Requirements for MixCont enhancements

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Date: 26-06-2017
Version: 1.0

Version history

Version	Date	Description of changes
0.1	07-10-2016	Kick-off with Peter Stello, Peter Boon, Cor Gringhuis, Richard Jongman
0.2	14-10-2016	First input from Peter Boon during interview
0.3	21-10-2016	Input from interviews with Cor, Vijay and Peter Boon
0.4	28-10-2016	Input from interview with Cor
0.5	07-11-2016	Input from interview with Cor and Vijay
0.6	24-01-2017 03-02-2017	Input from interview with Cor and Vijay
0.7	17-02-2017 and 10-03-2017	Input from interview with Cor and Vijay regarding screen layouts and fields
0.8	18-03-2017	Input from interview with Cor and Vijay regarding recipe functionality
0.9	18-03-2017	Input from interview with Cor and Vijay regarding recipe functionality
0.10	17-04-2017	Input from interview with Cor regarding recipe functionality, Vendor functionality and Mixer functionality. Update of Excel with all fields and their attributes.
0.11	02-05-2017	Some reports added by Vijay and calculation rules added by Cor
0.12	07-05-2017	Changes as a result of the review meeting on May 5th and some minor changes as a result of a discussion with Cor.
0.13	26-05-2017	Final additions by Cor.
1.0	26-06-2017	Final version

Distribution

Name	Position
Peter Stello	CEO
Peter Boon	Manager Production
Cor Gringhuis	R&D manager
Vijay Kalpoe	Material Developer
Richard Jongman	Controller
Stanislav Brassas	
Reyer Sneller	Projectmanager

Attachments

1. Appendix 1: Overview of database fields
2. Appendix 2: Recipes and their categories
3. Appendix 3: Ingredients and their categories
4. Appendix 4: Report Ingredient Overview
5. Appendix 5: Report Recipe Overview
6. Appendix 6: Report Omwalsrecept

Table of Contents

1 Introduction

The automation of the production and lab processes in the QEW production facilities, currently highly depends on 2 systems i.e. MixCont and Eclipse. The latter of the two systems is outdated and is no longer supported by the developer/manufacturer. This constitutes a risk regarding continuity of the business. For that reason QEW decided to ask the MixCont company to migrate the relevant parts of the Eclipse functionality to custom made extensions in MixCont.

During the past two years with some intervals effort has been spent from both sides (i.e. MixCont and QEW) to achieve the desired functionality in one integrated system, MixCont.
Despite the effort and good intentions, so far the goal has not yet been achieved.
An important cause of that is the fact that there is no functional requirement specification which should be the basis of a project.

QEW has decided that the availability of such a specification is an absolute must before we can finalize the project. That specification will reduce functional misunderstanding, will clearly define the scope of the project and will also enable us to control the planning and cost.

2 Objectives of the project

The objectives of the project are:

1. To achieve a system that will be sufficiently supported by the manufacturer, thus eliminating the risk of unavailability as a result of critical errors/outage;
2. To migrate existing relevant Eclipse functionality in equivalent custom made MixCont enhancements;
3. The addition of some new essential functions in MixCont;
4. The fast realization of the integration since the project already takes too long and since it is important to improve the business processes and to enable growth in the very near future.

3 Objective of this document

The objective of this document is to define a complete set of requirements that enables us to determine the gap between the current and the to-be situation. As a result of that, further steps and agreements can be made with MixCont.

4 Scope of the project

The scope of the project has mainly been defined as:

- Migration of existing recipe management functionality from Eclipse to MixCont including management of ingredients and components;
- Addition of some very essential new functions in recipe management;

Apart from this the scope also contains:

- Some minor enhancements/modifications in MC Launcher, Prodplan, MCSAP Browser, Prodplan, MCBrowser and MCReplicator;
- Documentation and training materials;
- Conversion of existing data from Eclipse to MixCont.

Starting points for this project:

1. There will be no modifications in the link between MixCont and SAP.
2. There will be no modifications in standard MixCont software; functional enhancements will be realized in separate custom made modules.

5 Functional requirements

5.1 Requirements regarding MCRecipe.

Context to show the importance of MCRecipe.
Recipes and ingredients are the fundament of the production of all compounds delivered by QEW. They are designed and defined in MixCont (1) and will be transferred to SAP (2). During the ordering and planning process in SAP the planning records are sent to MixCont (3). Together with the ingredients and the mixer control data (4) the recipes to be planned are sent to the Mixer PLC for production (5). See the figure below.

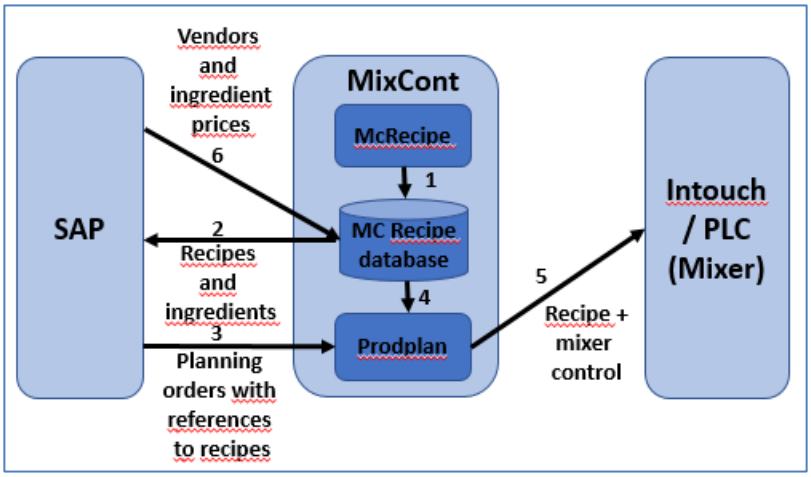

Figure 1

This emphasizes the importance of the correct functionality of MCRecipe in MixCont. It constitutes the heart of the total production process for QEW.

MCRecipe handles the following functionality:

- The definition of recipes;
- The definition of ingredients and components;
- The definition of Mixers;
- The definition of vendors (including customers).

The following chapters will describe this required functionality.

5.1.1 Recipes

The Recipe module consist of 3 separate screens (tabs):

- The recipe overview tab: to browse and search recipes (non editable);
- The recipe detail tab: detailed information of the recipe selected in the overview tab;
- The process tab with mixer instructions for the recipe selected in the overview tab.

These 3 tabs will be described in detail in the following 3 paragraphs.

5.1.1.1 Recipe Overview (RO) tab

This tab consists of 2 blocks:

- A: fields to select/filter the recipes (see fields definition in Appendix 1);

- B: a grid to display the selected/filtered recipes (all recipe fields in Appendix 1 are in this grid).

The purpose of this tab is to browse, filter, find, inspect and modify recipes.

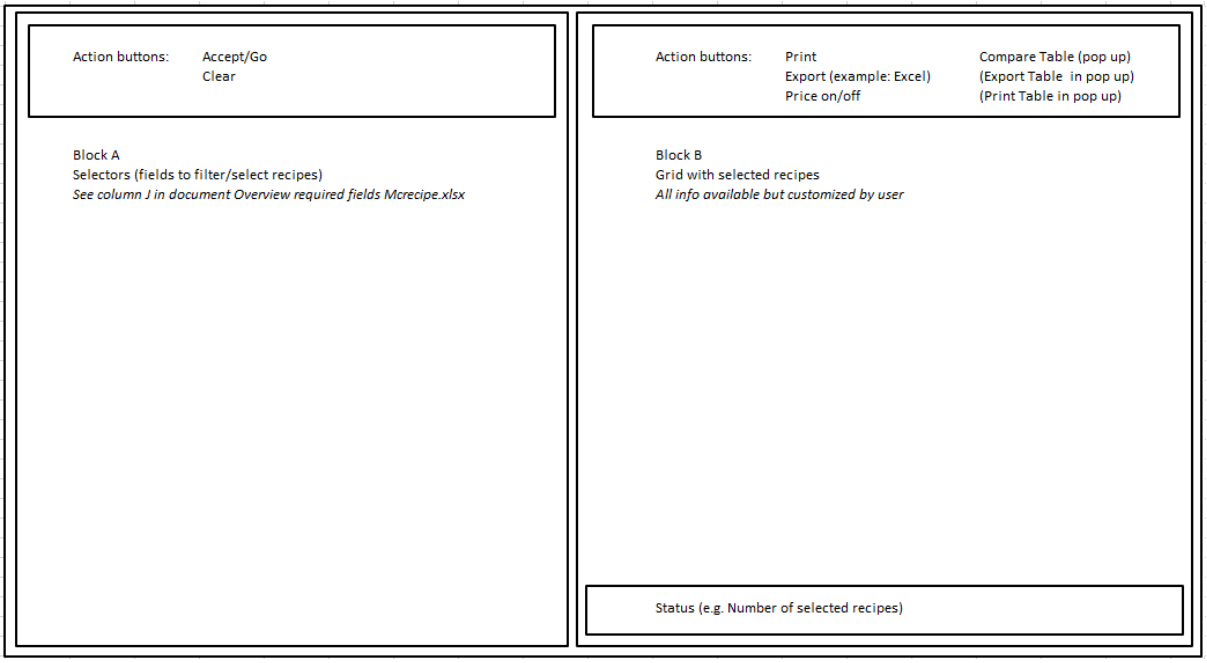

Figure 2

Requirements for the Overview tab.

Nr.	Description
1.	Filter function in block A. This function is used to browse through all recipes, to filter the recipes and to find/select the desired recipe. MixCont should support a search/filter function that uses the following search criteria:

Field name	Type of field
Recipe origin	Drop down list, populated with OOOO from field recipe code (VV-S-OOOO-A); See paragraph 5.1.1.4.
Recipe stage	Drop down list, populated with S-OOOO from field recipe code (VV-S-OOOO-A); OOOO has already been entered as a result of the selection in the previous field.
Recipe version	Drop down list (populated with VV-S-OOOO from field recipe code VV-S-OOOO-A from); S-OOOO has already been entered as a result of the selection in the previous field.
Recipe additional	Drop down list (populated with VV-S-OOOO from field recipe code VV-S-OOOO-A from); VV-S-OOOO has already been entered as a result of the selection in the previous field.
Description	Text field; filters case insensitive text; functions as a "contains" function in an SQL where clause without the need of entering wild cards.

