

## CASE STUDY

# CERAMIC SERIES 40 & 50 MAXIMUM FUEL EFFICIENCY

## Royal Caribbean Cruise Lines



• *Green Solutions  
for Marine Vessels*

• *Turns existing  
windows into  
"super windows"*

• *Prolongs life  
of interiors by  
reducing fading*

**Commercial Cruise Lines are now facing greater fuel costs than in any other time in the industry's history.**

### Task:

Royal Caribbean Cruise Lines (RCCL) wanted to impact fuel efficiency with an environmentally friendly, energy saving film product: one that would increase the performance, enhance views throughout the vessel, and ensure the comfort of passengers who want to enjoy the open sea, salt water and the exotic ports of call, both domestic and international.

### Solution:

When faced with the challenges of increased fuel efficiency, and preserving the views in all common areas of the vessel, RCCL's Facility Management Team considered replacing the

glass of all the vessels in question: Hüper Optik® Ceramic 50, and 40 delivered fuel efficiency savings, across vessel type and size. Hüper Optik's patented ceramic product was chosen because of its salt water durability, non-reflective nature and clarity. Hüper Optik® not only trained RCCL's international installation team, but also provided follow-up studies on the efficiency of film in salt water environments using hobo data loggers and infrared cameras during peak demand load times (historically between the hours of 12 and 7 p.m.).

### Result:

The installation of Ceramic 50 and Ceramic 40 on over 23 vessels, with over 500,000 sq. ft. of glass, increased fuel efficiency, and reduced the fading of carpets throughout each vessel. Each vessel reported cooler cabin temperatures, and more comfort throughout each ship's common areas. Hüper Optik® was able to reduce ambient temperatures by over 5 degrees Fahrenheit and surface temperatures by over 9 degrees Fahrenheit.



Performance data is based on this film being applied to the inside of 3mm clear glass. All data calculated using the definitions and equations in ISO9050 & ASHARE Handbook. The data is subject to variations within industry standards.  
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Meister Keramische Technologie