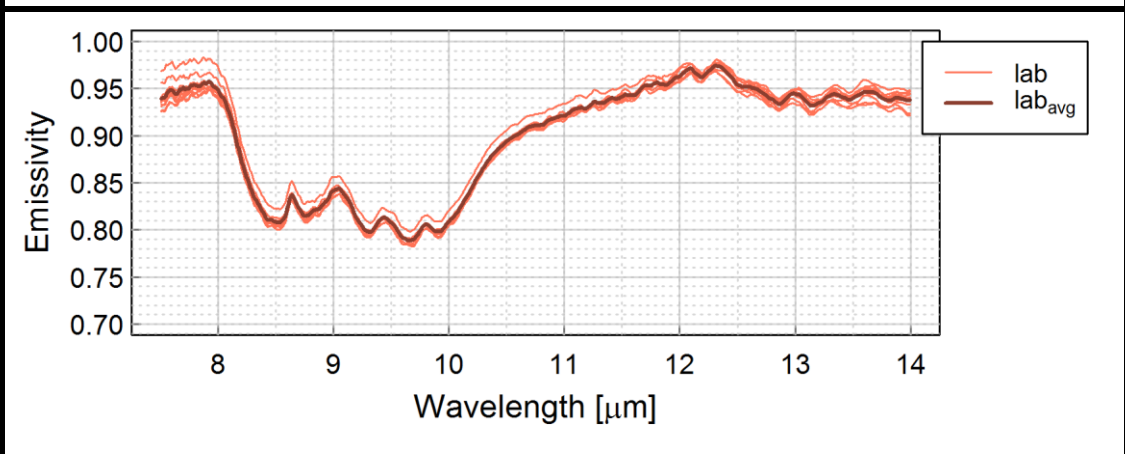
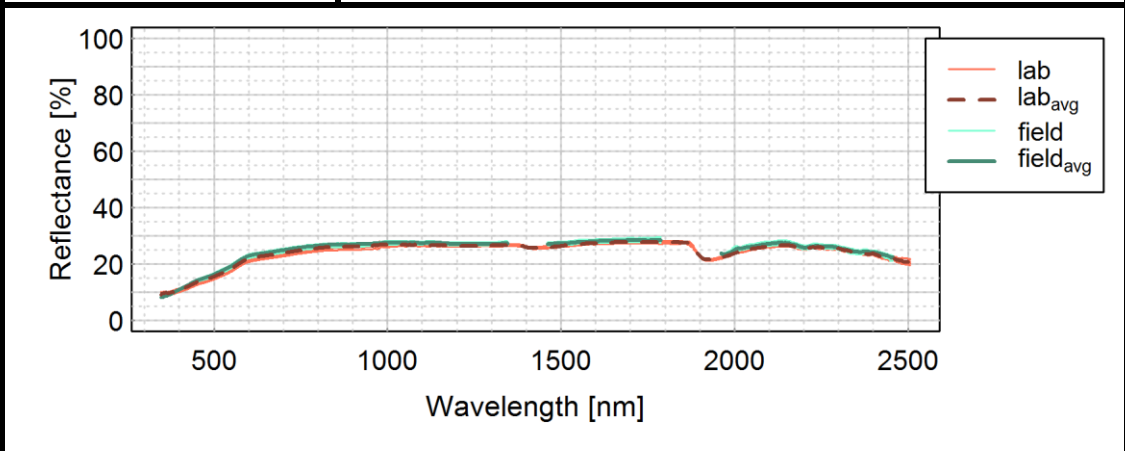
Class	Granite
Material	Granite
Colour	White/red/black
Status	New, dusty
Dimension [mm]	233 x 60 x 78



GRANITE_{G005}



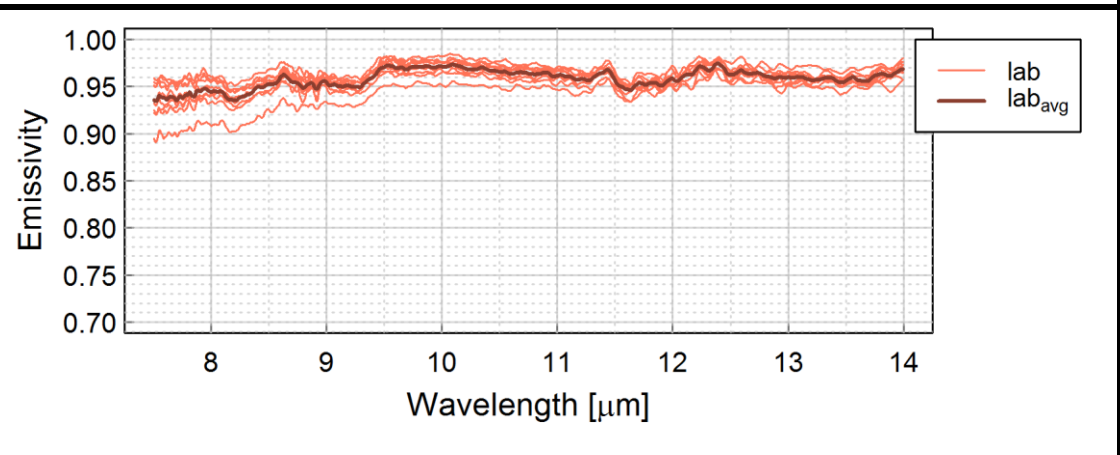
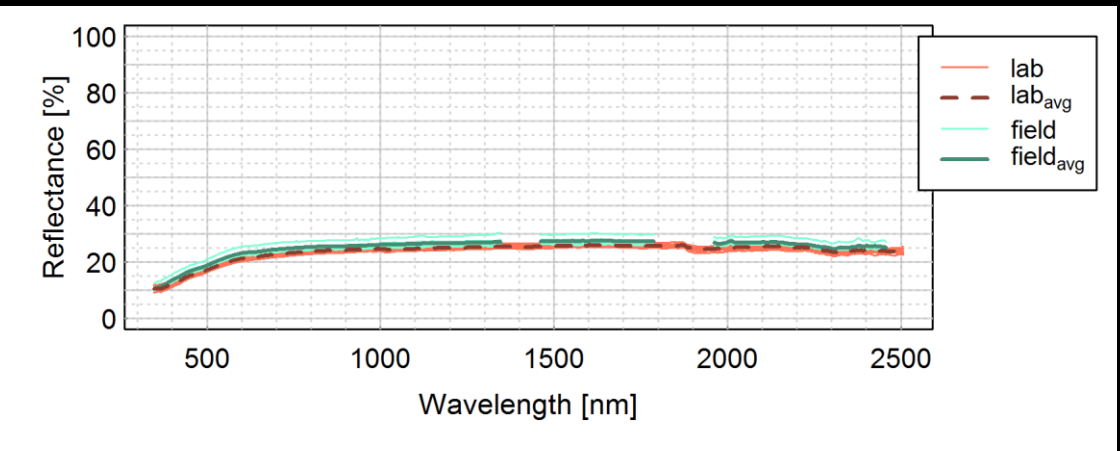
Class	Granite
Material	Granite
Colour	Red/black
Status	New
Dimension [mm]	125 x 50 x 111



ASPHALT_{A001}



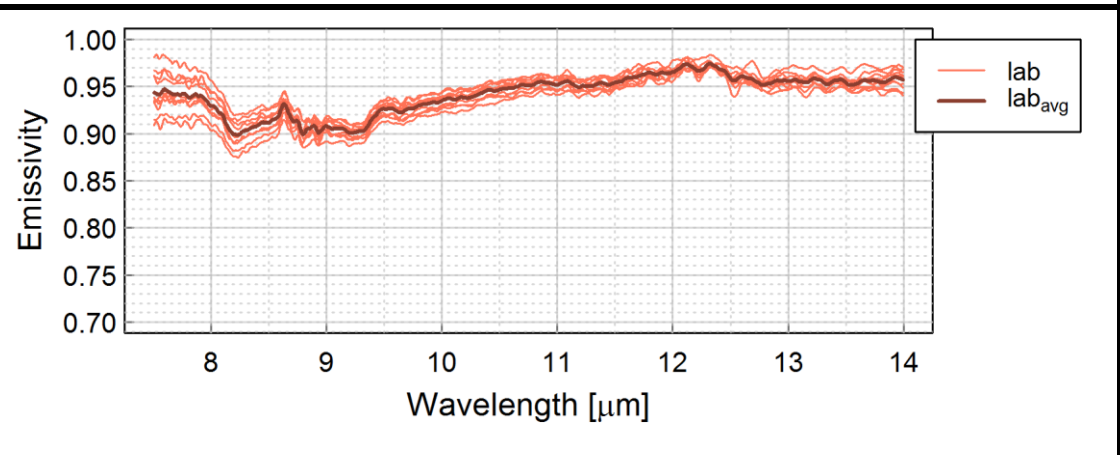
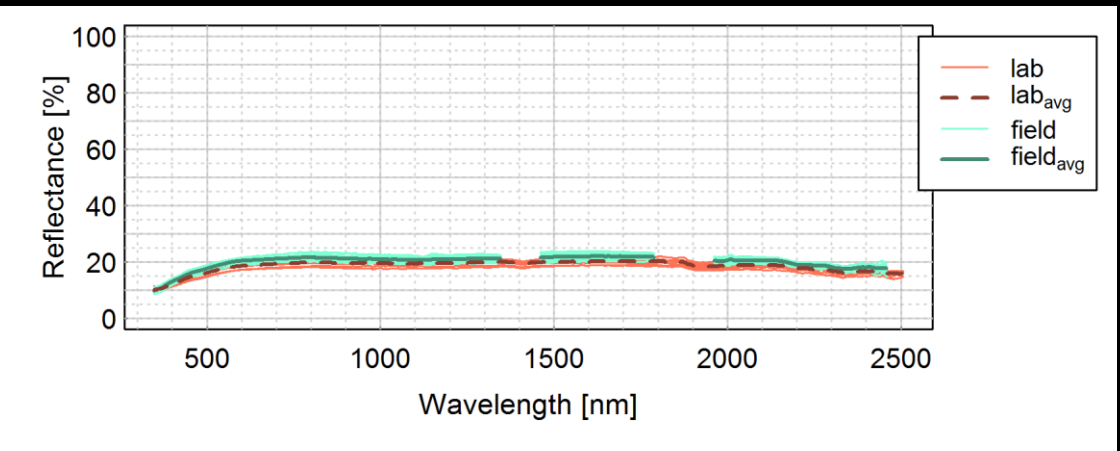
Class	Road asphalt
Material	Asphalt with stone aggregate
Colour	Black/grey
Status	Weathered
Dimension [mm]	190 x 83 x 68



ASPHALT_{A002}



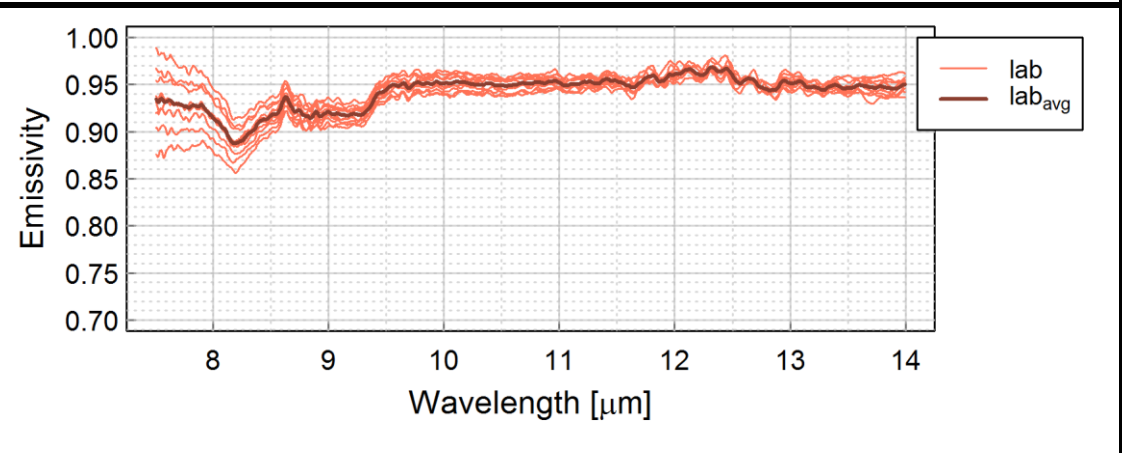
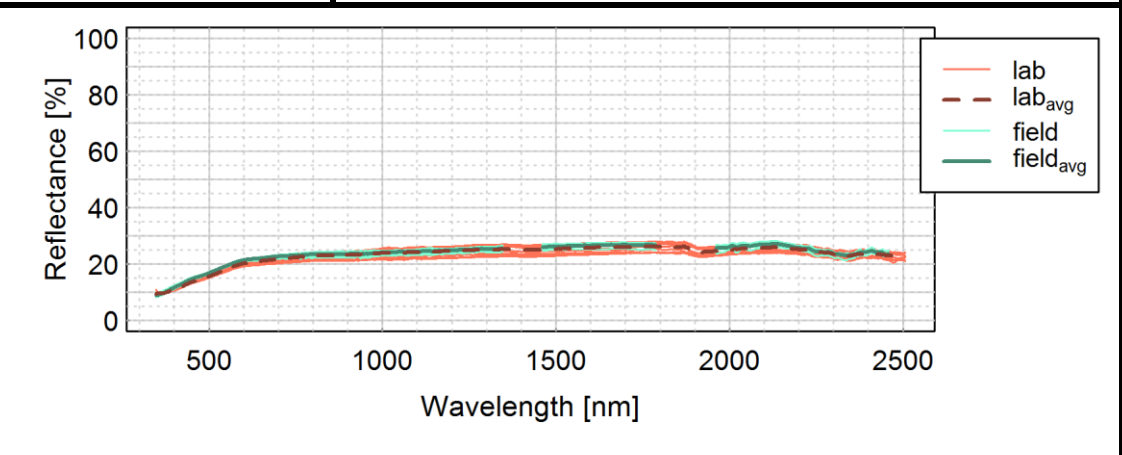
Class	Road asphalt
Material	Asphalt with stone aggregate
Colour	Black/grey
Status	Weathered
Dimension [mm]	60 x 100 x 200



ASPHALT_{A003}



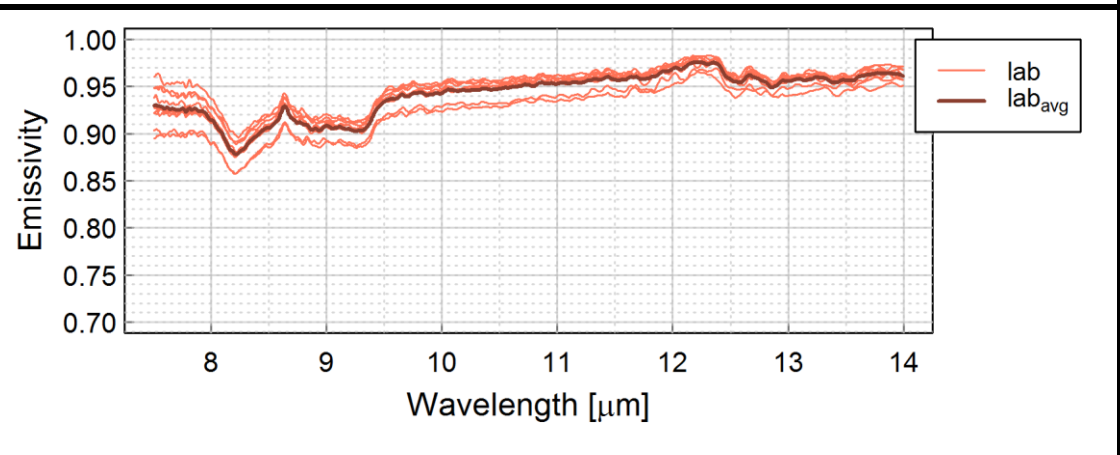
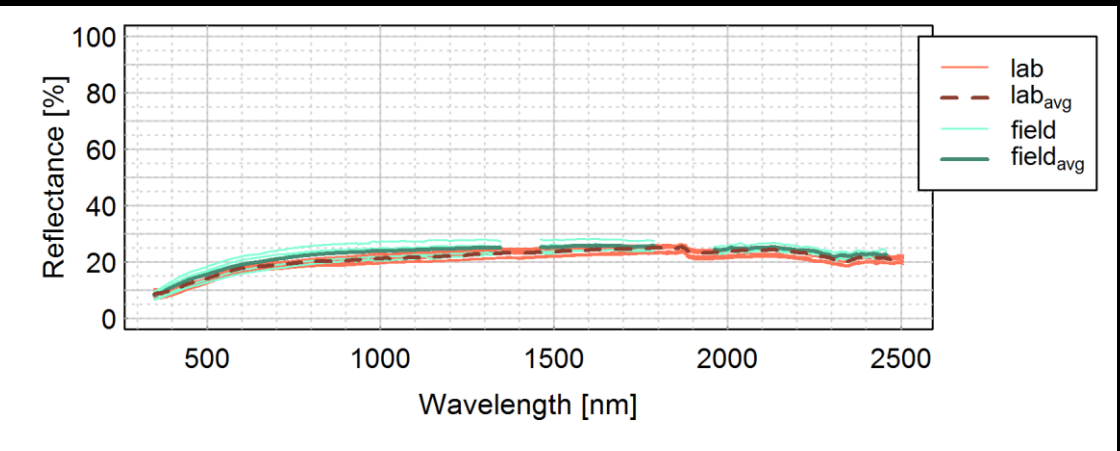
Class	Road asphalt
Material	Asphalt with stone aggregate
Colour	Black/grey
Status	Weathered
Dimension [mm]	60 x 90 x 150



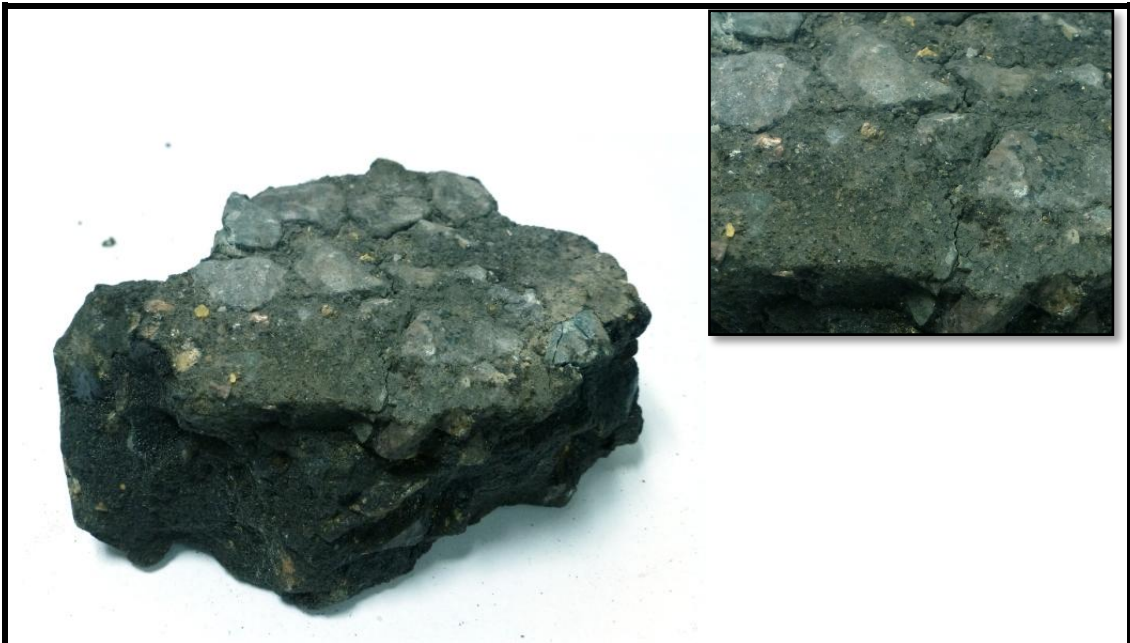
ASPHALT_{A004}



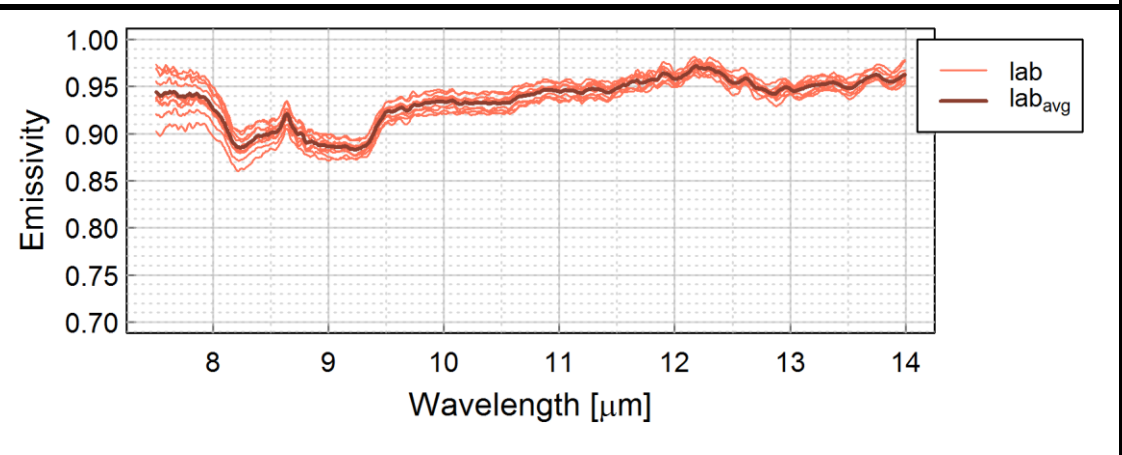
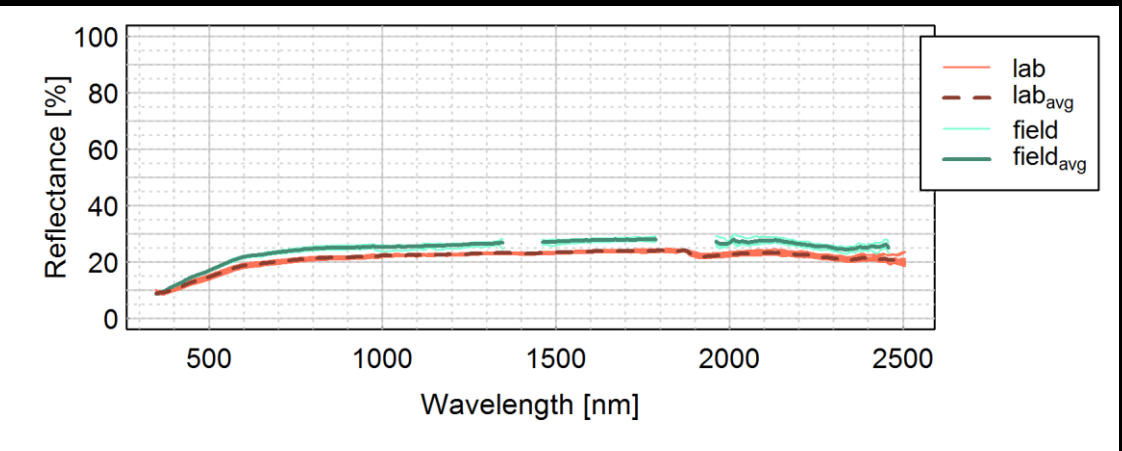
Class	Road asphalt
Material	Asphalt with stone aggregate
Colour	Black/grey
Status	Weathered
Dimension [mm]	120 x 50 x 170



ASPHALT_{A005}



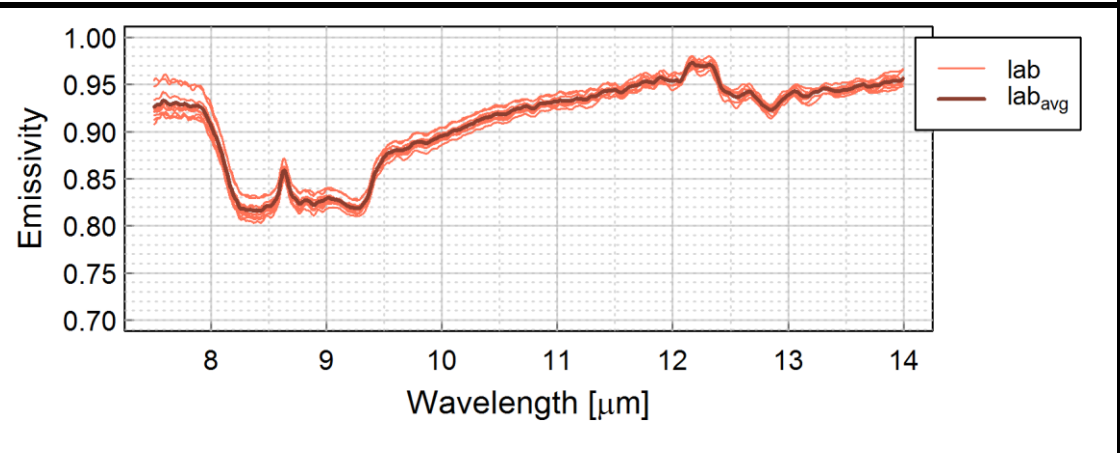
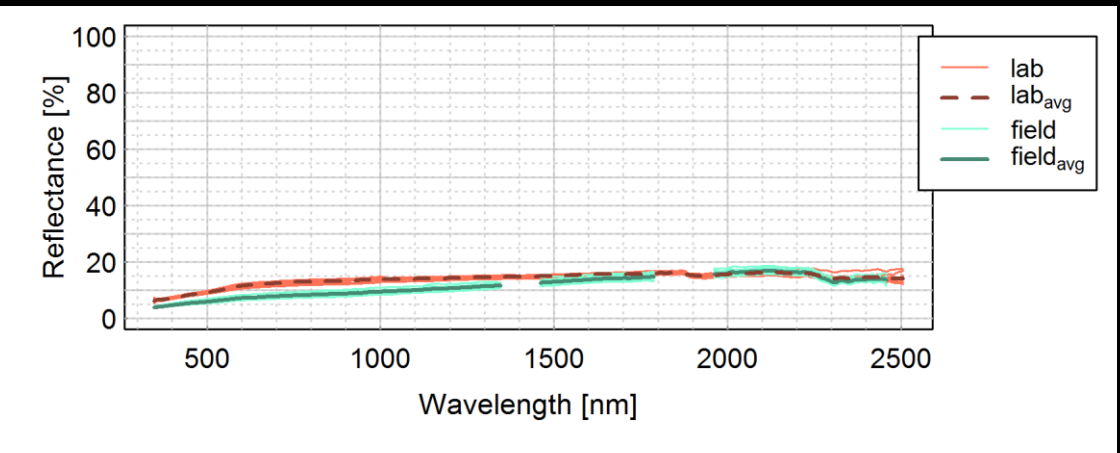
Class	Road asphalt
Material	Asphalt with stone aggregate
Colour	Black/grey
Status	Weathered
Dimension [mm]	55 x 75 x 130



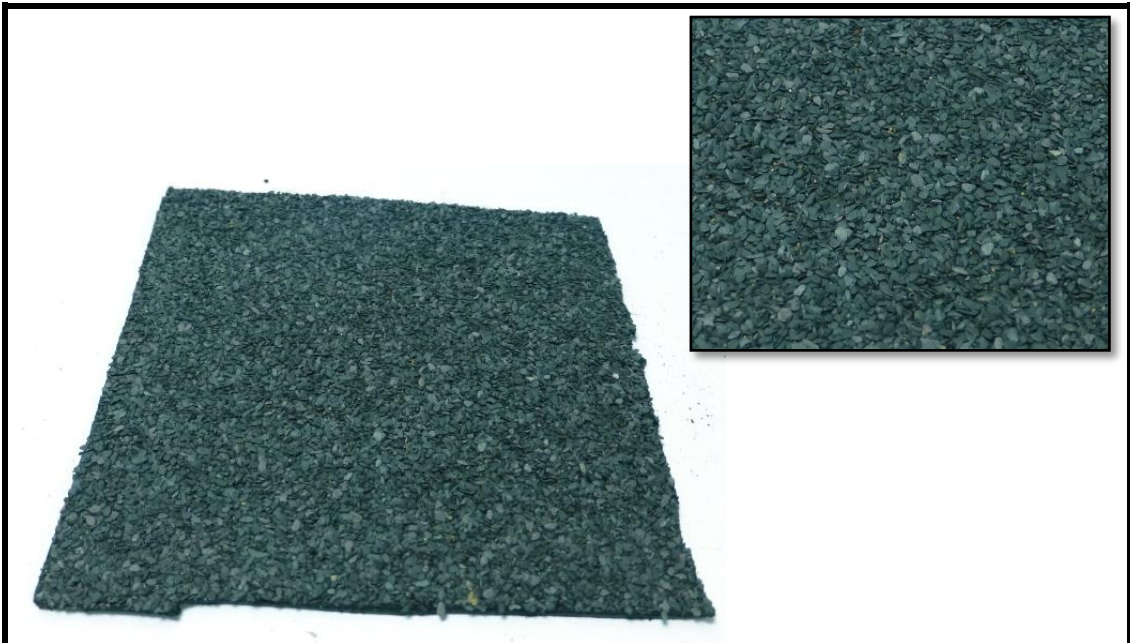
ASPHALT A006



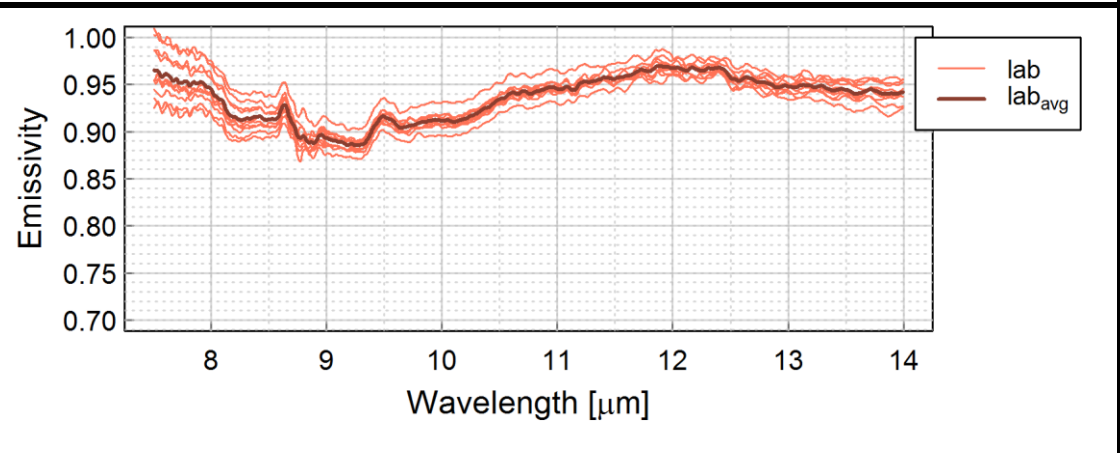
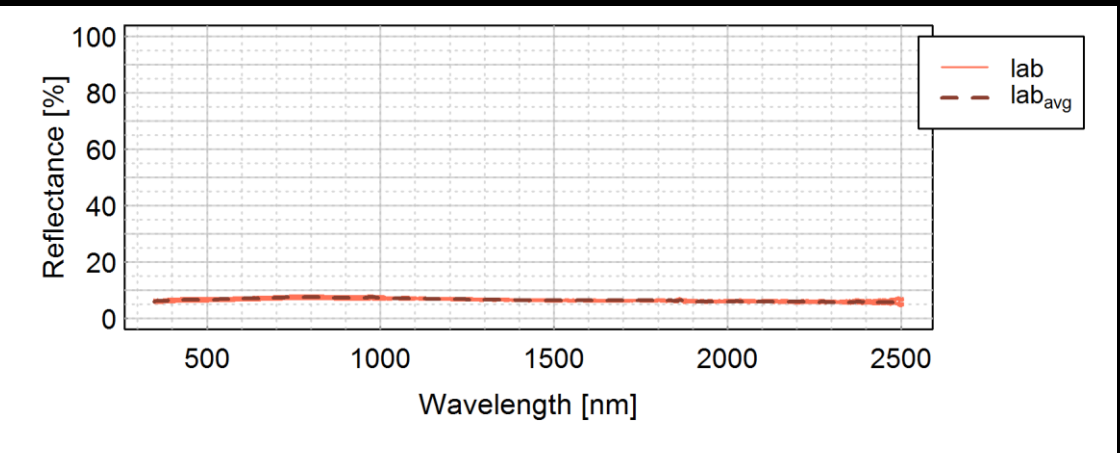
Class	Road asphalt
Material	Asphalt with stone aggregate
Colour	Black/grey
Status	Weathered
Dimension [mm]	30 x 145 x 180