Customer name	Dropdown-list (customers in vendor tabel)
Intellectual Property	Dropdown-list (customers in vendor tabel)
Polymer Group code	This dropdown list shows a tree with recipe categories (codes and names) i.e. a main category with 2 sub categories. MixCont will search from the fields Prime Polymer, Second polymer and Third polymer. See appendix 2.
Mixer	Drop down list from mixer table
Status	Drop down list with multiple select. A status can be Active, Inactive, Old, Under Construction or Unlocked. The dropdown list allows a multiple select and by default Active and Unlocked are selected.
Underlying recipe origin	Drop down list, populated with OOOO from field recipe code (VV-S-OOOO-A); See paragraph 5.1.1.4.
Underlying Recipe stage	Drop down list, populated with S-OOOO from field recipe code (VV-S-OOOO-A); OOOO has already been entered as a result of the selection in the previous field.
Underlying Recipe version	Drop down list (populated with VV-S-OOOO from field recipe code VV-S-OOOO-A from); S-OOOO has already been entered as a result of the selection in the previous field.
Underlying Recipe additional	Drop down list (populated with VV-S-OOOO from field recipe code VV-S-OOOO-A from); VV-S-OOOO has already been entered as a result of the selection in the previous field.
Ingredient code	This is a dropdown list showing a tree structure containing all ingredients shown in categories as described in 1 in paragraph 5.1.2.4. Each branch of the tree ends with a list of ingredients that are assigned to the (sub) category. The selection of recipes can be based on a single ingredient code but can also be based on a (sub)category code. It must be possible to select multiple items in the tree with the option to choose for “AND” of for “OR”.
Class	Drop down list with multiple select
Color	Drop down list
Industry	Drop down list
Recipe type	Drop down list
Curing system	Drop down list
Curing process	Drop down list
Certificate	Drop down list with multiple select
Norm	Drop down list
Hardness sha Min	Numeric value (integer 2 digits)
Hardness sha Max	Numeric value (integer2 digits)
FDA	Yes/No
BFR	Yes/No

	Foodprove	Drop down list
	Price Min	Numeric value (real value)
	Price Max	Numeric value (real value)
	User definable field 1 in the recipe table	Depending on the field type (text, value, date)
	User definable field 2 in the recipe table	Depending on the field type (text, value, date)
	User definable field 3 in the recipe table	Depending on the field type (text, value, date)
	….	
	User definable field 10 in the recipe table	Depending on the field type (text, value, date)

After entering a criterion in one of the fields above the grid in block B will be refreshed and the drop down in block A lists will be repopulated*) based on remaining entries that satisfy the criterion.

The criteria function as a filter mechanism. When changing the criteria the filter result is updated immediately and shown in the grid*). By entering more criteria the result set is narrowed down.

*) If for performance reasons the immediate showing of filtered results in the grid or the repopulating of dropdown lists would be too slow, as an alternative solution the selection will be started upon a click on the Go button..

2. Action buttons
The action buttons in this screen support the following functions:
In block A:
- Accept/Go: if the filtering of recipes is not automatically started after entering the selection criteria (because of performance issues), the filtering will be started by clicking this button. (See also requirement 1 in this table). If automatic filtering is possible this button is not required.
- Clear: clears all selection criteria fields.

In block B:
- Print: Prints the list of selected recipes (see requirement 3 in this table)
- Export: exports the list of selected recipes to Excel
- Price On/Off: to hide / unhide all price information in screen forms and in reports.
- Compare (see requirement 4 in this table);

3. The report of selected recipes shows the following information:
- Recipe code
- Description
- Customer name
- Polymer group
- Price
- Density
- Hardness

	The header contains contains the default header info (see paragraph 5.9, requirement 2) and the selection criteria.
4.	Recipe compare function. The compare function offers a popup to select a maximum of 20 recipes. This is done by a table of 20 rows and two columns. In the first column there is a dropdown list in each row showing recipe codes and their names. By entering characters the list is shortened and limited to the recipe codes started with these characters. By selecting a code that code is entered in the first column and the corresponding description is entered in the second column. In this way multiple recipes can be selected. After entering the required recipe codes the report can be generated in a table. The columns contain: 1. Column 1: a merged list of all ingredients and underlying recipes in the selected recipes; 2. Column 2: A description of the ingredient/ underlying recipe; 3. All other columns: PHR value per ingredient or Weight, depending on a radio button on the top, of the form. The first 4 rows contain: 1. the recipe codes 2. the recipe description 3. Recipe density 4. Recipe price per kg The information above is shown in a table.

Code	Omschr.	00-L-3621A	00-L-3621B	00-L-3621C
	Omschr.	1810 PROCESSING	1810 PROCESSING	1810 PROCESSING
	S.Gew. [kg/l]	1.093	1.151	1.160
	Recept prijzen [EURO/kg]	2.054	2.148	2.184
30853	TSR CV50	90.00	60.00	60.00
14024	BR CIS96	10.00		
30373	STRUKTOL A86	0.50		
10068	ZINKOXIDE	5.00	10.00	12.50
11188	STEARINEZUUR	1.00	1.00	1.00
15837	CALCIUMZEEP	1.60		
17203	ZINK ZEEP	1.50		
11537	TMQ	1.50	1.50	1.50
11418	6PPD	1.50	1.50	1.50
11389	ANTILUX 600	2.00	1.50	1.50
30890	DEOTACK RS	3.00	4.00	4.00
12395	DURALINK HTS	1.00	1.50	1.50
10100	ROET N550 FEF	40.00	35.00	
30807	NAPHTENISCHE OLIE	5.00	3.00	3.00
31023	DCBS-80	1.88		
31075	PREMIX S INSOL65	3.08	3.08	3.08
17692	KER 1502		40.00	
14011	ULTRASIL AS 7		10.00	10.00
30776	TBBS-80		1.88	1.88
15604	SBR 1507			40.00
30071	ROET N772 SRF-LM			35.00
	Totale phr lab	**168.56**	**173.96**	**176.46**

At the end of the table there is a row with totals (weight or PHR) per recipe.

At the bottom of the form there are two buttons:

- Print: prints this information in a report;

	• Exports this information to Excel
5.	Status bar. The bottom of the screen shows: • The number of recipes that match the filter criteria.
6.	By double clicking a row in the grid in block B the recipe will be shown in detail in the detail tab and can then be modified.
7.	In the recipe grid the columns can be hidden and the order of the columns can be changed and stored for future use in user defined settings (no global settings for all users).

5.1.1.2 Recipe Details (RD) tab

This tab mainly consists of the following blocks:

- A: Identity, describing the recipe with a code and a description (see fields definition in Appendix 1); these fields are non-editable except in case of adding a new recipe;
- B: General info of the recipe (see fields definition in Appendix 1); this block describes the attributes of a recipe;
- C: Details of the selected recipe (see fields definition in Appendix 1); This block contains the composition of a recipe (ingredients and underlying recipes) and their main features;
- D: Notes (see fields definition in Appendix 1).

Purpose of this tab is:

- Define the attributes and composition of a recipe;
- Conversion of the PHR recipe to a weights recipe.

