Correction Factors for SFC Measurements with different Methods

Preliminary Note

In practice, it often happens that SFC values are measured by different methods. The measurementt results are usually not comparibel but the differences between the results are reproducible. But even here there are exceptions as far as reproducibility is concerned: Cocoa butter as an example is always measured using a ß-stabilizing method. Mesasurements usind a non-stabilizing method gives different values at each repetition. On the other hand, this is quite possible for Palm stearin. The results between stabilizing and non-stabilizing methods are indeed somewhat different, but the differences are reproducible in most cases.

Usually this is not a problem - to measure fats using different methods. A problem, however, is to predict the SFC values of blends whose components were measured by different methods. For example if the blend contains both polymorphic and non-polymorphic type fats.

Let's see an example of a blend consisting of components whose SFC values were measured by different methods - ß-stablizing and non-stabilizing methods:

50% Shea stearin (measured using ß-stabilizing methd)
30% Palm oil (measured using non-stablizing method)
20% Palm olein (measured using non-stablizing method)

In this case the blend is measured using a ß-stabilizing method. A calculation is not possible, because the SFC values of stabilizing and non-stabilizing methods are nor compatible. To solve this problem, we came up with the idea to adapt the measured SFC values to different methods using correction factors. In the past we used this procedure in the lab to adapt SFC values of a rapid method to the standard method. The only requirement for this procedure is that the results of the measurements are reproducible. An example of palm oil is shown in the table below.

Temperature	SFC values		
	Measured with Rapid method	Correction Factor	Result: Standard method
10°C	46.0	+4.0	50.0
20°C	21.1	+1.5	22.6
30°C	9.2	+0.3	9.5
40°C	0.2	+2.6	2.8

That was a big advantage, because the SFC values were already available after 20 minutes. Of course, the values are sometimes very different to the standard method. But with the correction factors, we have obtained sufficient accuracy for the production control measurements.

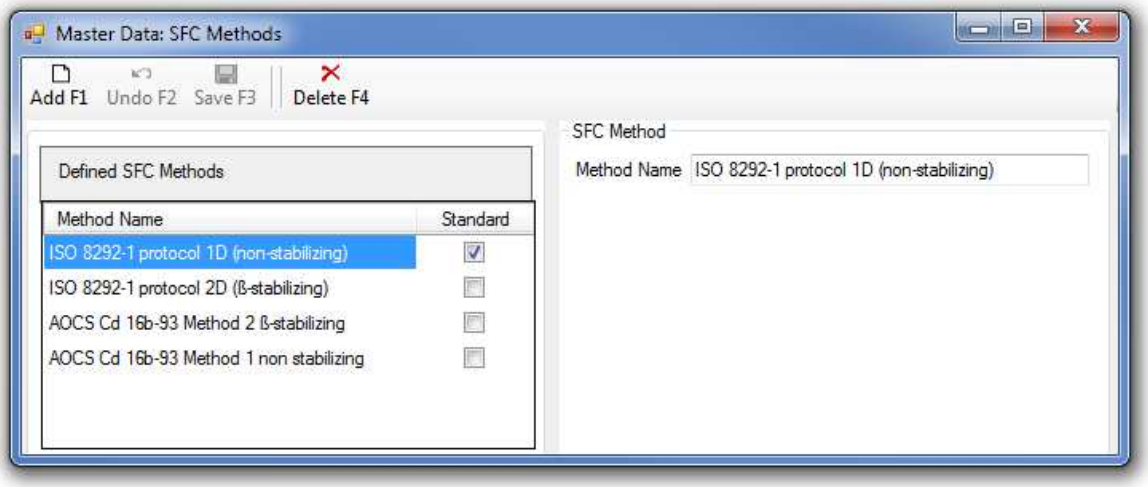
In order to adopt this procedure for the calculation of SFC values of fat blends, the following steps are required:

- Definition of the required SFC methods eg.
  ISO 8292-1 protocol 1D (non-stabilizing),
  ISO 8292-1 protocol 2D (ß-stabilizing), etc.
- Definition of procedures eg.
  From ISO 8292-1 protocol 1D (non-stabilizing) to ISO 8292-1 protocol 2D (ß-stabilizing)
- Determination of the correction factors for each component
- Definition of a SFC method for each component.
- Application for the calculation of blends with components measured with different methods

Preparation of the Data

Definition of SFC Methods

The first step is the definition of SFC methods used in the laboratory. This is done in a simple way with the dialog shown below.

