

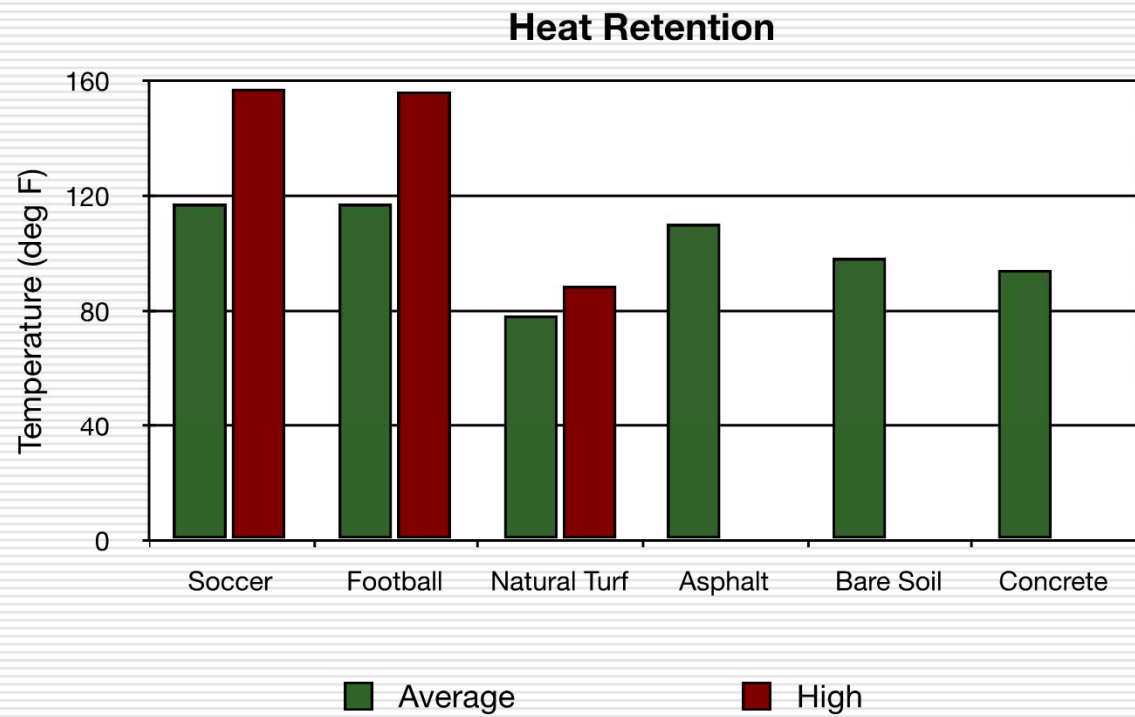
# Measuring Heat of Synthetic Turf

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**A Simplified Look at  
Solar Reflective Index and  
Surface Temperature**