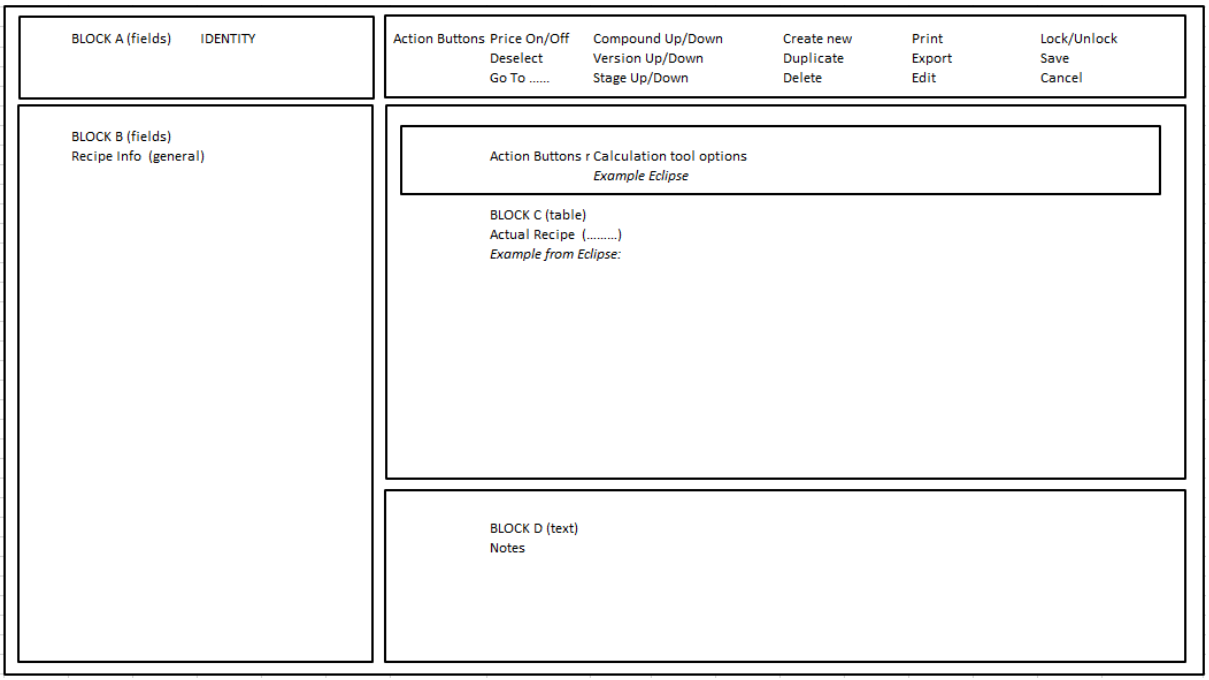

Figure 3

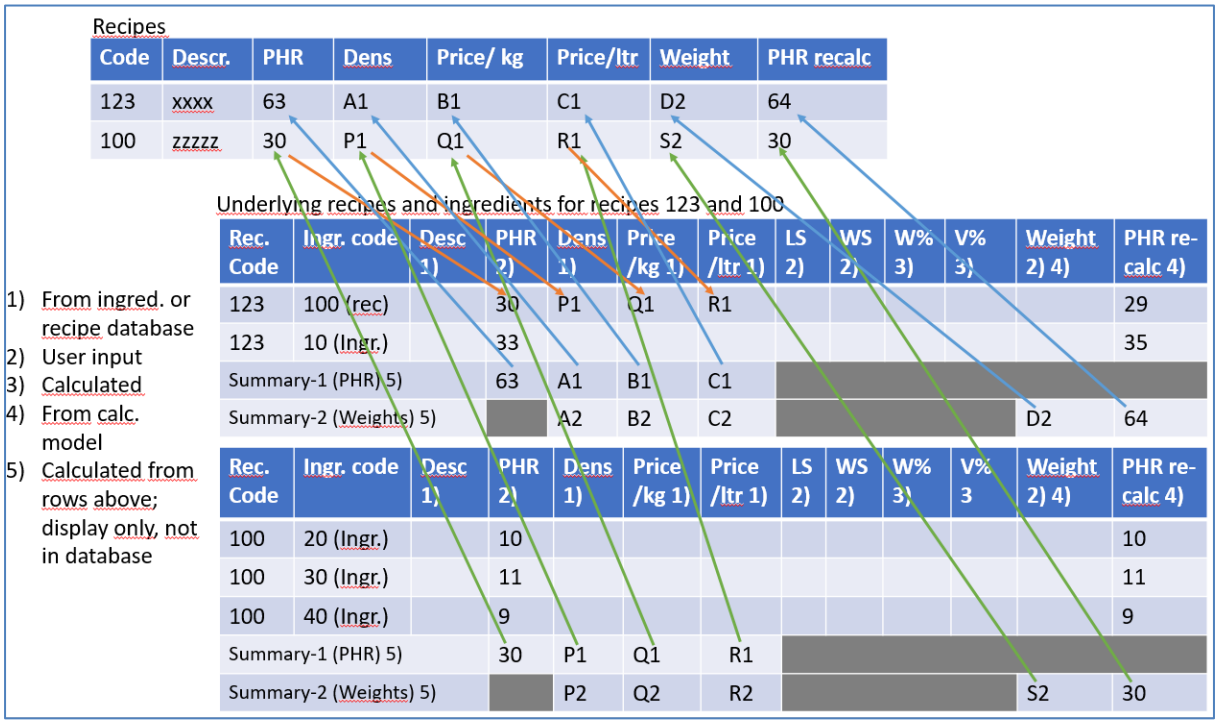

Figure 4: (relationship between recipes and underlying recipes and ingredients)

Requirements for the Details tab.

Nr.	Description
1.	Block C shows the composition of a recipe that consists of ingredients and – possibly – underlying recipes. Figure 4 shows a diagram explaining the structure of a recipe. The top table in this figure shows a brief example of the main recipe records as shown in the grid in block B of the previous tab (par. 5.1.1.1). The other two tables contain rows with ingredients and underlying recipes being part of the recipes shown in the top table. To understand the functionality first take a look at Figure 4: (relationship between recipes and underlying recipes and ingredients) at the bottom table. This table describes the 3 ingredients of recipe 100. Description, density and prices are derived from the ingredients database. PHR, LS and WS are values entered by the user. W% and V% are calculated based on the other fields in the same record and Weight and PHR recalc are determined by the calculation module (see requirement 6). The summary-1 values (total or average) are stored in the main recipe record in the top table. The summary-2 values (totals of Weight and PHR recalc) are stored in the main recipe record in the top table. The other values are shown in the form only. In recipe 123 the underlying recipe 100 is used. PHR, density and prices of recipe 100 are used in recipe 123. LS and WS are values entered by the user and the PHR value of recipe 100 can be modified by the user. W% and V% are calculated based on the other fields in the same record and Weight and PHR recalc are determined by the calculation module (see requirement 6). The summary-1 values (total or average) are stored in the main recipe record in the top table.

	The summary-2 values (totals of Weight and PHR recalc) are stored in the main recipe record in the top table. The other values are shown in the form only. The calculations of certain fields mentioned above are described in requirement 6 of this table.
2.	Action buttons The action buttons in this screen support the following functions: On the top of the screen: • Left / Right arrow: go to previous / next recipe origin within the selection of the overview tab; • Down / Up arrow: go to previous / next version number within the selection of the overview tab; • Stage Up/Down: go to previous / next stage within the selection of the overview tab; • Go To field + button: after entering the recipe name in the edit field and after clicking the Go To button the details of that recipe within the selection of the overview tab should be shown. • Delete: delete the entire selected recipe; button is enabled after Unlock; • Create new: Add a new recipe • Duplicate: copy the selected recipe • Print: Prints the recipe (See Appendix 5 and 6) • Export: exports the selected recipe info to Excel (see 5.1.1.1 requirement 4) • Price on/off: to hide / unhide all price information of all recipes in screen forms and in reports; • Lock/Unlock: a recipe can only be edited or deleted when its status is unlocked. After clicking an Unlock button the user is asked to confirm the unlock. The Unlock status of a recipe is indicated in red text. • Edit: enables changing values in the form; button is enabled after Unlock; after clicking Edit the system forces the user to Save or Cancel before leaving this tab. • Save: saves the changes in the recipe • Cancel: cancels the changes in the recipe • De-select: removes all filters applied in Overview tab and applies optional default filters (for Status e.g.). In block C: • Calculation (see requirement 6 in this table); button is enabled after Unlock.
3.	By double clicking an ingredient, the system will show the ingredient detail tab for that ingredient.
4.	Before a recipe is changed a warning will be generated if the recipe is used by other recipes.
5.	Recipes cannot be deleted when they are part of a different recipe.
6.	Calculation module and calculation types. Goal of this module is to convert a PHR recipe into a weight recipe. In this module the weights of the ingredients in a recipe are calculated based on the PHR (Parts per Hundred Rubber) value and the mixer volume and fill factor.

There are 3 options for the calculation shown in a pop-up screen:

- Calculation based on the total batch weight (shown in the orange square);
- Calculation based on the mixer fill factor (shown in the green square;)
- Calculation based on the fixed 1st ingredient/recipe weight (shown in the red square)

Recipe composition

Ingr. code	Descr.	PHR	Dens	Price /kg	Price /ltr	LS	WS	W%	V%	Weight	PHR re-calc
20	Ingred 1				E			A	B	C1	D
30	Ingred 2				E			A	B	C2	D
40	Ingred 1				E			A	B	C3	D
Summary-1 (PHR)		U1	P1	Q1	R1						
Summary-2 (Weights)			P2	Q2	R2					S2	T2
								Mixer fill factor %		F	

The pop-up will show the following information with 3 options:

	Description		Input
1	Calculation based on the total batch weight		Weight in kg with 2 decimals
2	Calculation based on the mixer fill factor		Percentage < 100%
3	Calculation based on the fixed 1st ingredient/recipe weight		Weight in kg with 2 decimals Weight
	Ok button	Apply button	Cancel button

By choosing one of the three options, entering the corresponding input value and by clicking the Apply button the weight and recalculated PHR per ingredient/underlying recipe (Cells C and D) and the values of the summary lines are calculated and modified in the table.

The Apply button is used to calculate the values without storing them in the database. After clicking the Apply button the pop-up screen is still active. After clicking the Cancel button the original values are restored and the pop-up screen is closed. After clicking the OK button the calculations are executed and the pop-up screen is closed. The calculated values will be stored in the database after clicking the Save button.

The algorithms for the calculations are:

Field	Formula
A	$A = \sum_{1}^{n} 100 * \frac{phr}{U1)}$
B	$B = \sum_{1}^{n} 100 * P1 * (\frac{phr}{U1})/p$
C	Options (see table above): • Option 1: Cx = (S2 * Ax)/100; • Option 2: Cx = (F * Mixer Volme * Bx * p)/100; • Option 3: Cx = (C1/A1) * Ax; C1 = value is entered in the pop-up. x = 1 to n

	D	$Dx = \frac{10000 * \mathrm{Cx}}{\sum_1^n (Cpol * \%rubber)}$ Cpol = Cx but only for ingredients with group code A**, B** en C** (see Appendix 3). %rubber is an ingredient field (field 108 in appendix 1).	
	E	Price/ltr = price/kg * p	
	U1	U1 = $\sum_1^n \mathrm{phr}$	
	P1	P1 = $\sum_1^n (\frac{\mathrm{p*phr}}{U1})$	
	P2	P2 = $\sum_1^n (\frac{\mathrm{p*D}}{\mathrm{T2}})$	
	Q1	Q1 = $\sum_1^n (\frac{\mathrm{price/kg*A}}{100})$	
	Q2	Q2 = $\sum_1^n (\frac{\mathrm{price/kg*D}}{\mathrm{T2}})$	
	R1	R1 = $\sum_1^n (\frac{\mathrm{price/l*B}}{100})$	
	R2	R2 = $\sum_1^n (\frac{\mathrm{price/l*D}}{\mathrm{T2}})$	
	S2	Two options (see table above): • In case of option 2 or 3: S2 = $\sum_1^n \mathrm{C}$ • In case of option 1: value is entered in the pop-up	
	T2	T2 = $\sum_1^n \mathrm{D}$	
	F	Two options (see table above): • In case of option 1 or 3: F = S2/(P2 * Volume mixer) • In case of option 2: value is entered in the pop-up.	
	Note: • In case lowercase characters are used, that means the value refers to the relevant ingredient. In case uppercase characters are used, that means the value refers to the line with the totals. For example: P1 = density of the total, p = density of the relevant ingredient; • n = the number of ingredients		
7.	In case a recipe uses an ingredient which is inactive, that ingredient will be highlighted.		

