`Sustainable Sourcing of Products and Materials for Green Buildings

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Growth of Green Buildings in India

- Substantial growth in Green Buildings
  - Expected to reach 10 billion sq.ft by year 2022
- Increased demand for credible Green building products

Till date
- More than 4000 Registered Green Building Projects
- More than 4.68 Billion sq.ft.
Challenges Faced by end users

Typical Questions

• How do I know the product is green?
• If green, to what extent?
• Is it green in performance (or) materials used?
• What if the product is green in performance but not during manufacture?

Thus far...

• Extent of Green based on declarations
  □ Examinee & Examiners are same
• Dependence on Certifications from other countries
  □ Not fine tuned for Indian conditions
‘GreenPro’ Certification for Products and Materials

- Assess ‘How green is a product’
  - Based on ‘Life Cycle Based’ approach on par with international standards

- Highlights the way forward to achieve environmental performance
Progress made so far...

- More than 300 green products certified
  - Under 15 Building Product Categories
- ‘GreenPro’ Certification welcomed by Indian Industry
Key Focus areas in Green Buildings

- Energy Efficiency
- Indoor Environmental Quality
- Material & Resources
- Water efficiency
- Sustainable Sites
Energy Efficiency
Energy Performance

- Thermal performance of construction block – significantly affects overall energy performance of building
- High thermal insulation – Very important
- ‘U’ value need to be tested as per ASTM standards
- High performance blocks available with ‘U’ value of 0.7 W/m²K
Performance Comparison
Conventional Brick Vs ‘GreenPro’ Certified Block

- Building Type: Office
- Location: Hyderabad, Composite Climate
- U value (overall heat transfer coefficient)
  - ‘GreenPro’ certified block (9 inch): 0.7 W/m² k
  - Conventional Brick (9 inch): 2.6 W/m² k

- WWR: 40%
- Conditioned area: 20,000 sft
## Performance Comparison

<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conventional Brick</strong></td>
<td>24</td>
<td>25</td>
<td>30</td>
<td>33</td>
<td>30</td>
<td>32</td>
<td>30</td>
<td>28</td>
<td>28</td>
<td>27</td>
<td>24</td>
<td>26</td>
<td>336</td>
</tr>
<tr>
<td><strong>GreenPro certified block</strong></td>
<td>23</td>
<td>23</td>
<td>28</td>
<td>31</td>
<td>28</td>
<td>31</td>
<td>29</td>
<td>27</td>
<td>27</td>
<td>26</td>
<td>23</td>
<td>25</td>
<td>322</td>
</tr>
</tbody>
</table>

**Savings 4.27%**

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## Results

<table>
<thead>
<tr>
<th>S No</th>
<th>Parameter</th>
<th>Conventional Brick</th>
<th>GreenPro certified Block</th>
<th>Saving (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Monthly Peak Demand (kW)</td>
<td>1268.9</td>
<td>1183.1</td>
<td>6.7</td>
</tr>
<tr>
<td>2</td>
<td>Energy (kWh*1000)</td>
<td>336140</td>
<td>321770</td>
<td>4.27</td>
</tr>
<tr>
<td>3</td>
<td>AC Capacity (TR)</td>
<td>56</td>
<td>47</td>
<td>9</td>
</tr>
</tbody>
</table>

Increase in Energy saving potential for high raise buildings
Products and materials impacting Energy Performance

- **Glazing**
  - ‘U’ Value – 1.7 -2.5 W/mK
  - Solar Heat Gain Coefficient – 0.1 -0.4
  - Visual Light Transmittance

- **Fenestrations**

- **Building Insulation**
  - Thermal Conductivity – 0.04 -0.04 W/mK

- **High SRI Products and Materials**
  - SRI Index - >70%
  - Paints, Tiles
Indoor Environmental Quality
Indoor Environment Quality

- For Paints – GreenPro

  demands for

  - Very low Volatile Organic Compound
  - ROHS Compliance
    - Lead, Chromium, Cadmium, Mercury
  - Elimination of Formaldehyde

"THERE IS NO KNOWN LEVEL OF LEAD EXPOSURE THAT IS CONSIDERED SAFE."

World Health Organization
# Paints Vs Green Paints

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Paints</th>
<th>Green Paints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volatile Organic Compound (VOC) in mg/lit</td>
<td>&gt;100</td>
<td>10-50</td>
</tr>
<tr>
<td>Presence of Heavy metals – Lead, Cadmium, Chromium and mercury</td>
<td>Yes</td>
<td>&lt; 0.1 % (or) 1000 ppm</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>High</td>
<td>&lt; 0.1%</td>
</tr>
</tbody>
</table>

GreenPro Encourages water based Paints and elimination of solvents
Material & Resources
Materials & Resources

- To bring down virgin material consumption through
  - Recycling
  - Utilization of Industrial waste

- Use local materials

- Ensures elimination of Toxic, Hazardous & Carcinogenic materials
Green Cement & Concrete

- Utilizes maximum Industrial waste
  - PPC – Fly ash based cement (upto 35%)
  - PSC – Slag Cement (upto 70%)
- Low GHG emission per ton of Cement produced
- Minimum utilization of natural resources
Water Efficient Plumbing Fixtures

- Enhance efficiency of plumbing fixtures, thereby minimising potable water use

<table>
<thead>
<tr>
<th>Fixture Type</th>
<th>Baseline Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Closets (Full-flush)</td>
<td>6 LPF</td>
</tr>
<tr>
<td>Water Closets (Half-flush)</td>
<td>3 LPF</td>
</tr>
<tr>
<td>Urinals</td>
<td>4 LPF</td>
</tr>
<tr>
<td>Faucets / Taps*</td>
<td>6 LPM</td>
</tr>
<tr>
<td>Health Faucet*</td>
<td>6 LPM</td>
</tr>
<tr>
<td>Showerhead / Handheld Spray*</td>
<td>10 LPM</td>
</tr>
</tbody>
</table>
Benefits of Certified Green Products

❖ **End User**

➢ **Make lives Easier**

☐ No due diligence is required –

Time & Effort saved

➢ **Enhances the performance of Green Buildings**

➢ **Will bag credits right during selection**

☐ Credit Points in IGBC Rating system
Benefits of Certified Green Products

❖ Product Manufacturer

➢ Differentiates the product from Competition

➢ Finds applications in

  ❑ Green buildings, Townships, Homes, Hotels, Hospitals, Cities
  ❑ Green Companies

➢ Increased Market reach

  ❑ Environmentally Conscious Customers
To Sum Up…

 Certified Green Products
  ➢ Widely accepted by all the stakeholders in India
  ➢ Growing much faster

 End-Users finding it easier in selecting products and materials

 ‘GreenPro’
  ➢ Expanding gradually to all building product categories
  ➢ Creates a Win-Win for all stakeholders