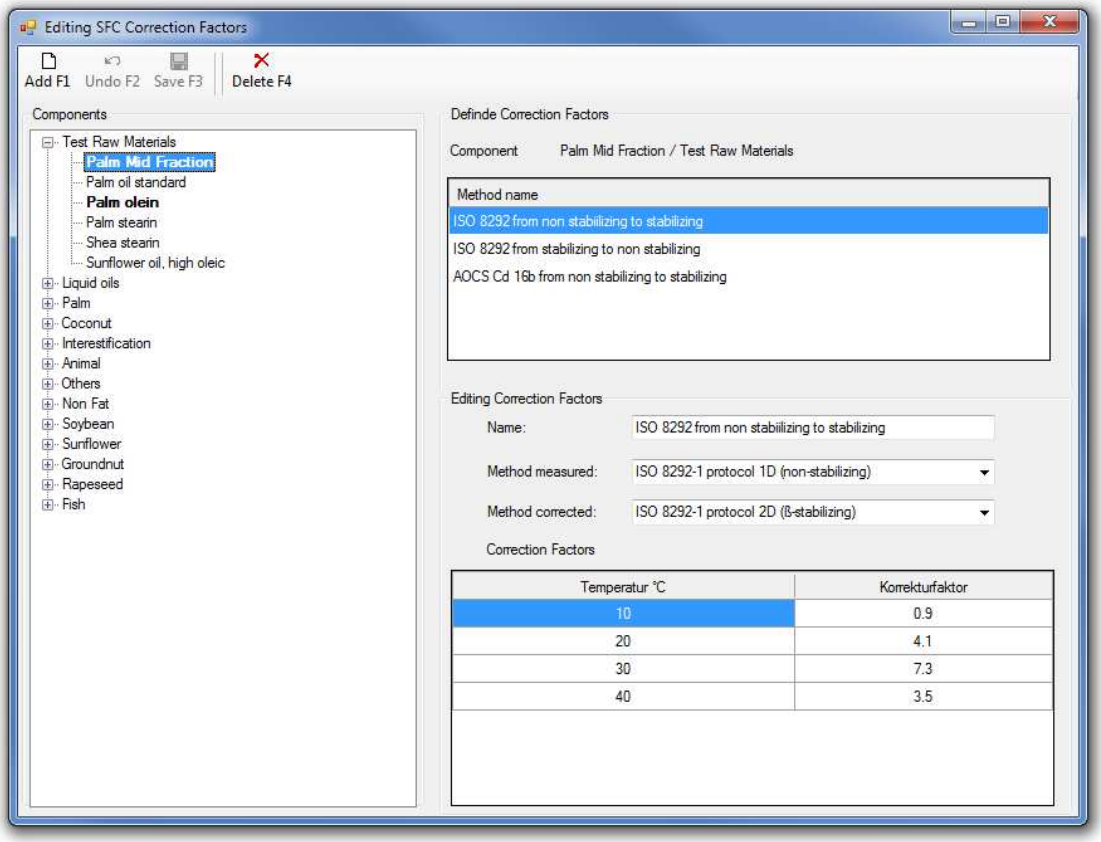


With the Checkbox a standard method can be defined. This standard method is set to all components, but can be changed at any time. Also, when a new datasheet for calculation is created, the default method is autometically applied, but can also be changed as needed.

Definition of Procedures and Input of Correction Factors

The next step is the definition of procedures. A procedure defines the operation of the correction factors, e.g. correction of SFC values from a non-stabilizing to a stabilizing method. It should be noted that this is not possible for all components, e.g. for cocoa butter. For each component a procedure can be defined.