5.1.1.3 Recipe Process (RP) tab

This tab consists of 6 blocks:

- A: Identity, describing the recipe with a code and a description (see fields definition in Appendix 1); these fields are non-editable;
- B: Copy; function to copy the Process parameters from a different recipe to the current recipe;
- C: the editor to define the mixing step commands and parameters (see fields definition in Appendix 1);

- D: the grid with the mixing sequence steps for operation in PLC mode (see fields definition in Appendix 1);
- E: the process parameters (see fields definition in Appendix 1); this block is non-editable;
- F: the recipe details (see fields definition in Appendix 1). The information here is almost identical to the information in block C of the recipe details tab, but is display-only.
- G: the grid with the mixing sequence steps for operation in MixCont mode (see fields definition in Appendix 1);

Purpose of this tab is to define the mixer control sequence for the combination of that recipe and the chosen mixer.

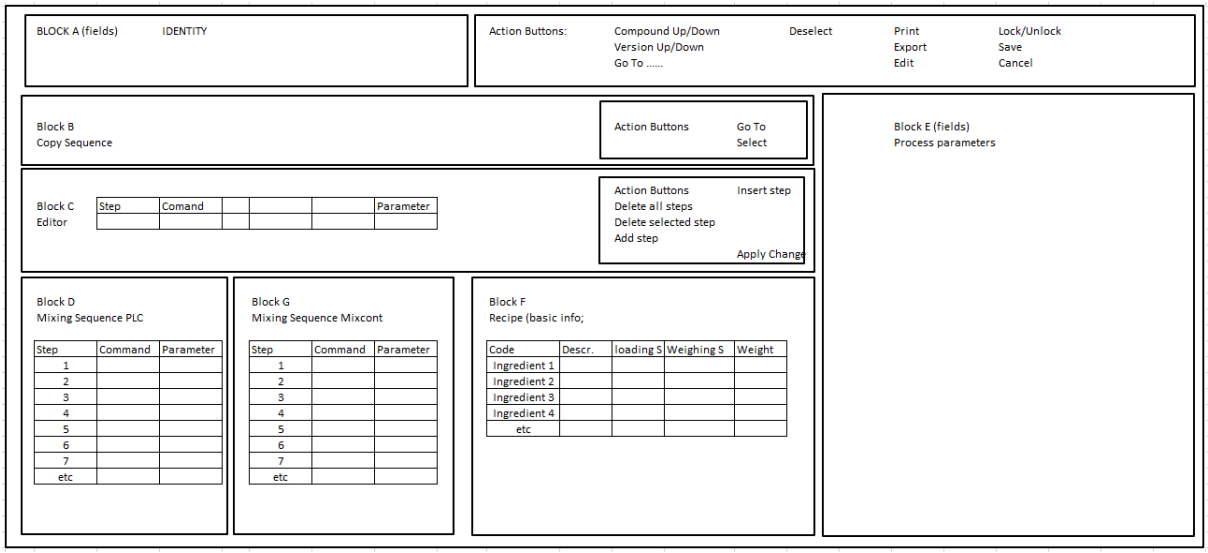

Figure 5

Requirements for the Process tab.

Nr.	Description
1.	Mixer instructions (block D and G). The Mixer can operate in 3 modes: A. Manual mode: the mixer is operated manually by the MMI of Intouch; B. PLC mode: the mixer is controlled by the PLC C. MixCont mode: the mixer is controlled by the PLC and by the MixCont server via the OPC link. In mode B and C instructions for the mixer are required to be able to operate the mixer. Instruction sets for both modes are defined in blocks D and G. An instruction set consists of several steps with commands and parameters. There is no fixed number of steps per mode. The commands and their parameters are depending on the command set of the PLC.
2.	Action buttons The action buttons in this screen support the following functions: On the top of the screen: • Left / Right arrow: go to previous / next recipe origin within the selection of the overview tab;

	• Down / Up arrow: go to previous / next version number within the selection of the overview tab; • Go To field + button: after entering the recipe name in the edit field and after clicking the Go To button the parameters of that recipe within the selection of the overview tab should be shown; • Print: Prints the recipe (same report as generated in the same tab); • Export: exports the selected recipe to Excel; • A recipe can only be edited or deleted when its status is unlocked. After clicking an Unlock button the user is asked to confirm the unlock. The Unlock status of a recipe is indicated in red text. • Edit: enables changing values in the form; button is enabled after Unlock; after clicking Edit the system forces the user to Save or Cancel before leaving this tab; • Save: saves the changes in the recipe; • Cancel: cancels the changes in the recipe. • De-select: removes all filters applied in Overview tab and applies optional default filters (for Status e.g.). In block B: • Go To: is a dropdown list with recipe codes and descriptions; • Select: after selection of a recipe in the Go To dropdown list the process parameters from that recipe are copied to the parameters of the recipe shown in this form. In block C: • Insert step: insert a step before the selected step in block D or G; • Add: add a step at the end of the grid in block D or G; • Delete step: delete the step selected in the grid in block D or G; • Delete all: delete all steps in the grid in block D or G • Apply: confirm change in step after editing the step
3.	On clicking a row in the grid of block D or G the values of that row are copied to the Editor fields in block C. Only after clicking the Apply button the values are copied to the grid in block D or G. All applied changes are shown in the grid only and not stored in the database yet until the Save button has been clicked.
4.	The parameters in this tab are not generic but are specific for this combination of recipe and mixer.

5.1.1.4 General recipe requirements

Nr.	Description
1.	A recipe is identified as a recipe code. The structure of the recipe code is VV-S-OOOO-A in which: • VV = the version number (format NN) • S = the stage number (format X) • OOOO = the origin number (format XNNN)

<table>
<tr><td></td><td>
A = the additional identification, possibly also used as a (mixer dependent) release. (format A)
In the format:
N = 0-9
X = 0-9 or A-Z
A = A-Z
</td></tr>
<tr><td>2.</td><td>
Structure of a recipe.
A recipe consists of:
Various ingredients (raw materials). Each ingredient can consist of:
Various components
One or more underlying recipes (layered recipes)
Mixer instructions
In theory there is no limit to the number of levels in which recipes can use other underlying recipes.
In fact each level represents a phase in the mixing process.
Ingredients including their components are not a result of a QEW mixing process but will be purchased from a vendor.
</td></tr>
<tr><td>3.</td><td>
Recipe fields.
The recipe fields are defined in Appendix 1 (category Recipe).
</td></tr>
<tr><td>4.</td><td>
Recipe categories.
Each recipe can be a assigned a category or subcategory.
The category consists of 2 characters.
To each recipe a category and two sub categories can be assigned. The figure below is just a brief example showing the structure. The full table is available in Appendix 2.
<table>
<tr><th colspan="2">Main category</th><th colspan="2">Sub category 1</th><th colspan="2">Sub category 2</th></tr>
<tr><th>Code</th><th>Descr.</th><th>Code</th><th>Descr.</th><th>Code</th><th>Descr.</th></tr>
<tr><td rowspan="6">A</td><td rowspan="6">Recepten algemeen</td><td>AA</td><td>NR + IA</td><td>AAA</td><td>Voorgemasticeerd NR</td></tr>
<tr><td>AB</td><td>SBR</td><td></td><td></td></tr>
<tr><td>AC</td><td>BR</td><td></td><td></td></tr>
<tr><td>AD</td><td>EPM + EPDM</td><td></td><td></td></tr>
<tr><td>AE</td><td>IIR + CIIR + BIIR</td><td></td><td></td></tr>
<tr><td>Etc.</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td></tr>
<tr><td>5.</td><td>Each recipe has a version (A in VV-S-OOOO-A) that depends on the mixer in which the recipe will be used to produce the compound. In SAP the responsible employee selects the mixer that will be used to create the compound and therefore decides the recipe as well.</td></tr>
<tr><td>6.</td><td>Ingredients in a recipe are used by their real name and not their trade name (defined per vendor). During production planning the vendor and thus trade name is selected.</td></tr>
<tr><td>7.</td><td>In each grid the rows can be sorted based on a random column.</td></tr>
<tr><td>8.</td><td>Save buttons are disabled unless the system has detected a change that could be saved.</td></tr>
<tr><td>9.</td><td>
A recipe can have one of the following statuses:
Unlocked: an unlocked recipe can be edited and cannot be produced or copied to SAP.
</td></tr>
</table>

	• Locked: this status does not exist in MixCont but is further specified in 3 sub statuses:
	  ○ Active: will be copied to SAP via de MixCont-SAP link only for recipes with Class “Production”; only active recipes can be used and produced in Prodplan;
	  ○ Inactive: will be stored in Mixcont but is not copied to SAP;
	  ○ Old: Older version and not in use anymore; not copied to SAP;
	  ○ Under Construction: recipe that needs further modifications before it will get the Active status; not copied to SAP.

5.1.2 Ingredients

The Ingredients module consist of 4 separate screens (tabs):

- The ingredients overview tab: to browse and search ingredients (non editable);
- The ingredient detail tab: detailed information of the ingredient selected in the overview tab; this information can be edited;
- A tab with vendor and warehouse information related to ingredients.

These 3 tabs will be described in detail in the following 3 paragraphs.

5.1.2.1 Ingredients overview (IO) tab

The overview tab contains the following blocks:

- A: selection fields to filter/filter the ingredients (see fields definition in Appendix 1);
- B: a grid to display the selected/filtered ingredients (all ingredient fields in Appendix 1 are in this grid).

The purpose of this tab is to browse, filter, find inspect and modify ingredients.