ASPHALT_{A007}



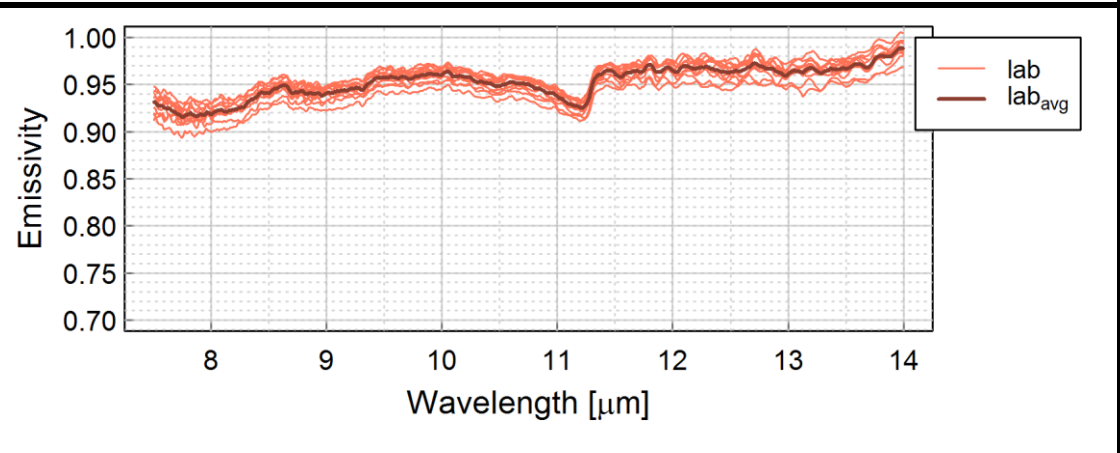
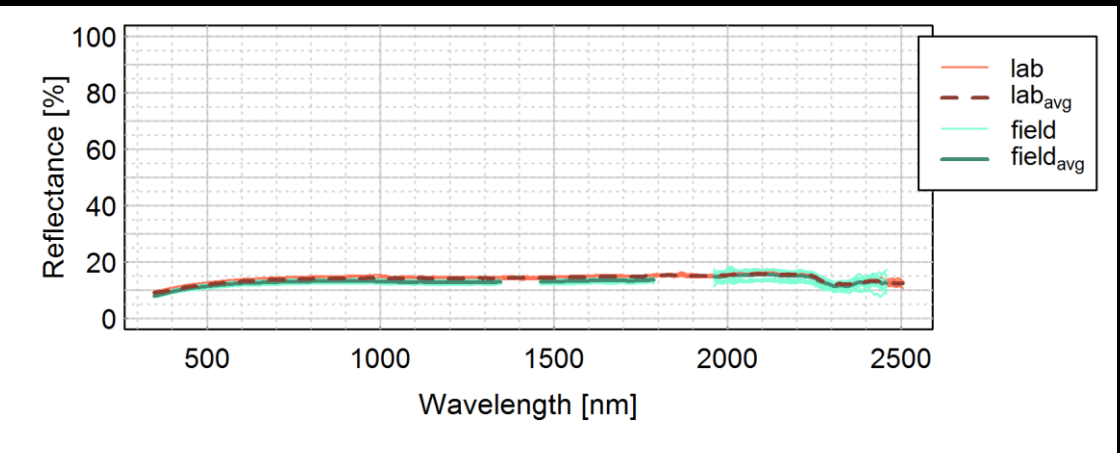
Class	Asphalt roofing
Material	Asphalt roofing shingle with slate chippings
Colour	Grey
Status	New
Dimension [mm]	165 x 3 x 170



ASPHALT_{A008}



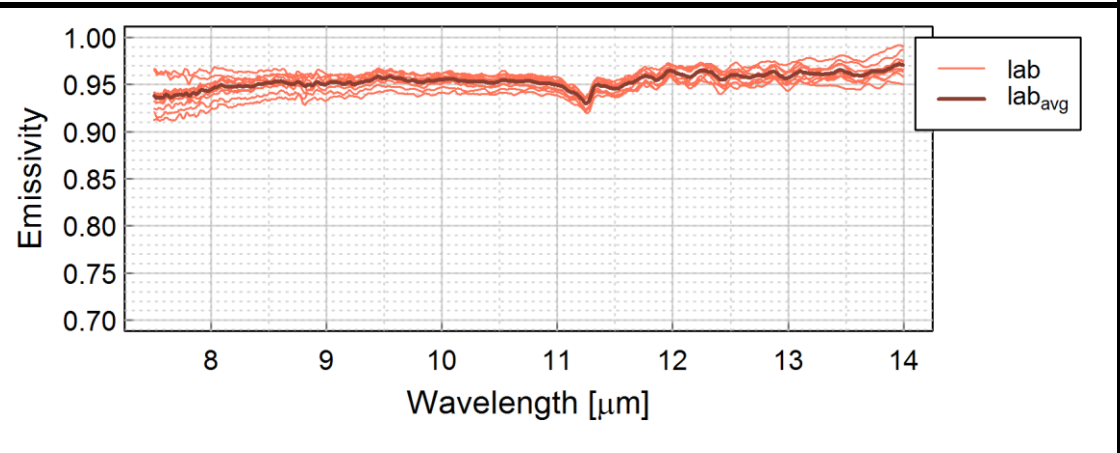
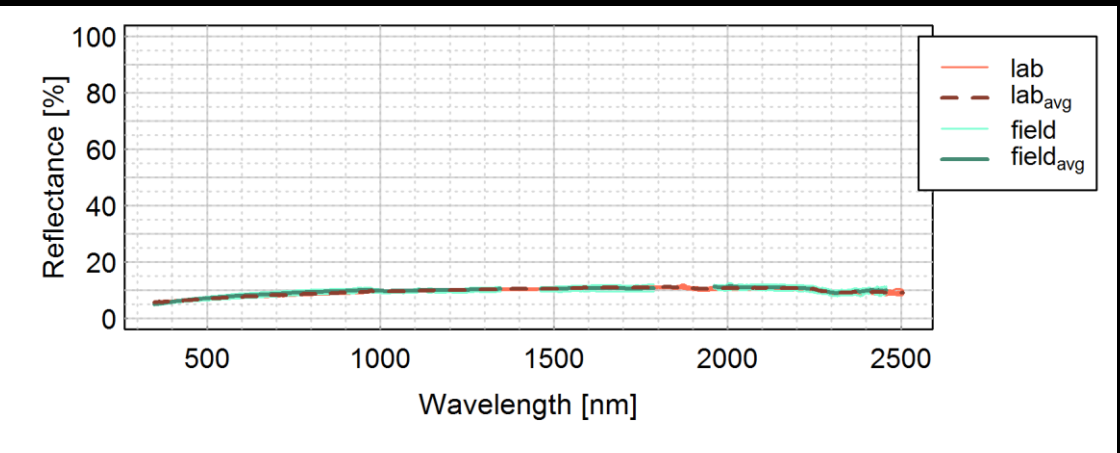
Class	Road asphalt
Material	Tarmac
Colour	Black
Status	Weathered
Dimension [mm]	140 x 25 x 140



ASPHALT_{A009}



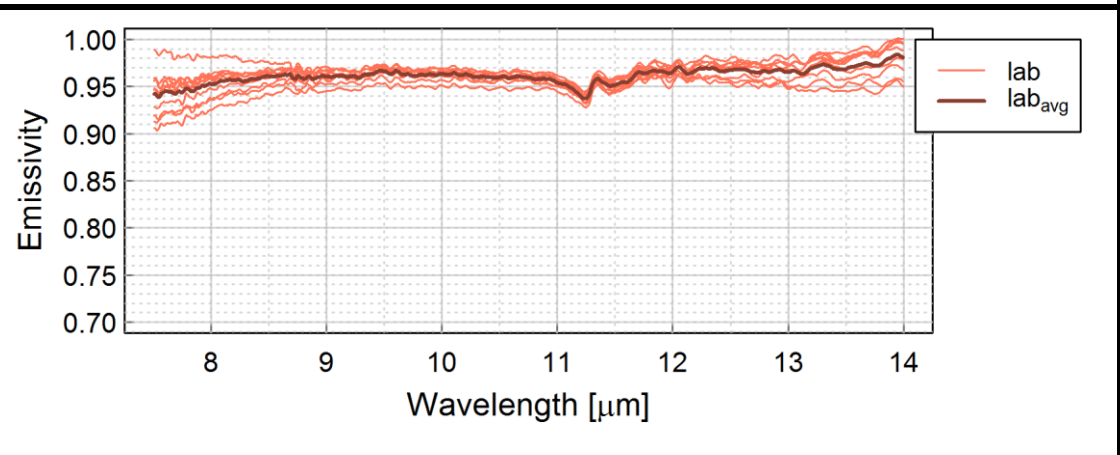
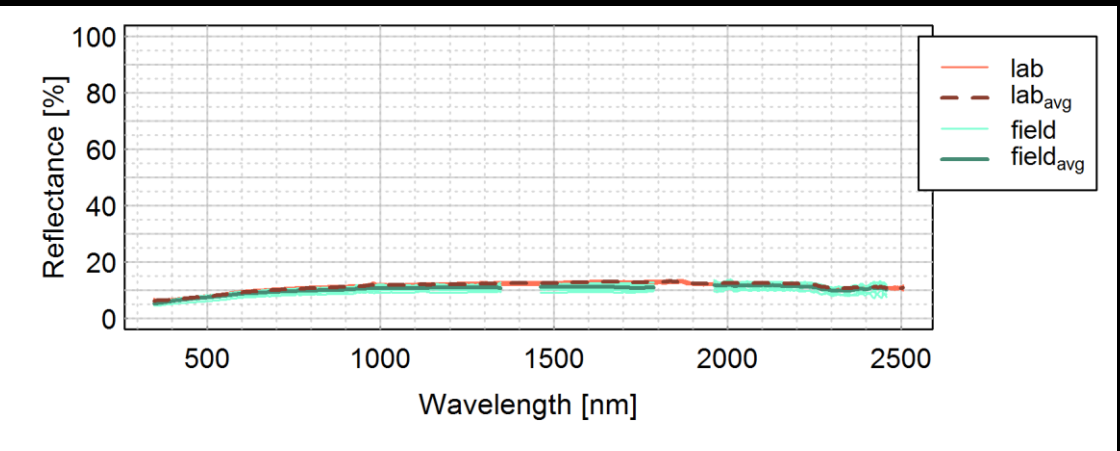
Class	Road asphalt
Material	Tarmac
Colour	Black
Status	Weathered
Dimension [mm]	60 x 21 x 85



ASPHALT_{A010}



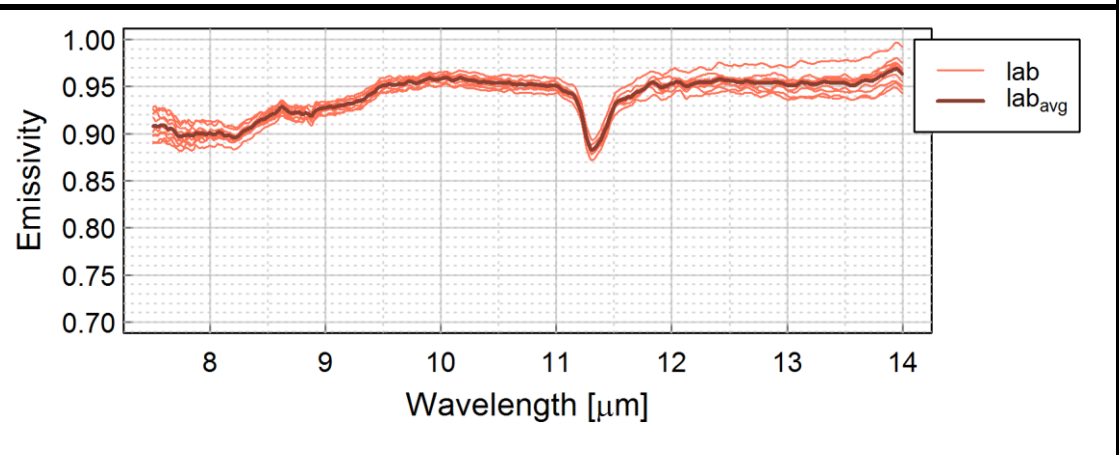
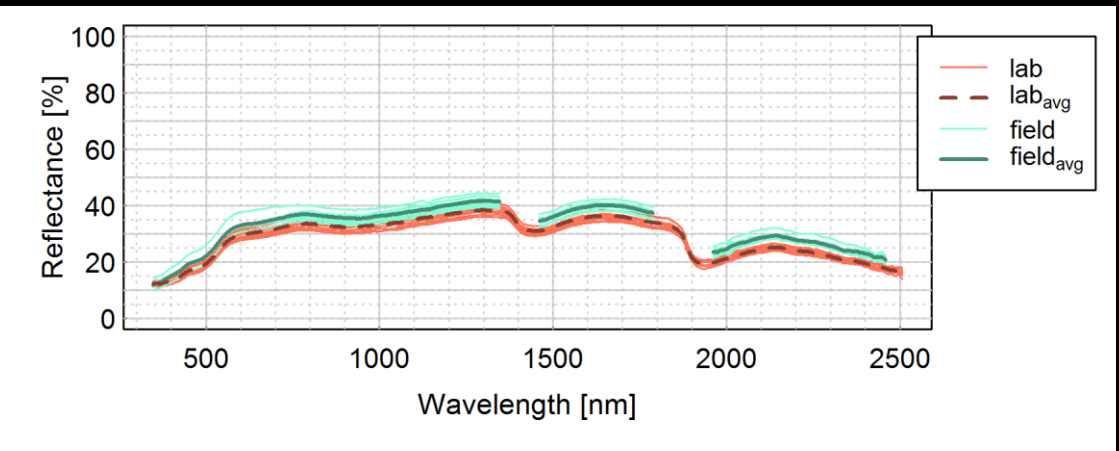
Class	Road asphalt
Material	Tarmac
Colour	Black
Status	Weathered
Dimension [mm]	65 x 21 x 80



CONCRETE/CEMENT_{C001}



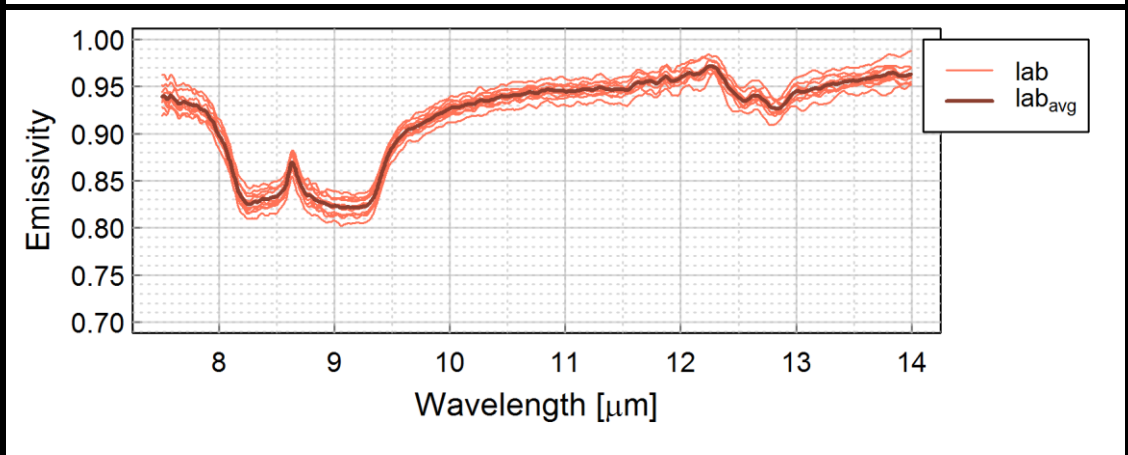
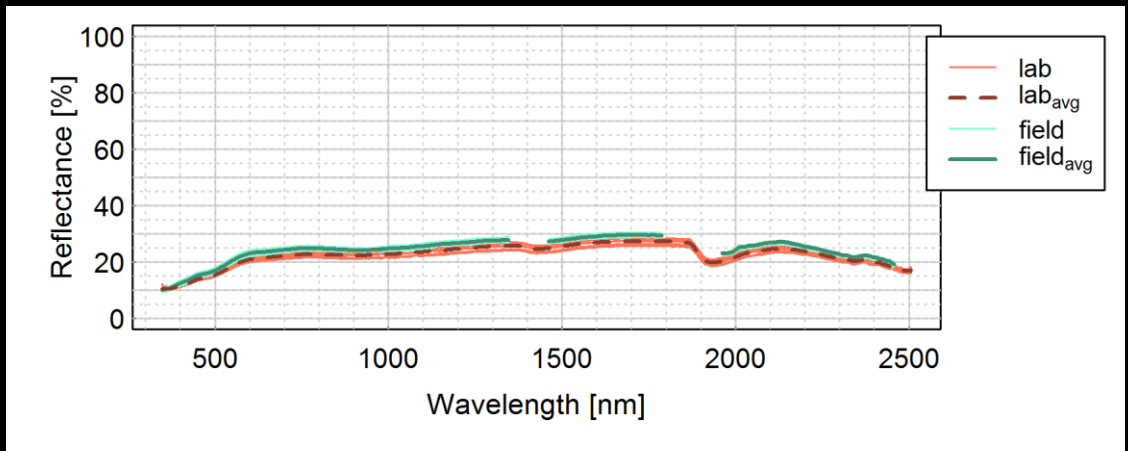
Class	Cement
Material	Cement
Colour	Grey/ochre
Status	Weathered
Dimension [mm]	367 x 60 x 140



CONCRETE/CEMENT_{C002}



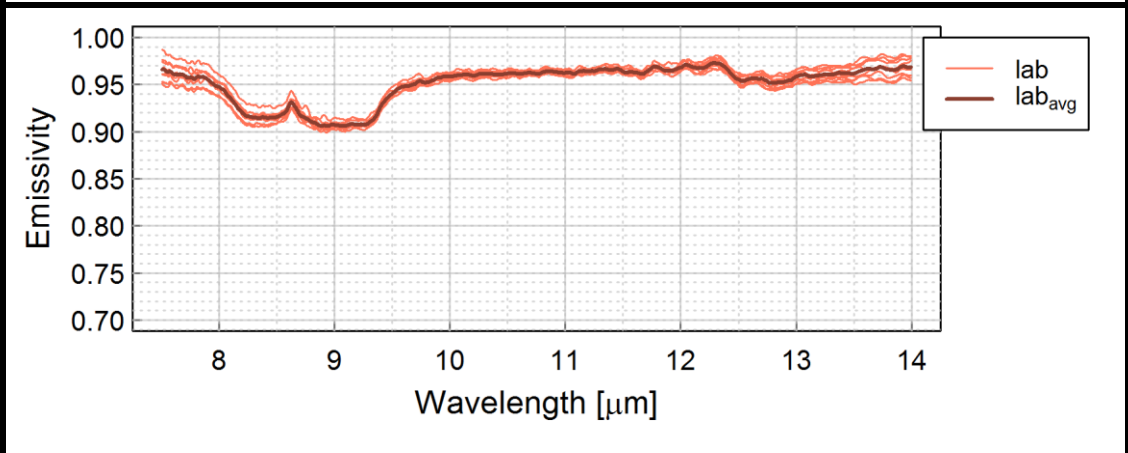
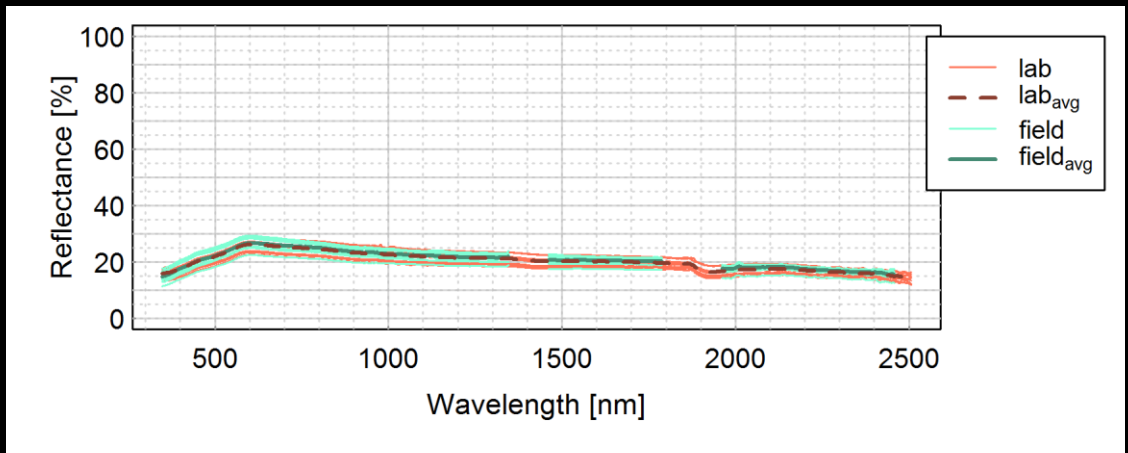
Class	Concrete
Material	Concrete with small aggregate
Colour	Grey/white
Status	New
Dimension [mm]	198 x 53 x 100



CONCRETE/CEMENT_{C003}



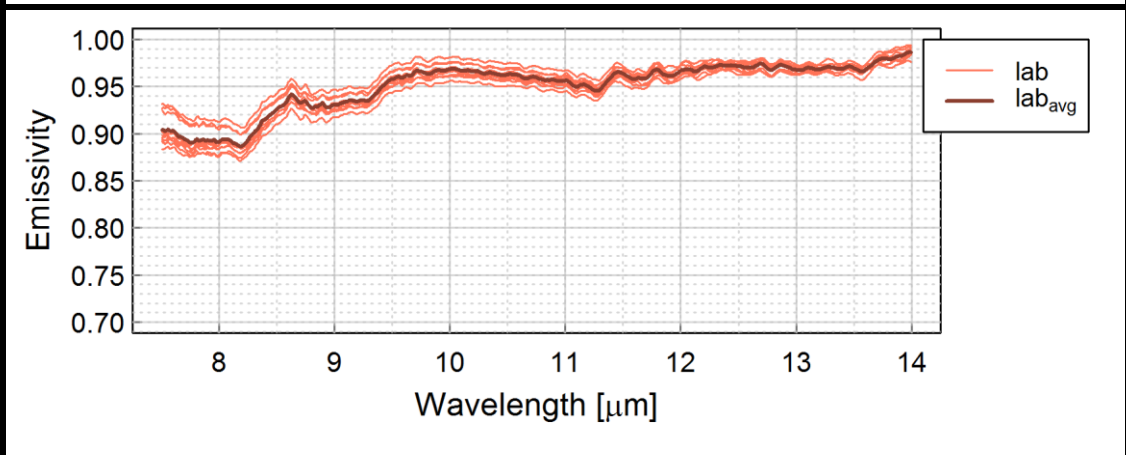
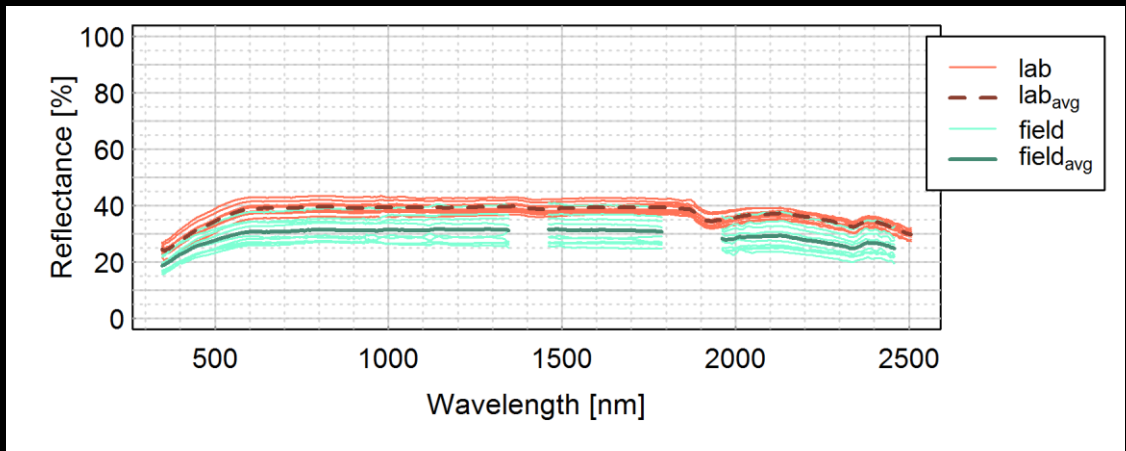
Class	Cement
Material	Cement
Colour	Grey
Status	Weathered
Dimension [mm]	268 x 44 x 148



CONCRETE/CEMENT_{C004}



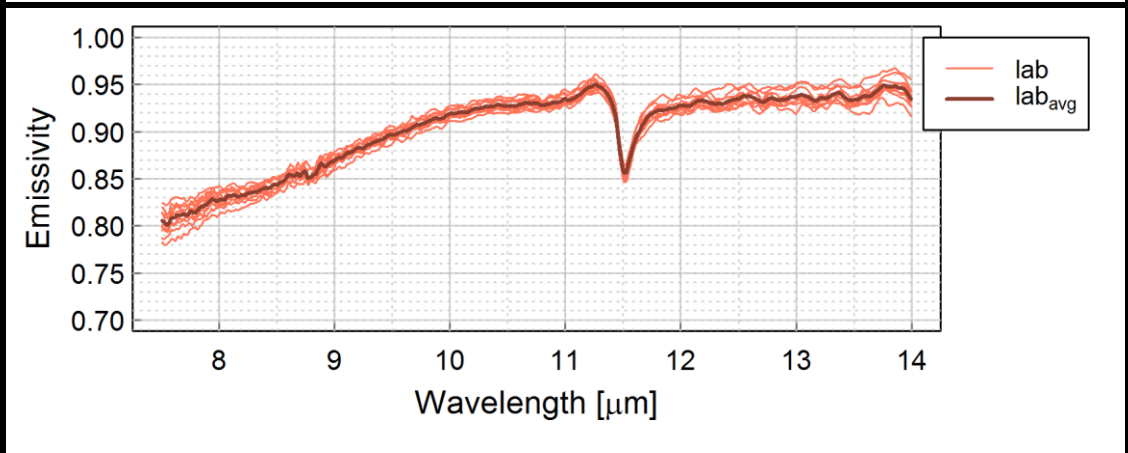
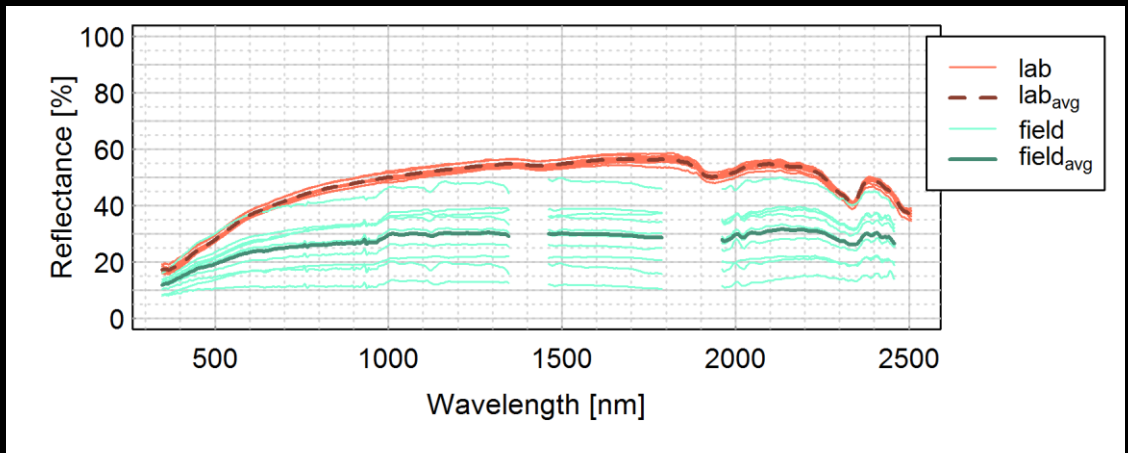
Class	Concrete
Material	Concrete with small stone aggregate
Colour	Grey
Status	Weathered
Dimension [mm]	110 x 72 x 85



