EXAMPLE 1-1 Heating of a Copper Ball

Modelica code

```
model Example_1_1 "Heating a copper ball"

  import Modelica.Constants;
  import Modelica.SIunits;
  import Modelica.SIunits.Conversions.NonSIunits;

  parameter SIunits.Density              rho =              8950 "Density (kg/m3)";
  parameter SIunits.Diameter             D =                0.1  "Diameter (m)";
  parameter SIunits.SpecificHeatCapacity cp(min=0) =        395  "Heat cap. (J/(kg.C))";
  parameter NonSIunits.Temperature_degC  T1(min=-273.15) = 100  "Initial temp. (C)";
  parameter NonSIunits.Temperature_degC  T2(min=-273.15) = 150  "Final temp. (C)";
  parameter SIunits.Time                 dT(min=1e-9) =     1800 "Time interval (s)";

  output SIunits.Area         A    "Area (m2)";
  output SIunits.Volume       V    "Volume (m3)";
  output SIunits.Mass         m    "Mass (kg)";
  output SIunits.Heat         Q    "Heat transferred (J)";
  output SIunits.HeatFlowRate Qavg "Heat flow rate (W)";
  output SIunits.HeatFlux     qavg "Heat flux (W/m2)";

equation

  A    = Constants.pi*D^2;
  V    = A*D/6;
  m    = rho*V;
  Q    = m*cp*(T2-T1);
  Q    = Qavg*dT;
  Qavg = qavg*A;

end Example_1_1;
```