New Material for Illuminated Panels

Microcellular Reflective Sheet

- Contributes bright internally lit sign panels with improved sign surfaces
- Cuts energy cost of facade signs by 50%
- Reduces illumination blurs (striped patterns of lamps)
- Reduces illumination blurs and color variations in LED planar light sources (backlights and sign panels)

FURUKAWA ELECTRIC
MCPET Realizes Bright, Vivid Displays

1. Reflectance is increased 99%, of which 96% is diffused reflection. Reflection is balanced between blue and red light.

As the diffused reflectance of mirrored of metallic reflection panels is less than 10%, such panels are only able to reflect the light source in a specified direction. Moreover, metallic reflection panels absorb red light, changing the color of the reflected light to a bluer tint than the original light source. Since the reflectance ratios low to begin with, the reflected light becomes dark and bluish. As can be seen in the figure below, MC-PET reflects blue light with wavelengths of 400 nm and red light with wavelengths of 700 nm nearly equally, allowing the production of very bright sign surfaces.

2. Energy costs can be reduced by 50% for facade signs and 30% for conventional signs.

1. By placing MC-PET reflection panels not only behind but also above, below and beside fluorescent lights, necessary lighting can be reduced from two rows to one row of 40 watt lights for a facade sign with a 1100 mm width. See the figure below left for an example of results.

2. For a conventional sign using lighting of seven fluorescent lights per 2m² (1.5m x 1.2m), the use of MC-PET reflection panels reduces the necessary lighting to five lights per 2m². The cost savings reflect the reduction of one fluorescent light bulb per square meter of lighting. See the figure below right.

Energy savings (per 2m²) ······ 2 x 40 - watt fluorescent lights

Energy savings per day
40 watts x 2 lights x 20 hours per day = 1,600 watt-hours per day
Energy savings per year
1.6 x 25 yen x 365 days = 14,600 ······ 14,600 yen per 2m²
14,600 / 2m² = 7,300 ······ 7,300 yen
3 **Illumination blurs (striped patterns of lamps) are reduced. Please consult us for blurs related to especially thin signs (under 40 mm).**

In general, when the distance between the lamps and the sign surface is short, the areas immediately above the lamps are overly bright and the areas between lamps are dark, resulting in illumination blurs on the sign surface. Simply by using MCPET reflection panels, higher illuminance between lights results in a more balanced lighting effect and a reduction in blurs and striping. For especially thin signs where reducing the blurring effect is difficult, we have special methods to solve the problem. Please consult us for details.

![Countermeasures of Illumination Blurring on Sign Surfaces](chart)

**Diagram:** Countermeasures of Illumination Blurring on Sign Surfaces

- Distance between fluorescent light and acrylic sign panel = 55 mm
- Fluorescent light: 40 watts

**Legend:**
- MCPET reflection panel + 7.5 mm aluminum tape above lamps
- White-coated reflection panel
- White-coated reflection panel + 5 mm aluminum tape above lamps

4 **Installation is easy with a cutter knife. MCPET panels can be attached behind fluorescent lamps with special two-sided adhesive tape.**

We recommend the following two-sided tape.
Manufacturer: Sumitomo 3M Ltd. Product name: VHB™ Double Coated Foam Tape

<table>
<thead>
<tr>
<th>Tape</th>
<th>Product No.</th>
<th>Thickness</th>
<th>Color</th>
<th>Basic Material</th>
<th>Adhesive</th>
<th>Liner</th>
<th>Temperature Resistance (°C)</th>
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<tbody>
<tr>
<td>General use</td>
<td>Y-4950</td>
<td>1.14</td>
<td>White</td>
<td>Acrylic foam</td>
<td>Regular</td>
<td>Acrylic</td>
<td>Paper</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-20 to 150 °C</td>
</tr>
</tbody>
</table>

5 **Maintenance**

Although MCPET is treated with an anti-static process, we recommend cleaning once per year to maintain long-term function.
Can be used with various types of products

### Illuminated box and luminous ceiling

- **Conventional structure**
  - Increasing brightness by 60%
  - Uneven light output is eliminated

- **MCPET**
  - Saving energy by 40%
  - Same level of illuminance is maintained

*Installed upside down for luminous ceiling.

### Ceiling light

- **Using MCPET**
  - Two fluorescent lights can provide the same brightness as three or more conventional fluorescent lights.

- **Conventional type**
  - Steel panel with white coating is used for the reflector.

**Saving energy by 30% on embedded lighting system**

Furthermore, using an energy-saving fluorescent light can save energy by 70% in total.

### Showcase

- **Increasing illuminance of a showcase**

### Double-sided signboard

- **Fluorescent light**
  - Double-sided MCPET Cap
  - Mounting bracket
  - MCPET reflector bar

- **Structure of a thin double-sided light source**

- **Socket**
- **Making a 100 mm thick double-sided board is possible with a fluorescent light pitch of 200mm.**

**Increasing illuminance by 30%**
Facade Signboard of a Convenience Store

50% to 70% reduction of the energy needed for a conventional facade signboard.

- Scaling down to a one-light system saves 50% energy.
- Furthermore, when used with an energy-saving fluorescent light, a total energy saving of 70% can be achieved.

Thin Signboard

Structure of thin-type signboard

MCPET (ridge-shaped)
- Apex angle: 90°
- Height of crest: Fluorescent light top height

Milk translucent acrylic board:
- (Equivalent to Mitsubishi Rayon’s #430, 3mm t)

Fluorescent light (normal tube)

Fluorescent light pitch: 150mm

Diffusion cap

LED planar light source (backlight and signboard)

Structure of LED planar light source

- Reduces uneven light output.
- Reduces fluctuations in light output

Milk translucent acrylic board

LED

MCPET (perforated product)

- Thin structure is possible.
- The number of LEDs can be reduced if the board is constant in thickness.

Note: Use LEDs with a wide angle of visibility.
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