

# Da Vinci Smart Manufacturing

## BRD S08.02 \_Lab Analysis\_SpoutAnalysis

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1.0	Leopoldo Rivera Sahana Badal	S08.02 First draft	22/05/2025

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## 1. Spout Analysis

### 1.1. Spout Analysis List Screen

This screen will display a list of analysis records for samples taken from the furnace spout before being collected in the ladle. These records are pulled from an external source, Xray, and populated in the list screen. Users can also add new analysis records directly in the system. The Spout Analysis ID is system-generated using the analysis date and time, furnace number and reprise. Below is a detailed layout of the screen.

#### 1.1.1 Header Section

- **Title:** "Spout Analysis"
- **Stats Section:** Total count of Draft | New | Linked | Rejected
- **Search Bar:** Tooltip text: Search by Analysis ID (Furnace ID\_DDMMYY\_HHMM\_Reprise)
- **Filters:**
  - Analysis Date and Time -
    - Date range picker
  - Furnace ID -
    - Multiselect Dropdown:
    - All furnaces for which analysis exists.
  - Status -
    - Multiselect Dropdown:
    - Values: New/Draft/Linked/Rejected
  - Shift
    - Multiselect Dropdown
    - Values: 1/2/3
  - Source
    - Multiselect Dropdown:
    - Values: Manual/Xray
  - Clear Filter - This will clear all the applied filters
  - All Filter drop downs should be sorted alphabetically / numerically
- **Action Buttons in Header:**
  - **Add Analysis:** Button to create a new analysis record.

#### 1.1.2 Analysis List Section

- The main area of the screen will feature a data table displaying the spout analysis records. The table will have the following columns:
- **Table Default Sorting :** Analysis Date and Time in descending order.
- **Spout Analysis ID:**
  - System-generated ID in the format (Furnace ID\_DDMMYY\_HHMM\_Reprise).
  - Sorting: Yes
  - Frozen - Yes

- **Furnace ID:**
  - The furnace number from which the sample was taken.
  - Sorting: Yes
  - Frozen: No
- **Analysis Date & Time:**
  - The date and time when the analysis was conducted.
  - Sorting: Yes
  - Frozen: No
- **Source:**
  - The source of the sample. (Options: Xray, Manual).
  - Sorting: Yes
  - Frozen: No
- **Shift:**
  - Shows the shift to which the analysis record belongs to (1,2,3)
  - Sorting: Yes
  - Frozen: No
- **Status:** Indicates the status of the record (Draft, New, Linked, Rejected).
  - **New** – Any Spout Analysis record created either from Xray or submitted Manually will have the initial status as New.
  - **Draft** - During the creation of an analysis record, it can be saved as a draft. This will be indicated by a Draft status.
  - **Linked** – Once a spout analysis record is linked to a Tap Id under Core process, the status in the list screen will display as Linked.
  - **Rejected** – On the list screen, a user can mark a submitted record as rejected, which will be indicated by a Rejected status.
  - Sorting: Yes
  - Frozen: No
- **Created By:**
  - Shows the UserID | First name + Last name
  - Sorting: Yes
  - Frozen: No
  - **Note:** Horizontal scroll is required to be able to navigate through all columns and visualize all data but always respecting the frozen columns.
- **Action Buttons:** Depending on the status, allows users to edit or view the record.
  - **Draft:**
    - Add Details – Additional details can be included into the analysis record prior to submission.
    - Delete – Selected analysis record will be permanently deleted
    - View - Record details can be viewed in non-editable mode
  - **New:**
    - View – Record details can be viewed in non-editable mode
    - Edit – Record details can be edited
    - Mark as Rejected – Record status can be changed to Rejected
  - **Linked:**
    - View – Record details can be viewed in non-editable mode
  - **Rejected:**

- View – Record details can be viewed in non-editable mode
- **Pagination Controls:** Navigation buttons to browse through multiple pages of records, if applicable (for more than 10 records).
- Rows Per page : Default 10, Dropdown values: 10, 20, 30, 40, 50
- Once one spout analysis with the same furnace ID, Date and time has been linked, the remaining records with other reprises both in the status New and Draft will be automatically be changed to Rejected status. Once unlinked in production screen, they will revert to New status.