# The Issue

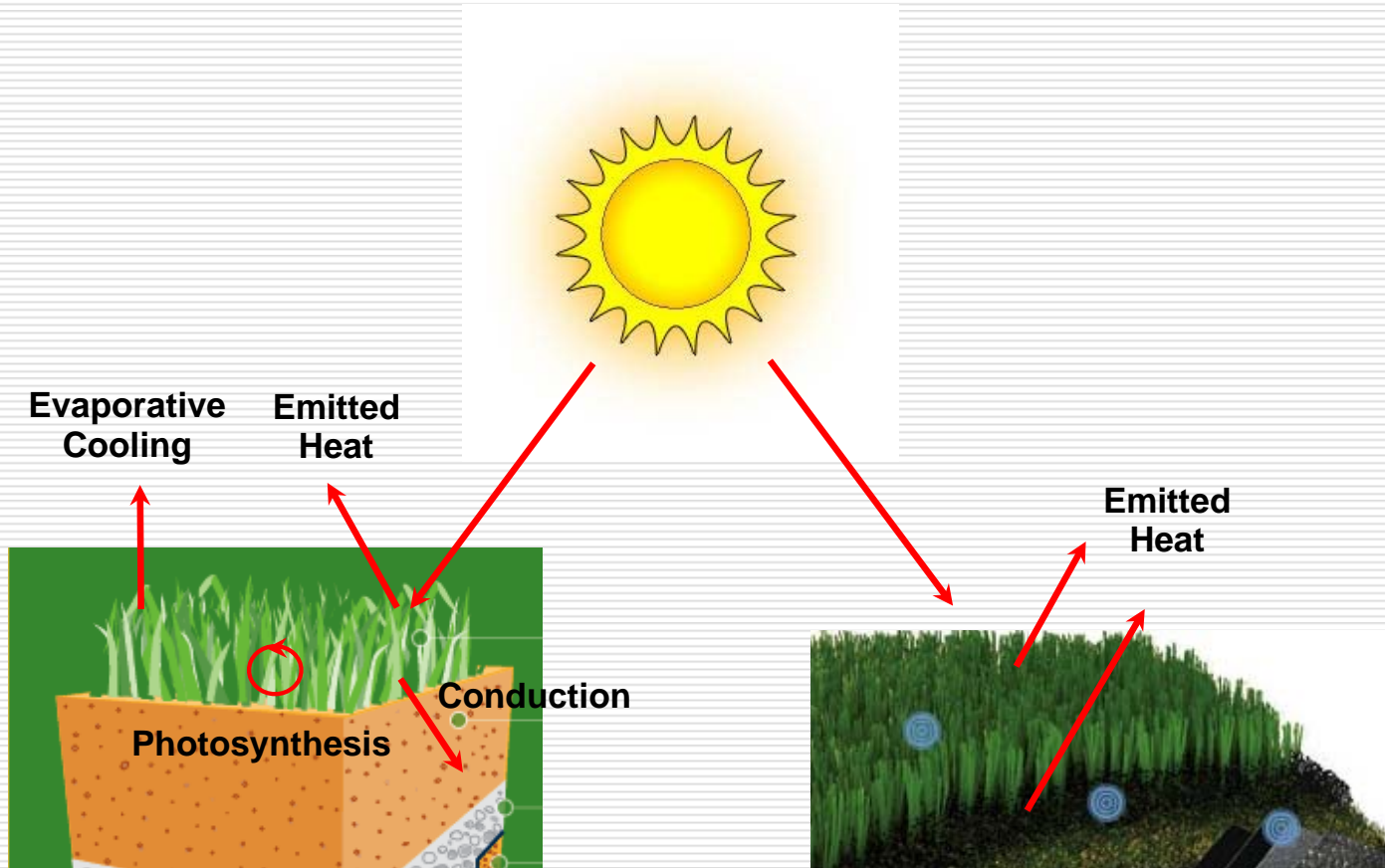
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“Synthetic Surface Heat Studies”  
C. Frank Williams and Gilbert E. Pulley Brigham Young University

# Why is Natural Turf Cooler?

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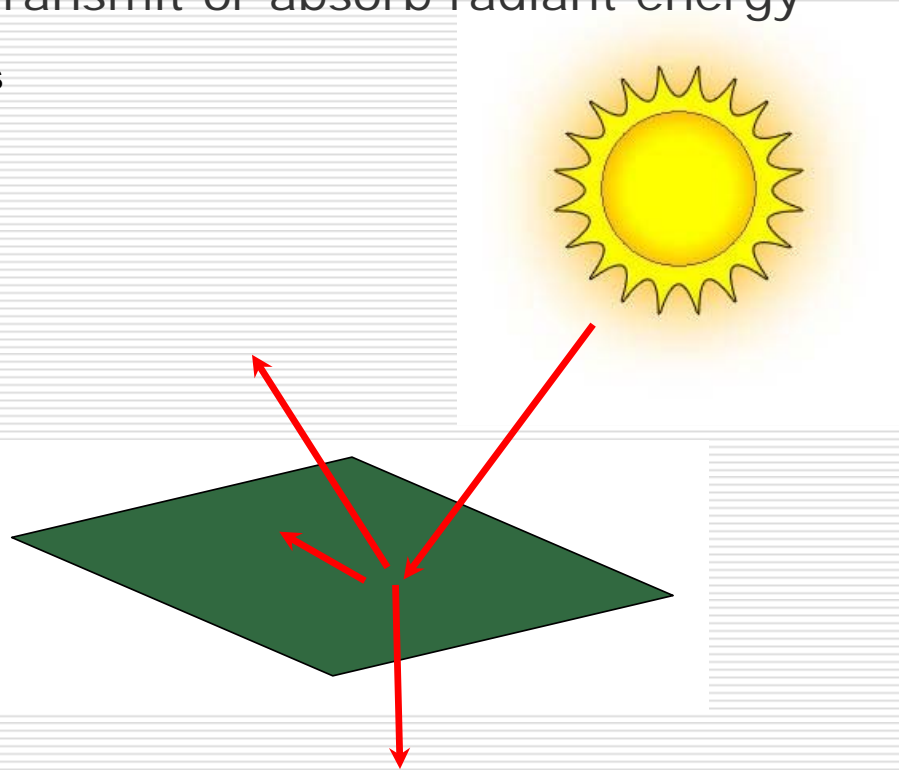