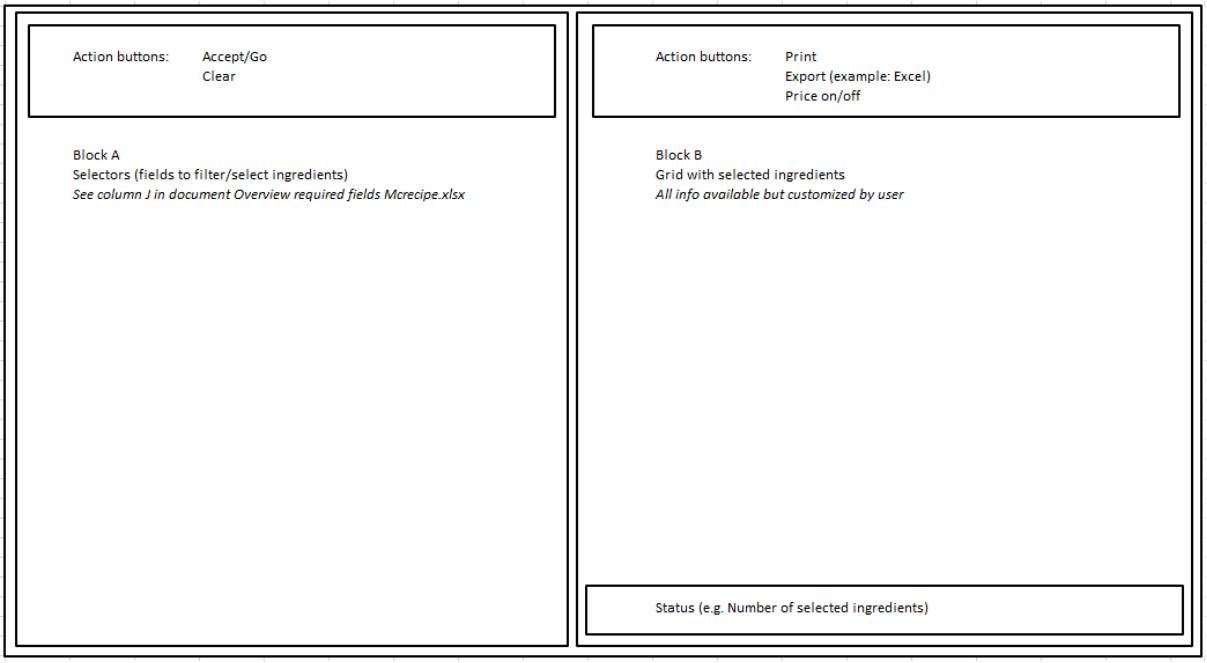

Figure 6

Requirements for the overview tab.

Nr.	Description
1.	Browse and search function (in the overview tab). The database has several thousands of ingredients. Therefore it should be possible to search for ingredients based on the following search criteria:

Field name	Type of field
Ingredient code	Drop down list
Ingredient description	Text field; filters case insensitive text; functions as a “contains” function in an SQL where clause without the need of entering wild cards.

	Chemical name	Text field; filters case insensitive text; functions as a "contains" function in an SQL where clause without the need of entering wild cards.
	Group name	Drop down list with a tree structure as defined in requirement 1 in paragraph 5.1.2.4.
	Trade name	Text field; filters case insensitive text; functions as a "contains" function in an SQL where clause without the need of entering wild cards.
	Status	Drop down list, multiple select
	Class	Drop down list, multiple select
	Location	Drop down list
	ADR Class	Drop down list
	Packaging Group	Drop down list
	CMR classification	Drop down list, multiple select
	FDA Approved	Drop down list, multiple select
	DGR21 Approved	Drop down list, multiple select
	Warenwet Approved	Drop down list, multiple select
	UN-code	Drop down list
	CAS-number	Drop down list
	CLP Classification	Drop down list; multiple select
	H phrases	Drop down list; multiple select
	P phrases	Drop down list; multiple select
	Risk Assessment	Yes/No
	User definable field 1	To be defined
	…	
	…	
	..	
	User definable field 10	To be defined

2.	Action buttons The action buttons in this screen support the following functions: In block A: • Accept/Go: if the filtering of ingredients is not automatically started after entering the selection criteria (because of performance issues), the filtering will be started by clicking this button. (See also requirement 1 in paragraph 5.1.1.1). If automatic filtering is possible this button is not required. • Clear: clears all selection fields In block B: • Print: Prints the list of selected ingredients (see requirement 7 in this table) • Export: The export will contain the (filtered) rows in the grid mentioned in the search function mentioned before • Price On/Off: Toggle switch to show/hide prices in all forms and all reports.
3.	Status bar. The bottom of the screen shows: • The number of ingredients that match the filter criteria.
4.	In the ingredients grid the columns can be hidden and the order of the columns can be changed and stored for future use in user defined settings (no global settings for all users).

5.	By double clicking a row in the search grid an ingredient will be shown in detail and can be modified in the detail tab.
6.	An ingredient cannot be deleted when it is part of a recipe.
7.	Report of selected ingredients. MixCont should be able to produce a report containing: • Ingredient code • Ingredient description • Group and group name • Price • CMR • Status • Class

5.1.2.2 Ingredients details (ID) tab

The details tab contains the following blocks:

- A: Identity, describing the ingredient with a code and a description (see fields definition in Appendix 1); these fields are non-editable except in case of adding a new ingredient;
- B: ingredient information (see fields definition in Appendix 1);
- C: safety info (see fields definition in Appendix 1);
- D: a grid with components (see fields definition in Appendix 1);
- E: notes (see fields definition in Appendix 1);

The purpose of this tab is to define ingredients with its characteristics to use them as a basis for recipes.

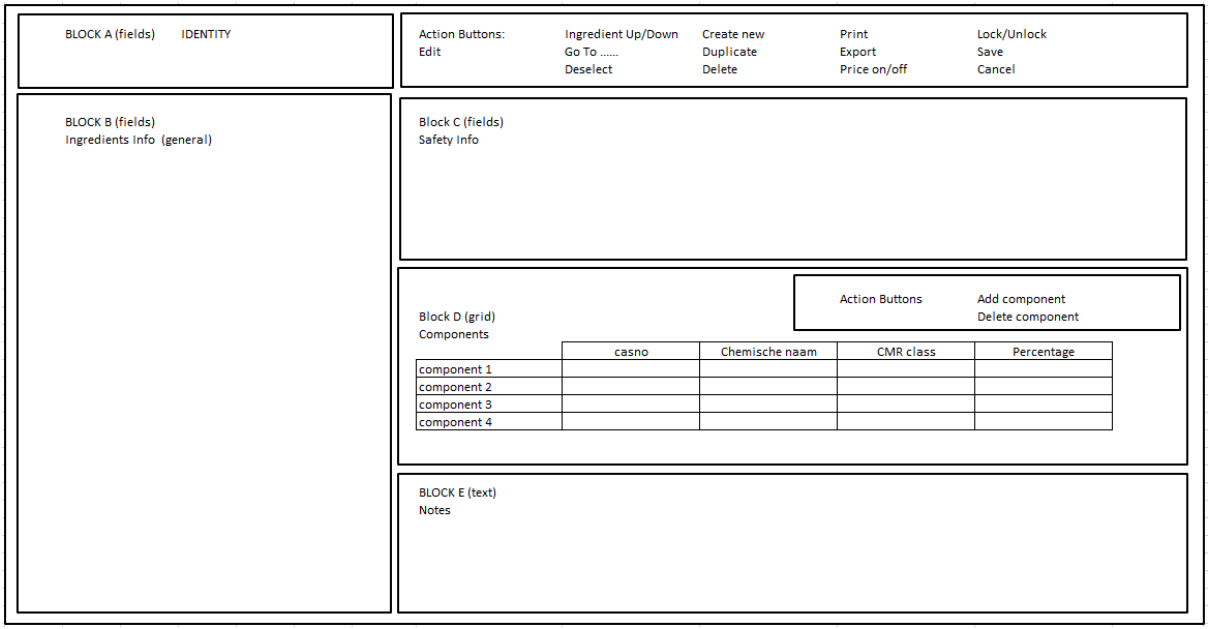

Figure 7

Requirements for the details tab.

Nr.	Description
1.	Action buttons The action buttons in this screen support the following functions: On the top of the screen: • Down / Up arrow: go to previous / next ingredient within the selection of the overview tab; • Go To field + button: after entering the ingredient name in the edit field and after clicking the Go To button the details of that ingredient within the selection of the overview tab should be shown. • Delete: delete the selected ingredient; button enabled after Unlock; an ingredient cannot be deleted when it is part of a recipe; • Create new: Add a new ingredient • Duplicate: copy the selected ingredient • Print: Prints the ingredient (see Appendix 4) • Export: exports the selected ingredient to Excel • Price on/off: to hide / unhide all price information in screen forms and in reports; • Lock/Unlock: an ingredient can only be edited or deleted when its status is unlocked; • Save: saves the changes in the ingredient; • Cancel: cancels the changes in the ingredient; • Edit: enables changing values in the form; button is enabled after Unlock; after clicking Edit the system forces the user to Save or Cancel before leaving this tab; • De-select: removes all filters applied in Overview tab and applies optional default filters; In block D: • Add component (drop down from component table); (after Unlock); • Delete component; (after Unlock);
2.	In block D the rows will be automatically sorted on the Percentage column. Sorting will be done from high (top of the list) to low (bottom of the list.

