EXAMPLE 1-11 Heat Transfer between Two Isothermal Plates

Modelica code

```
model Example_1_11 "Heat Transfer between Two Isothermal Plates"
  import Modelica.Constants;
  import Modelica.SIunits;

  parameter SIunits.Temperature         T1 =                   300     "Plate 1 T (K)";
  parameter SIunits.Temperature         T2 =                   200     "Plate 2 T (K)";
  parameter SIunits.Length              L(min=0) =             0.01    "Lenght (m)";
  parameter SIunits.Area                A(min=0) =             1       "Area (m^2)";
  parameter Real                        epsilon(min=0,max=1) = 1       "Emissivity (-)";
  parameter SIunits.ThermalConductivity k_air(min=0) =         0.0219  "Air con";
  parameter SIunits.ThermalConductivity k_ure(min=0) =         0.026   "Urethane";
  parameter SIunits.ThermalConductivity k_sup(min=0) =         0.00002 "Superinsulation";

  output SIunits.HeatFlowRate Q_cond_a  "Heat flow rate (W)";
  output SIunits.HeatFlowRate Q_cond_c  "Heat flow rate (W)";
  output SIunits.HeatFlowRate Q_cond_d  "Heat flow rate (W)";
  output SIunits.HeatFlowRate Q_rad     "Heat flow rate (W)";
  output SIunits.HeatFlowRate Q_a       "Heat flow rate (W)";
  output SIunits.HeatFlowRate Q_b       "Heat flow rate (W)";
  output SIunits.HeatFlowRate Q_c       "Heat flow rate (W)";
  output SIunits.HeatFlowRate Q_d       "Heat flow rate (W)";

  Real Q_cond_par;

equation
  Q_cond_par = A*(T1-T2)/L;
  Q_cond_a   = k_air*Q_cond_par;
  Q_cond_c   = k_ure*Q_cond_par;
  Q_cond_d   = k_sup*Q_cond_par;
  Q_rad      = epsilon*Constants.sigma*A*(T1^4-T2^4);
  Q_a        = Q_cond_a + Q_rad;
  Q_b        = Q_rad;
  Q_c        = Q_cond_c;
  Q_d        = Q_cond_d;

end Example_1_11;
```