Energy Management by Intelligent Coating Systems
Introducing ECKART’s programme to promote environmentally aware manufacturing and business practices – a comprehensive concept that influences all our processes and is an indispensable part of our product development.

**Responsible**
An awareness of our responsibilities ensures that we go far beyond what is required of us by law. Hence, ECKART employs its own full-time energy manager who works with us constantly to improve energy efficiency and reduce carbon emissions. In 2008, for instance, we saved over 60,000 litres of fuel oil through the thermal recycling of waste solvents.

We also reduced loss through leakage from 36% to 26% in the energy-intensive production of compressed air, whilst simultaneously increasing output by 22%. And, since 2009, we’ve reduced our annual water consumption by 12,000 m³ through the installation of a new cooling tower featuring a closed-cycle cooling system.

**Sustainable**
ECKART is constantly improving the environmental sustainability of its products through measures such as the use of biodegradable materials, continual reductions in harmful emissions and drastic cuts in the use of volatile organic compounds (VOCs) in our inks and coatings. Hence, we’ve been producing aluminum pigments for water-based coating technologies since around 1980.

**Balanced**
As a client, our environmental credentials mean that you’ll receive added benefit. Eco-friendliness is just as much a part of our products as excellent application suitability, superior processing and value for money. These factors don’t necessarily have to be mutually exclusive.

**Would you like to find out more?**
For detailed information on the ECKART Blueffects programme, visit our website at www.eckart.net/blueffects
Energy Management by Intelligent Coating Systems

Saving energy and reducing climate-damaging CO₂ play an increasingly essential role in future. Concentrating on that, intelligent coating systems can already today accomplish a substantial contribution.

Aluminum exhibits one of the highest IR-reflections among all metals. Pigments manufactured from aluminum, and inserted into coatings show after application – depending on the intended purpose – either a heat-insulating effect or procure that buildings heat-up considerably less.

Based on intensive research, ECKART has developed pigments and pigment concentrates that guarantee a maximum of IR-reflection in optimized coating formulations.

Due to that, in the attic barrier paint area emission values of less than 20% can be achieved. In the field of decorative paints with insulating effect reflection values of more than 50% can be achieved for the entire IR-area. Thus it is possible to cost-effectively contribute already in these days to a future-oriented, creative energy management.

### Recommended Products

<table>
<thead>
<tr>
<th>Product name</th>
<th>Effect/color shade</th>
<th>Average particle size</th>
<th>Pigment percentage</th>
<th>Supply form</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHINEDECOR 5000</td>
<td>Silver extra bright</td>
<td>50 microns</td>
<td>60 %</td>
<td>paste Ready to use</td>
</tr>
<tr>
<td>SHINEDECOR 3500</td>
<td>Silver bright</td>
<td>35 microns</td>
<td>55 %</td>
<td>pigment concentrate</td>
</tr>
<tr>
<td>HYDROXAL DC 5000</td>
<td>Silver extra bright</td>
<td>50 microns</td>
<td>65 % solid</td>
<td>Aluminum paste</td>
</tr>
<tr>
<td>HYDROXAL DC 3500</td>
<td>Silver bright</td>
<td>35 microns</td>
<td>60 % solid</td>
<td></td>
</tr>
</tbody>
</table>

### Energy Balance of a building without specific insulation

**Summer**
- Ceiling: 25%-35%
- Windows: 25%-35%
- Air leakage: 5%-15%
- Walls: 15%-25%
- Floor: 10%-20%

**Winter**
- Ceiling: 25%-35%
- Windows: 11%-20%
- Air leakage: 15%-25%
- Floors: 10%-20%
- Walls: 15%-25%
Heat reflection dependent on wall painting

- The heat migrates from inside to outside
- With reflective paints, that heat radiates back into the room
  - saving of heating costs
  - perfect thermal comfort

Functionality

The increase of Shinedecor in the formulation, leads directly to higher reflective values!

MIR-Reflexion spektra (diffuse Reflexion, Ulbricht sphere)

reflection [%]

- white wallpaint $R(\lambda) = 0.05$
- 10% SHINEDECOR 5000 in ECKART guiding formulation $R(\lambda) = 0.36$
- 20% SHINEDECOR 5000 in ECKART guiding formulation $R(\lambda) = 0.48$
Conventional interior wall paints absorb averagely 95% of thermal radiation and completely emit heat via walling.

Transparent interior wall paints specially modified with aluminum pigments can reflect up to 50% of that heat.

This technical widely uncomplicated measure leads to a significant reduction in energy consumption and, associated with that, lower impact on environment, caused by CO₂-emissions.

Furthermore, the achieved heat reflection subjectively contributes to a higher degree of comfort and well-being in the room. For that reason ECKART developed a waterborne pigment concentrate “SHINEDECOR” that is easy to use and warrants a comfortable application.

SHINEDECOR is inserted into conventional transparent interior wall paints – identical to the procedure with tinting paints. The so mixed wall paint is then applied by roller brush, paint brush or spraying.
Attic barrier coatings have been commercially available for more than 20 years, but have only recently received intense interest due to the potential to significantly reduce cooling bills in hotter climates.

In a home, heat is transferred into attics and then into the inner walls by three ways: conduction, convection, and radiation. Radiation is the transfer of infrared energy from a hot surface to a colder surface through air. Attic barrier coatings (or Interior Radiation Control Coatings, IRCC), when applied on the underside of the roof decking, function by lowering the surface emittance from around 0.70 (for most typical building materials) to 0.24 or lower.

The attic barrier coating functions by limiting heat transfer via radiation. In general, attic barrier coatings do not reduce heat transfer by convection or conduction. In order for an attic barrier coating to function properly, the painted surface must face a minimum of 2 inches of air space. Energy efficiencies will not be realized if the coating is “sandwiched” between two solid surfaces.
It has been determined that aluminum provides the lowest emissivity currently possible. There are several types of aluminum products currently on the market to reduce heat transfer into attics, which include aluminum foil laminates, aluminized plastic films, and aluminum containing attic barrier coatings. Attic barrier coatings offer advantages in regards to the ease and cost of installation, particularly in retrofit applications.

ECKART is committed to the development of next generation green products which will lower energy costs and reduce negative impacts on the environment. To this end, ECKART has developed starting point attic barrier formulations containing ECKART aluminum pigments which obtain emissivity values below 0.20 according to ASTM C1371 (i.e., 80 % or more of the radiant energy reflected).
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</tr>
</thead>
<tbody>
<tr>
<td>HYDROXAL W 22NL</td>
<td>Silver extra bright</td>
<td>50 microns</td>
<td>70 % solid</td>
<td>Aluminum paste</td>
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<tr>
<td>HYDROXAL W 24NL</td>
<td>Silver bright</td>
<td>35 microns</td>
<td>70 % paste</td>
<td>Aluminum paste</td>
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<tr>
<td>HYDROXAL W 2</td>
<td>Leafing Silver bright</td>
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<td>Aluminum paste</td>
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<tr>
<td>HYDROXAL W 4</td>
<td>Leafing Silver</td>
<td>16 microns</td>
<td>65 % solid</td>
<td>Aluminum paste</td>
</tr>
<tr>
<td>HYDROXAL W 2NL</td>
<td>Non leafing Silver bright</td>
<td>20 microns</td>
<td>65 % solid</td>
<td>Aluminum paste</td>
</tr>
<tr>
<td>HYDROXAL W 4NL</td>
<td>Non leafing Silver</td>
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</table>

Heating Plate ~ 50 °C (~122 °F)

low emission

silver

white/neutral

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