5.1.2.3 Ingredients purchase (IP) tab

The purchase tab contains the following blocks:

- A: Identity, describing the ingredient with a code and a description (see fields definition in Appendix 1); these fields are non-editable except in case of adding a new ingredient;
- B: Trade names and vendors (see fields definition in Appendix 1);
- C: Warehouse information (see fields definition in Appendix 1);

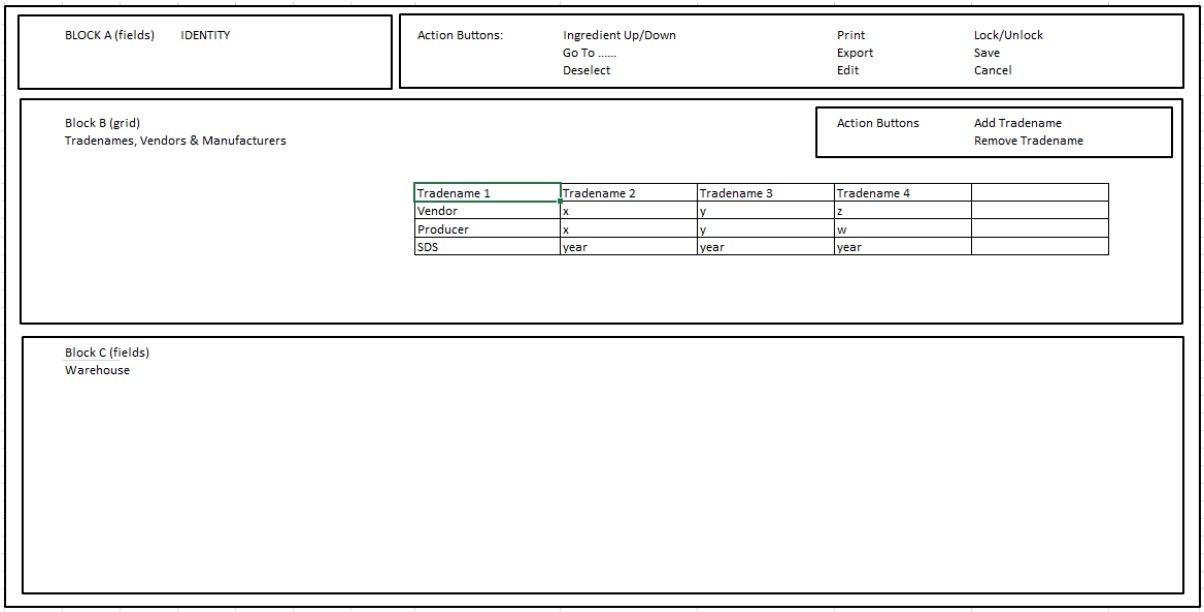

Figure 8

Requirements for the purchase tab.

Nr.	Description
1.	Action buttons The action buttons in this screen support the following functions: On the top of the screen: • Down / Up arrow: go to previous / next ingredient. • Go To field + button: after entering the ingredient name in the edit field and after clicking the Go To button the details of that ingredient should be shown. • Print: Prints the ingredient (see Appendix 4) • Export: exports the selected ingredient to Excel • Lock/Unlock: an ingredient can only be edited or deleted when its status is unlocked; • Save: saves the changes in the ingredient • Cancel: cancels the changes in the recipe • Edit: enables changing values in the form; button is enabled after Unlock; after clicking Edit the system forces the user to Save or Cancel before leaving this tab; • De-select: removes all filters applied in Overview tab and applies optional default filters; In block B: • Add trade name (incl. vendor, produces and SDS) from a dropdown list; • Remove trade name.
3.	Trade names. An ingredient can have multiple trade names and each trade name can be linked to one or more vendors. The links between an ingredient, trade names and vendors will be defined in the ingredients detail form.

5.1.2.4 General ingredient requirements

Nr.	Description
1.	To each ingredient a category and two optional sub categories can be assigned. The figure below is just a brief example showing the structure. The full table is available in Appendix 3.
2.	Structure of an ingredient An ingredient can consist of several components.
3.	Ingredient fields. The Ingredients fields are defined in Appendix 1 (category Ingredients).
4.	Component fields. The Ingredients fields are defined in Appendix 1 (category Components).
5.	In each grid the rows can be sorted based on a random column.
6.	MixCont is leading in the link to SAP regarding ingredients except for ingredient prices in which SAP is leading. Editing of prices does not have to be disabled in MixCont.
7.	An ingredient can have one of the following statuses: • Active: will be copied to SAP via de MixCont-SAP link only for ingredients with Class "Production"; • Inactive: will be stored in Mixcont but is not copied to SAP; • Phased out: Older version and not in use anymore; is not copied to SAP.

Ingredient categories

Main category		Sub category 1		Sub category 2	
Code	Descr.	Code	Descr.	Code	Descr.
A	Natuur-rubber	AA	RSS1, SMR5	AAA	Uncompounded
				AAB	Precured
		AB	RRS2, SMR10		
		AC	SMR50		
B	Synthetisch rubber	BA	SBR	BAA	Staining
				BAB	Non staining
		BB	BR		
Etc.					

5.1.3 Components

The components tab (tab CO) contains the following blocks:

- A: component information (see fields definition in Appendix 1);
- B: notes (see fields definition in Appendix 1);
- C: coupled ingredients (see fields definition in Appendix 1);
- D: Grid with all components (all component fields in Appendix 1).

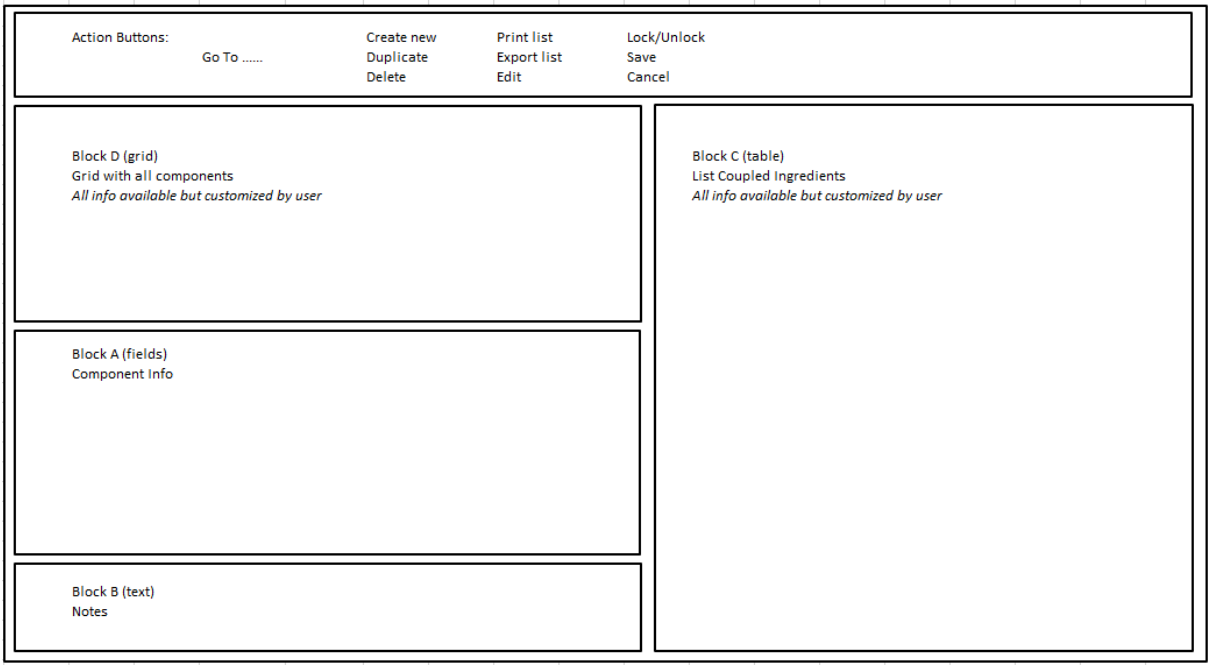

Figure 9

Requirements for the component tab.

Nr.	Description

1.	Action buttons
	The action buttons in this screen support the following functions:
	• Go To field + button: after entering the component name in the edit field and after clicking the Go To button the details of that component should be shown;
	• Delete: delete the selected component; button is enabled after Unlock;
	• Create new: Add a new component;
	• Duplicate: copy the selected component;
	• Print: Prints a component; there are two reports depending on the number of records selected in the grid in block D:
	  ○ No records selected or more than one record selected: the report contains a table with the selected components (no selection means all records) with all fields (in columns) without the notes fields;
	  ○ One component selected: the report contains all component fields for that component including the notes field;
	• Export: exports the selected components to Excel;
	• Lock/Unlock: a component can only be edited or deleted when its status is unlocked;
	• Edit: enables changing values in block A and B of the form; button is enabled after Unlock; after clicking Edit the system forces the user to Save or Cancel before leaving this tab;
	• Save: saves the changes in the component
	• Cancel: cancels the changes in the component

5.1.4 Mixer requirements

The Mixer module consists of one tab (tab M) to describe the mixer functionality.

The tab contains the following blocks:

- A: mixer info (see fields definition in Appendix 1); shows details of the equipment/mixer selected in the grid in block C;
- B: Notes (see fields definition in Appendix 1);
- C: a grid with listed mixers/equipment (all fields definition in Appendix 1);