# Emissivity

Materials can reflect, transmit or absorb radiant energy

The degree to which a material absorbs and emits heat is its emissivity

	Emissivity
skin	0.99
grass	0.98
water	0.95
soil	0.95
clay	0.95
glass	0.94
asphalt	0.93
polyethylene (black)	0.92
sand	0.90
granite	0.90
rubber	0.90
concrete	0.85
nylon	0.85
cotton	0.80
aluminum foil	0.04



# Measuring Surface Heat

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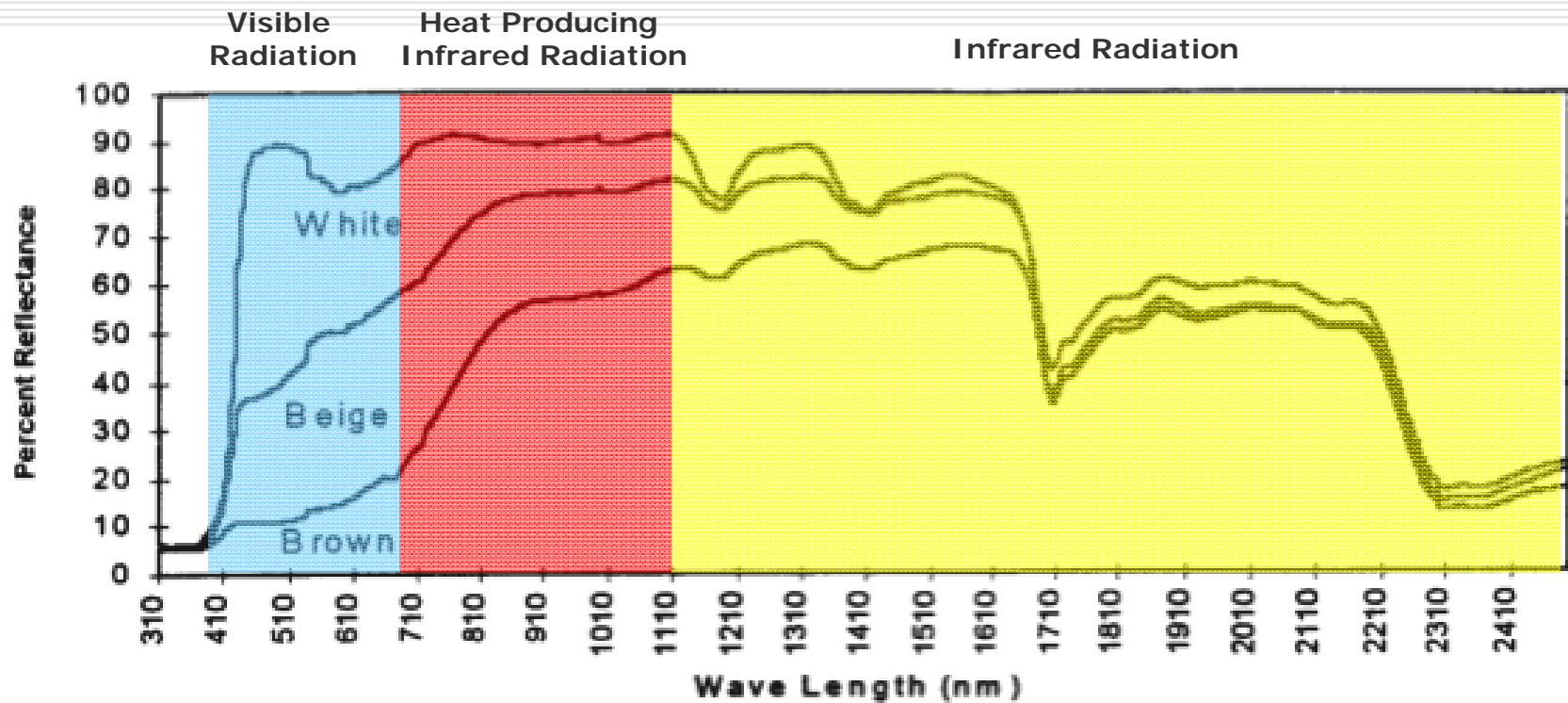
- Solar Reflective Index (SRI)
  - Surface Temperature
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# SRI