**Export Function:** The export function must extract ALL the information including chemical results of the list of records shown based on the combined results of filter selection, sort and search criteria. as the following example:

Spout Analysis ID	Furnace ID	Created At	Created by/ Modified by	Components	Shift	Source	Status	Al (%)	Ca (%)	Fe (%)	Ti (%)	V (%)	Ni (%)	P (%)
101_190525_0246_M	101	19/05/2025   02:46 AM	UserID   First name + Last name	test	1	Manual	Rejected	1.9	1.9	1.9	1.9	1.9	1.9	1.9
101_160525_1025_M	101	16/05/2025   10:25 AM		test	1	Manual	New	1.9	1.9	1.9	1.9	1.9	1.9	1.9
9009_160525_0856_M	9009	16/05/2025   08:56 AM		test	2	Manual	Rejected	1.9	1.9	1.9	1.9	1.9	1.9	1.9

6_160525_0 823_M	6	16/0 5/20 25   08:2 3 AM			1	M an ua l	Dr aft	1. 9						
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**Exported**      **File**      **Name:**      **Spout**      **Analysis**

**Customize Columns:** Users can enable or disable all columns based on their preference. Only the enabled columns will be visible in the list. Columns marked as ‘frozen’ will be enabled by default and cannot be modified.

Spout Analysis ID	Furnace ID.	Analysis Date & Time	Source	Shift	Status
7_231024_1058_M	7	29/10/2024   01:10 AM	Manual	3	New
11_151024_1529_M	7	29/10/2024   01:10 AM	Manual	1	Linked
11_151024_1122_M	7	29/10/2024   01:10 AM	Manual	1	Linked
7_031024_1331_M	7	29/10/2024   01:10 AM	Manual	3	New
10_031024_0615_M	7	15/10/2024   03:14 PM	Xray	1	Draft
12_280924_0449_O	7	15/10/2024   03:14 PM	Xray	1	Draft
11_280924_0427_O	7	29/10/2024   01:10 AM	Manual	1	Linked
11_270924_2306_O	7	15/10/2024   03:14 PM	Xray	2	Rejected
12_270924_2040_O	7	15/10/2024   03:14 PM	Xray	2	Rejected
11_270924_1720_O	7	15/10/2024   03:14 PM	Xray	2	Rejected

## 1.2. Add Spout Analysis Screen

This screen will allow users to input and manage analysis records, organised into two sections: Basic Information and Analysis Values. Mandatory fields will be marked with an asterisk (\*). Below is a detailed layout incorporating the requirements.

**Header:** Back Icon | Add Spout Analysis

### 1.2.1. Basic Details:

- **Furnace ID\*:**
  - User selects the furnace ID from a single select dropdown, from which the sample was taken.
  - Mandatory - Yes

- Default value - No
    - Field Type - Single Select Dropdown Values: All active furnaces
    - Validation - No
  - Analysis Date and Time\*:**
    - Users select the date and time of the analysis using a date picker.
    - Mandatory - Yes
    - Default value- Current Date and time will be displayed as default.
    - Field Type Single Date and time picker
    - No Validation
  - Reprise:**
    - Auto populated as “M” for manual addition of records.
    - Mandatory - Yes
    - Default Value - “M” auto populated
    - Validation: It cannot be edited.
  - Source:**
    - Auto populated as “Manual” for manual addition of records.
    - Mandatory - Yes
    - Default Value - “Manual” auto populated
    - Validation It cannot be edited.
  - Analytical Device:**
    - Users selects from dropdown the device used for the analysis.
    - Mandatory - No
    - Default Value - None
    - Validation - No
    - Field Type - Single select dropdown (Xray)
  - Shift\*:**
    - Users selects the shift from a single select dropdown, during which the sample was taken.
    - Mandatory: Yes
    - Default Value - No
    - Field Type: Single select dropdown (1, 2, 3)
    - Validation - No
  - Comments:**
    - Users can input any additional comments.
    - Mandatory - No
    - Default Value - None
    - Field Validation - All (Including special characters), 100 characters
  -

### **1.2.2. Analysis Values Section:**

- This section allows user to input detailed analysis values, which include a standard set of elements.
  - Mandatory - No
  - Default value: 0.0000

- Field Validation - Max 100 as it is in %. upto 4 decimal points eg., 100.0000%
  - **Al (%)**: Users input the percentage of Aluminum.
  - **Fe (%)**: Users input the percentage of Iron.
  - **Ca (%)**: Users input the percentage of Calcium.
  - **Ti (%)**: Users input the percentage of Titanium.
  - **Ni (%)**: Users input the percentage of Nickel.
  - **V (%)**: Users input the percentage of Vanadium.
  - **P (%)**: Users input the percentage of Phosphorus.

