Density Conversions in DLL file

1 Introduction

The conversion DLL file of unit Density is written in C/C++ programming language style, and do not require any extra code in using this DLL file. This DLL file includes 2 functions to handle the Density conversions as follow:

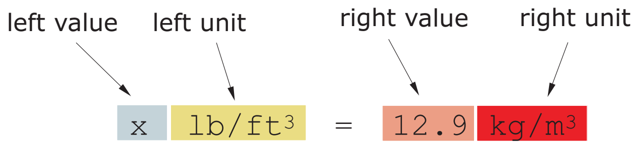
```
double LP_UnitConversionsDensity_GetLeftValue (char* LeftUnit, char* RightUnit, double RightValue)  ;
double LP_UnitConversionsDensity_GetRightValue(char* LeftUnit, char* RightUnit, double LeftValue )  ;
```

2 Problems in Density conversion

The two functions in DLL file are used to handle all Density conversions in two problems.

Problem 1 The unknown value is on the **left hand side** of equation

This problem in conversions is described in the figure:



The value x is obtained by either one of two methods:

- Method A : The code is :

```
double x ;
x = LP_UnitConversionsDensity_GetLeftValue("PoundPerCubicFoot", "KilogramPerCubicMeter", 12.9)   ;
```

- Method B : The code is :

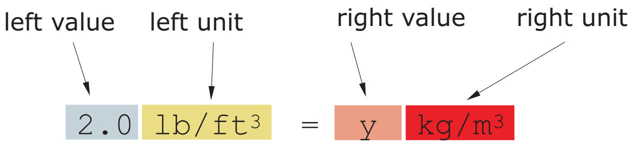
```
char LeftUnit[]   = "PoundPerCubicFoot"                   ;
char RightUnit[]  = "KilogramPerCubicMeter"             ;

double RightValue = 12.9              ;

double x = LP_UnitConversionsDensity_GetLeftValue(LeftUnit, RightUnit, RightValue)   ;
```

Problem 2 The unknown value is on the **right hand side** of equation

This problem in conversions is described in the figure:



The value y is obtained by either one of two methods:

- Method A : The code is :

```
double y ;
y = LP_UnitConversionsDensity_GetRightValue("PoundPerCubicFoot", "KilogramPerCubicMeter", 2.0)   ;
```

- Method B : The code is :

```
char LeftUnit[]  = "PoundPerCubicFoot"            ;
char RightUnit[]   = "KilogramPerCubicMeter"      ;

double LeftValue = 2.0                  ;

double y = LP_UnitConversionsDensity_GetRightValue(LeftUnit, RightUnit, LeftValue)   ;
```

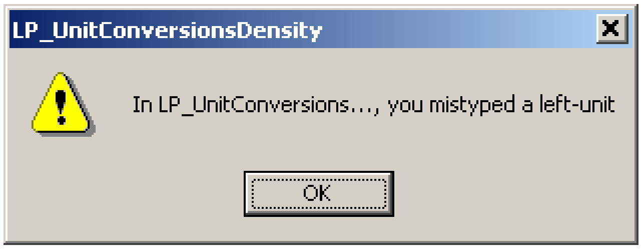
(...continue in next page)

3 Unit names in Density conversions

You can choose the unit name (case sensitive) in the following table for parameters, LeftUnit and/or RightUnit

MilligramPerCubicMillimeter	OunceAvoirPerCubicInch
MilligramPerCubicCentimeter	OunceAvoirPerCubicFoot
MilligramPerLiter	OunceAvoirPerUSGallon
MilligramPerCubicMeter	OunceAvoirPerUKGallon
GramPerCubicMillimeter	OunceTroyPerCubicInch
GramPerCubicCentimeter	OunceTroyPerCubicFoot
GramPerLiter	OunceTroyPerUSGallon
GramPerCubicMeter	PoundPerCubicInch
KilogramPerCubicMillimeter	PoundPerCubicFoot
KilogramPerCubicCentimeter	PoundPerCubicYard
KilogramPerLiter	PoundPerUSGallon
KilogramPerCubicMeter	PoundPerUKGallon
MetricTonPerCubicMeter	ShortTonPerCubicFoot
GrainPerUSGallon	ShortTonPerCubicYard
GrainPerUKGallon	LongTonPerCubicFoot
SlugPerCubicFoot	LongTonPerCubicYard

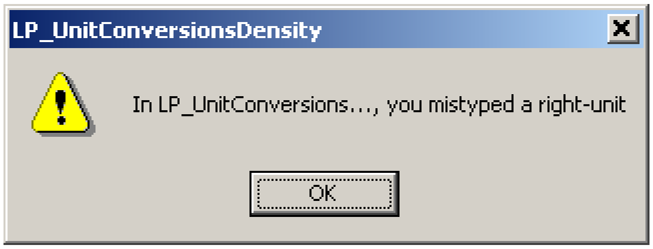
When your unit name is not in this table, the returns of functions are -1 and the error message will issue as shown in the following figures:



LP_UnitConversionsDensity

In LP_UnitConversions..., you mistyped a left-unit

or



In LP_UnitConversions..., you mistyped a right-unit

4 Tip

1. The parameters in two functions have the same order of unit name (LeftUnit is first and RightUnit is second) and the last parameter is the known value.

2. Use function LP_UnitConversionsDensity_GetLeftValue(..) if your **unknown** value is on the **left hand side** of the equation.

3. Use function LP_UnitConversionsDensity_GetRightValue(..) if your **unknown** value is on the **right hand side** of the equation.