CONCRETE/CEMENT_{C005}



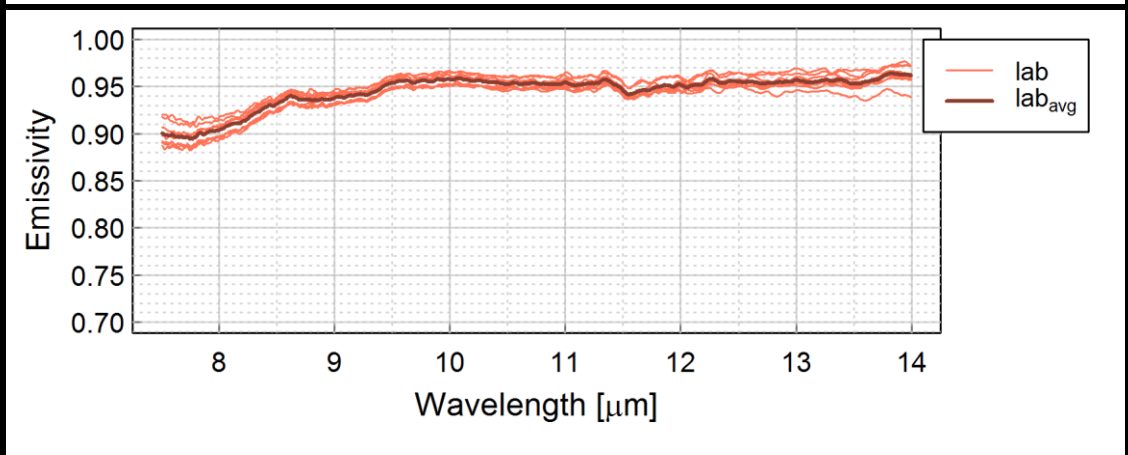
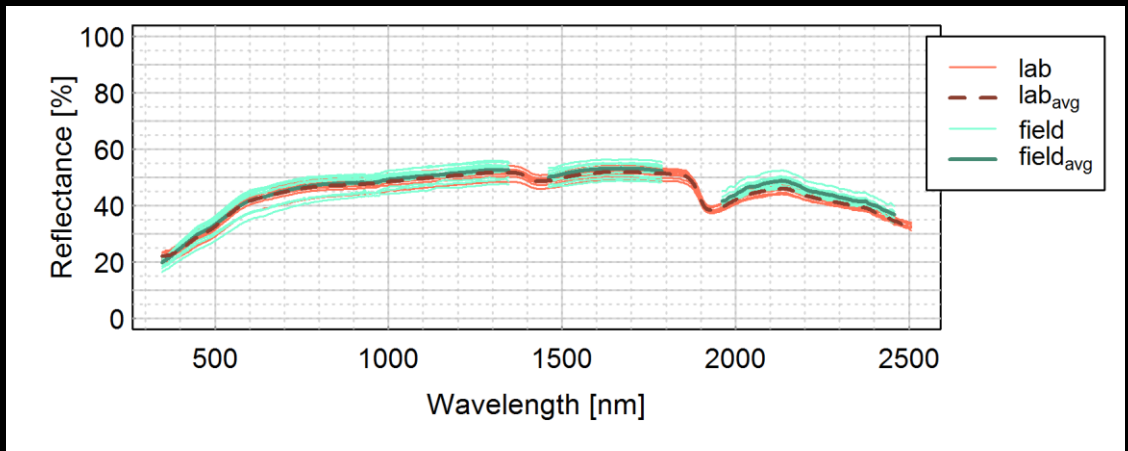
Class	Cement
Material	Cement
Colour	Grey
Status	Weathered
Dimension [mm]	80 x 45 x 115



CONCRETE/CEMENT_{C006}



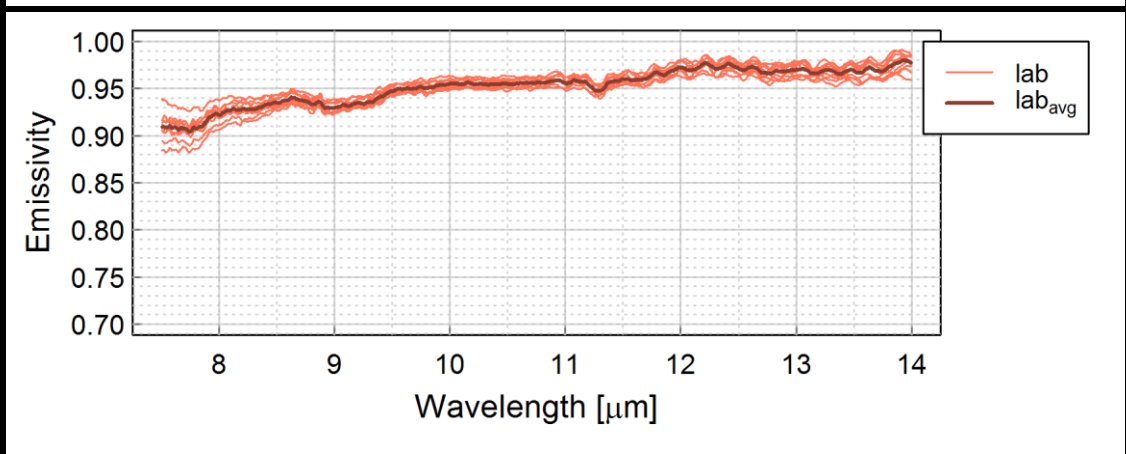
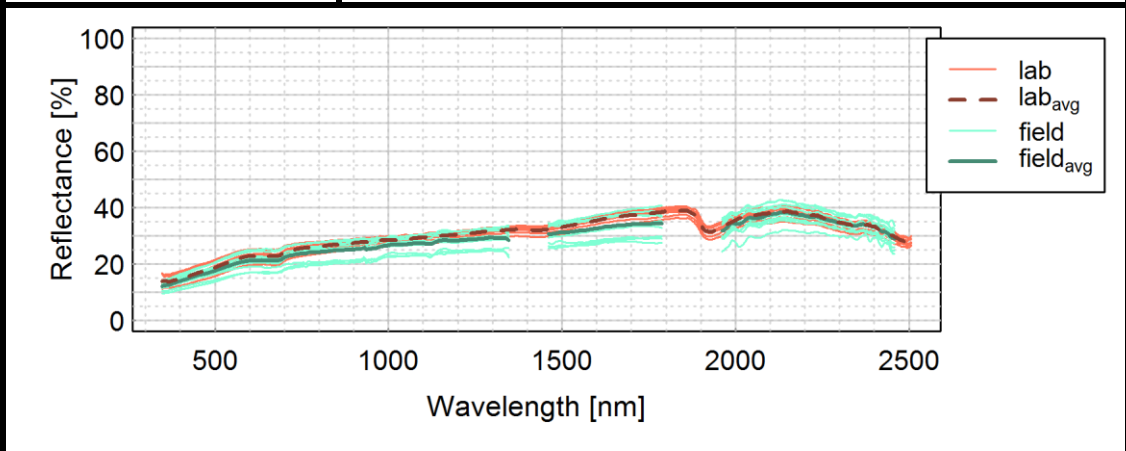
Class	Concrete
Material	Concrete with small stone aggregate
Colour	White
Status	Weathered
Dimension [mm]	90 x 150 x 250



CONCRETE/CEMENT_{C008}



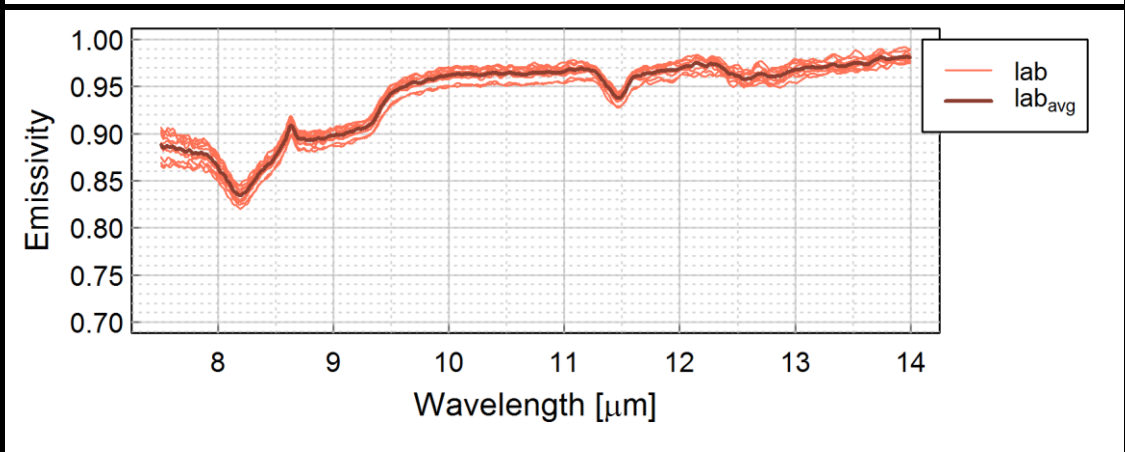
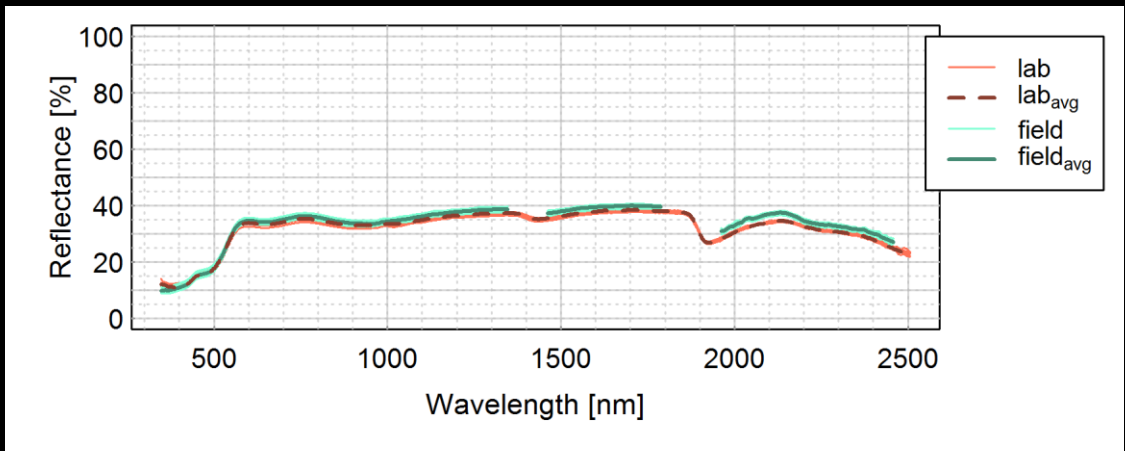
Class	Concrete
Material	Concrete
Colour	Grey
Status	Weathered/rough
Dimension [mm]	120 x 20 x 108



BRICK_{B001}



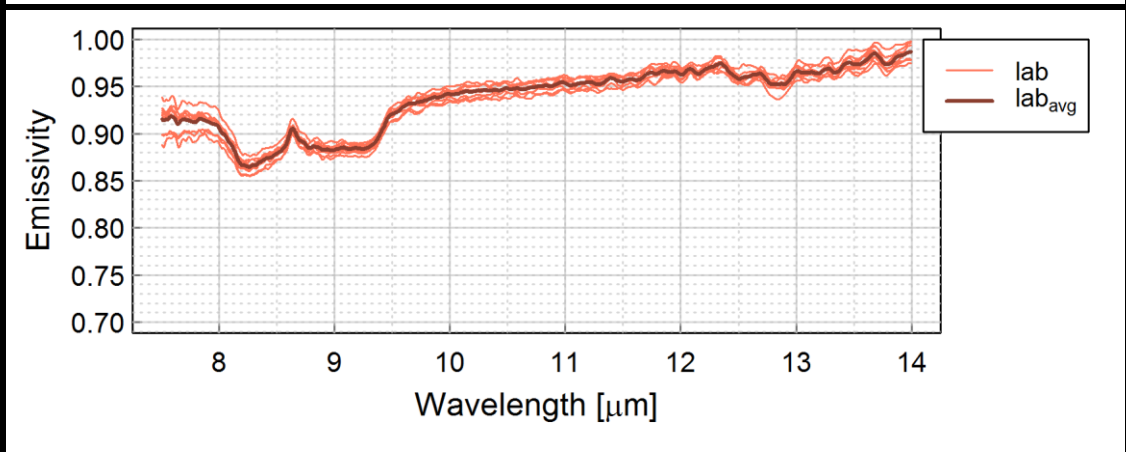
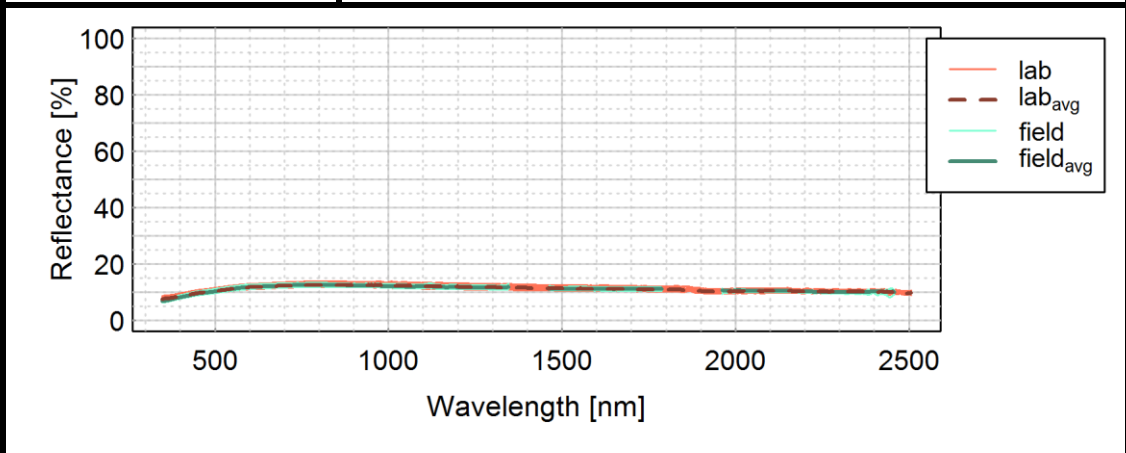
Class	Cement brick
Material	Cement
Colour	Yellow
Status	New
Dimension [mm]	200 x 60 x 100



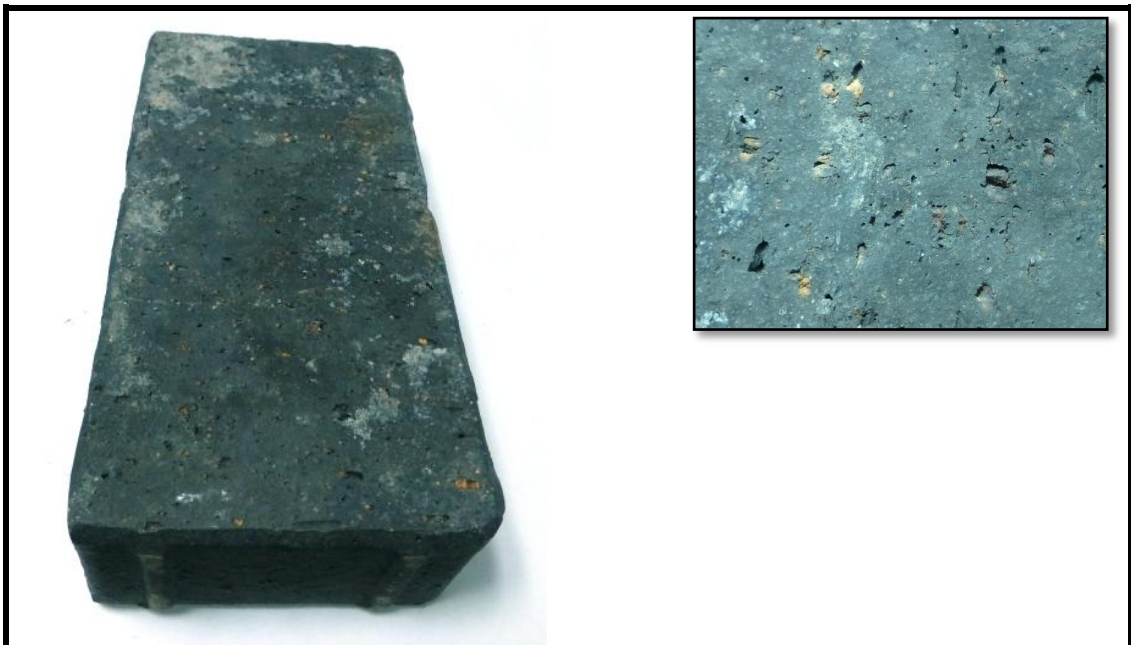
BRICK_{B002}



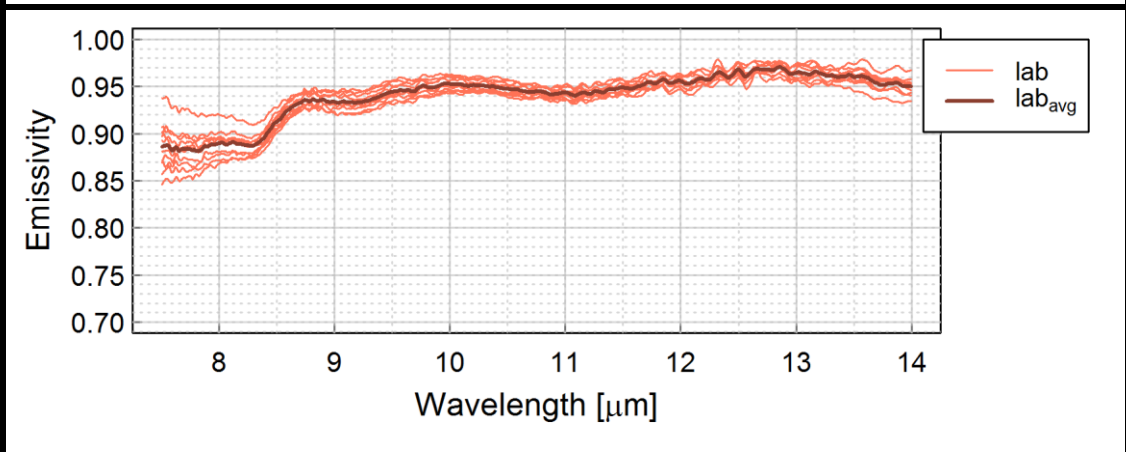
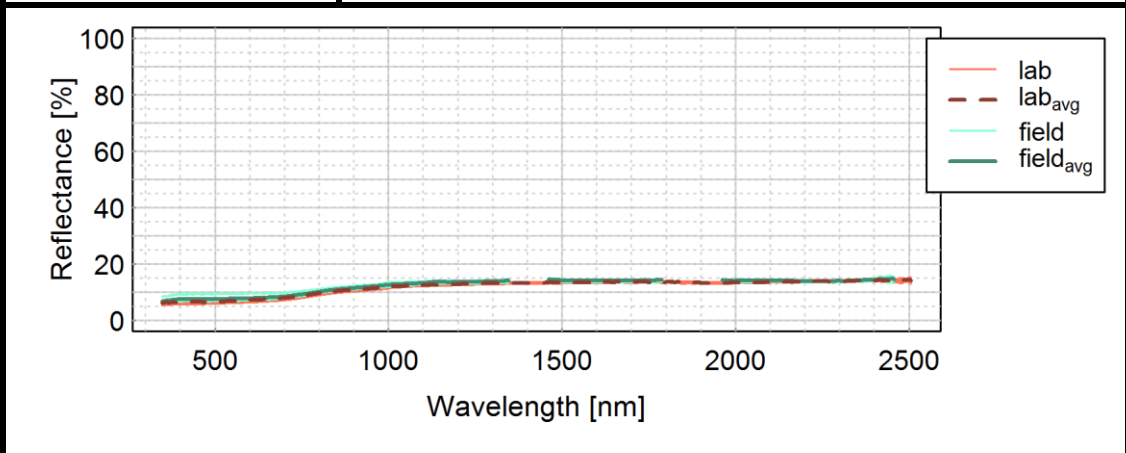
Class	Cement brick
Material	Cement
Colour	Black/light grey
Status	New, sandy
Dimension [mm]	200 x 58 x 98



BRICK_{B003}



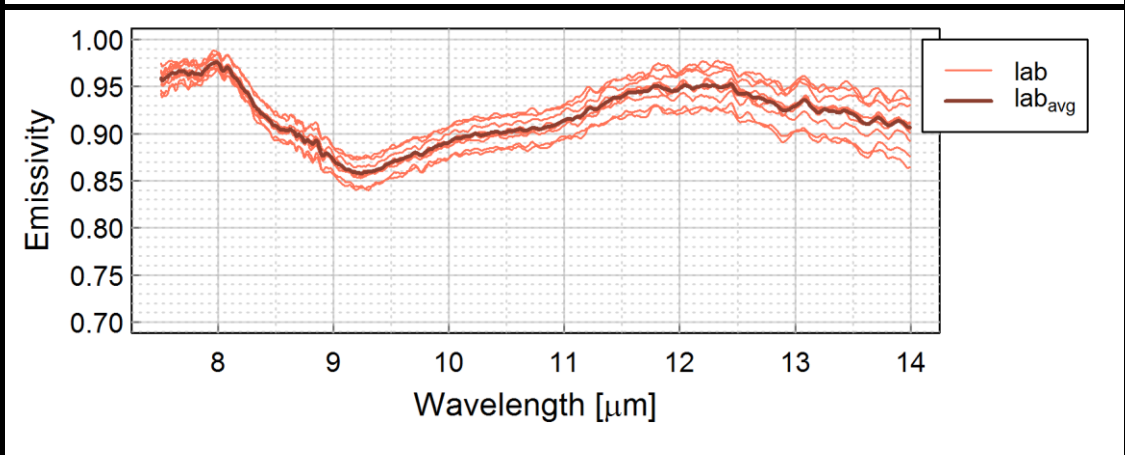
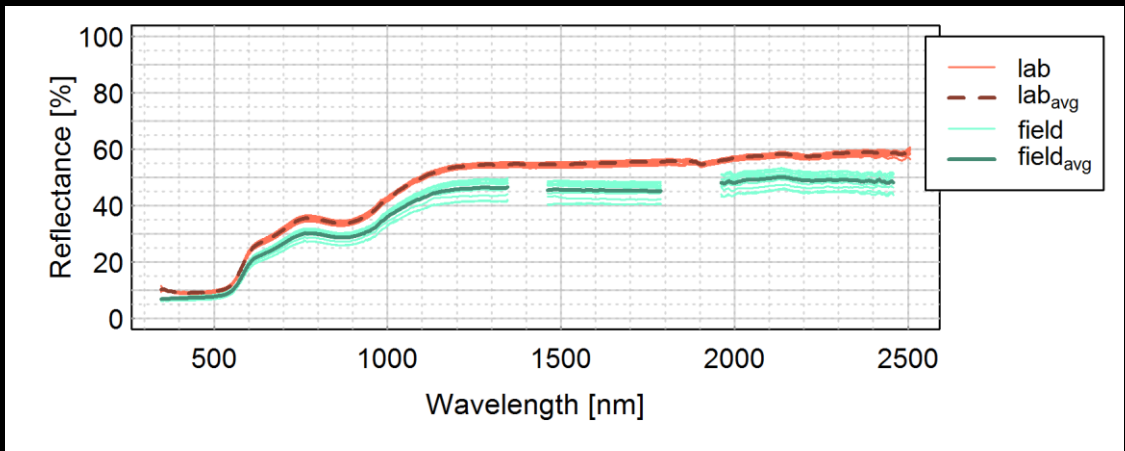
Class	Cement brick
Material	Cement
Colour	Black
Status	New
Dimension [mm]	195 x 52 x 98



BRICK_{B004}



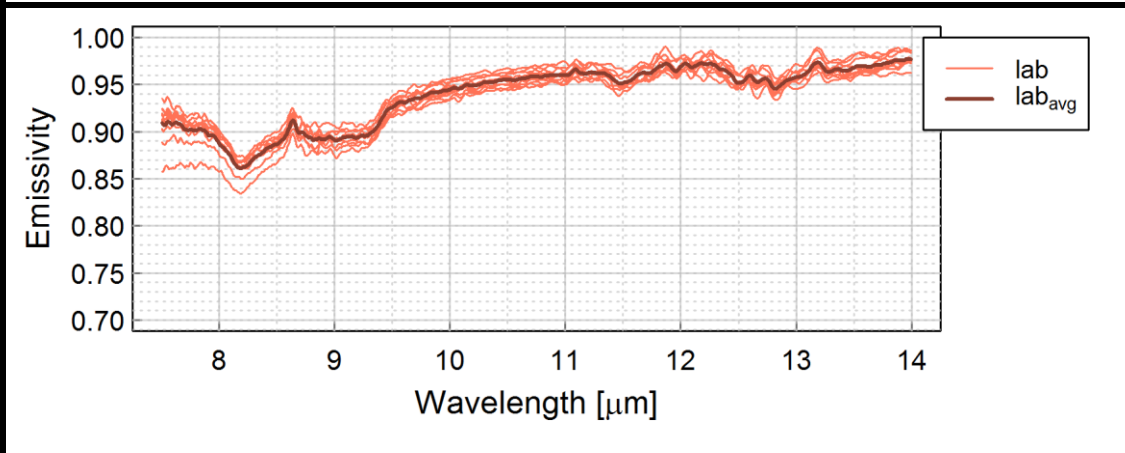
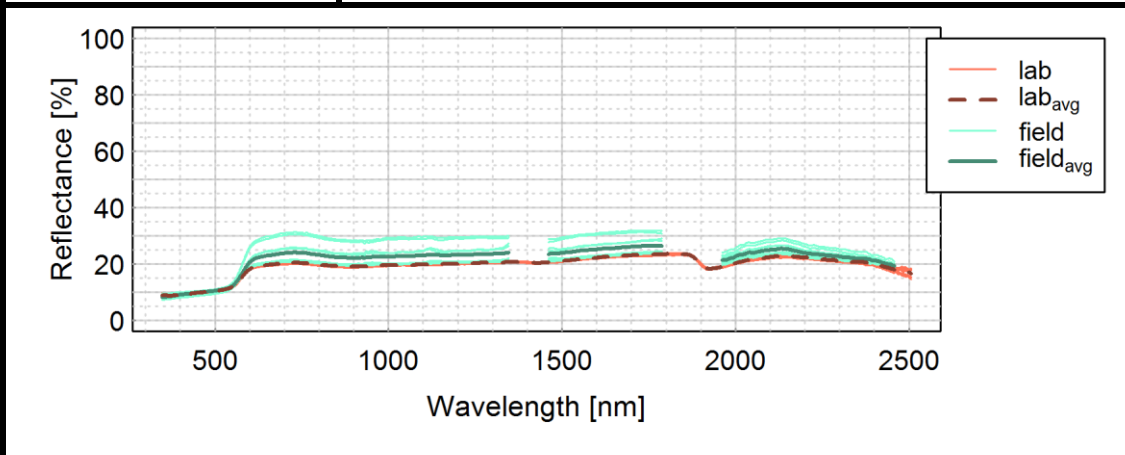
Class	Ceramic brick
Material	Ceramic with cement
Colour	Red
Status	Weathered
Dimension [mm]	62 x 35 x 52



BRICK_{B005}



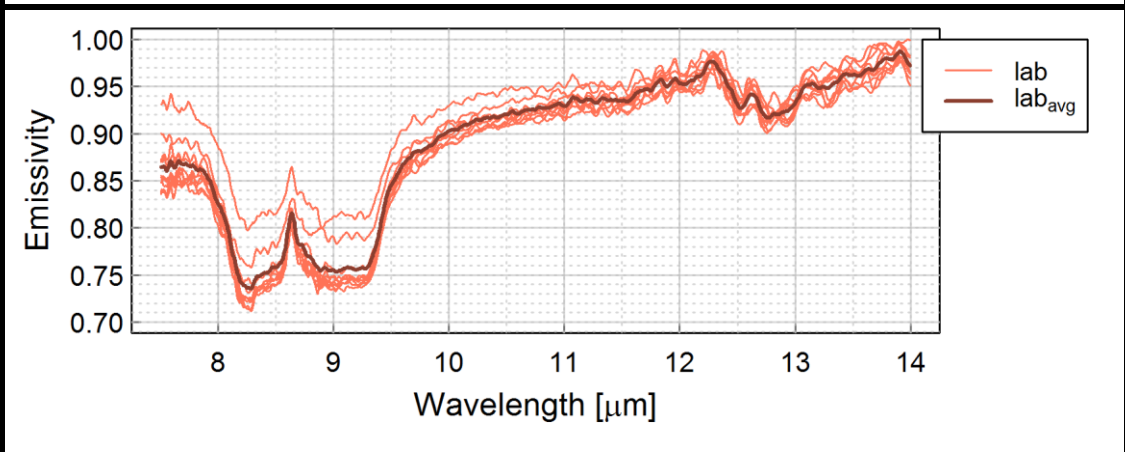
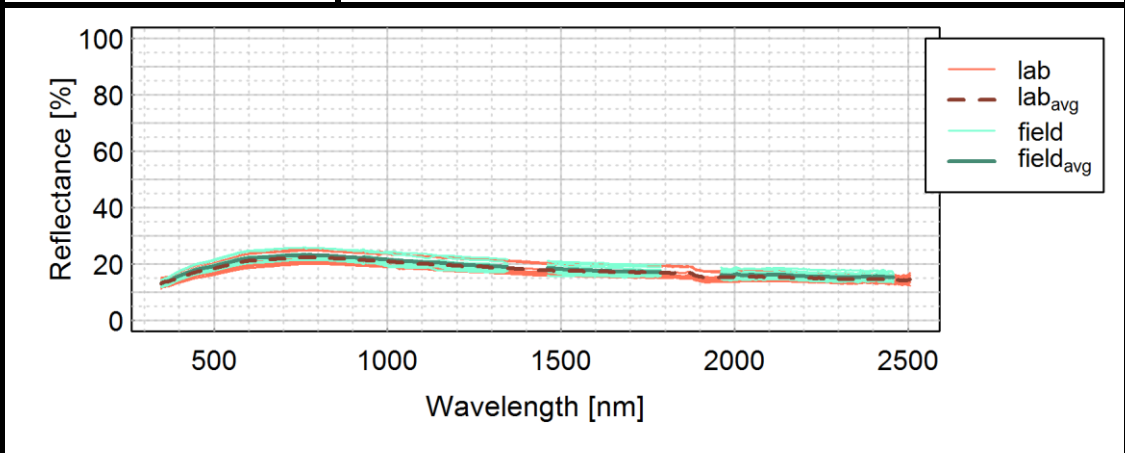
Class	Cement brick
Material	Cement
Colour	Red
Status	Weathered
Dimension [mm]	138 x 60 x 100