### 1.2.3. Action Buttons

- **Save Draft**: Saves the record as a draft (Status: Draft) and validates for a unique analysis ID.
- **Submit**: Submits the record as complete (Status: New) and validates for a unique analysis ID.
- **Cancel**: Cancels the current operation and returns to the list screen

**Basic Details**

Furnace ID.*	Analysis Date & Time*	Reprise*	Source*
Select Material Type	15/10/2024 11:23 AM	M	Manual

**Analysis Values**

Elements	Analysis Values (%)
AI	0
Ca	0
Fe	0

Elements	Analysis Values (%)
Ni	0
P	0
Ti	0

Elements	Analysis Values (%)

### 1.3. Edit Spout Analysis

This screen provides interface for editing existing analysis records, allowing users to update editable fields while keeping essential identifying information non-editable. The ability to save edited records, view a change history log provides flexibility and transparency in managing the analysis process. Below is a detailed layout incorporating these requirements.

**Header:** Back Icon | Spout Analysis ID : “101\_190525\_0246\_M”

#### 1.3.1. Basic Details:

- **Furnace ID.:**

- Non-editable and pre-populated with the existing value.
- Default value - No
- Mandatory: Yes
- **Analysis Date and Time:**
  - Non-editable and pre-populated with the existing value.
  - Default value- Current Date and time will be displayed as default.
  - Mandatory: Yes
- **Reprise:**
  - Non-editable and pre-populated with “M”.
  - Mandatory: Yes
- **Source:**
  - Non-editable and pre-populated with the “Manual”.
  - Mandatory: No
- **Shift:**
  - Non-editable and pre-populated with the existing value.
  - Default value - None
  - Mandatory: Yes
- **Analytical Device:**
  - Non-editable and pre-populated with the existing value.
  - Mandatory: No
  - Default value - None
- **Comments:**
  - Editable and pre-populated with the existing value.
  - Default value - None
  - Mandatory: No
  - Field Validation All (Including special characters), 100 characters
- 

### **1.3.2. Analysis Values Section:**

- This section has elements that are editable and pre-populated with the existing value
- Mandatory - No
- Default value: 0.0000
- **Al (%)**, **Fe (%)**, **Ca (%)**, **Ti (%)**, **Ni (%)**, **V (%)**, **P (%)**

### **1.3.3. Action Buttons**

- **Save:** Saves the record as a draft (Status: Draft) and validates for a unique analysis ID.
- **Cancel:** Cancels the current operation and returns to the list screen

The screenshot shows the 'Spout Analysis ID: 7\_231024\_1058\_M' edit screen. The 'Basic Details' section contains fields for Furnace ID (7), Analysis Date & Time (15/10/2024 11:23 AM), Reprise (M), Source (Manual), Analytical Device (Xray), Shift (1), and a Comments input field. The 'Analysis Values' section displays tables for different elements and their analysis percentages:

Elements	Analysis Values (%)
Al	1.23
Ca	0
Fe	0

Elements	Analysis Values (%)
Ni	0
P	0
Ti	0

Elements	Analysis Values (%)
V	0

At the bottom right are 'Cancel' and 'Save' buttons.

## 1.4. Add Details Screen

This screen provides interface for editing existing analysis records, allowing users to update editable fields while keeping essential identifying information non-editable.

This is only for Analysis Ids that are in draft status and not yet submitted

### 1.4.1. Basic Information Section:

This section captures the essential details about the material being analyzed.

- **Furnace ID:**
  - Non-editable and pre-populated with the existing value.
  - Default value - No
  - Mandatory: Yes
- **Analysis Date and Time:**
  - Non-editable and pre-populated with the existing value.
  - Default value- Current Date and time will be displayed as default.
  - Mandatory: Yes
- **Reprise:**
  - Non-editable and pre-populated with “M”.
  - Mandatory: Yes
- **Source:**
  - Non-editable and pre-populated with the “Manual”.
  - Mandatory: No
- **Shift:**
  - Non-editable and pre-populated with the existing value.
  - Default value - None
  - Mandatory: Yes
- **Analytical Device:**