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- Solar Reflective Index (SRI) is a measure of the relative steady-state temperature of a surface with respect to a standard white surface (SRI = 100), and a standard black surface (SRI = 0) under defined standard solar and ambient conditions.
    - SRI measures the ability of a material to reflect heat
    - ASTM E903
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# SRI

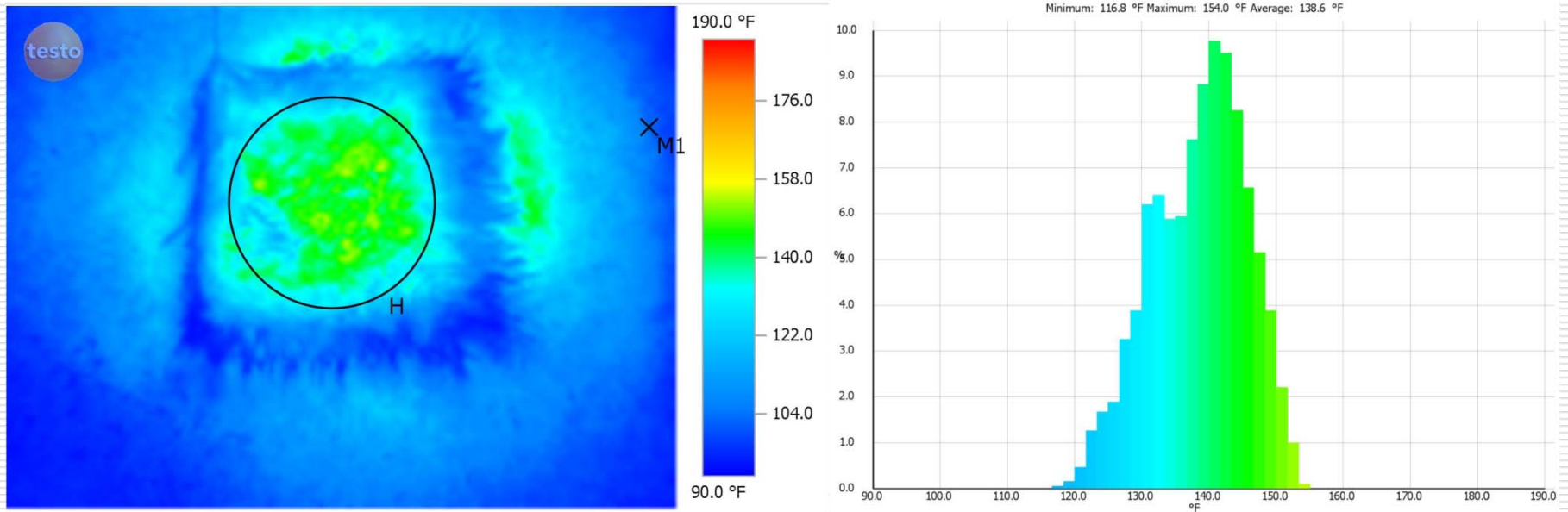


Predicting Maximum Field Service Temperatures From Solar Reflectance, Hardcastle , Coloring Technology for Plastics, pp 59-67.