BRICK_{B006}



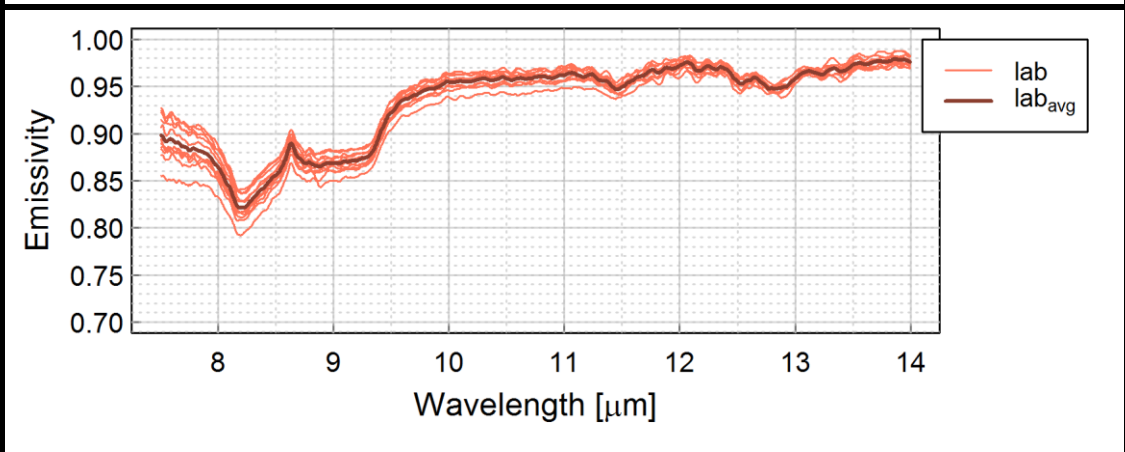
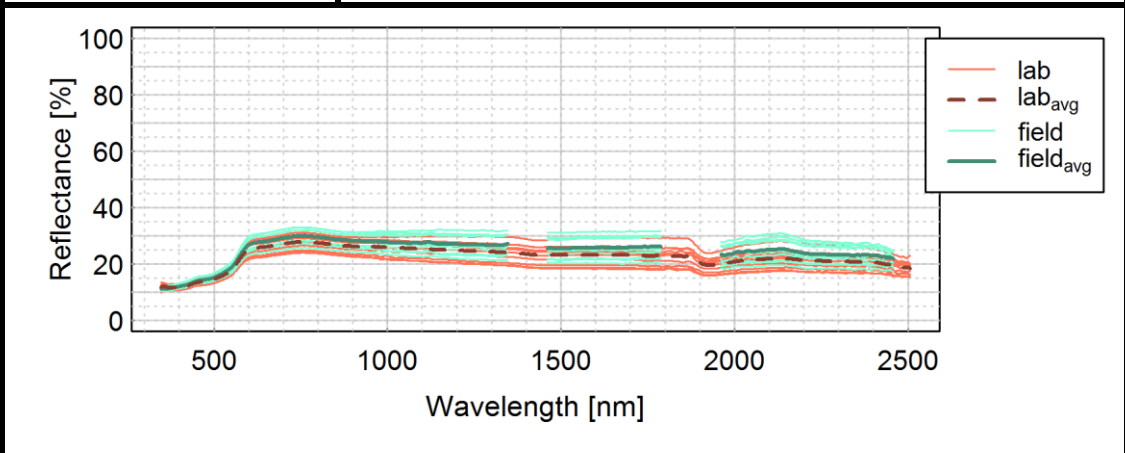
Class	Cement brick
Material	Cement
Colour	Black
Status	Sandy
Dimension [mm]	200 x 60 x 100



BRICK_{B007}



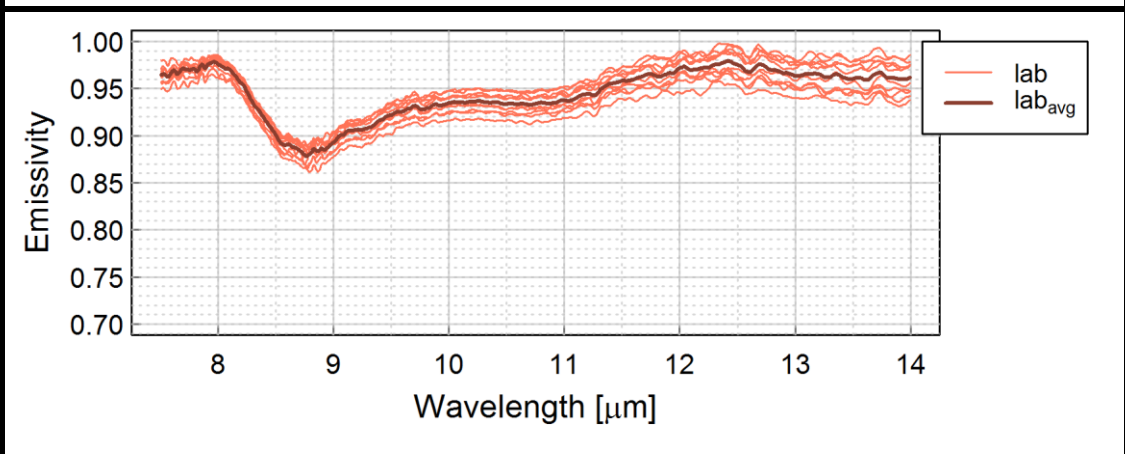
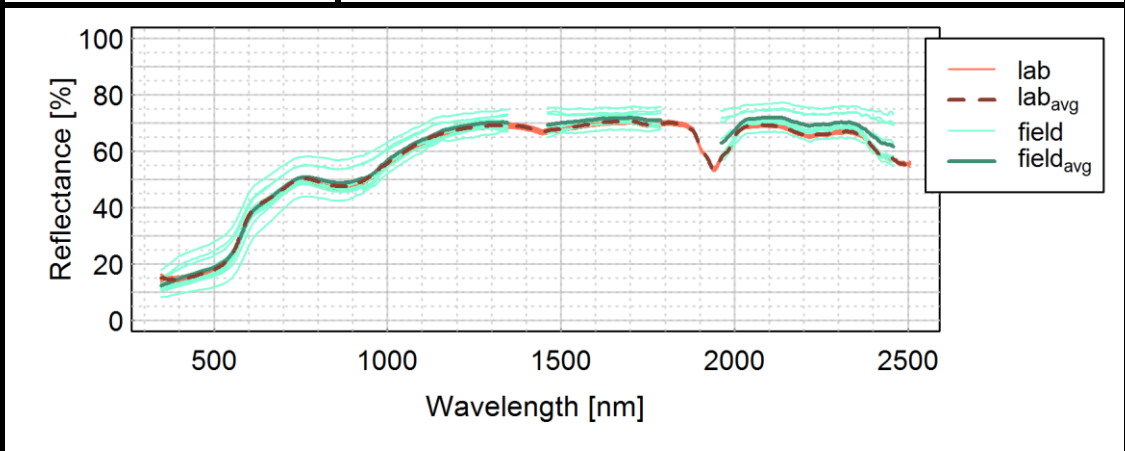
Class	Cement brick
Material	Cement
Colour	Light red
Status	New
Dimension [mm]	200 x 60 x 100



BRICK_{B008}



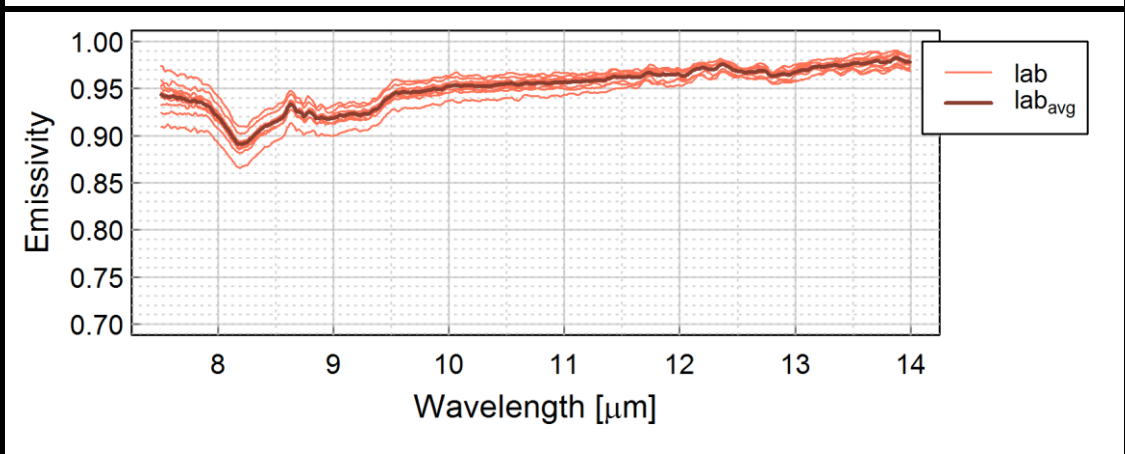
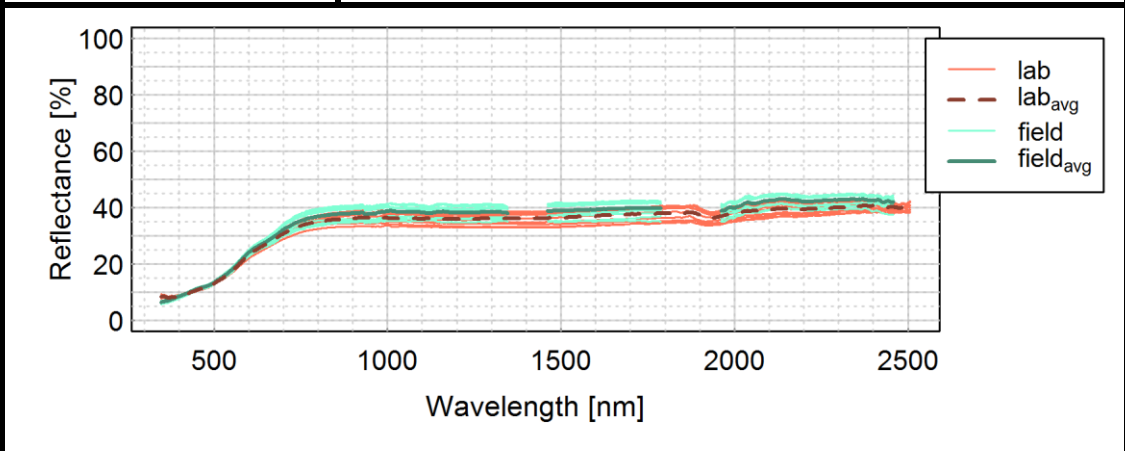
Class	Ceramic brick
Material	Ceramic
Colour	Light red
Status	New
Dimension [mm]	212 x 63 x 100



BRICK_{B009}



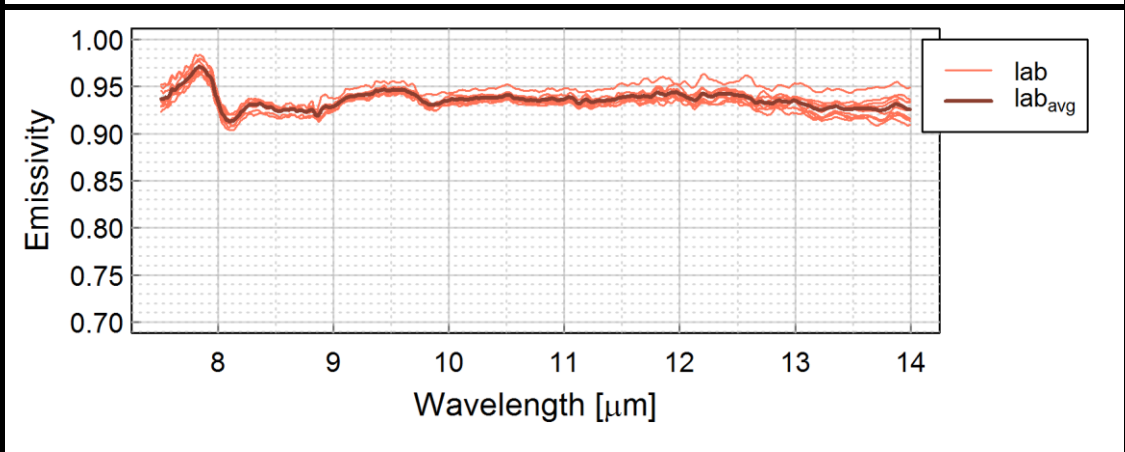
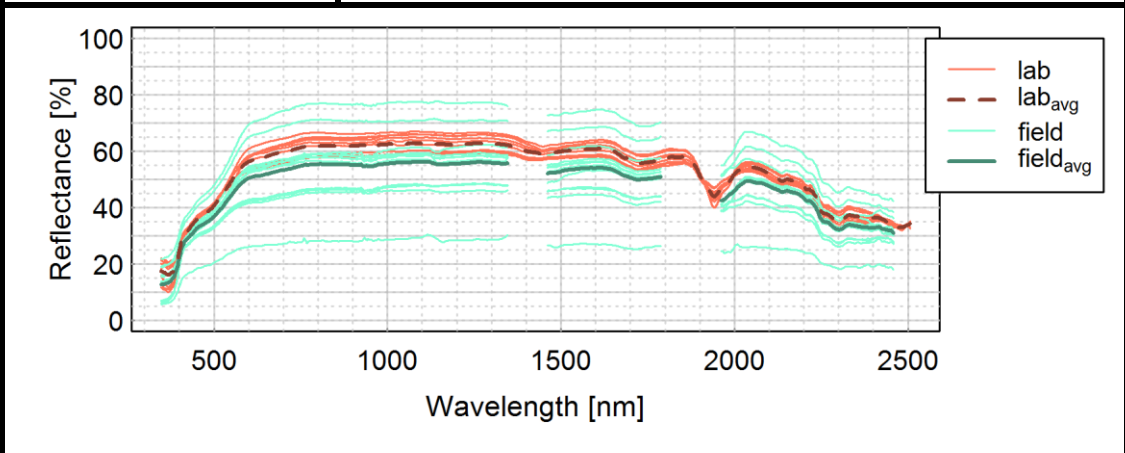
Class	Cement brick
Material	Cement
Colour	Red
Status	Weathered
Dimension [mm]	110 x 63 x 105



BRICK_{B010}



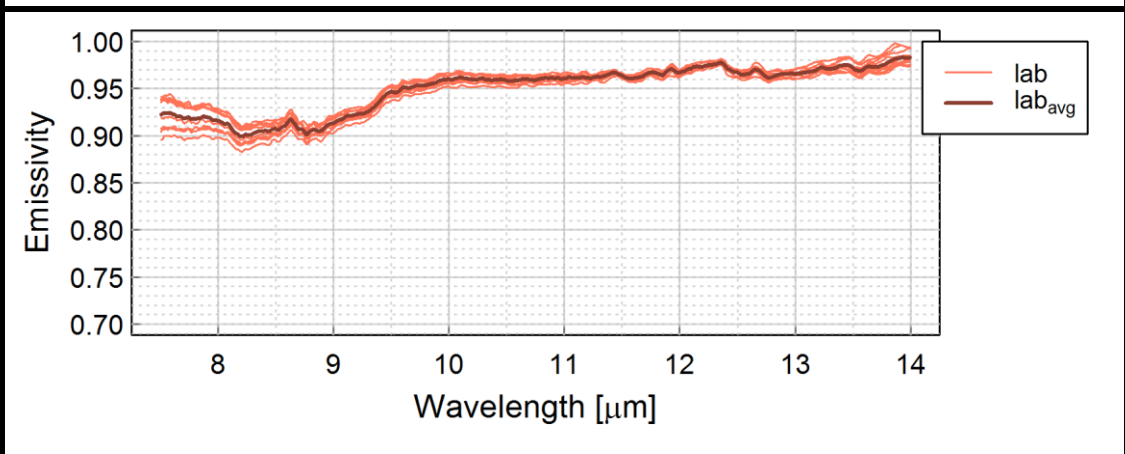
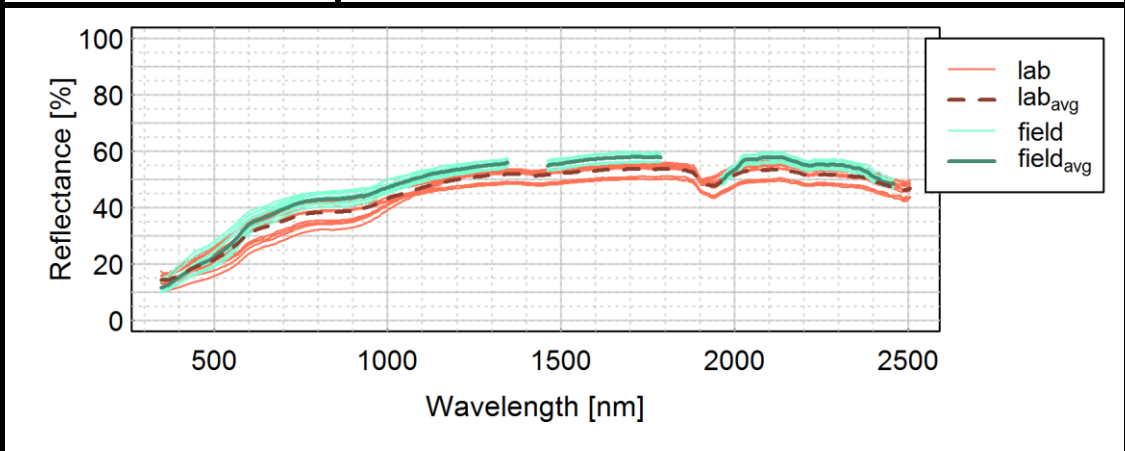
Class	Ceramic brick
Material	Ceramic with paint
Colour	Red with beige and grey paint
Status	Weathered
Dimension [mm]	110 x 80 x 100



BRICK_{B011}



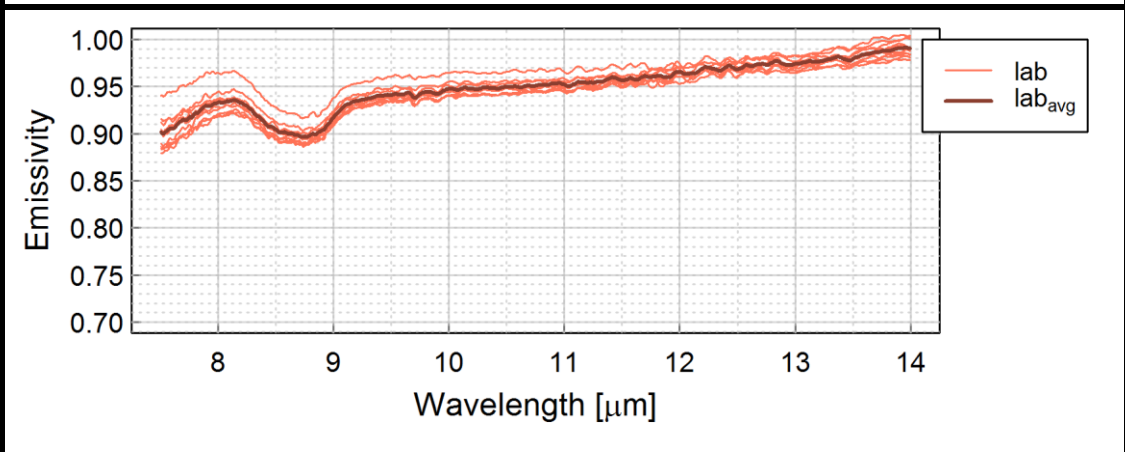
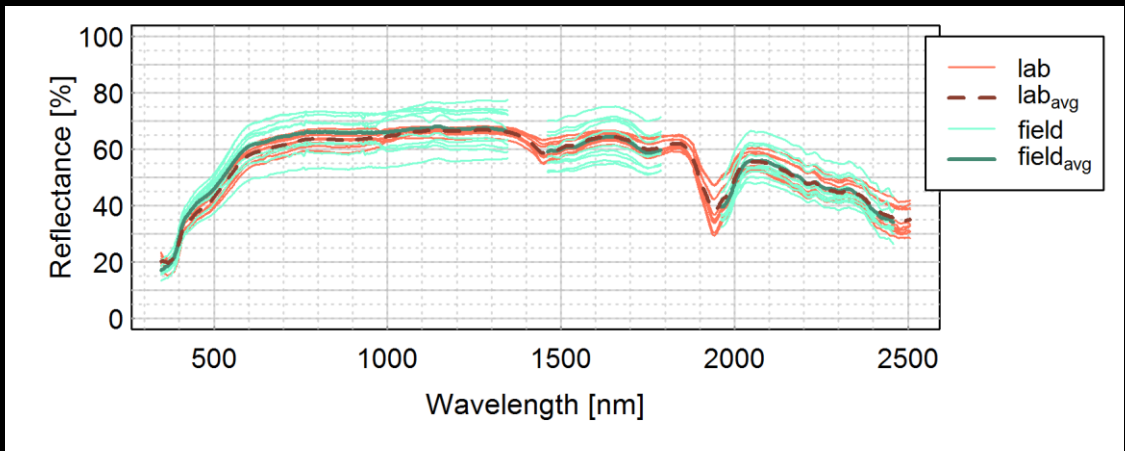
Class	Ceramic brick
Material	Ceramic brick with cement
Colour	Red/grey
Status	Weathered
Dimension [mm]	230 x 63 x 100



BRICK_{B012}



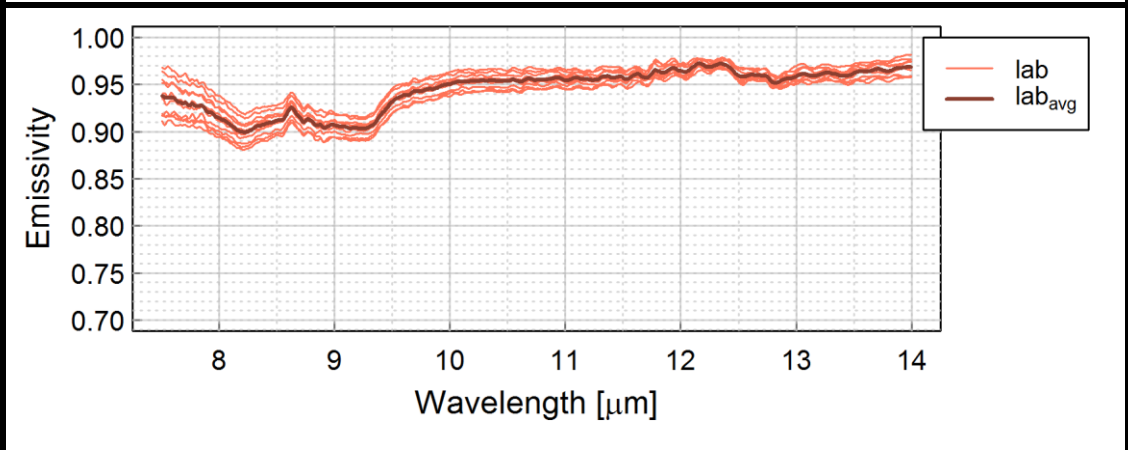
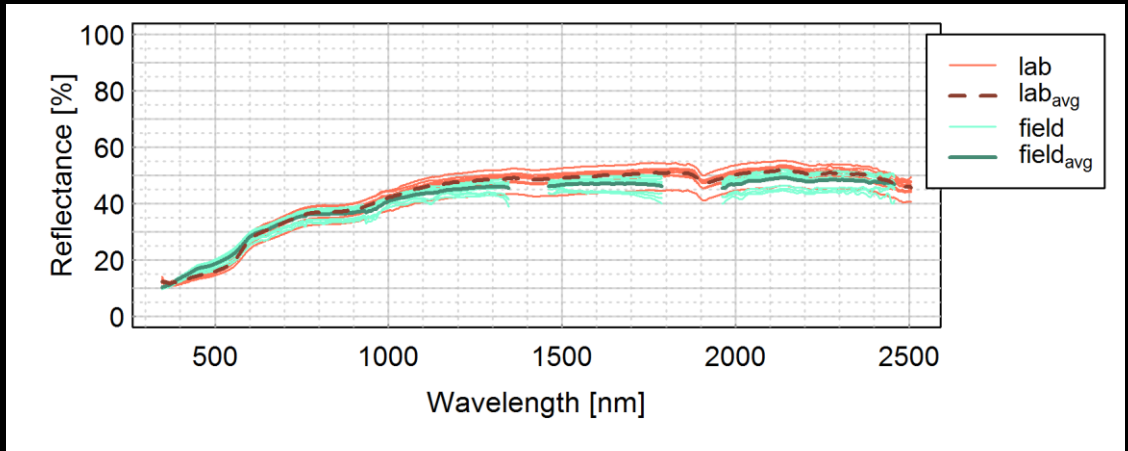
Class	Ceramic brick
Material	Ceramic brick with paint
Colour	Red with white paint
Status	Weathered
Dimension [mm]	112 x 70 x 107



BRICK_{B013}



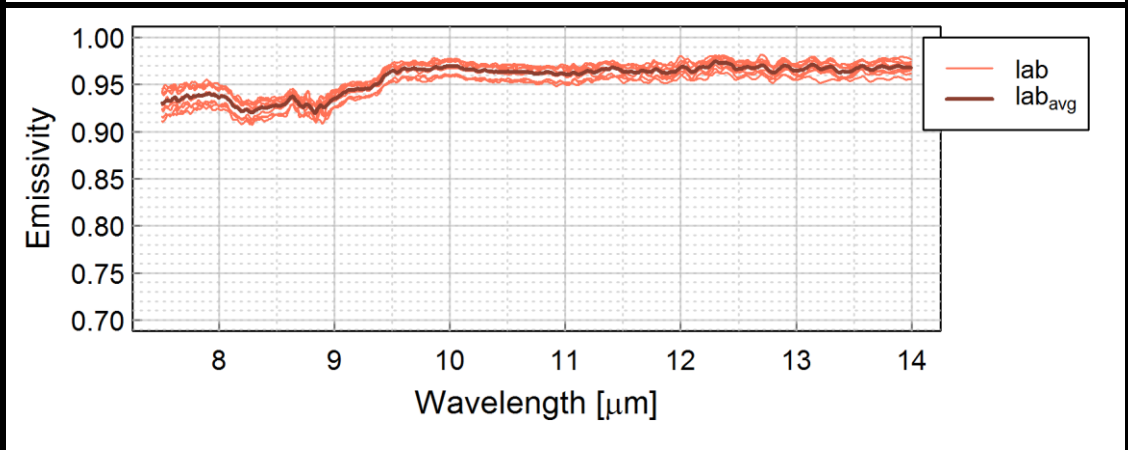
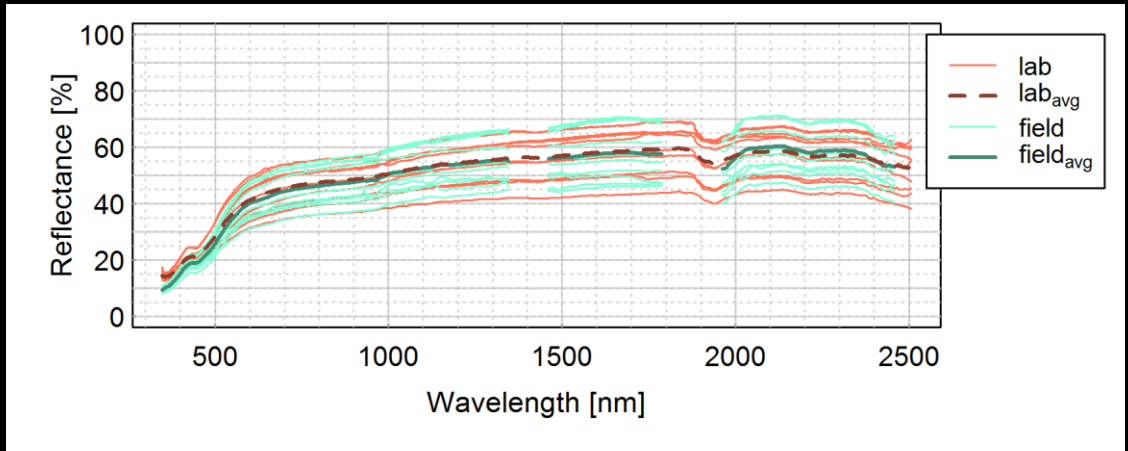
Class	Ceramic brick
Material	Ceramic brick
Colour	Red
Status	Weathered
Dimension [mm]	46 x 60 x 100