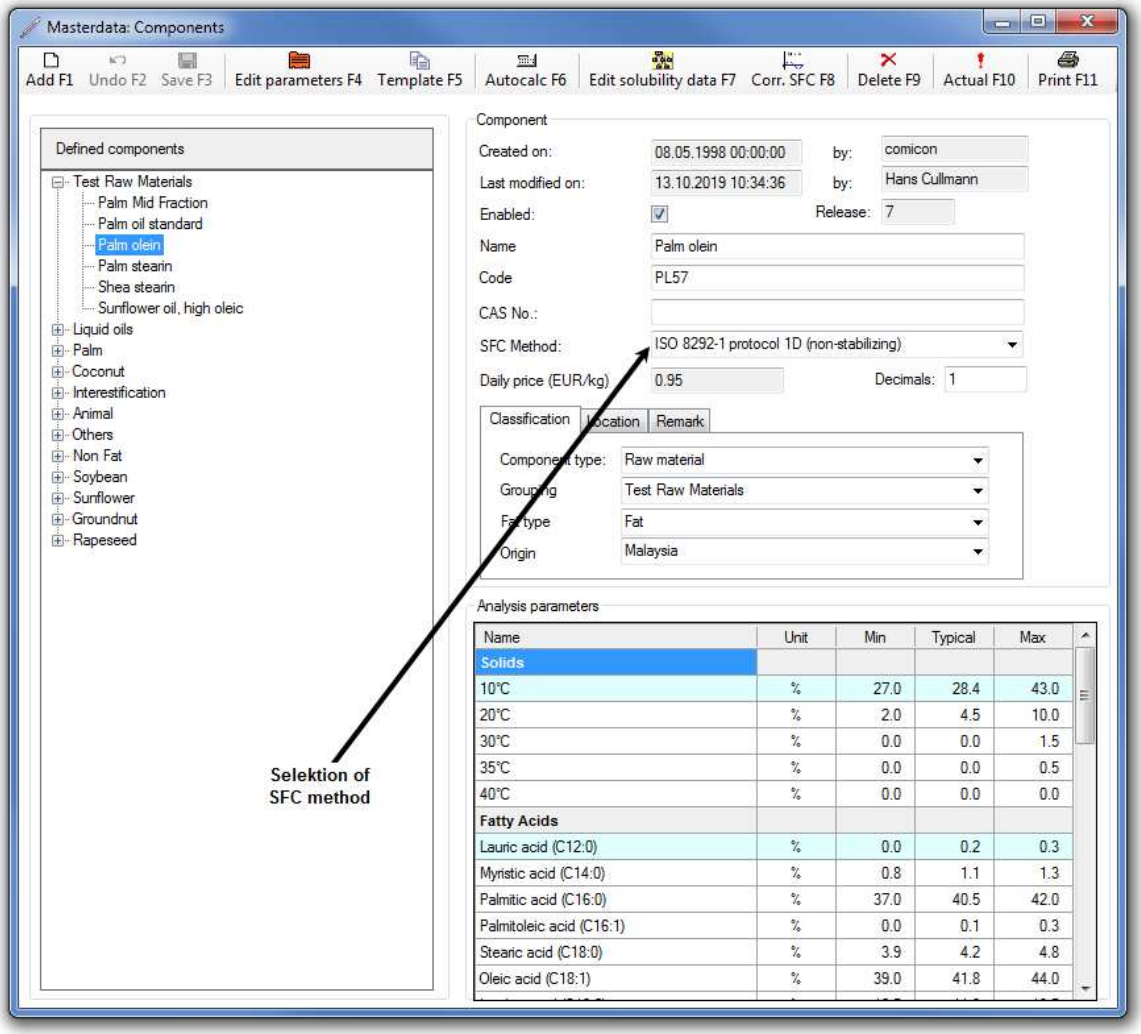
The correction factors must be determined once for 10°C to 40°C. For this purpose, the components are measured with both methods and the difference is determined. This difference - the correction factor - is then entered for each temperature in the dialog shown below. Please note: the correction factors can be both positive or negative.



On the left side of the dialog, all available components are listet. The components for which procedures and correction factors have already been defined are shown in bold. The definitions apply to all versions of a component, so only need to be entered once. If no correction factors are defined for a component, the factor is set to zero.