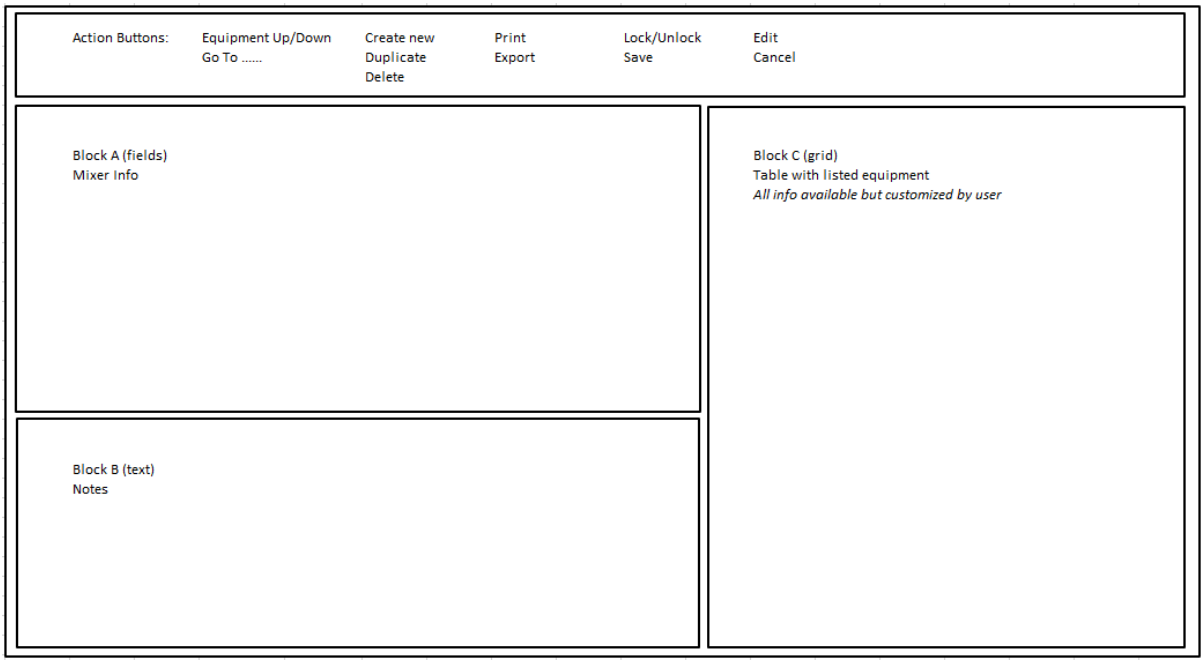

Figure 10

Requirements

Nr.	Description

1.	Action buttons
	The action buttons in this screen support the following functions:
	On the top of the screen:
	• Delete: delete the selected mixer; a mixer cannot be deleted when the mixer is used in a recipe;
	• Create new: Add a new mixer;
	• Duplicate: copy the selected mixer;
	• Print: Prints the mixer data; there are two reports depending on the number of records selected in the grid in block C:
	  ○ No records selected or more than one record selected: the report contains a table with the selected equipment (no selection means all records) with all fields (in columns) without the notes fields;
	  ○ One component selected: the report contains all mixer fields for that component including the notes field;
	• Export: exports the selected mixer data to Excel;
	• Lock/Unlock: a mixer can only be edited or deleted when its status is unlocked;

	• Edit: enables changing values in the form; button is enabled after Unlock; after clicking Edit the system forces the user to Save or Cancel before leaving this tab; • Save: saves the changes in the mixer; • Cancel: cancels the changes in the mixer.
2.	Mixer fields. The Ingredients fields are defined in Appendix 1 (category Mixer).
3.	Currently there is only one PLC controlled mixer. MixCont therefor only supports the steps for that mixer to define a sequence program consisting of commands and parameters (see Appendix 1). The structure of the MixCont software however should be prepared to adding new mixers with sequence programs that consist of steps with other variables (number and type) than those that are currently in use. See also paragraph 5.1.6.2.
4.	In the MixCont server the load of the various processes should never result in a situation where the OPC link (link to the PLC's) does not get enough resources (CPU, memory, etc.) to control the mixer process in an accurate and adequately responsive way.

5.1.5 Vendor requirements

The Vendor module consists of one tab (tab V) to describe the vendor functionality. Vendor data is synchronized from SAP to MixCont. Apart from the vendor data also certain customers will we transferred from SAP to MixCont.

The tab contains the following blocks:

- A: Vendor info (see fields definition in Appendix 1);
- B: A grid showing coupled trade names and ingredients for the selected vendor (see fields definition in Appendix 1);
- C: Notes regarding the selected vendor (see fields definition in Appendix 1);

Purpose of the tab is to shows all information of one vendor and the links between vendor and ingredients/trade names.

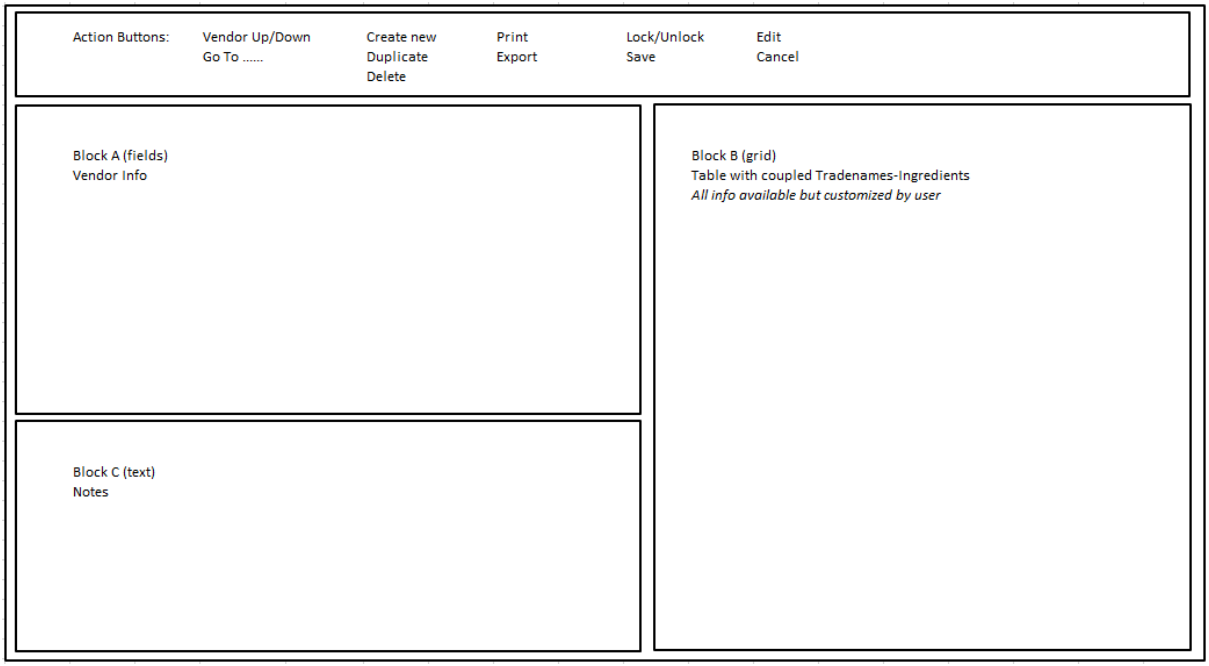

Figure 11

Requirements

Nr.	Description
1.	Action buttons The action buttons in this screen support the following functions: On the top of the screen: • Down / Up arrow: go to previous / next vendor; • Go To field + button: after entering the vendor name in a dropdown list with vendors and after clicking the Go To button the details of that vendor should be shown; • Delete: delete the selected vendor; • Create new: Add a new vendor; • Duplicate: copy the selected vendor; • Print: Prints the data of the selected vendor; • Export: exports the vendor data to Excel after showing a pop-up with the option to select all data or the selected vendor only;

	• Lock/Unlock: a vendor can only be edited or deleted when its status is unlocked; • Edit: enables changing values in the form; button is enabled after Unlock; after clicking Edit the system forces the user to Save or Cancel before leaving this tab; • Save: saves the changes in the vendor; • Cancel: cancels the changes in the vendor.
2.	Vendor fields. The Ingredients fields are defined in Appendix 1 (category Vendor).
3.	Although this is a vendor table this table will also be used for certain customers. Vendors and customers are selected in SAP and transferred/updated to MixCont via the link SAP-MixCont.
4.	SAP is leading in the definition of vendors. In case fields are modified in MixCont, the values of these fields will be overwritten during the next sync with SAP.
5.	A vendor cannot be deleted if a trade name (for an ingredient) is linked to that vendor.

5.1.6 Maintenance of reference data

Reference data is the set of permissible values to be used by other data fields.
There are several types of reference data:

A. Data in a database table that is used to populate a dropdown list and data is likely to be changed and therefor the data can be changed by means of a user interface;
B. Data in a database table that is used to populate a dropdown list and data is not likely to be changed and if a change is needed the table is modified by a database administrator;
C. Data that is hard coded in the software e.g. a fixed list of options in a dropdown list; this type of data is not described here;

Types A and B are described in this paragraph.

5.1.6.1 Reference data with a user interface

The following list contains a number of tables with data which is used in dropdown lists. MixCont should provide a user interface that:

- First selects the name of the list
- Then MixCont shows a grid with the current items
- And then enables the user (with highest authorization level only) to modify, delete and add/insert items. Deleting items is allowed only when de item is no longer used in any database record.

The list of tables to maintain is:

1. Recipe status (now: Active/Inactive/Old/Under Construction/Unlocked)
2. Recipe class (now: Production/Calculation/Development)
3. Recipe color
4. Recipe type
5. Recipe certificate
6. Recipe norm
7. Recipe palette
8. Recipe Curing System
9. Recipe Curing Process
10. Recipe Industry
11. Recipe Delivery Form
12. Recipe TempDie1&2
13. Recipe First&SecondOpDie1&2
14. Recipe Sample1&2
15. Ingredient status (now: Active/Inactive/Phased out)
16. Ingredient class (now: Production/Development/Calculation, Unlocked)
17. Ingredient form
18. Ingredient location
19. Ingredient ADR Class
20. Ingredient Packaging Group
21. Ingredient UN-code
22. Ingredient CAS-number
23. Ingredient CLP Classification
24. Ingredient/Component CMR classification (now: Carcinogenic/Mutagenic/Reprotoxic/no)

25. Ingredient/ Component REACH status
26. Mixer type

5.1.6.2 Reference data without a user interface

1. Ingredient/Component Labels (CLP): fixed list with codes (GHS01-GHS09) and icons
2. Mixer Commands for PLC mode
3. Mixer Command for MixCont mode

For the future it is expected that new mixers will be added to the production facilities. In that case possibly the reference tables for the corresponding mixers will be defined by means of a user interface (see previous paragraph) with the option to define more variables than 2 and including format requirements and validation rules/restrictions.