BRICK_{B014}



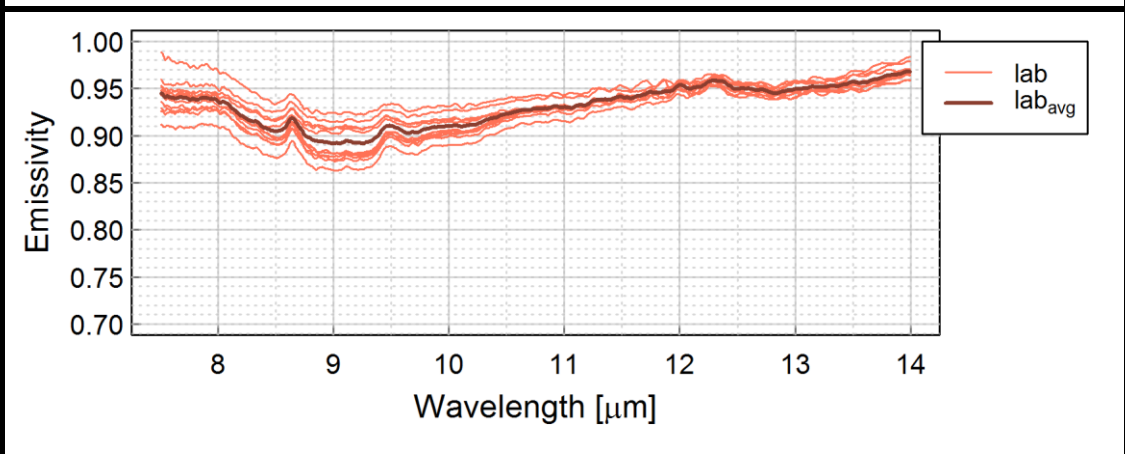
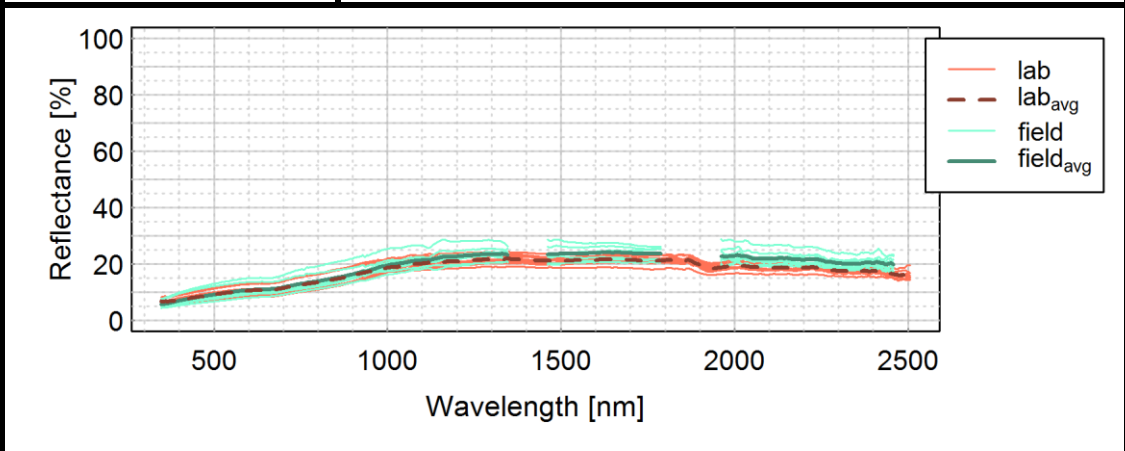
Class	Ceramic brick
Material	Ceramic brick
Colour	Yellow/grey
Status	Weathered
Dimension [mm]	130 x 68 x 90



ROOFING SHINGLE_{L001u}



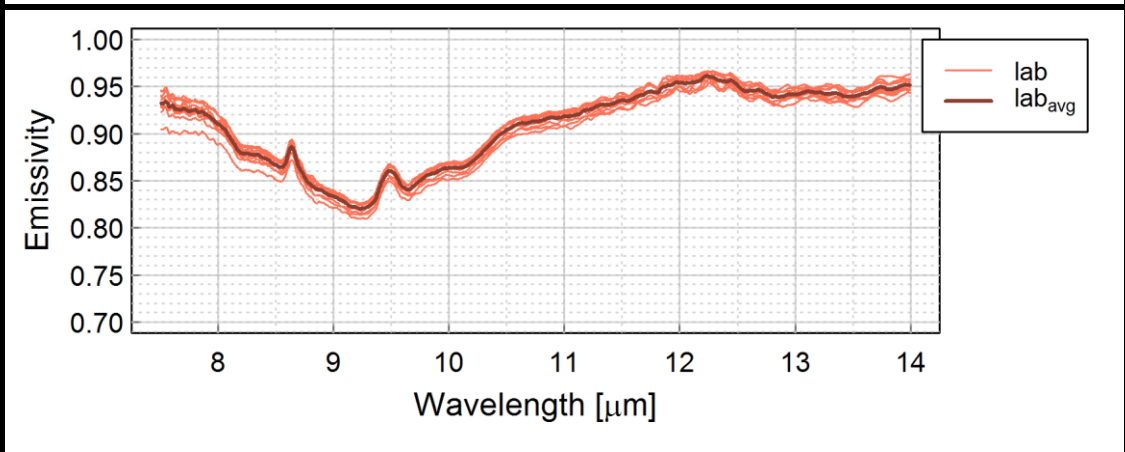
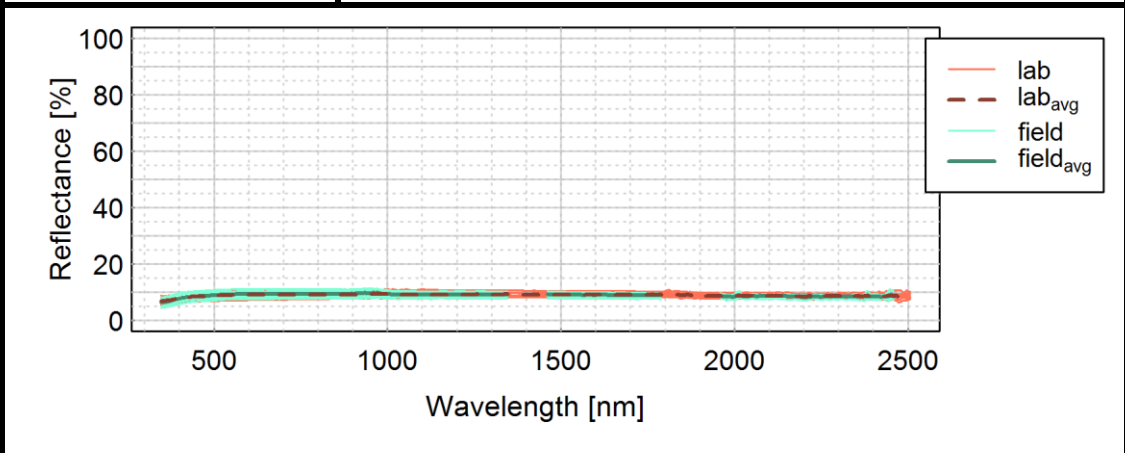
Class	Roofing shingle
Material	Slate roofing shingle
Colour	Grey
Status	Weathered
Dimension [mm]	255 x 3 x 210



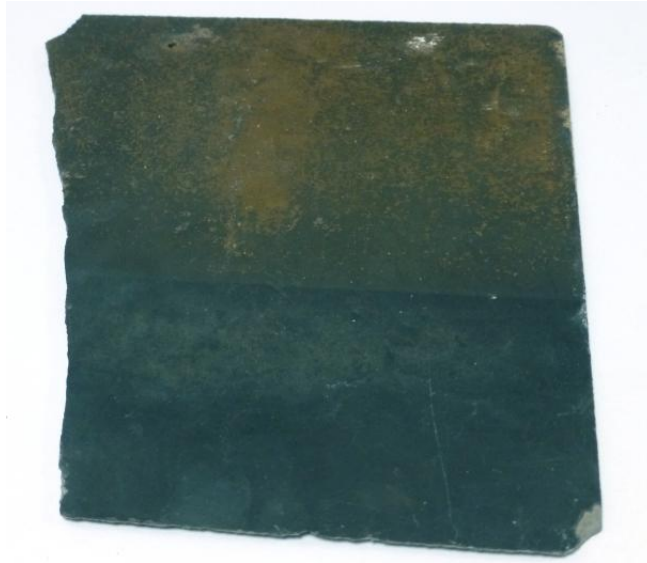
ROOFING SHINGLE_{L001d}



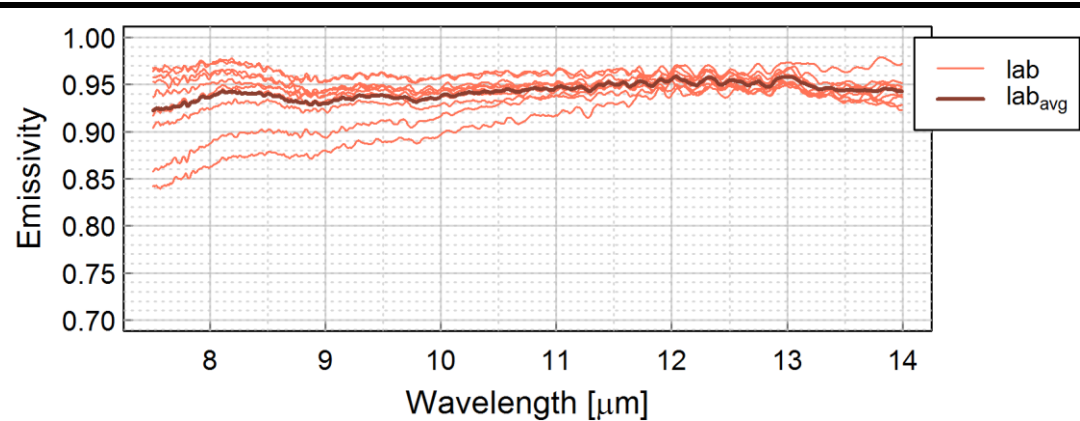
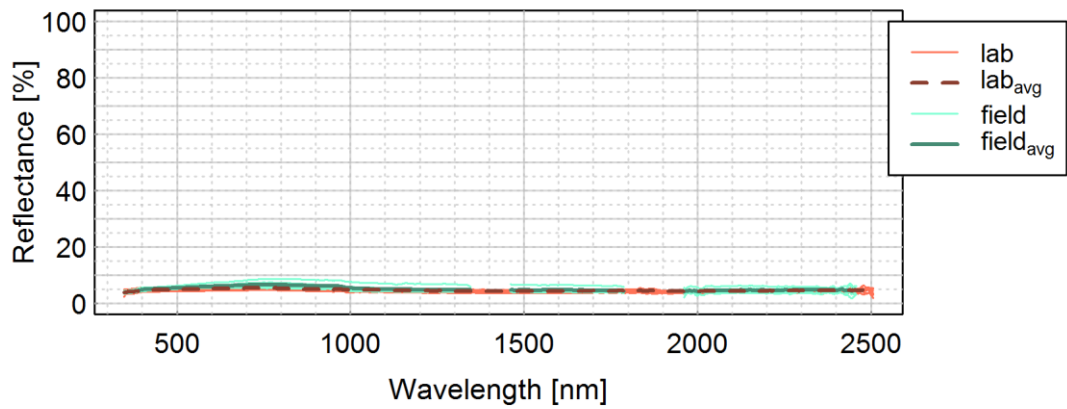
Class	Roofing shingle
Material	Slate
Colour	Grey
Status	Clear
Dimension [mm]	255 x 3 x 210



ROOFING SHINGLE_{L002}



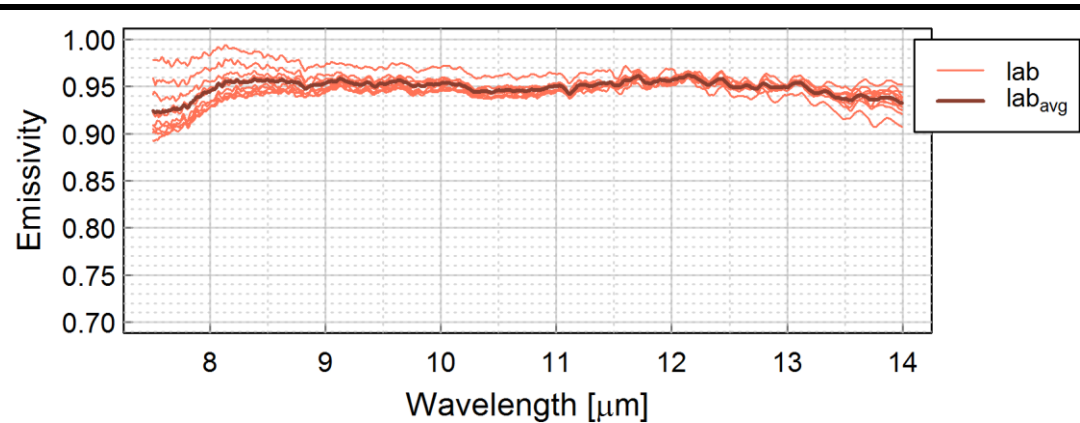
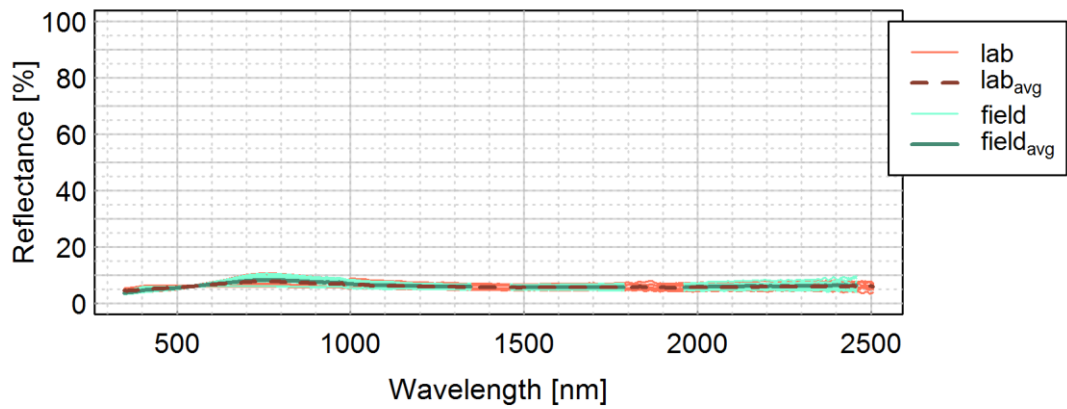
Class	Roofing shingle
Material	Fibre cement
Colour	Black
Status	Weathered
Dimension [mm]	232 x 3 x 241



ROOFING SHINGLE_{L003}



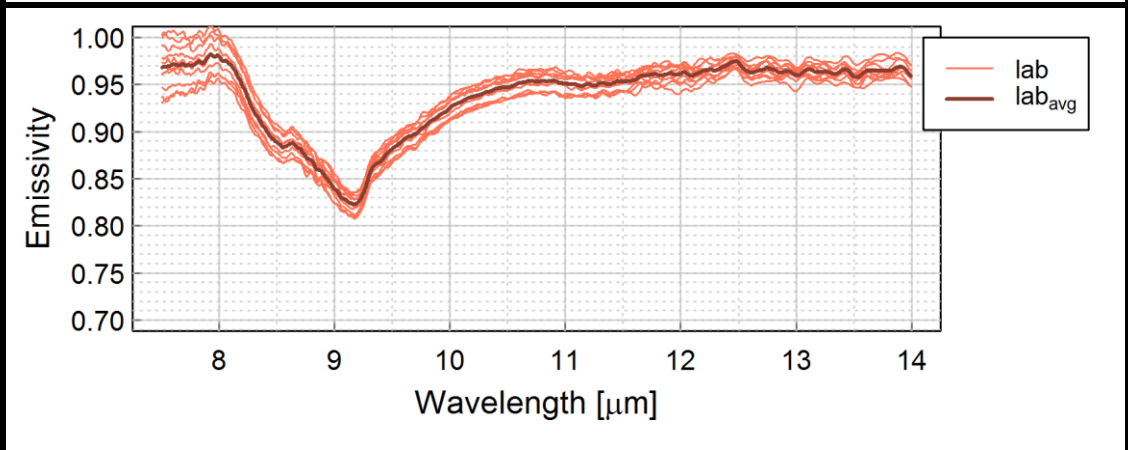
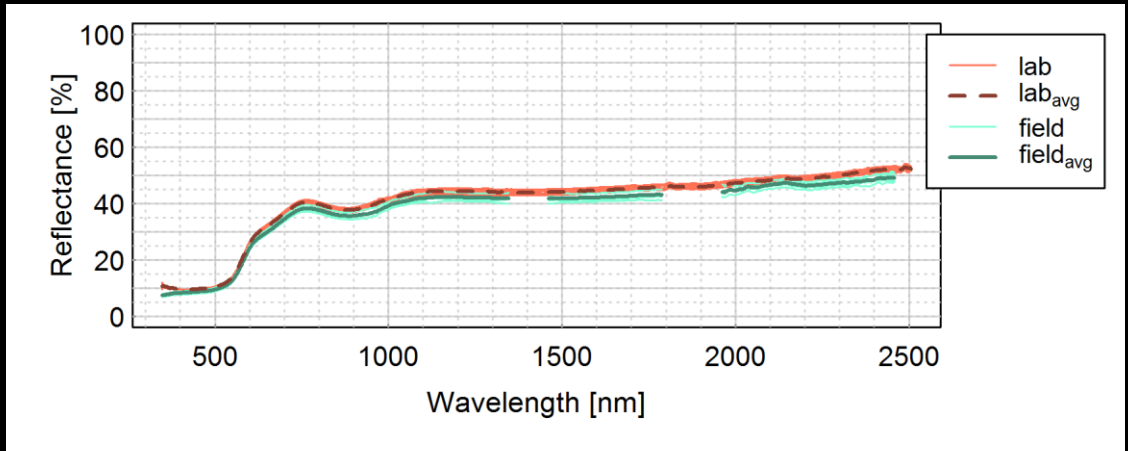
Class	Roofing shingle
Material	Fibre cement
Colour	Black
Status	Weathered
Dimension [mm]	230 x 3 x 207



ROOFING TILE_{R001}



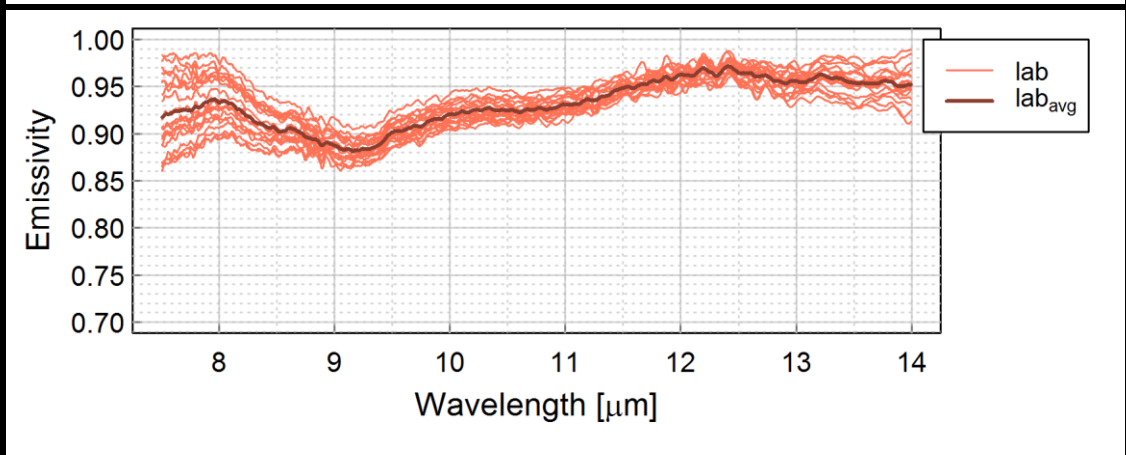
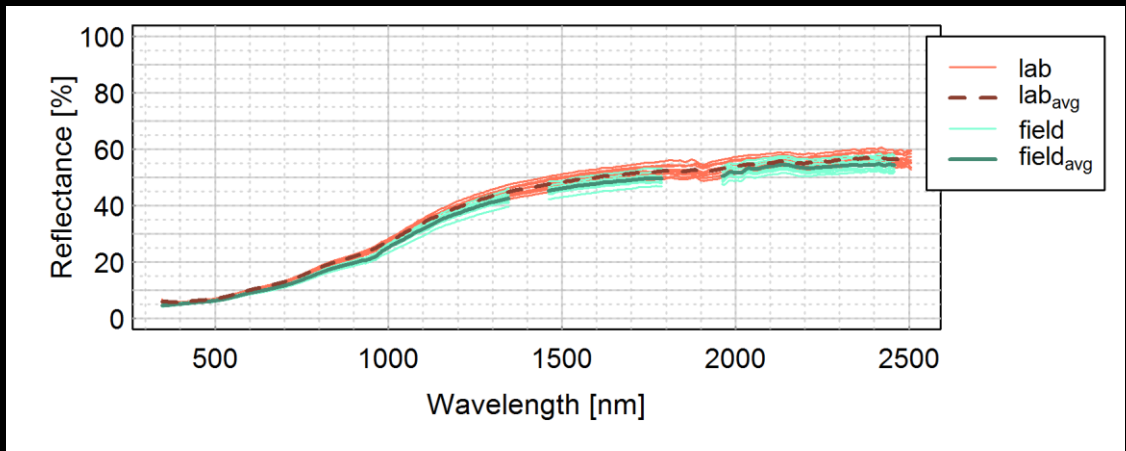
Class	Roofing tile
Material	Ceramic
Colour	Black
Status	New
Dimension [mm]	150 x 11 x 150



ROOFING TILE_{R002}



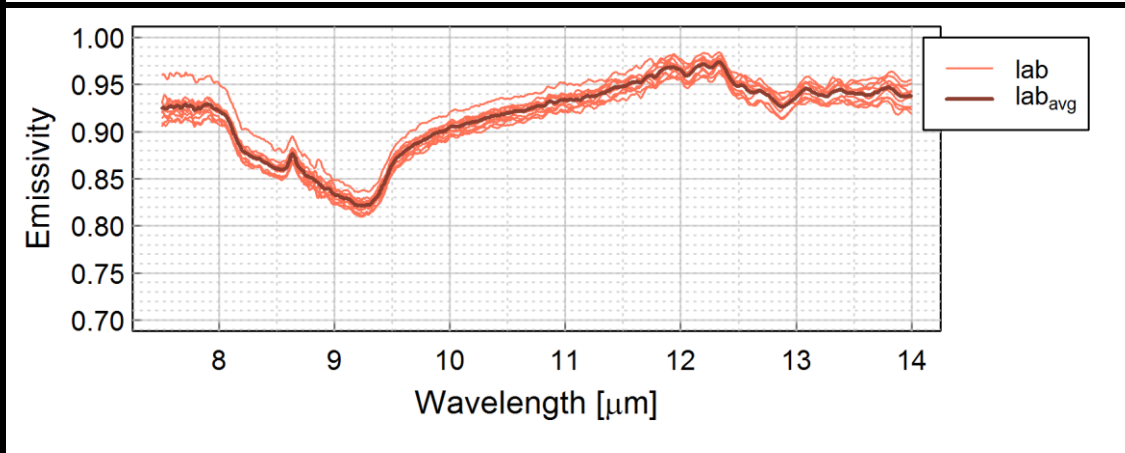
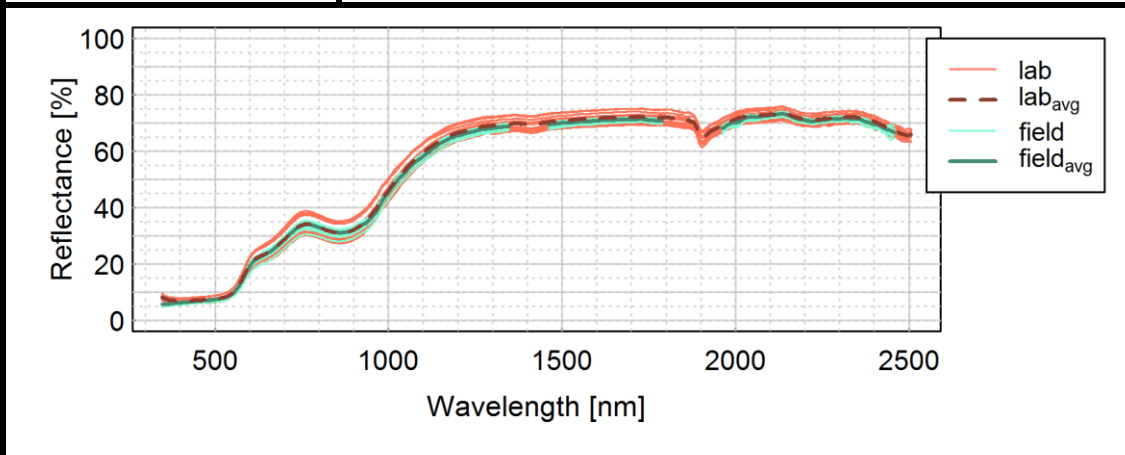
Class	Roofing tile
Material	Ceramic
Colour	Brown
Status	New
Dimension [mm]	300 x 10 x 200



ROOFING TILE_{R003}



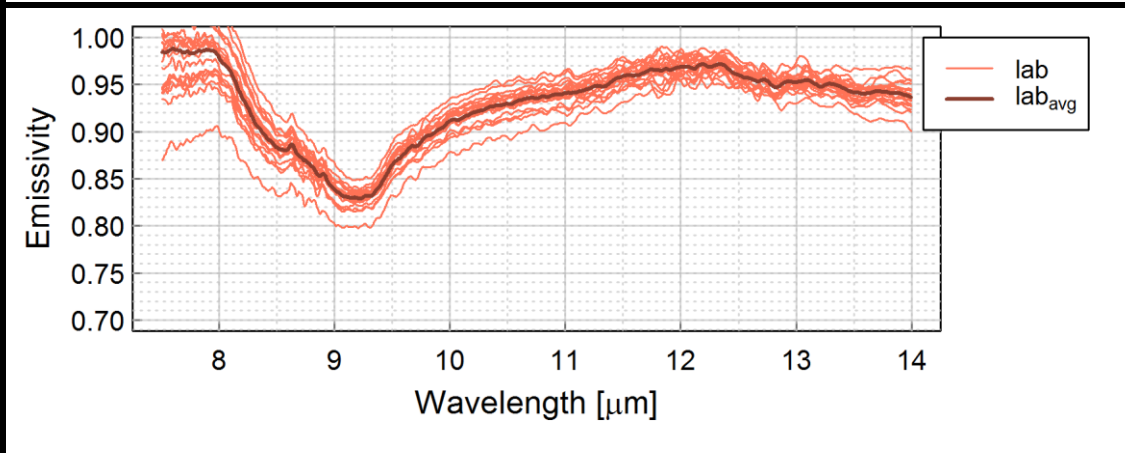
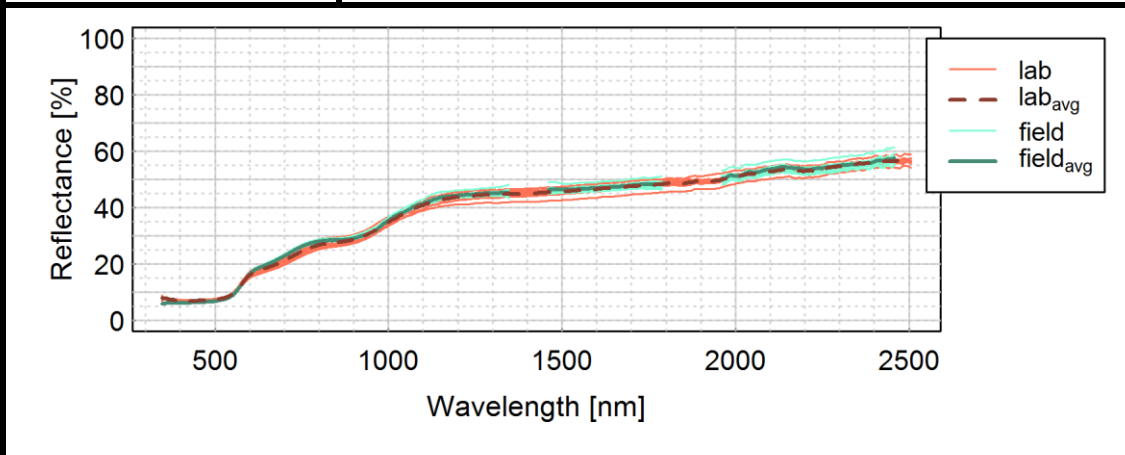
Class	Roofing tile
Material	Cement
Colour	Rustic red
Status	New
Dimension [mm]	270 x 12 x 170