# Surface Temperature

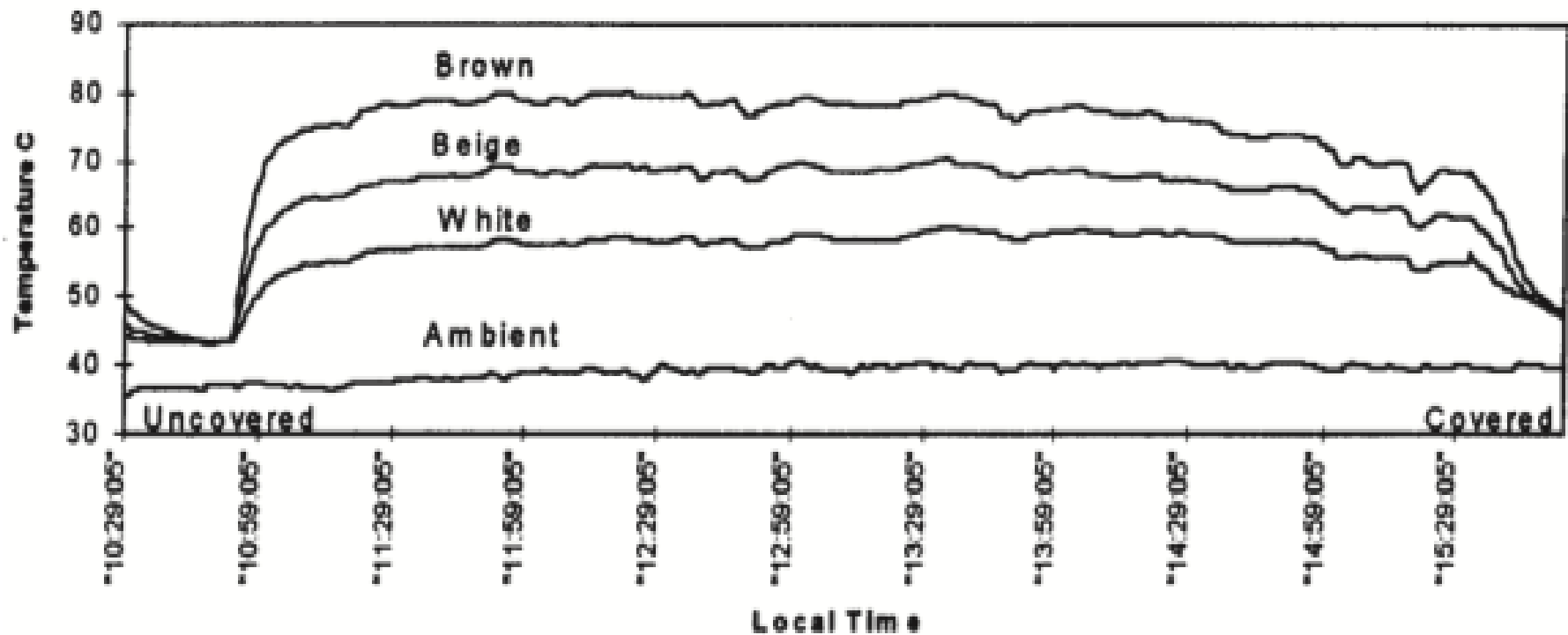
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- Measurement of the actual surface temperature
  - Thermal imaging





# Surface Temperature



Predicting Maximum Field Service Temperatures From Solar Reflectance, Hardcastle , Coloring Technology for Plastics, pp 59-67.

# Comparison of Measurement Methods

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	<b>SRI</b>	<b>Surface Temperature</b>
<b>Direct or Indirect Measurement</b>	Indirect	Direct
<b>Lab Test or Actual Use Conditions Test</b>	Lab Test	Lab Test or Use Conditions
<b>Standardized Test</b>	Yes (ASTM E903)	No
<b>Ability to Correlate to Actual Surface Temperature</b>	Can be Modeled	Good
<b>Ability to Accommodate an Irregular Surface</b>	Not Ideal	Good

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