Compare heat-transfer coefficients for water flowing at an average temperature of 40°C and at a velocity of 0.5 m/s in a 2.54 cm diameter duct using Colburn analogy.

In[•]:=
```
U = 0.5; d = 2.54 × 10^-2; Tw = 40;
ρ = ThermodynamicData["Water", "Density",
    {"Temperature" → Quantity[Tw, "DegreesCelsius"]}][[1]];
μ = ThermodynamicData["Water", "Viscosity",
    {"Temperature" → Quantity[Tw, "DegreesCelsius"]}][[1]];
κ = ThermodynamicData["Water", "ThermalConductivity",
    {"Temperature" → Quantity[Tw, "DegreesCelsius"]}][[1]];
Cp = ThermodynamicData["Water", "IsobaricHeatCapacity",
    {"Temperature" → Quantity[Tw, "DegreesCelsius"]}][[1]];
Pr = μ Cp / κ; ReD = ρ U d / μ; f = 0.079 ReD^-1/4;
NuD = h d / κ;
St = NuD / (ReD Pr);
```

In[•]:=
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Solve[St Pr^2/3 == f/2, h]
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Out[•]=
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{{h → 2611.17}}
```