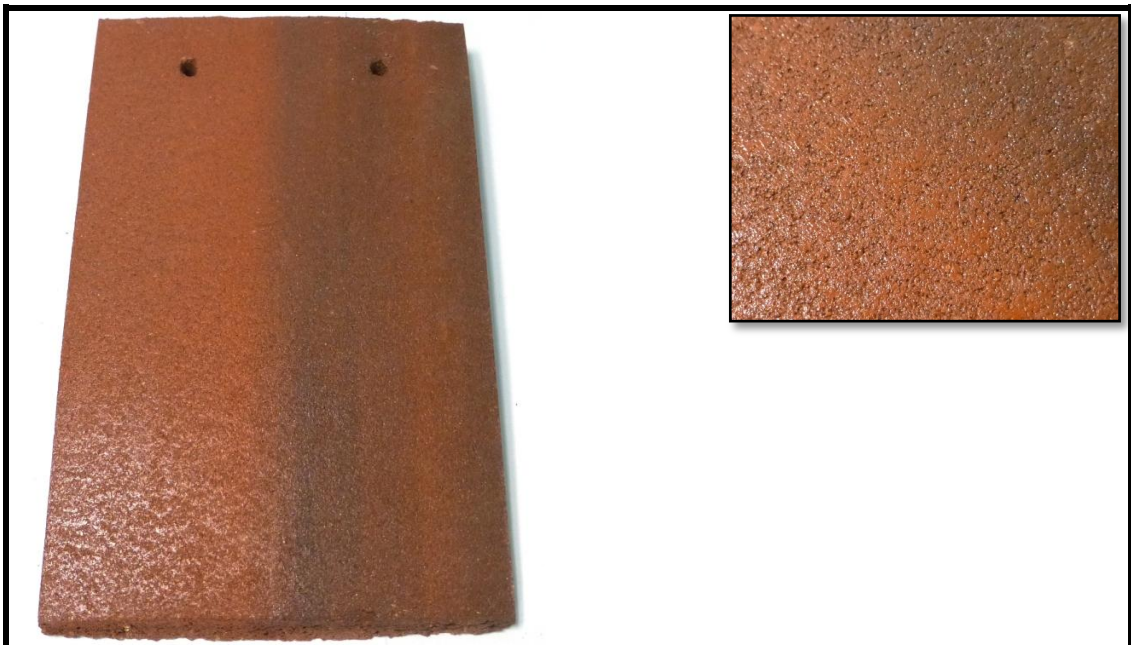
ROOFING TILE_{R004}



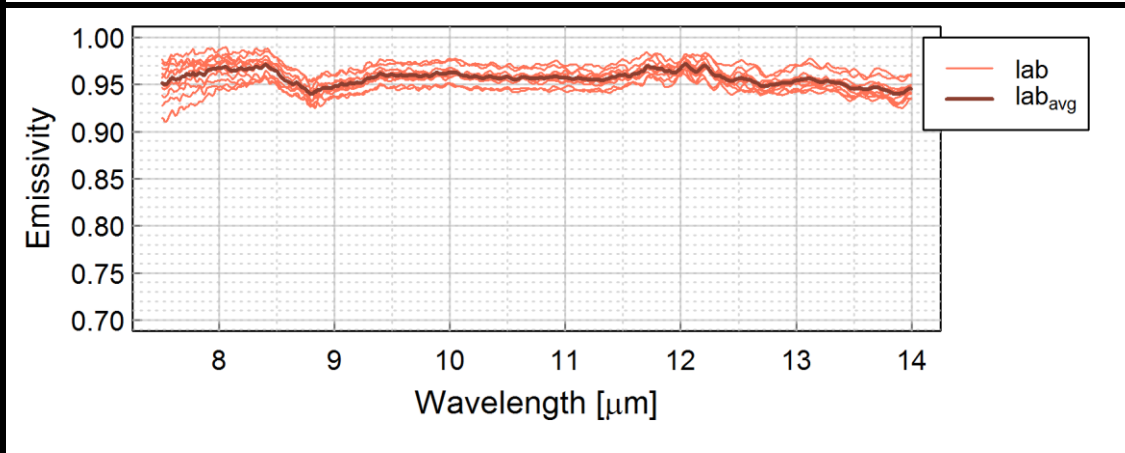
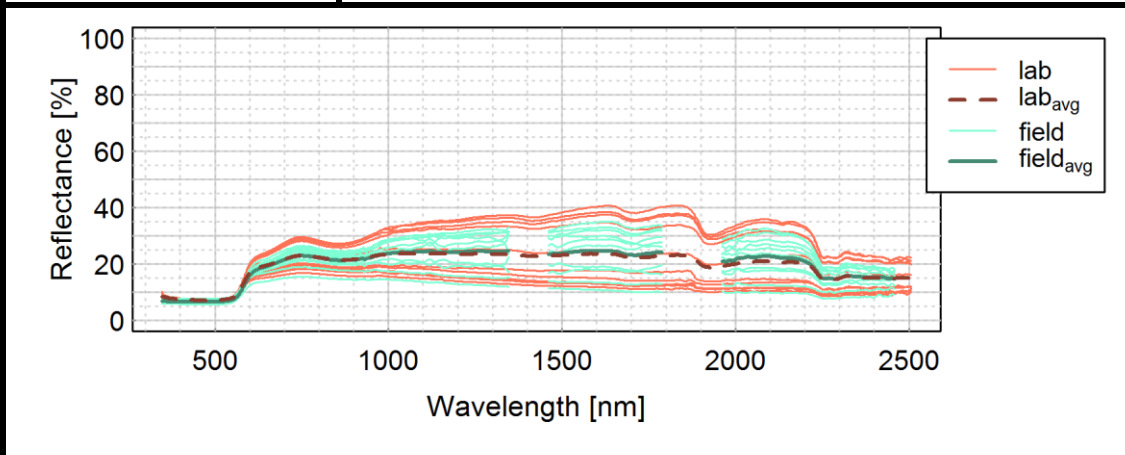
Class	Roofing tile
Material	Ceramic
Colour	Burnt red
Status	New
Dimension [mm]	300 x 13 x 200



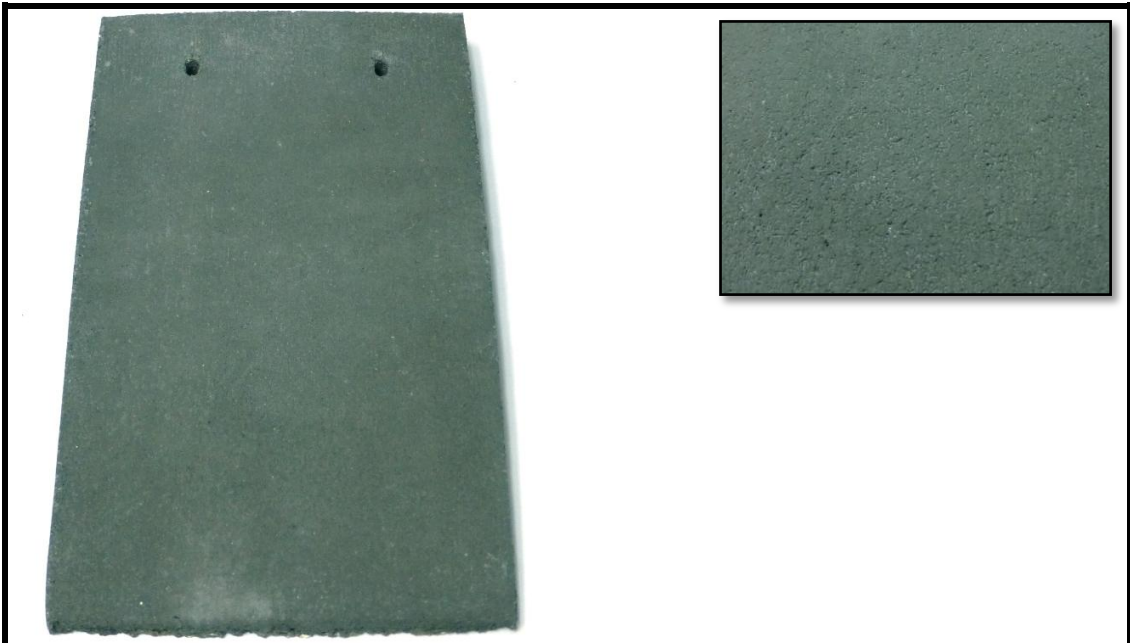
ROOFING TILE_{R005}



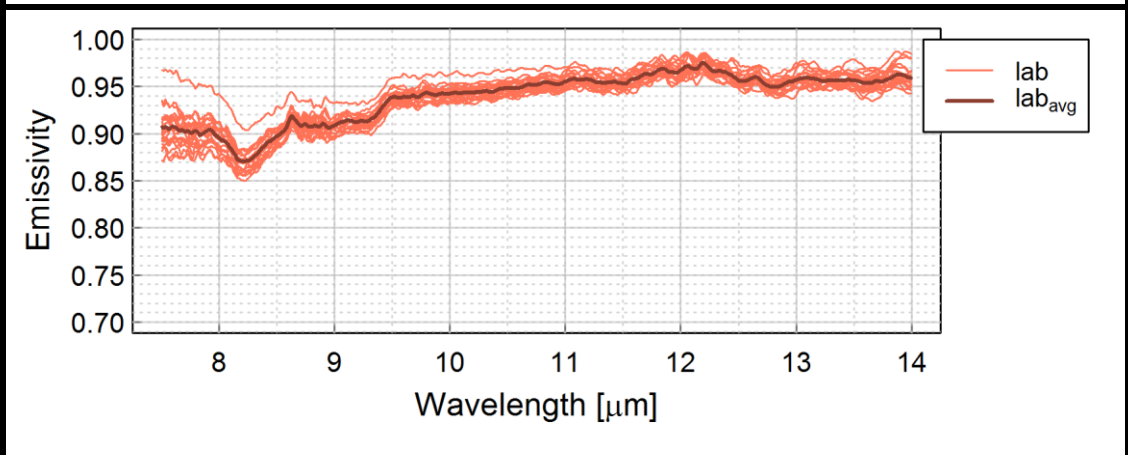
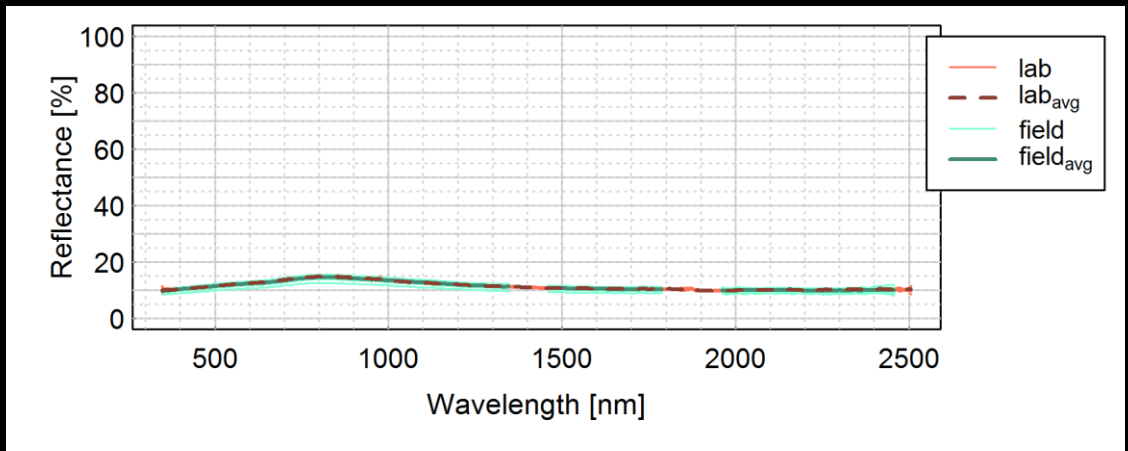
Class	Roofing tile
Material	Cement
Colour	Rustic red/black shading
Status	New/shiny
Dimension [mm]	260 x 12 x 165



ROOFING TILE_{R006}



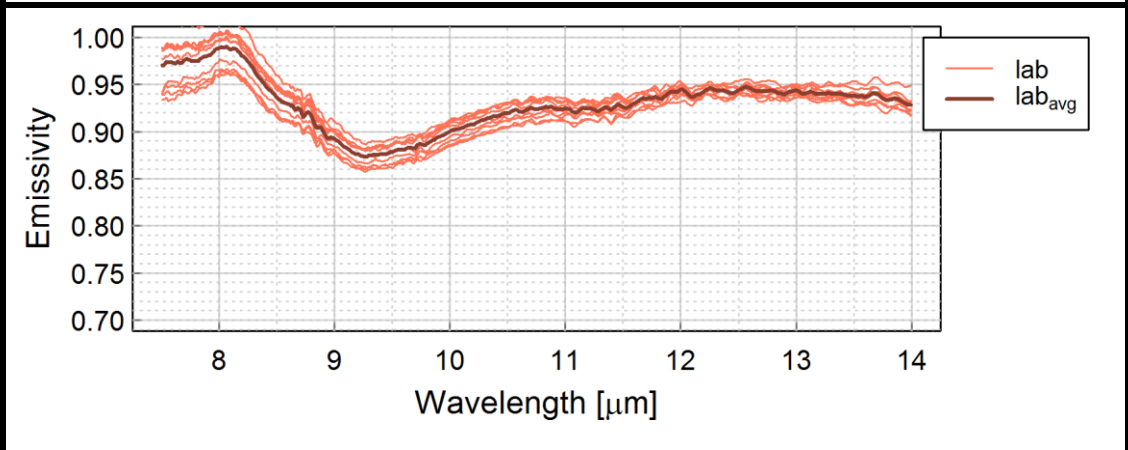
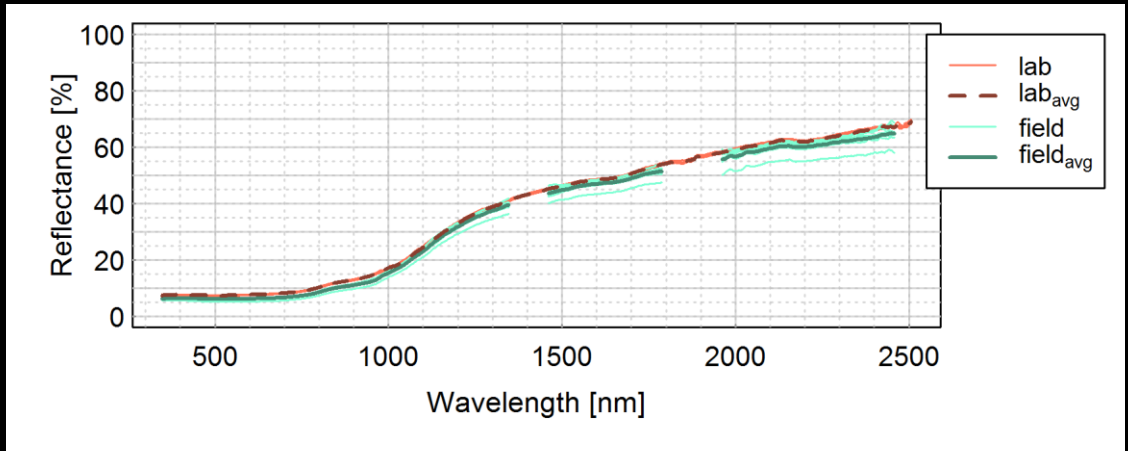
Class	Roofing tile
Material	Cement
Colour	Slate grey
Status	New
Dimension [mm]	265 x 11 x 165



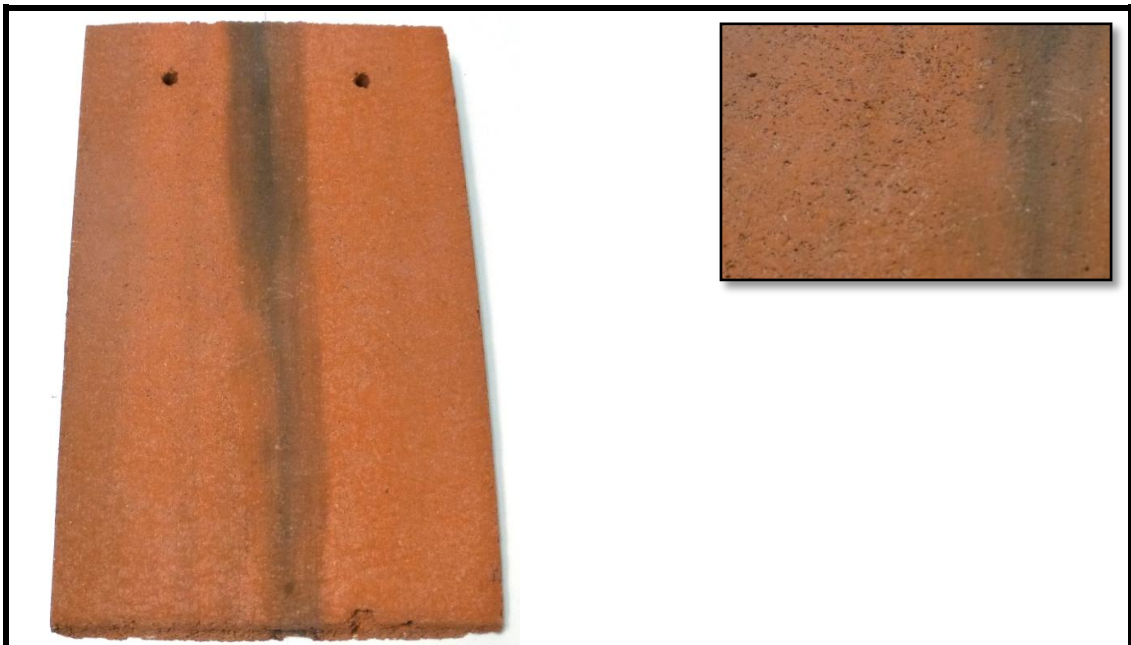
ROOFING TILE_{R007}



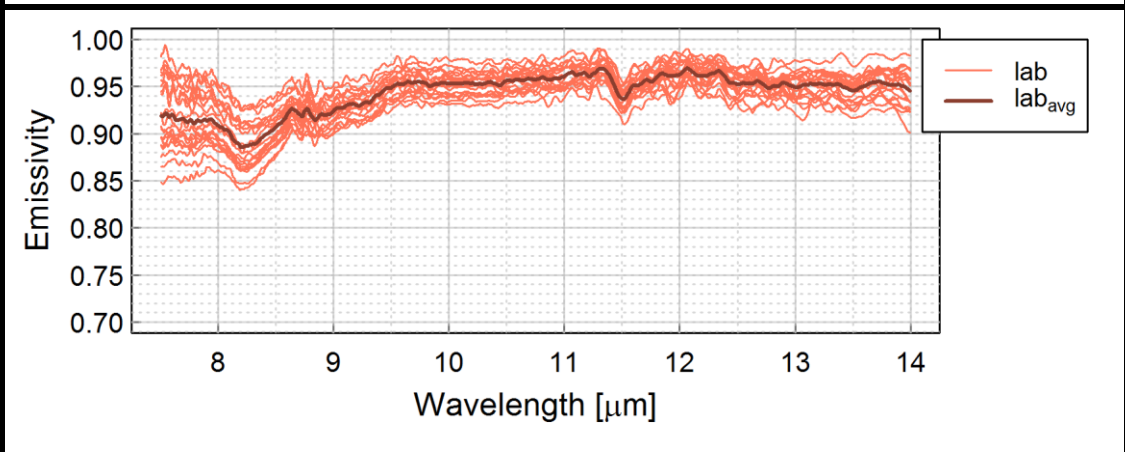
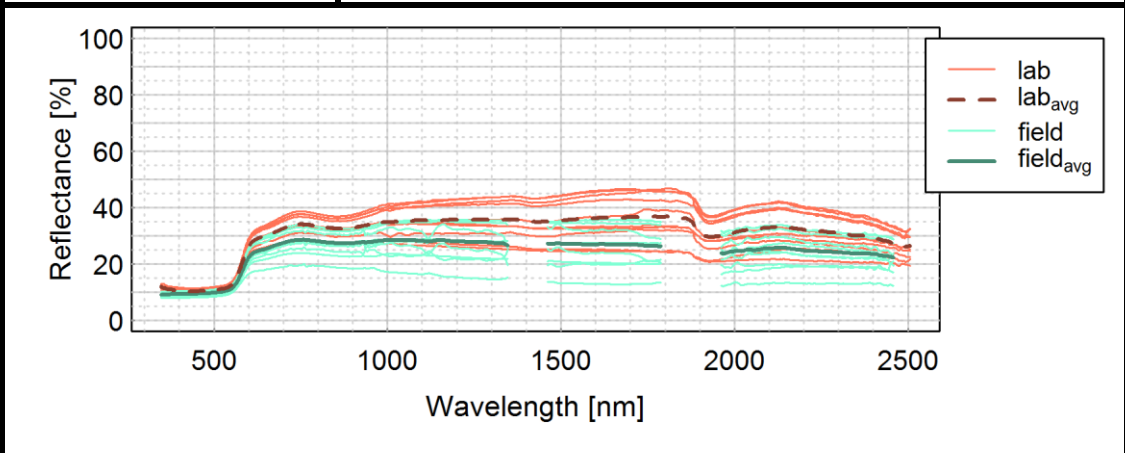
Class	Roofing tile
Material	Ceramic
Colour	Black
Status	New
Dimension [mm]	410 x 15 x 320



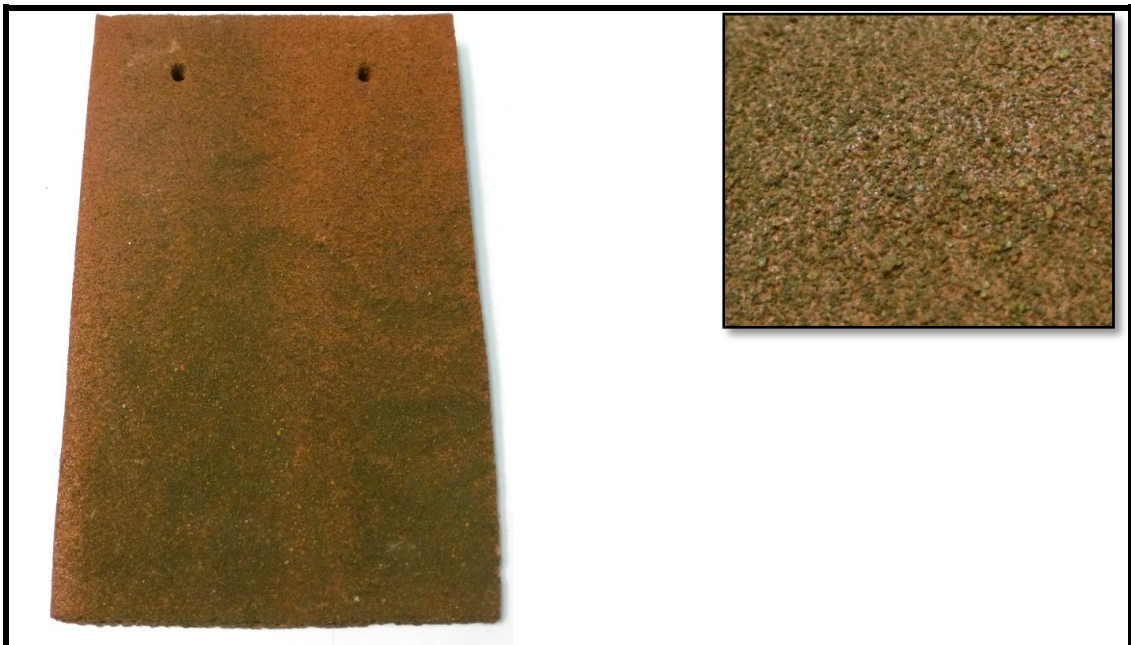
ROOFING TILE_{R008}



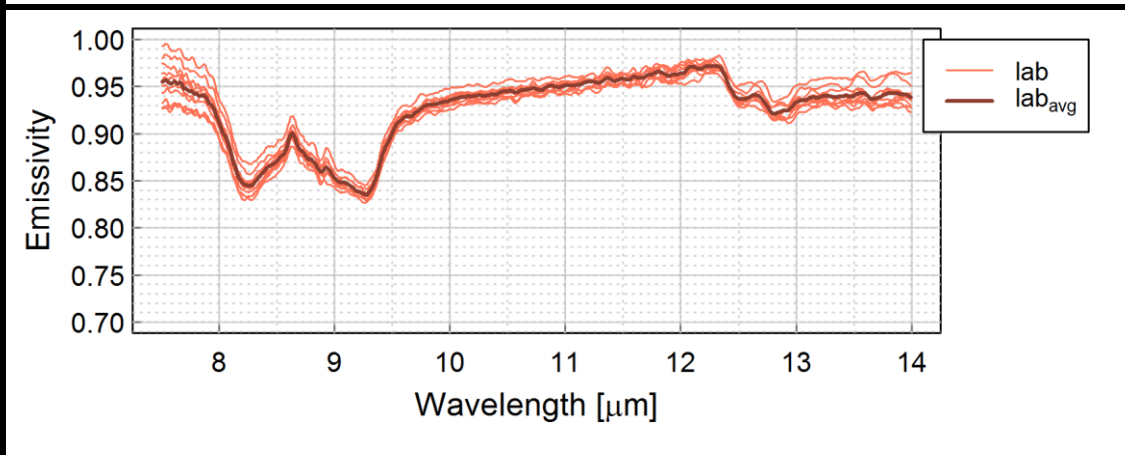
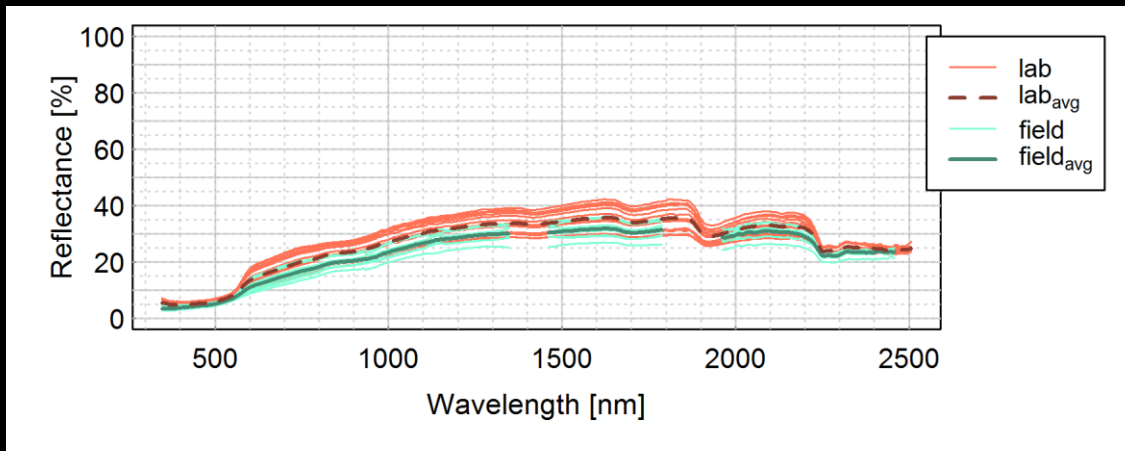
Class	Roofing tile
Material	Cement
Colour	Rustic red
Status	New
Dimension [mm]	260 x 12 x 165



ROOFING TILE_{R009}



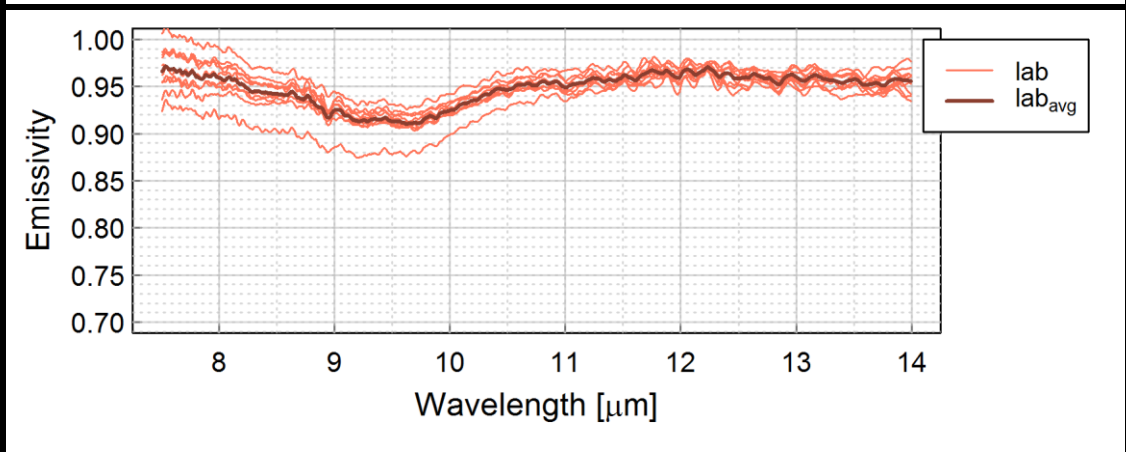
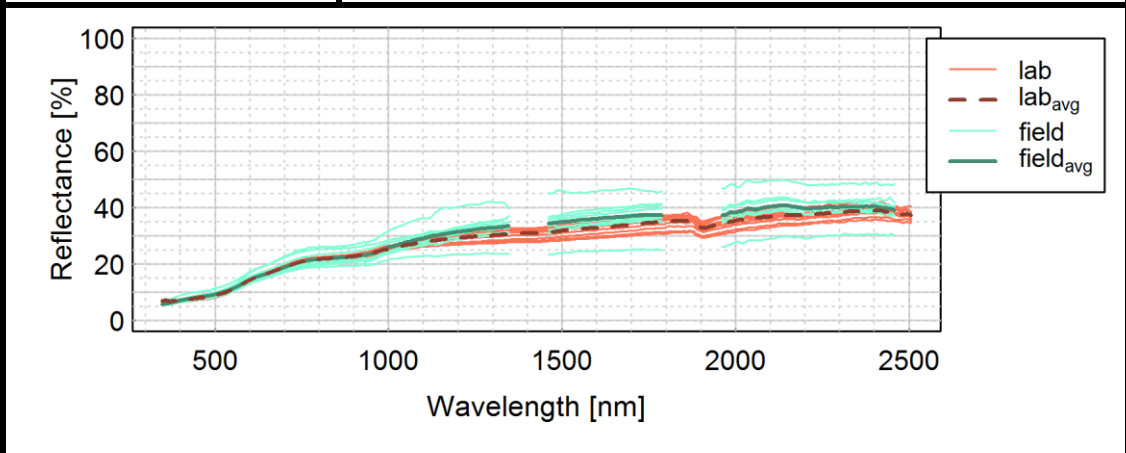
Class	Roofing tile
Material	Cement
Colour	Autumn red
Status	New/rough
Dimension [mm]	260 x 12 x 165



ROOFING TILE_{R010}



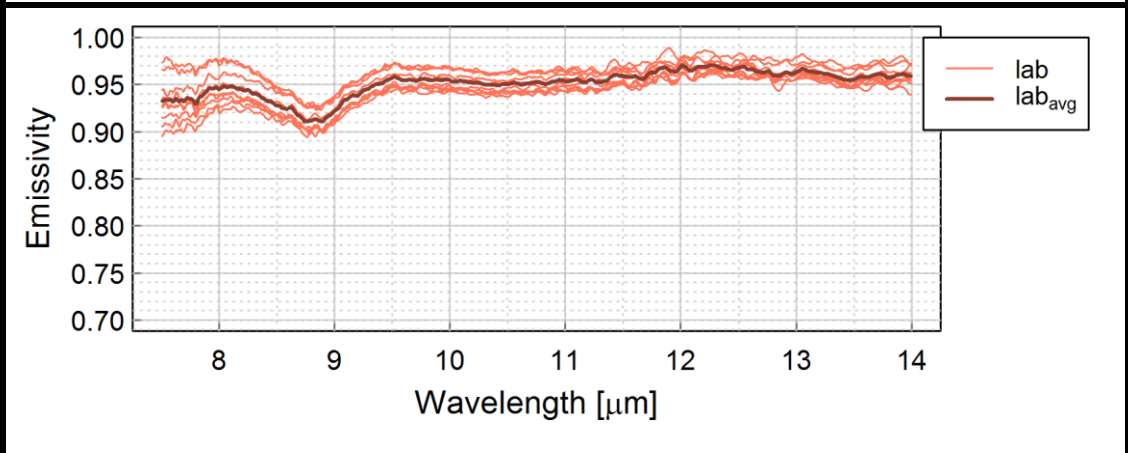
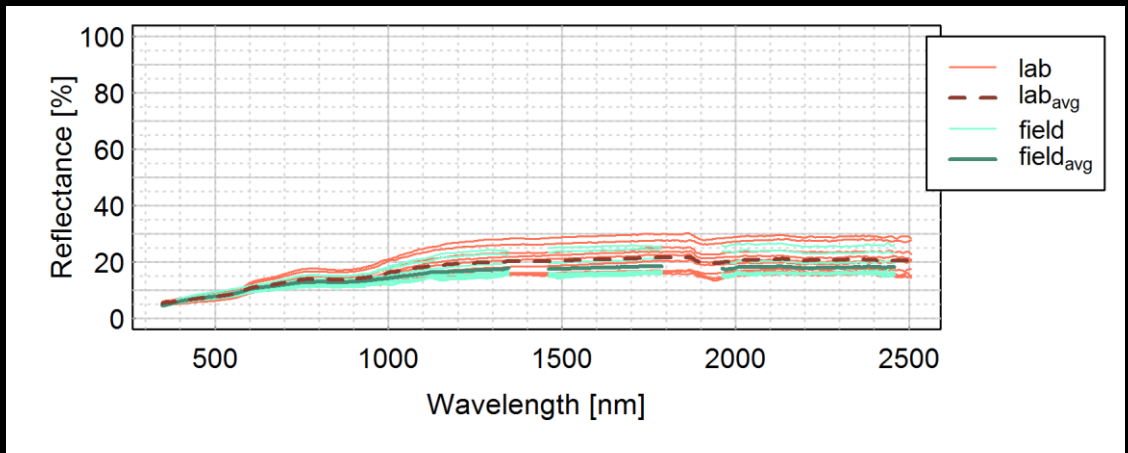
Class	Roofing tile
Material	Ceramic
Colour	Red
Status	Weathered
Dimension [mm]	130 x 10 x 165