- Non-editable and pre-populated with the existing value.
- Mandatory: No
- Default value - None
- **Comments:**
  - Editable and pre-populated with the existing value.
  - Default value - None
  - Mandatory: No
  - Field Validation All (Including special characters), 100 characters

#### **1.4.2. Analysis Values Section:**

This section has elements that are editable and pre-populated with the existing value

- Mandatory - No
- Default value: 0.0000
- **Al (%), Fe (%), Ca (%), Ti (%), Ni (%), V (%), P (%)**

#### **1.4.3. Action Buttons**

- **Save:** Saves the edited record values (Status: Draft)
- **Submit:** Saves the edited record values (Status: New)
- **Cancel:** Cancels the current operation and returns to the list screen

Spout Analysis ID : 7\_231024\_1058\_M

Nora James

Basic Details	
Furnace ID.*	7
Analysis Date & Time*	15/10/2024 11:23 AM
Reprise*	M
Source*	Manual
Analytical Device	Xray
Shift*	1
Comments	Enter Comments

Analysis Values	
Elements	Analysis Values (%)
AI	1.23
Ca	0
Fe	0
Elements	Analysis Values (%)
Ni	0
P	0
Ti	0
Elements	Analysis Values (%)
V	0

Cancel Save as Draft Submit

#### **1.5. View Spout Analysis**

This screen allows users to **view details** of an existing analysis record. All fields are displayed in **read-only mode** by default. Users have access to additional utilities for editing, exporting, and viewing change history.

##### **1.5.1. Header Section**

- Back Icon | Spout Analysis ID : 7\_231024\_1058\_M | **Edit Icon:** Allows users to switch from view mode to edit mode to update the record.
- **Export Icon:**
  - Enables users to export the analysis details as a CSV file.
  - The tooltip should read “Download CSV”.
  - Downloads the record in CSV format.
  - This option is not available for records in Draft status.
  - The file must include the following headers and display the values as the following example:
  - **Export File Name:** Composed by the following elements:
    - Spout Analysis ID
    - “Results”

Example: SA\_9009\_050525\_1215\_M\_Results

Element	Analysis Values (%)	Modified By	Modified At	Created By	Created At
Al	56.4645	pchakwate   Pradnya Chakwate	16/05/2025   11:57 AM	pchakwate   Pradnya Chakwate	16/05/2025   11:57 AM
Ca	2.2323	pchakwate   Pradnya Chakwate	16/05/2025   11:57 AM	pchakwate   Pradnya Chakwate	16/05/2025   11:57 AM
Fe	2.2323	pchakwate   Pradnya Chakwate	16/05/2025   11:57 AM	pchakwate   Pradnya Chakwate	16/05/2025   11:57 AM
Ni	6.6765	pchakwate   Pradnya Chakwate	16/05/2025   11:57 AM	pchakwate   Pradnya Chakwate	16/05/2025   11:57 AM

P	2.3453	pchakwate   Pradnya Chakwate	16/05/2025   11:57 AM	pchakwate   Pradnya Chakwate	16/05/2025   11:57 AM
Ti	7.5464	pchakwate   Pradnya Chakwate	16/05/2025   11:57 AM	pchakwate   Pradnya Chakwate	16/05/2025   11:57 AM
V	6.4564	pchakwate   Pradnya Chakwate	16/05/2025   11:57 AM	pchakwate   Pradnya Chakwate	16/05/2025   11:57 AM

- View Change History:** This button opens a modal or section showing a chronological list of all changes made to the record, including:
  - Timestamp of change
  - Field(s) modified
  - Previous and updated values
  - Name of the user who made the change
  - This option is not available for records in Draft status.**

The screenshot shows the DaVinci software interface. On the left is a sidebar with navigation options: Lab Analysis, Spout Analysis (selected), Raw Material Analysis, Tap Analysis, and other less visible options. The main area displays a Spout Analysis record with ID 101\_220525\_2155\_M. It shows basic details like Furnace ID 101, Analysis Date & Time 22/05/2025 | 09:55 PM, Analytical Device --, Shift 1, and analysis values for Elements AI, Ca, P, and Fe. A modal window titled "SPOUT ANALYSIS CHANGE HISTORY" is open, listing changes made by user "stelukuntla | Shiva Teja Telukuntla" on 22/05/2025 at 10:04 PM. The changes are for elements Ni, Ti, and Ca, with their Old (%) and New (%) values.