5.1.7 Hotkey combinations

In MCRecipe the following hotkey combinations can be used to quickly activate a function:

- CTRL+TAB: Switch between tabs;
- ALT+F4: Quit program;
- CTRL+N: Create a new document (identical to Create New in MCRecipe);
- CTRL+F: Go to function (identical to Go-To in MCRecipe, see paragraph 5.1.1.1 requirement 2 paragraph 5.1.2.1 requirement 2);
- Home: Go to upper row (in selected grid);
- End: Go to lower row (in selected grid);
- CTRL+A: Select all the items in a selected grid or all text in a notes field;
- CTRL+C: Copy value in field;
- CTRL+X: Cut value in field;
- CTRL+V: Paste value in field;
- CTRL+Z: Undo change;
- CTRL+Y: Re-do in notes field;
- CTRL+P: Print;
- CTRL+S: Save;
- CTRL+L : Lock / Unlock;
- CTRL+→: Increase recipe code (origin) by 1 (Recipe Details Tab, see paragraph 5.1.1.2 requirement 2);
- CTRL+←: Decrease recipe code (origin) by 1 (Recipe Details Tab, see paragraph 5.1.1.2 requirement 2);
- CTRL+↑: Increase version number by 1 (Recipe Details Tab, see paragraph 5.1.1.2 requirement 2 and paragraph 5.1.2.2 requirement 1);
- CTRL+↓: Decrease version number by 1 (Recipe Details Tab, see paragraph 5.1.1.2 requirement 2 and paragraph 5.1.2.2 requirement 1);
- CTRL+ PgUp: Increase stage number by 1 (Recipe Details Tab, see paragraph 5.1.1.2 requirement 2);
- CTRL+ PgUp: Decrease stage number by 1 (Recipe Details Tab, see paragraph 5.1.1.2 requirement 2);
- ALT + P: toggle prices on or off; enables or disables displaying / printing of price information in any form or report (depending on authorization).

5.2 Requirements regarding LabClient.

QEW assumes that the current functionality of LabClient is sufficient and therefor no additional requirements have been added to this document.

5.3 Requirements regarding MCLauncher.

The requirements below refer only to additions to the existing functionality. QEW presumes that apart from the requirements in this paragraph the existing functionality is sufficient.

<table>
<tr><th>Nr.</th><th>Description</th></tr>
<tr><td>1.</td><td>MCLauncher should provide a simple authorization model in which users get access to the various module in MixCont. There is no way to access the various modules outside MCLauncher.
The authorization model is defined in the following matrix
<table>
<tr><th rowspan="2">Function/tab[1)]</th><th colspan="4">Roles</th></tr>
<tr><th>Manager</th><th>Key user</th><th>User</th><th>Etc..</th></tr>
<tr><td>RO</td><td>R</td><td>R</td><td>R</td><td></td></tr>
<tr><td>RD</td><td>R/M/I/D</td><td>R/M/I</td><td>R</td><td></td></tr>
<tr><td>RP</td><td>R/M/I/D</td><td>R/M/I</td><td>R</td><td></td></tr>
<tr><td>IO</td><td>R</td><td>R</td><td>R</td><td></td></tr>
<tr><td>ID</td><td>R/M/I/D</td><td>R/M/I</td><td>R</td><td></td></tr>
<tr><td>IP</td><td>R/M/I/D</td><td>R/M/I</td><td>R</td><td></td></tr>
<tr><td>CO</td><td>R/M/I/D</td><td>R/M/I</td><td>R</td><td></td></tr>
<tr><td>V</td><td>R/M/I/D</td><td>R/M/I</td><td>R</td><td></td></tr>
<tr><td>M</td><td>R/M/I/D</td><td>R/M/I</td><td>R</td><td></td></tr>
<tr><td>Refence data (see 5.1.6)</td><td>R/M/I/D</td><td>R</td><td>R</td><td></td></tr>
</table>
[1)] = abbreviations of the tabs are explained in the Explanation tab in Appendix 1.

No/R/M/I/D:
• No = No access
• R: Read only access (incl. print and export)
• M: Modification Access (authorized to modify)
• I: Insert/Add
• D: Delete

The roles described in the table above are the basic roles. The system should be able to provide more roles and the number of roles should be unlimited.

If MixCont provides an existing and equivalent authorization model, that model could be acceptable. This is subject to discussion.</td></tr>
<tr><td>2.</td><td>MCLauncher provides the definition of users. To each user one or more roles can be assigned. Apart from that a role can also define:
• Prices on/off: off = all prices of recipes and ingredients invisible;
• Class P on/off: off = recipes with with this class are invisible
• Class C on/off: off = recipes with with this class are invisible</td></tr>
</table>

	• Class R on/off: off = recipes with with this class are invisible

5.4 Requirements regarding MCSAP Browser.

The requirements below refer only to additions to the existing functionality. QEW presumes that apart from the requirements in this paragraph the existing functionality is sufficient.

Nr.	Description
1.	There should be a possibility to disable/enable the link to SAP.
2.	When the link is enabled and depending on the authorization level the user has the possibility to initiate the total synchronization of data. This should be possible e.g. after enabling the link or on request in case the users suspect that the data has not been correctly synchronized.
3.	Synchronization of data could be scheduled on fixed intervals or on event basis (to be defined).
4.	Only recipes with a status Active and Class “Production” will be synchronized to SAP.
5.	Only ingredients with a status Active and Class “Production” will be synchronized to SAP.

Note:
The link between SAP and MixCont has only been used once so far for the initial replication of data from MixCont to SAP. Therefore extensive and careful testing should be performed to avoid actual data to be overwritten by old data.

5.5 Requirements regarding Prodplan.

The requirements below refer only to additions to the existing functionality. QEW presumes that apart from the requirements in this paragraph the existing functionality is sufficient.

The current Prodplan process includes the following steps (see figure on page 6):

- Manual export of planning data from SAP in Excel-format;
- Manual conversion to CSV-format;
- Manual File transfer of CSV to MixCont;
- Open CSV file in Prodplan;
- Perform filtering of records;
- Convert the selected lines into CSV format and
    - Add detailed recipe information
    - Add mixer control program (commands in text format to control the mixer)
- Result is not stored in MixCont but sent to Intouch (MMI of PLC system) in csv format by storing the csv file in V:\elims\micos\data\recipe.csv.

Nr.	Description
1.	Future requirement: retrieve released planned orders directly from the SAP-database to reduce the steps in the process described above.

2.	Recipes other than the status Active cannot be selected and sent to the PLC.

5.6 Requirements regarding Control Monitor.

MC Browser is the tool than monitors the production in realtime.
There are no additional requirements regarding this module.

5.7 Requirements regarding MCBrowser.

The browser provides a link to the relevant test results. This link has been developed but not activated yet.
There are no requirements regarding this module.

5.8 Requirements regarding MCReplicator.

This module replicates data between MixCont and Eclipse. This module now has the sole purpose to replicate data (incl. history) from Eclipse to MixCont. After this migration project MCReplicator can be de-activated.
The only requirement here is to convert all Eclipse data to MixCont that is required in MixCont.

5.9 Miscellaneous Requirements.

Nr.	Description
1.	From a user perspective the functionality that will be delivered in this migration project should be user friendly, that means that proceedings and operations will be logical, effective and efficient.
2.	Each report generated by the system will contain a standard header and footer. The header contains: the logo (on the right) and the report title (on the left). The footer contains the current date (on the left) and the page number on the right.
3.	When generating direct Excel-exports the right format should be verified by QEW in a preliminary version because it is our experience that this export can cause problems, that we would like to avoid.
4.	CSV-exports should be imported without problems and therefor the format (probably DOS-format) should be determined in consultation with QEW.

6 Non functional requirements

6.1 Plan of approach and planning

In general the following requirements apply to the steps to achieve the final result.

Nr.	Description
1.	Alignment session. The first step is an alignment session to enable MixCont (Stas) to understand the new requirement document. During that session the result should be: • The feasibility of the requirements; • The delta between the current situation and the desired situation; • A rough estimate / time table based on the following steps below. • Global plan of approach.
2.	Review of interfaces. There are two important interfaces: the interface to SAP and the interface to the PLC. Both interfaces have already been developed. It is important that the MCRecipe data will be delivered correctly to SAP and to Prodplan (arrows 2 and 4 in the figure in page 6). The review could result in modifications of this document.
3.	Development a. Based on the very rough screen layouts in this document and the table of fields per module in Appendix 1, MixCont will adjust/design the screen forms (layout/look & feel) without functionality underneath; Starting point is to reduce the size of the screen elements in the current design. b. As a next step QEW will review this design; c. After approval MixCont will make the necessary modifications and add the functionality underneath. Purpose of this approach is to minimize the steps, effort and cost to reach the final result.
4.	QEW will make a test plan with a detailed set of tests to verify the functioning of the software.
5.	Test runs based on the test plan.
6.	Acceptance test and go-live.

6.2 Maintenance and Support

QEW expects a proposal for a maintenance and support contract including a Service Level Agreement.

6.3 Documentation and training

The requirements for documentation and training are:

Nr.	Description
1.	User manuals. The MixCont system will provided with sufficient documentation to be able to perform the daily operations by the various users/roles in an easy way.
2.	Documentation for the key users/application manager. The MixCont system will provided with sufficient documentation to enable the key users /application manager to manage the application. This means e.g. documentation on how to add users, change authorization levels, change menu's, etc.
3.	Documentation for the system manager. The MixCont system will provided with sufficient documentation for the system manager to be able to technically manage the system (e.g. startup, shutdown, backup/restore and data cleansing in case historical data has to be reduced and removed to an off-line data source).
4.	Documentation will contain sufficient text (not just screen copies) to describe the functionality and to clearly explain the user how to use the system.
5.	The MixCont system will be provided with a description of the data model of the enhanced database.
6.	The project includes training and training course materials for users and super users.

6.4 Project conditions

Nr.	Description
1.	MixCont will deliver a result obligation to achieve the result in this document.
2.	The system will be delivered based on a fixed price.
3.	QEW wants to obtain the source code of all MixCont code and a full list of the tools (development tools, compilers, libraries, etc.), licenses of other software packages required to be able to use MixCont and a full description with a procedure that enables QEW or a third party to rebuild the software. By obtaining this right QEW will be able to maintain the software for the future