ROOFING TILE_{R012}



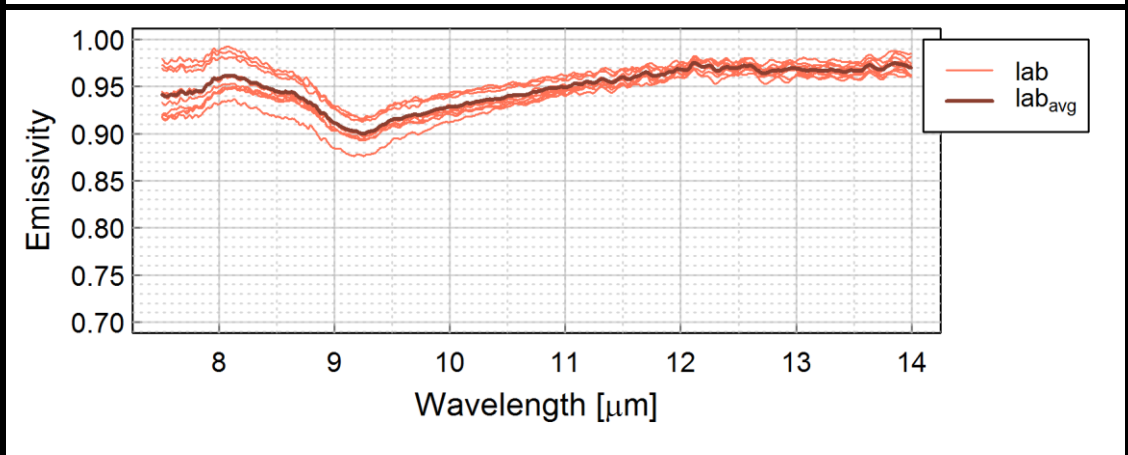
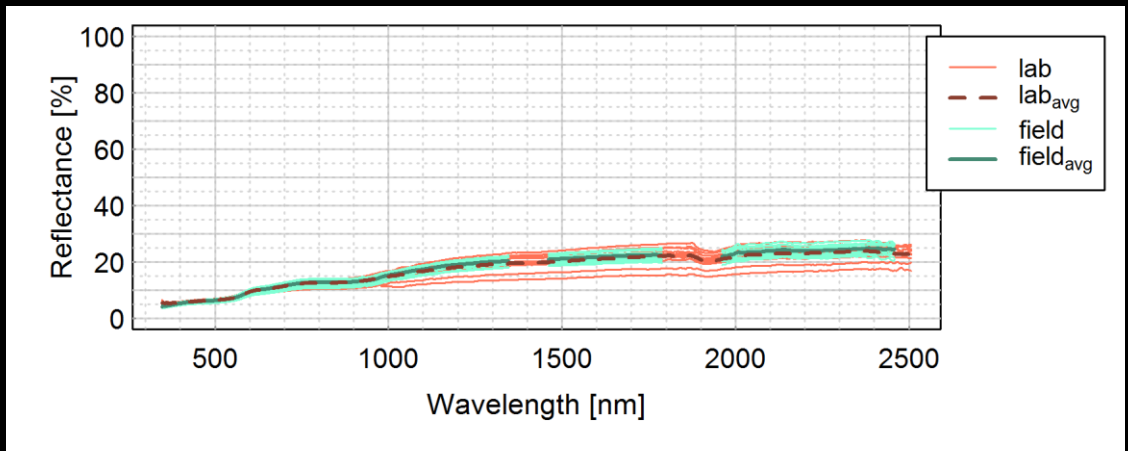
Class	Roofing tile
Material	Ceramic
Colour	Red
Status	Weathered
Dimension [mm]	90 x 12 x 195



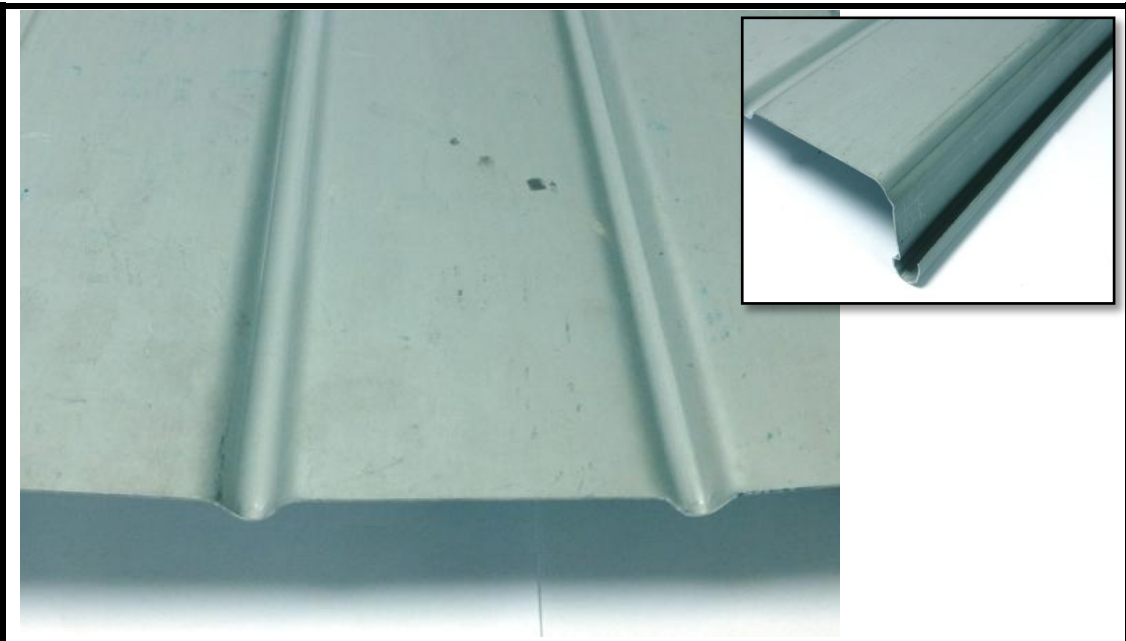
ROOFING TILE_{R013}



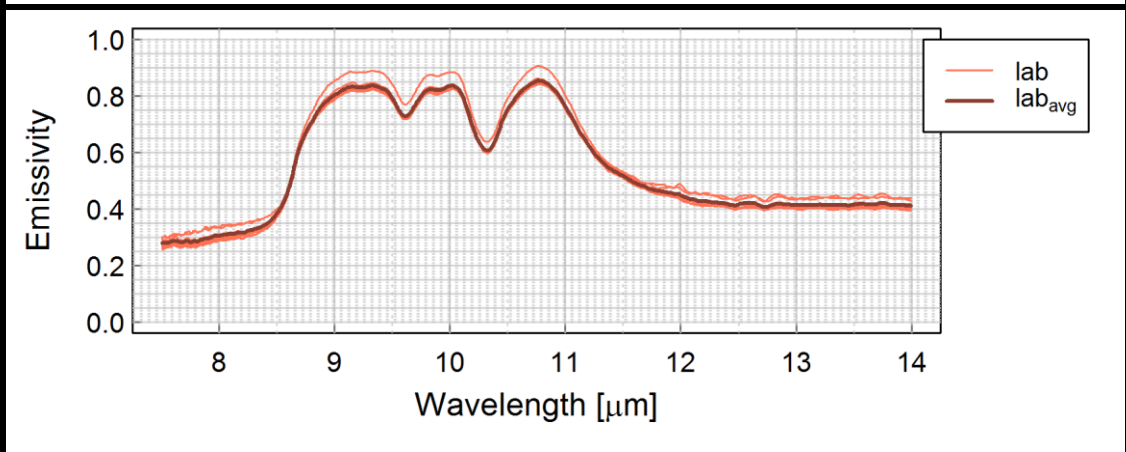
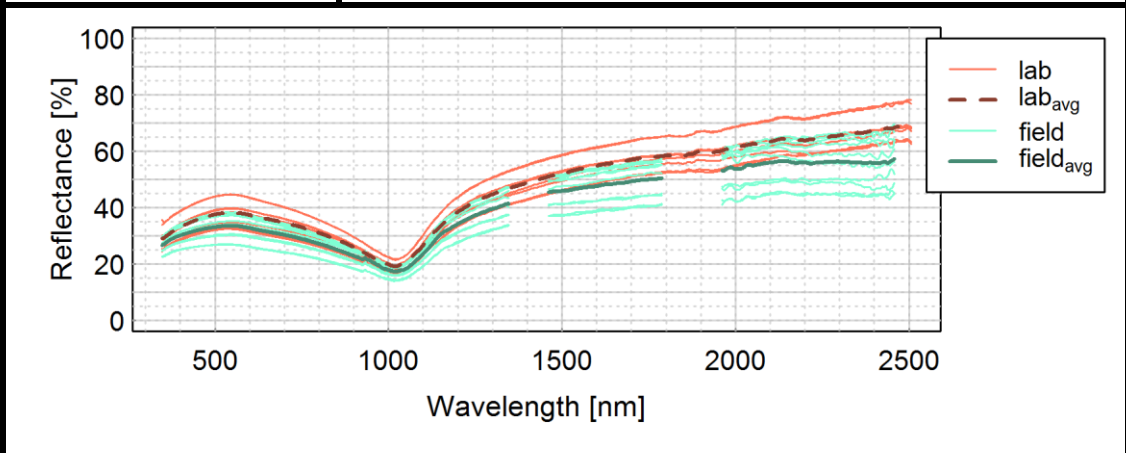
Class	Roofing tile
Material	Ceramic
Colour	Red
Status	Weathered
Dimension [mm]	115 x 12 x 130



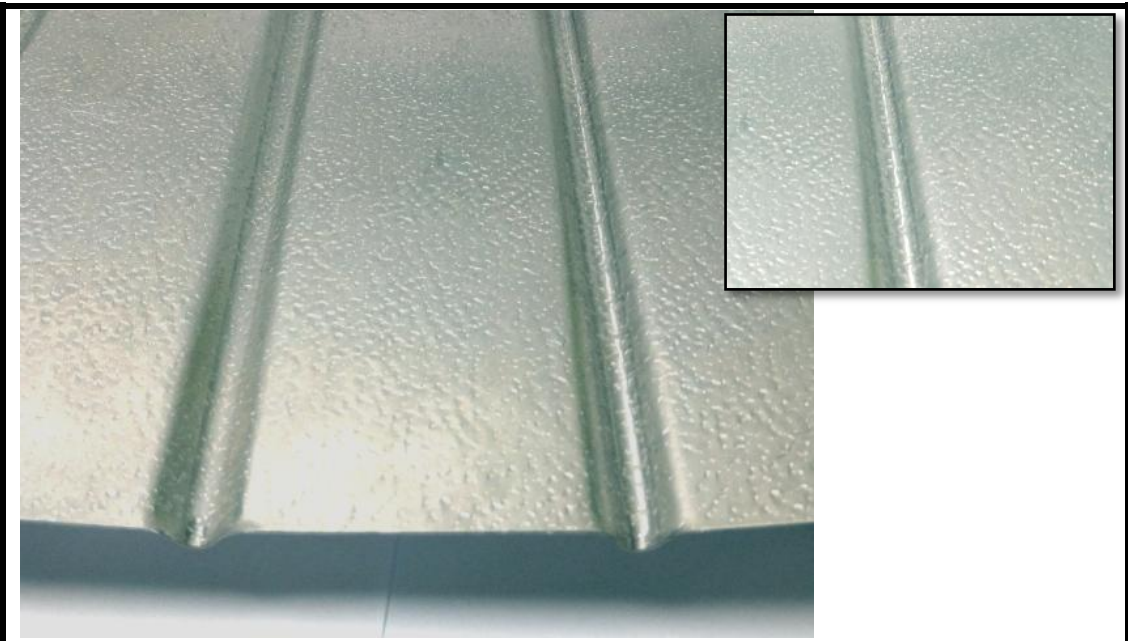
METAL_{Z001}



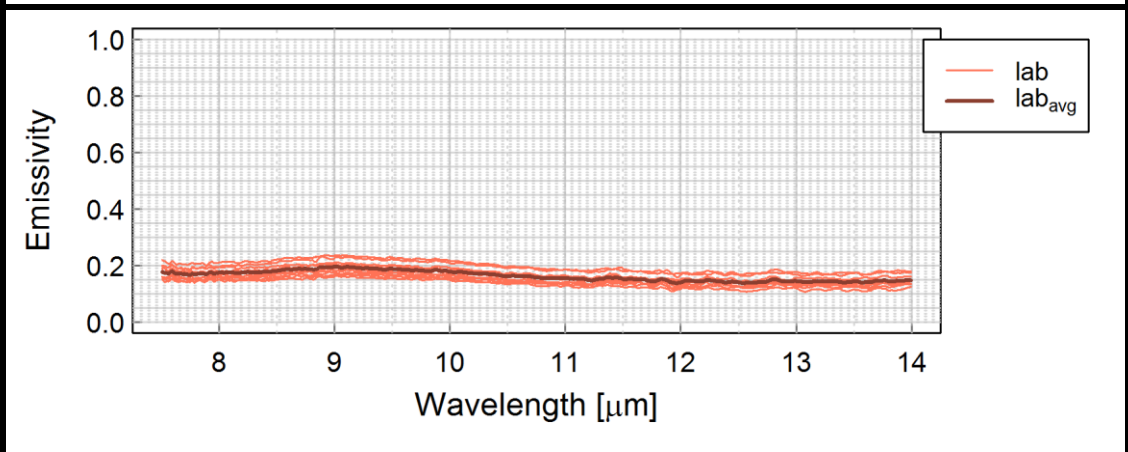
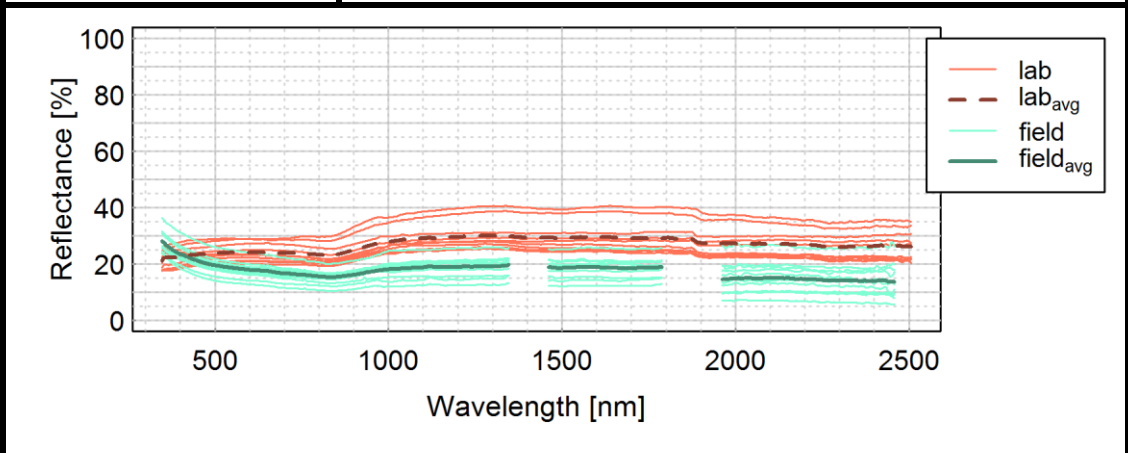
Class	Metal
Material	Aluminium plus zinc
Colour	Dull grey
Status	New
Dimension [mm]	390 x 1 x 295



METAL_{Z002}



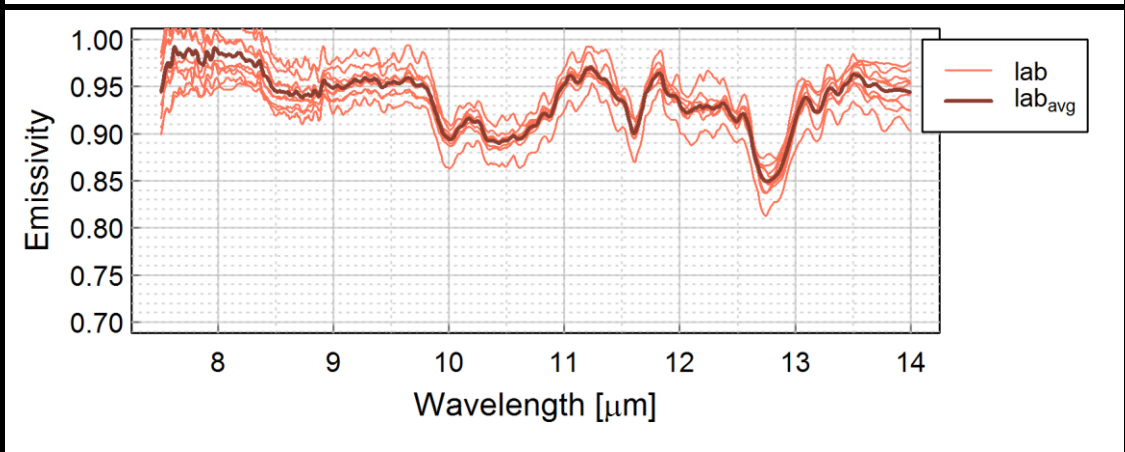
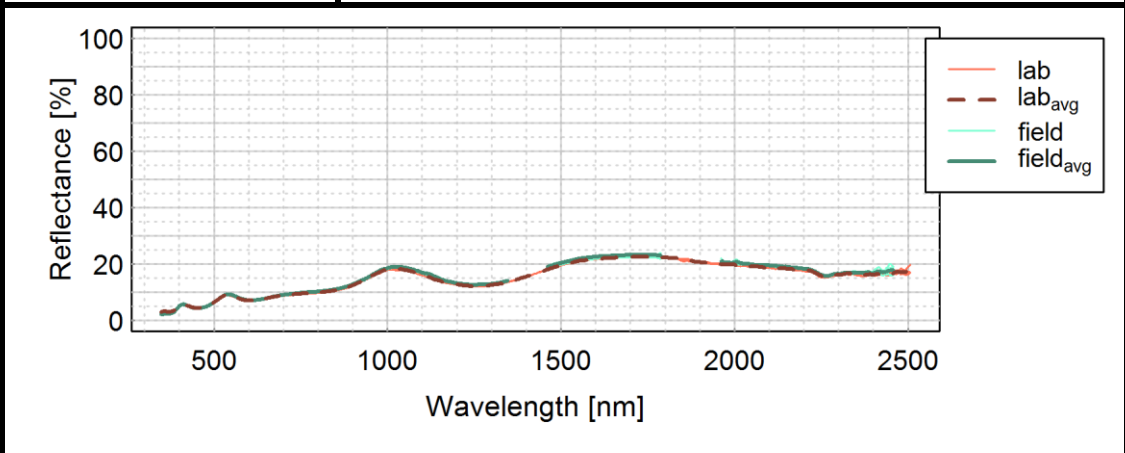
Class	Metal
Material	Aluminium, stucco
Colour	Shiny grey
Status	New
Dimension [mm]	380 x 1 x 295



METAL_{Z003}



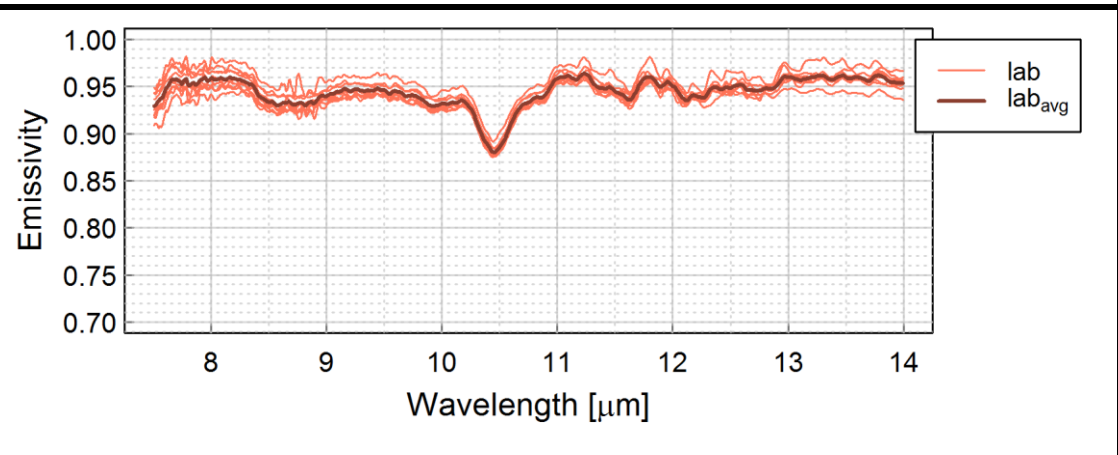
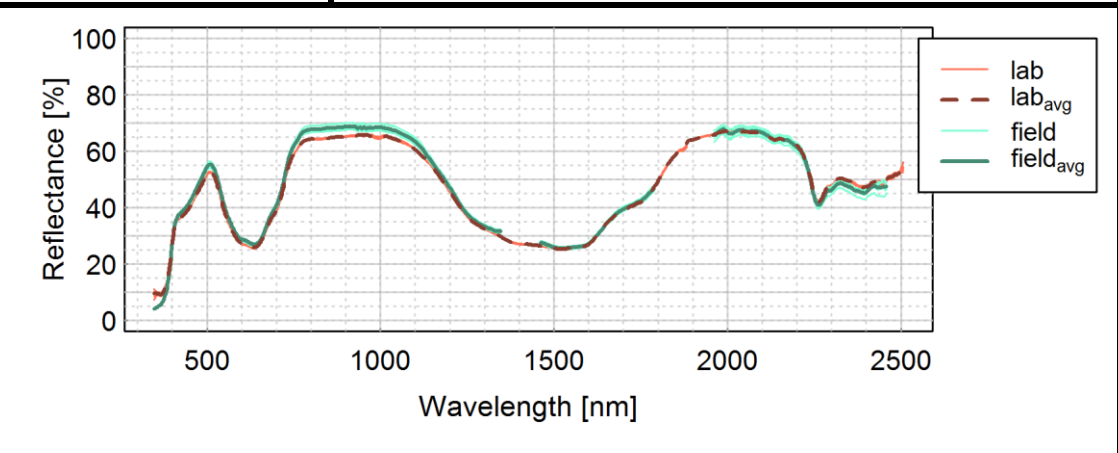
Class	Metal
Material	Metal with paint
Colour	Dark green
Status	New
Dimension [mm]	102 x 1 x 150



METAL_{Z004}



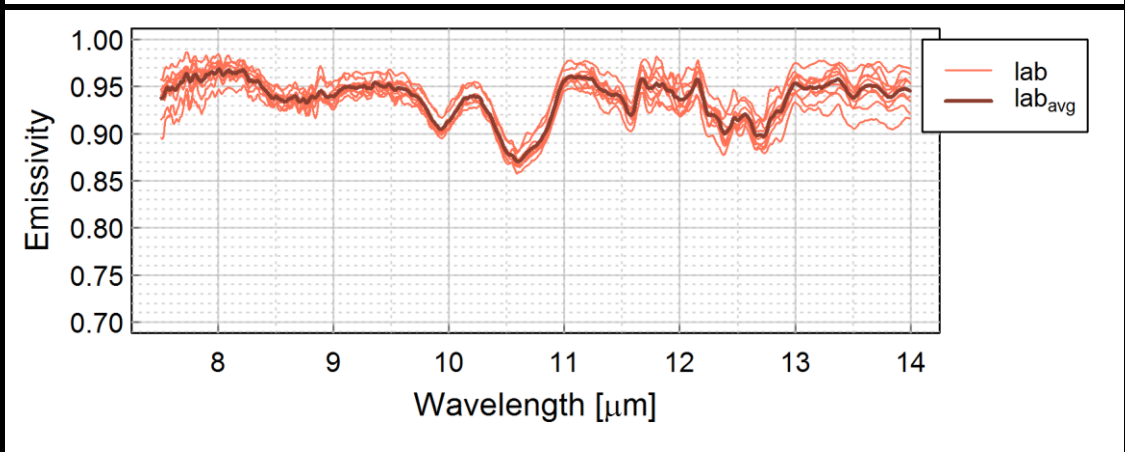
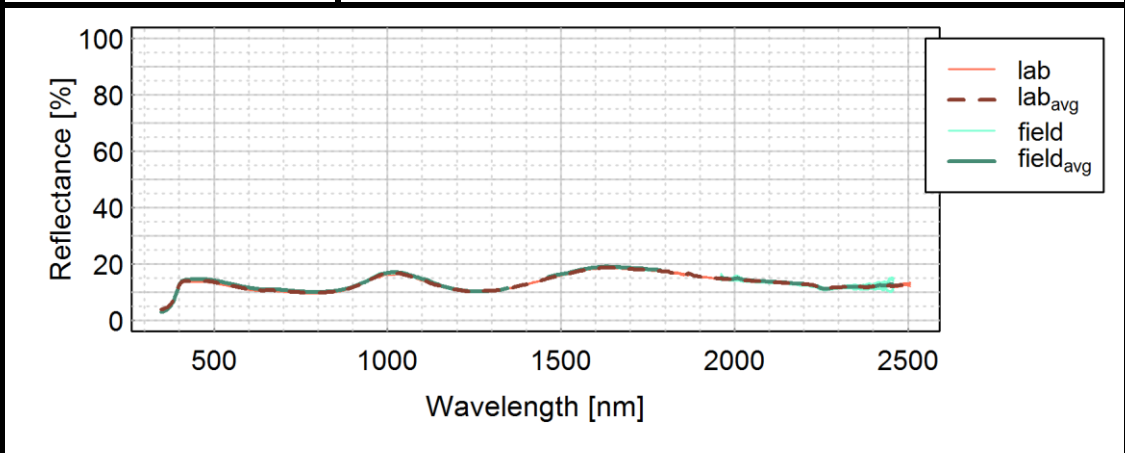
Class	Metal
Material	Metal with paint
Colour	Copper patina
Status	Weathered
Dimension [mm]	192 x 1 x 150



METAL_{Z005}



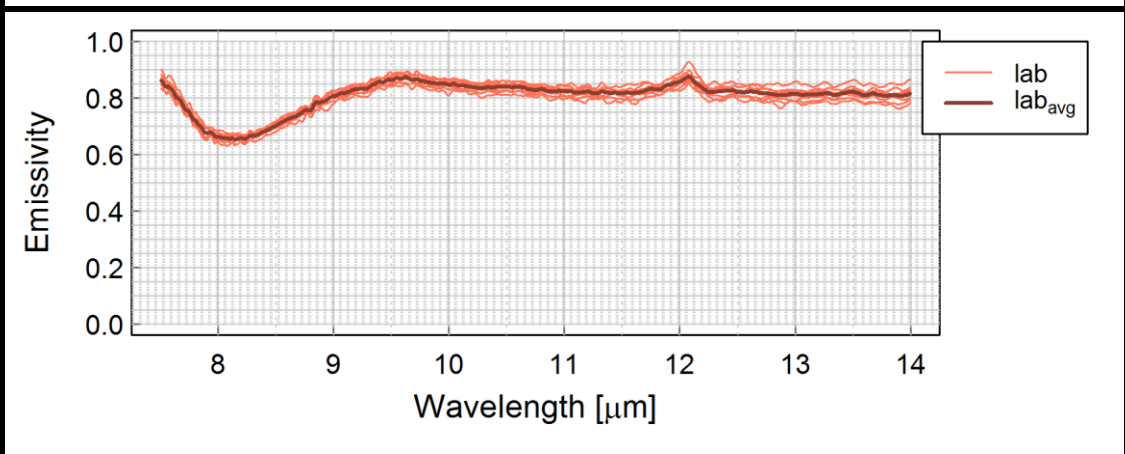
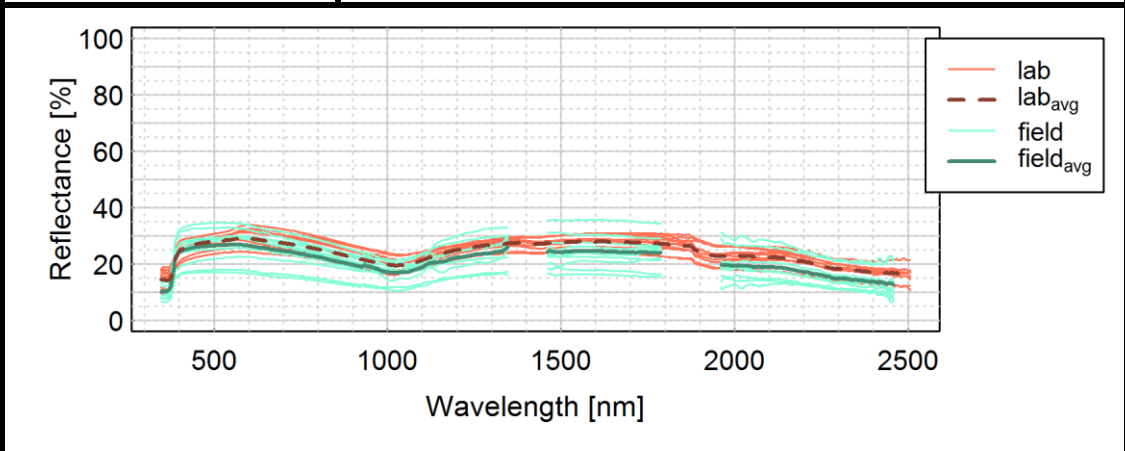
Class	Metal
Material	Metal with paint
Colour	Slate grey
Status	New
Dimension [mm]	152 x 1 x 205