Date	Username	Element	Old (%)	New (%)
22/05/2025 10:04 PM	stelukuntla   Shiva Teja Telukuntla	Ni	0.0000	0
		Ti	0.0000	11
		Ca	0.0000	8.9

- Export Icon - Downloads the records in CSV format, the tooltip should read “Download CSV”.**

### 1.5.2. Basic Details (Read-Only)

- **Furnace ID:** Displays the selected furnace from which the sample was taken.
- **Analysis Date and Time:** Shows the timestamp when the analysis was conducted.
- **Reprise:** Displays “M” for manual addition.
- **Source:** Displays “Manual” | “Xray”
- **Shift:** Shows the selected shift during which the sample was taken.
- **Analytical Device:** Displays the device used for analysis.
- **Comments:** Displays any user-provided notes, supporting special characters (max 100 characters)

### 1.5.2. Basic Details (Read-Only)

Displays a list of elemental analysis values as percentages. All values are formatted up to **four decimal places and three integers up to 100**, max value capped at **100.0000**.

Element	Value (%)
Al	3.4521
Fe	85.3200
Ca	0.4567
Ti	0.1234
Ni	2.3345
V	0.7854
P	0.1000

The screenshot shows the DaVinci software interface. On the left is a dark sidebar with the DaVinci logo at the top, followed by a navigation menu with 'Lab Analysis' selected. Under 'Lab Analysis', there are three options: 'Spout Analysis' (highlighted in orange), 'Raw Material Analysis', and 'Tap Analysis'. Below these are several small icons. At the bottom of the sidebar are links for 'Version 1.0', 'Change Language', 'Help', and 'Vista Manufacturers Plant: Anglefort'. The main content area has a header 'Spout Analysis ID : 101\_220525\_2155\_M' with a pencil icon and a 'View Change History' button. The header also includes a 'super user' dropdown and a download icon. The page is divided into sections: 'Basic Details' (Furnace ID: 101, Analysis Date & Time: 22/05/2025 | 09:55 PM, Reprise: M, Source: Manual) and 'Analysis Values' (a table showing elements Al, Ca, Fe, Ni, P, Ti, V with their respective analysis values in %). The 'Analysis Values' table is structured with three columns: Elements and Analysis Values (%).

Elements	Analysis Values (%)	Elements	Analysis Values (%)	Elements	Analysis Values (%)
Al	1.44	Ni	0	Ti	1.1
Ca	8.9	P	3.33	V	
Fe					

## 1.6. Mark Spout Analysis record as Rejected

Some records with the status “**New**” can be **manually marked as “Rejected”** using a designated icon in the list view.

When selected, a confirmation popup will appear with the message:

**“Are you sure you want to mark record 101\_160525\_1025\_M as Rejected? This action cannot be reverted.”**

Additionally, when one spout analysis (with the same Furnace ID, Date, and Time) is **linked** in the production screen, all other records with the same Furnace ID, Date, and Time—regardless of their **Reprise**—and in either **New** or **Draft** status, will be **automatically updated to “Rejected”**.

If the analysis is later **unlinked** from the production screen, those automatically rejected records will **revert back to “New”** status.

**Only roles with delete option will be able to Mark an analysis record as rejected.**

Spout Analysis Draft | 12 New | 5 Linked | 8 Rejected | 15

Add Analysis Export

Spout Analysis ID	Furnace ID	Analysis Date & Time	Source	Status	Shift
101_220525_2155_M	101	22/05/2025   09:55 PM	Manual	New	1
43_220525_0956_M	43	22/05/2025   09:56 AM	Manual	New	3
43_220525_0955_M	43			New	2
43_220525_0953_M	43			Draft	3
1_220525_0855_M	1			Rejected	1
1_220525_0808_M	1			New	1
6_220525_0805_M	6	22/05/2025   06:05 AM	Manual	Rejected	2
1_220525_0640_M	1	22/05/2025   06:40 AM	Manual	Linked	1
1_220525_0627_M	1	22/05/2025   06:27 AM	Manual	Rejected	1
2_220525_0603_M	2	22/05/2025   06:03 AM	Manual	Rejected	3

Showing 10 of 40 Rows Per Page: 10

**Message**

Are you sure you want to mark 101\_220525\_2155\_M as Rejected? This action cannot be reverted.

Cancel Proceed