Green Design
Innovative Building Envelope Systems

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Arup
Enclosure
Identifying Comfort

- Conduction
- Convection
- Radiation
- Evaporation
- Air Motion
- Relative Humidity
Mapping Comfort

- Temperature – 20 to 25 °C
- Humidity – 30 to 70 % RH
- Humidification / Dehumidification
- Heating / Cooling

ARUP
Other Conditions

- Metabolism / Activity Level
- Clothing / Insulation
- Air Movement
- Equipment

ARUP
Thermally Efficient Composites

Inert Infill in Glazing Units

Warm Edge Spacers

Third Generation of Glass Coatings

Self Shading Glazing Units

Thermally Bridged Window Systems
Reactive vs Proactive
Examples
ETFE canopy reduces the amount of solar radiation reaching the pedestrian area by 49%.

Patterned ETFE
Leaf print = 65% of area
SC = 0.4

HOT AIR

Clear ETFE
Hot air escapes above buildings

Direct sunlight providing sufficient daylight to pedestrian areas and adjoining retail spaces

Mechanical ventilation system producing 1.2 m/s air movement resulting in apparent 2°C drop in temperature

Central fountain chills ground paving to radiate coolth

Trees provide additional 30% shading
• Holistic Design Intent
• Responsive Architecture
• Integrating New Technologies

Thank You!