METAL_{Z006}



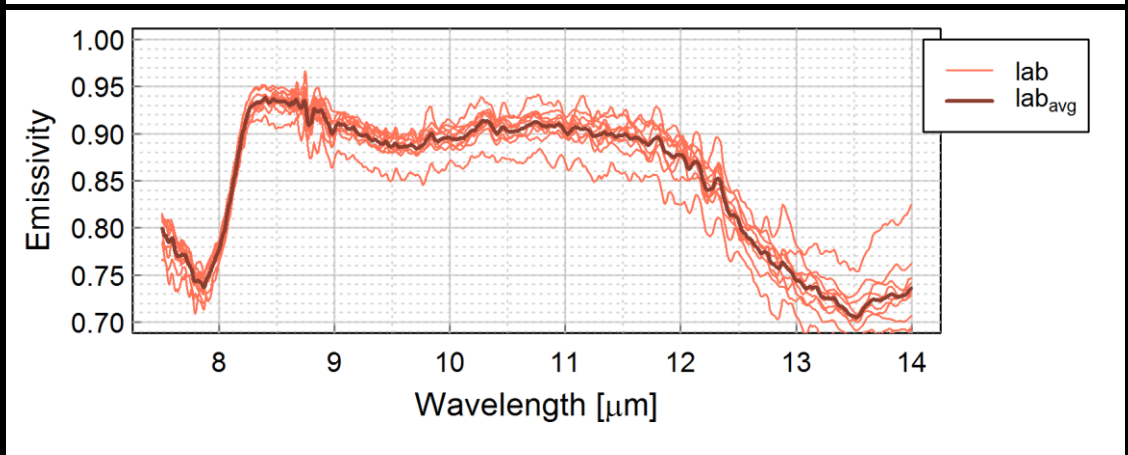
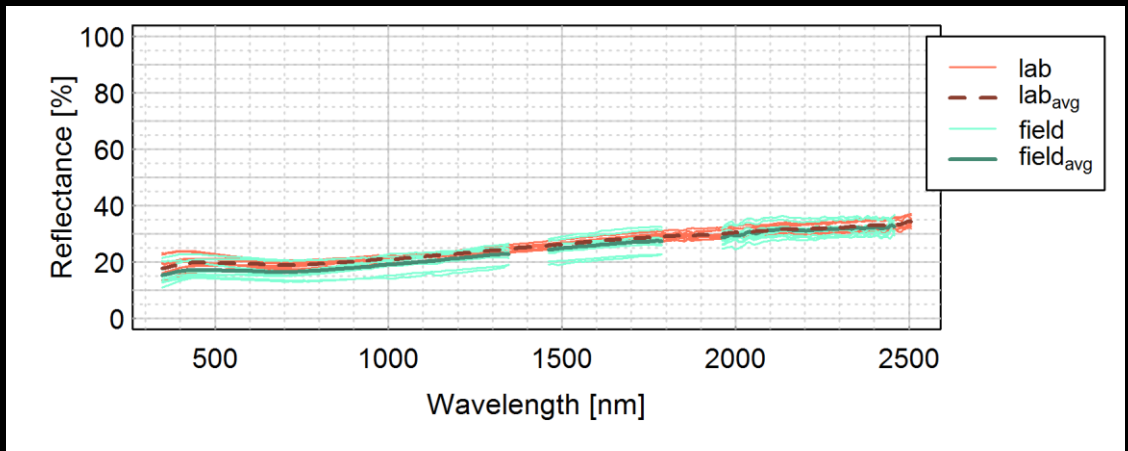
Class	Metal
Material	Aluminium
Colour	Grey
Status	Weathered
Dimension [mm]	220 x 1 x 230



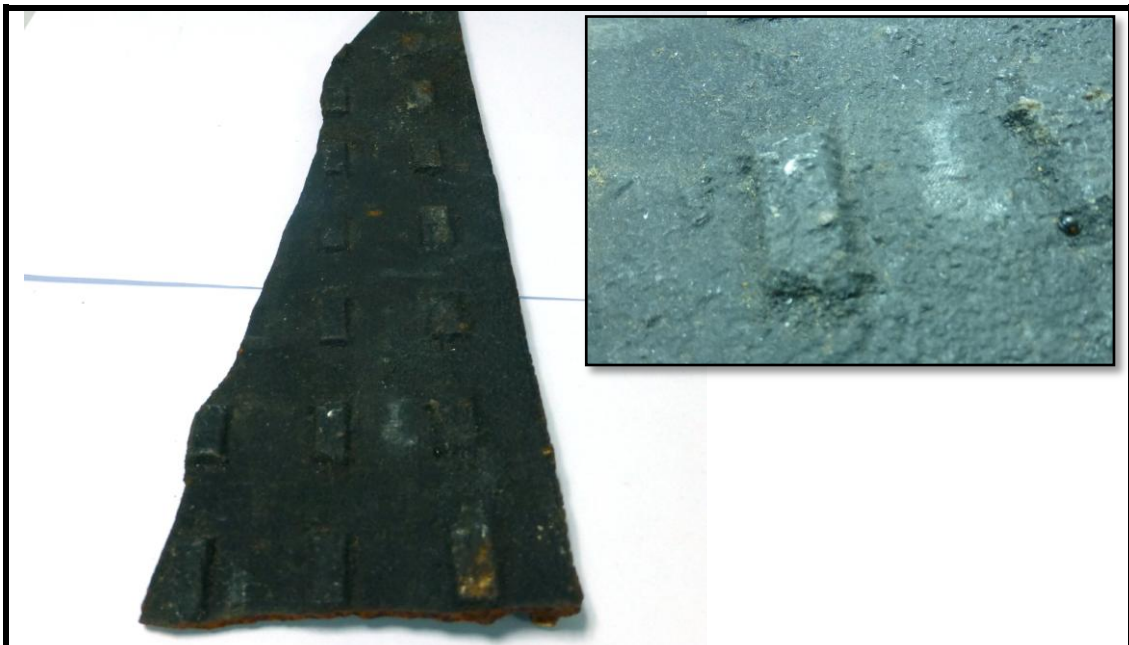
METAL_{Z007}



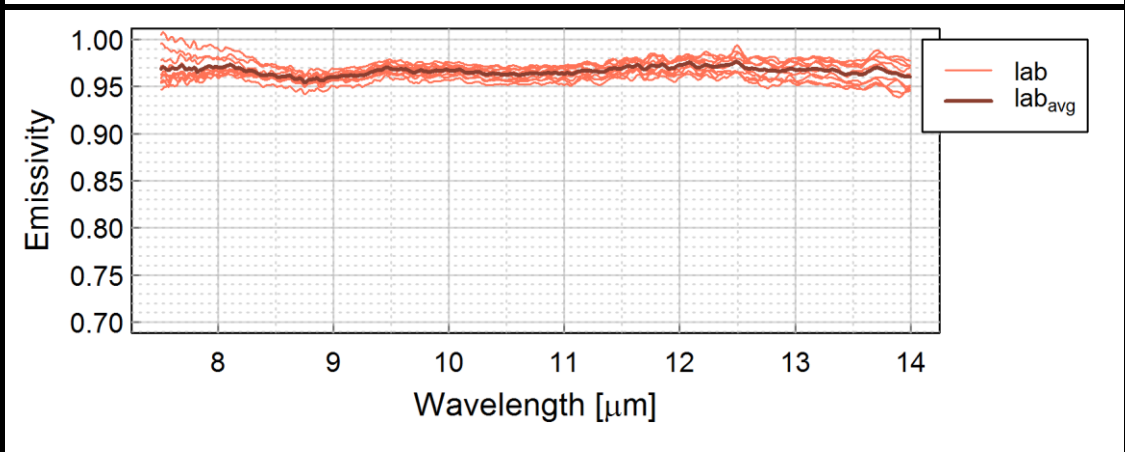
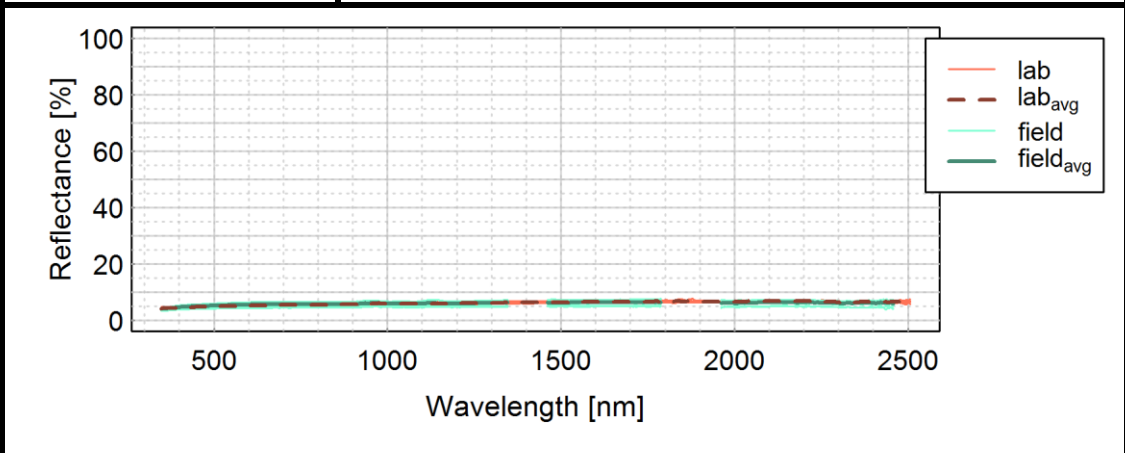
Class	Metal
Material	Lead
Colour	Grey
Status	Weathered
Dimension [mm]	254 x 2 x 200



METAL_{Z008}



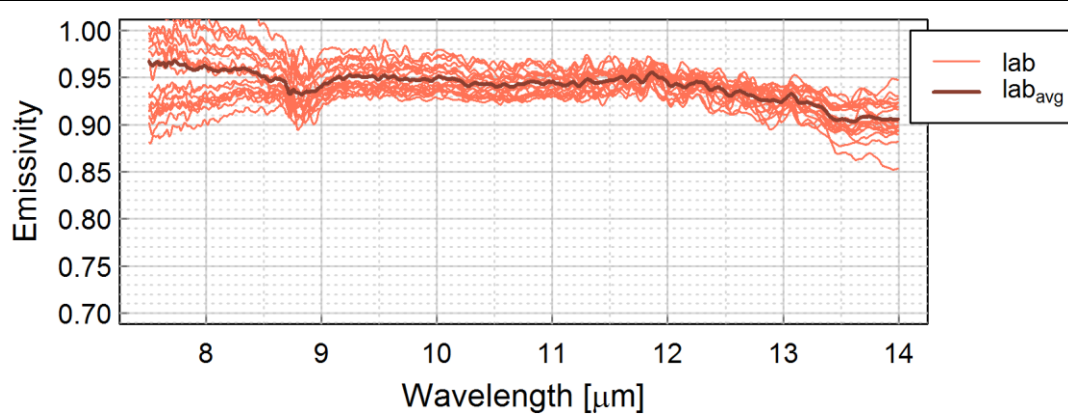
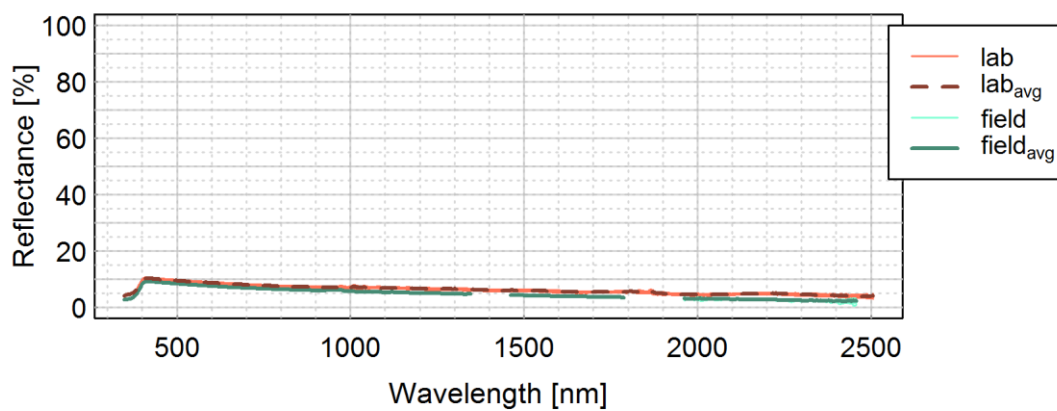
Class	Metal
Material	Iron
Colour	Black
Status	Weathered
Dimension [mm]	428 x 5 x 110



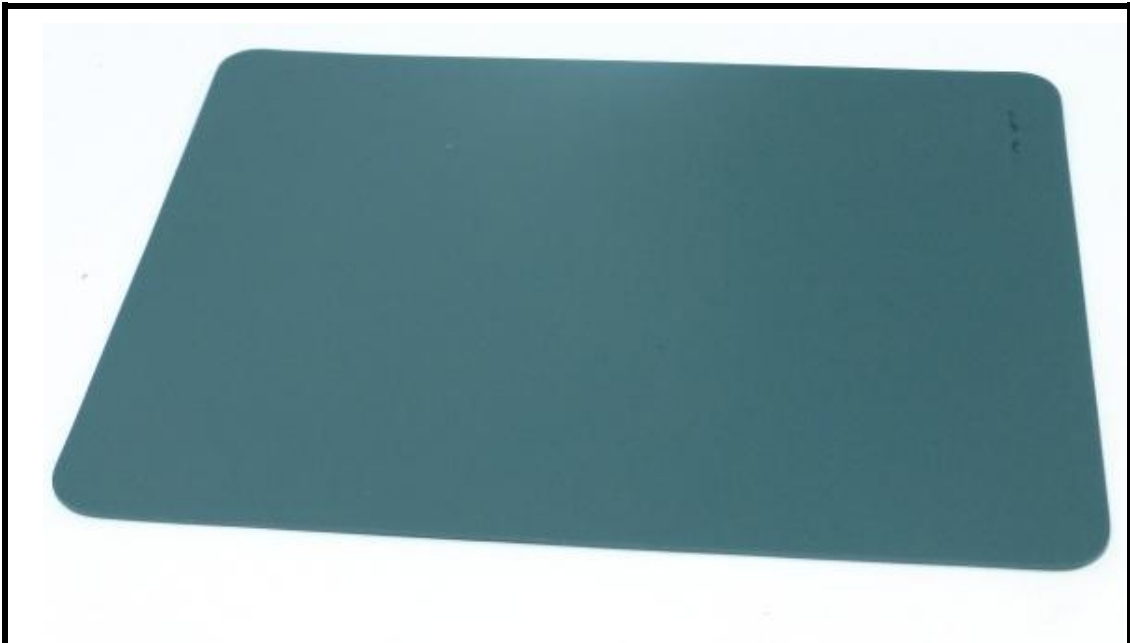
PVC_{v001}



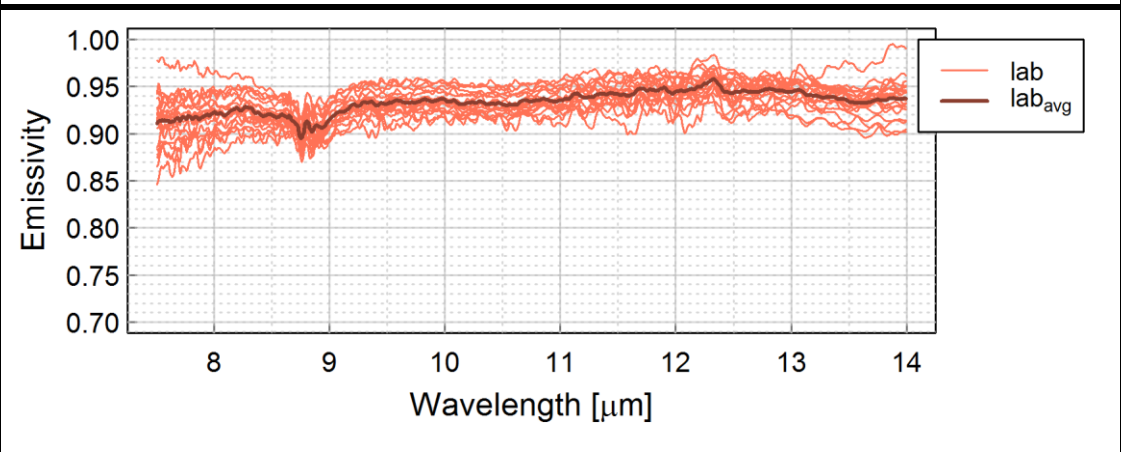
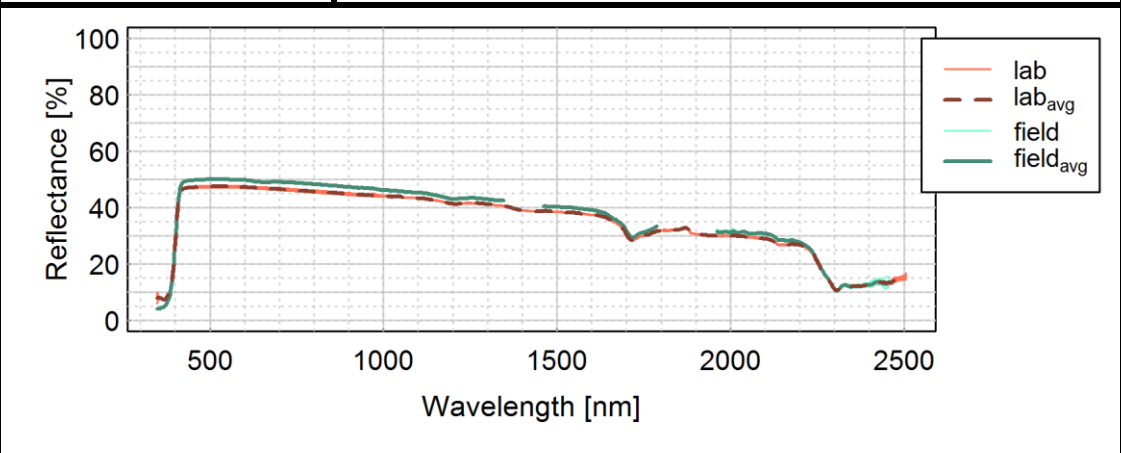
Class	PVC roofing sheet
Material	PVC
Colour	Lead grey
Status	New
Dimension [mm]	146 x 1 x 204



PVC_{v002}



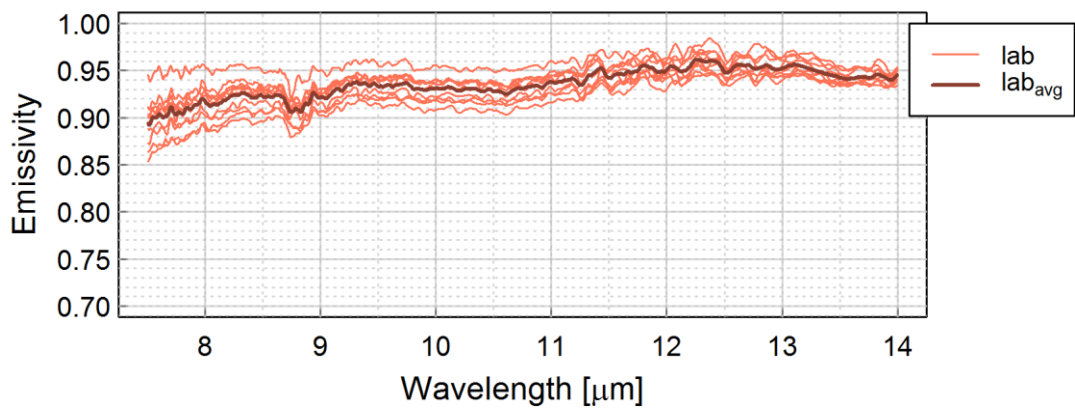
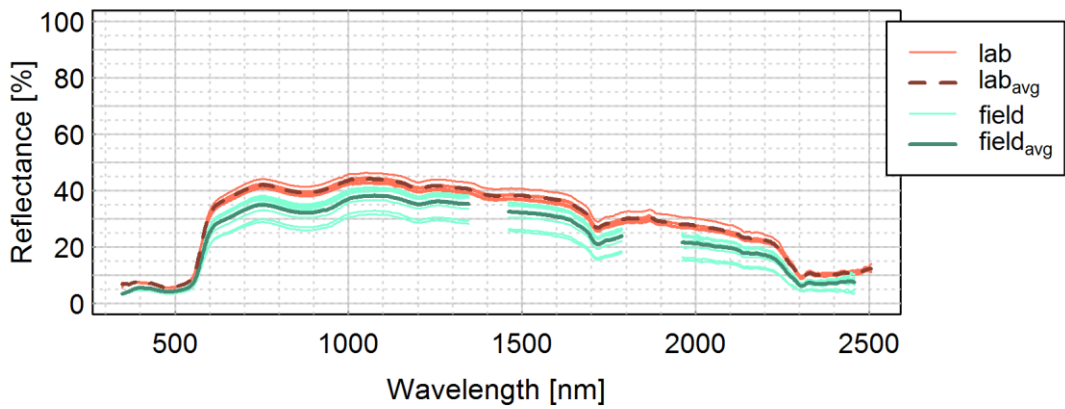
Class	PVC roofing sheet
Material	PVC
Colour	Light grey
Status	New
Dimension [mm]	146 x 1 x 204



PVC_{v003}



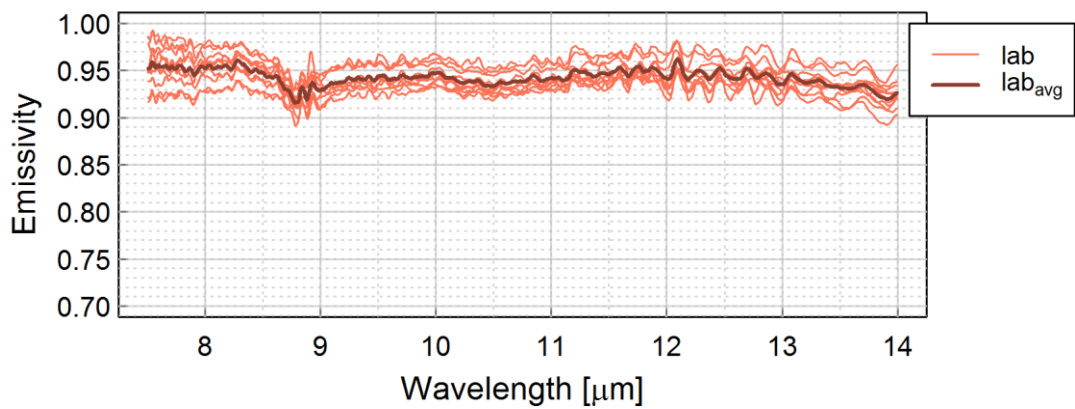
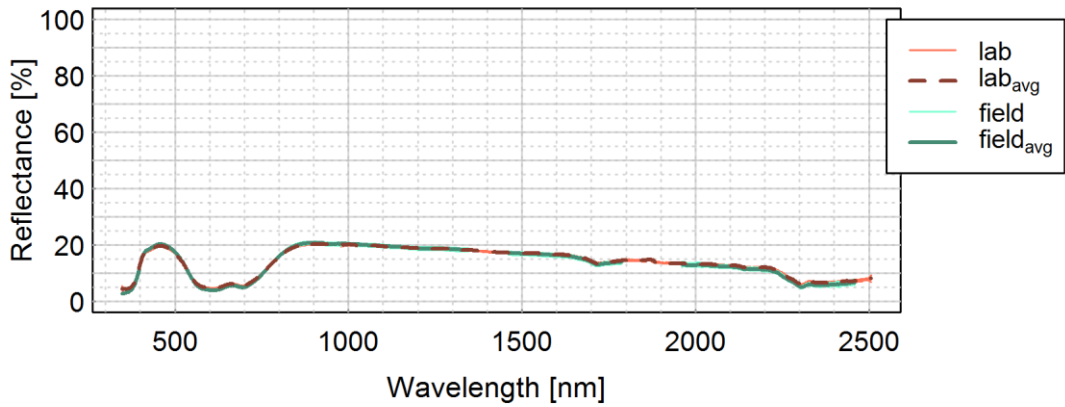
Class	PVC roofing sheet
Material	PVC
Colour	Copper
Status	New/structured
Dimension [mm]	146 x 1 x 204



PVC_{v004}



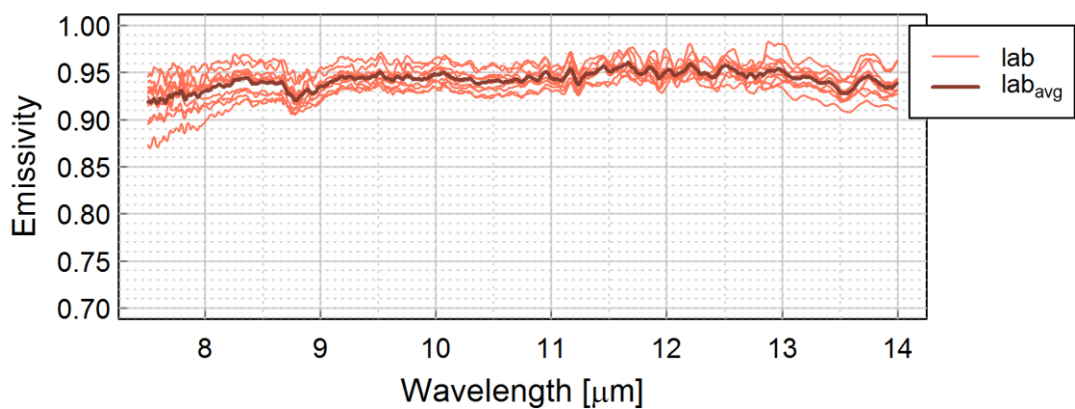
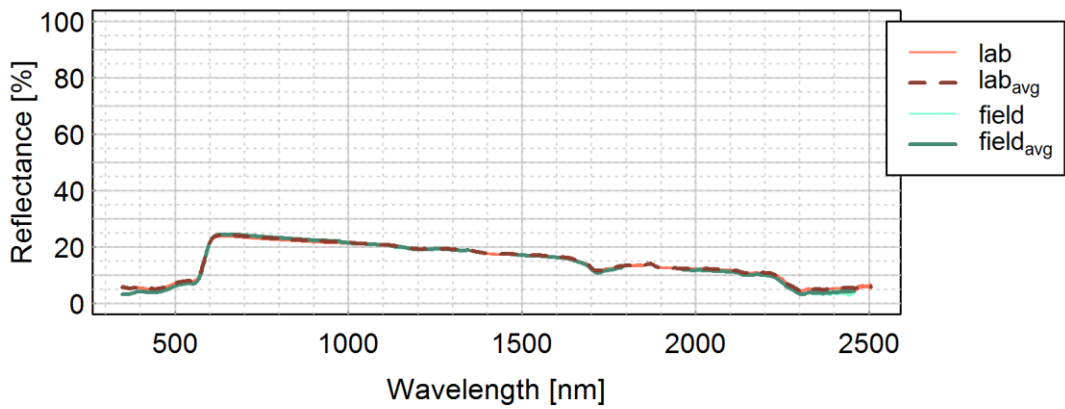
Class	PVC roofing sheet
Material	PVC
Colour	Azure blue
Status	New
Dimension [mm]	146 x 1 x 204



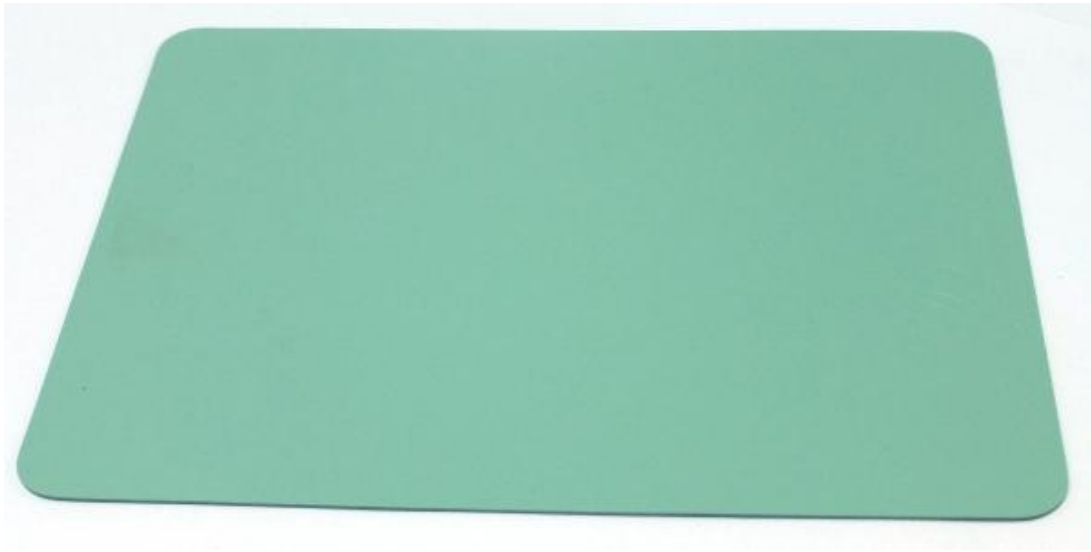
PVC_{v005}



Class	PVC roofing sheet
Material	PVC
Colour	Copper brown
Status	New
Dimension [mm]	146 x 1 x 204



PVC_{v006}



Class	PVC roofing sheet
Material	PVC
Colour	Copper patina
Status	New
Dimension [mm]	146 x 1 x 204