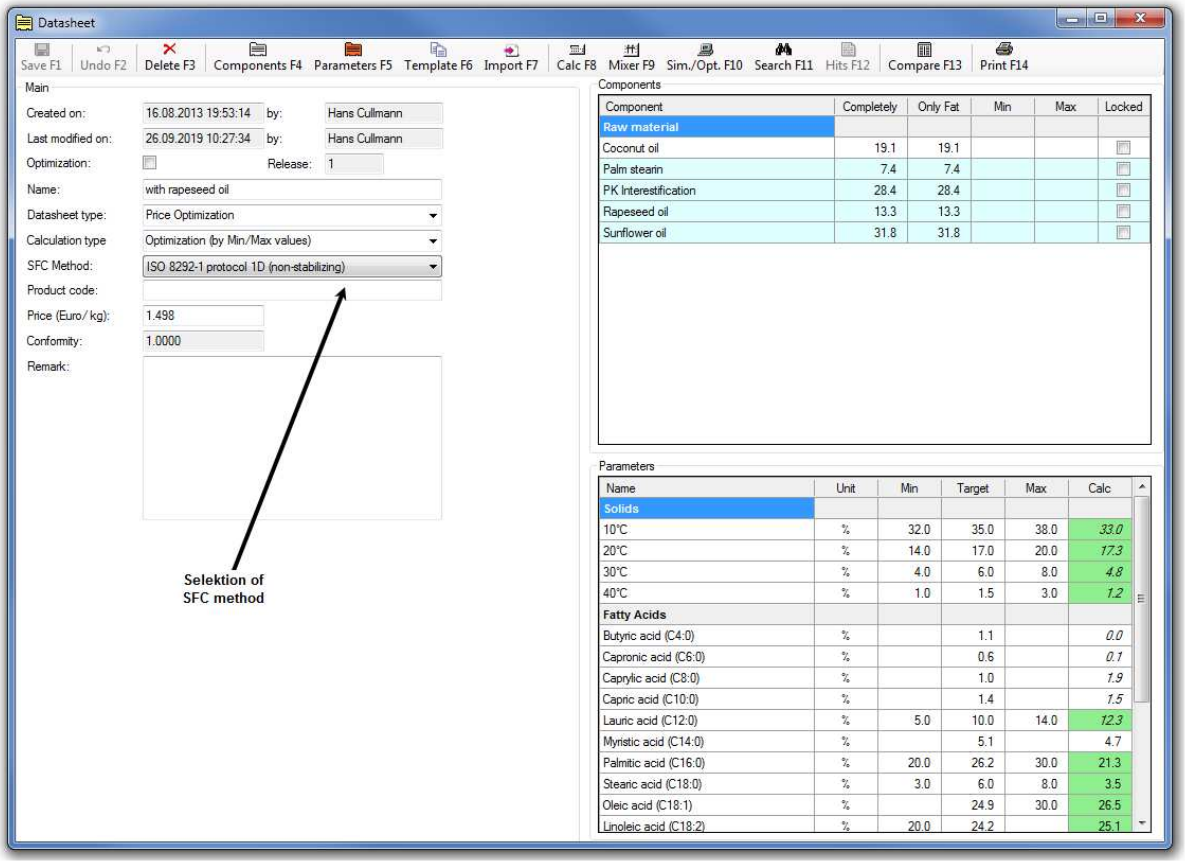
Definition of a SFC Method for Components

The definition of the SFC method for each component is done in the *Component Dialog* (please see below). If starting with correction factors the method is automatically set to the defined standard method for each component. Thereafter, the method for certain components can be changed.



Application

The correction factors are applied in the Datasheets (please see below). There is a new Selection Box 'SFC Method' (Please see arrow). With this the SFC method can be selected, with which the result of the SFC calculation should be done.



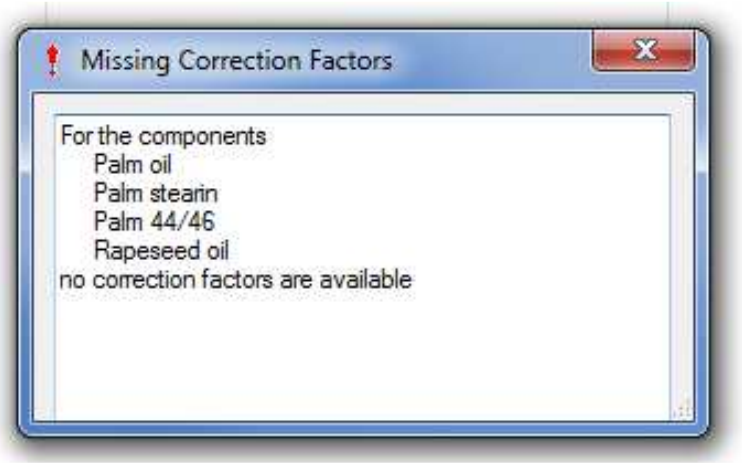
In practice there are two cases:

- No method is selected
  In this case no correction will be made. The SFC values of the blend are calculated using the original SFC values of the individual components.

- A SFC method is selected, eg. a ß-stabilizing method, because coconut oil is measured with this method. In this case the procedure is as follows:

  - Check all components to see if the SFC values were measured using the selected method.

- If not, then check if there are correction factors for the other components - correction factors from the SFC method of the components to the SFC method of the blend, eg from non-stabilizing method to ß-stabilizing method.
  - If not, an error message is created and the calculation is not performed. This error message lists all components for which no corresponding data are available.



  - If all data are available, the calculation is performed as follows:
    - Adding the correction factors to the original SFC values for the corresponding components.
    - Calculation of the SFC values of the blend with the corrected SFC values of the components.
    - Showing the SFC values of the blend for the selected SFC method.

This procedure is used for both simple calculation and more complex calculations. The complex calculations include simulation, optimization and the calculation of the SFC curve in the component mixer dialog.

Imprint

We would be glad to provide you with further information. Please feel free to contact us.

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Demo Version
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