

Da Vinci Smart Manufacturing

BRD S08.03 Lab Analysis Tap Analysis

Version	Created/Modified by	Description	Date
1.0	Leopoldo Rivera Sahana Badal	S08.03 First draft	22/05/2025

1. Tap Analysis	3
1.1. Tap Analysis List Screen	3
1.1.1 Header Section	3
1.2. Add Tap Analysis Screen.....	7
1.2.1. Basic Details:	7
1.2.2. Analysis Values Section:.....	8
1.2.3. Action Buttons.....	8
1.2.4. Validation:	8
1.3. Edit Tap Analysis.....	9
1.3.1. Basic Details:	9
1.3.2. Analysis Values Section:.....	10
1.3.3. Action Buttons.....	10
1.4. Add Details Screen	11
1.4.1. Basic Details:	11
1.4.2. Analysis Values:	12
1.4.3. Action Buttons.....	12
1.5. View Tap Analysis	12
1.5.1. Header Actions.....	13
1.5.2. Basic Information Section (Read-Only)	14
1.5.3. Analysis Values Section (Read-Only)	15
1.6. Mark Tap Analysis record as Rejected	16

1. Tap Analysis

1.1. Tap Analysis List Screen

This screen will display a list of analysis records for samples taken from 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 Tap Analysis ID is system-generated using the analysis date and tap number. Below is a detailed layout of the screen.

1.1.1 Header Section

- **Title:** "Tap Analysis"
- **Stats Section:** Total count of Draft | New | Linked | Rejected
- **Search Bar:** Tooltip text: Search by Analysis ID (Furnace ID_DDMM_Tap No._YY_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
- Tap No.
 - Multiselect Dropdown:
 - All Tap No.s entered associated with Tap Analysis Ids
- 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 tap analysis records. The table will have the following columns:
- Table Default Sorting : Analysis Date and Time in descending order
- **Tap Analysis ID:**
 - System-generated ID in the format (Furnace ID._DDMM_Tap No._YY_Reprise).
 - Sorting: Yes
 - Frozen - Yes
- **Furnace ID.:**
 - The furnace number from which the sample was taken.
 - Sorting: Yes
 - Frozen: No
- **Tap No.:**
 - The furnace number of 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
- **Created At**
 - Shows the UserID | First name + Last name
 - Sorting: Yes
 - Frozen: No
- **Status:** Indicates the status of the record (Draft, New, Linked, Rejected).
 - **New** – Any Tap 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 tap 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
- **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

The screenshot shows a table of tap analysis records with columns: Tap Analysis ID, Furnace ID, Tap No., Analysis Date & Time, Source, and Status. A modal dialog titled 'Delete Analysis' is open over the table, asking 'Are you sure you want to delete 10_1510_99_24_M1? This action cannot be reverted.' with 'Cancel' and 'Proceed' buttons. The status column for the selected row shows 'Rejected'.

Tap Analysis ID	Furnace ID	Tap No.	Analysis Date & Time	Source	Status
7_2410_5754_24_M1	10	5754	29/10/2024 01:10 AM	Manual	Linked
7_2910_4673_24_M1	10	5754	29/10/2024 01:10 AM	Manual	Linked
7_2410_164371_24_M2	10		29/10/2024 01:10 AM	Manual	Linked
7_2310_1212_24_M1	7				New
7_2310_15437_24_M1	MQ17_312				Draft
11_1710_5967_24_M1	MQ17_312	5967	15/10/2024 03:14 PM	Xray	Draft
7_1510_88_24_M3	11	88	29/10/2024 01:10 AM	Manual	Linked
10_1510_99_24_M2	MQ17_312	99	15/10/2024 03:14 PM	Xray	Rejected
15_0710_78_24_M3	MQ17_312	78	15/10/2024 03:14 PM	Xray	Rejected
11_0410_0498_24_M2	7	467	29/10/2024 01:10 AM	Manual	Linked

- 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 tap analysis with the same furnace ID, Date and tap No. 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:

Tap Analysis ID	Furnace ID	Created At	Comments	Tap No.	Source	Status	Al (%)	Ca (%)	Fe (%)	Ti (%)	V (%)	Ni (%)	P (%)
101_190525_0246_M	101	19/05/2025 02:46 AM	test	11	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	123	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	212	Manual	Rejected	1.9	1.9	1.9	1.9	1.9	1.9	1.9
6_160525_0823_M	6	16/05/2025 08:23 AM		1	Manual	Draft	1.9	1.9	1.9	1.9	1.9	1.9	1.9

- **Exported File Name:** Tap 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.

Tap Analysis ID	Furnace ID	Tap No.	Analysis Date & Time	Source	Status	
7_2410_5754_24_M1	10	5754	29/10/2024 01:10 AM	Manual	Linked	
7_2910_4673_24_M1	10	5754	29/10/2024 01:10 AM	Manual	Linked	
7_2410_154371_24_M2	10	5754	29/10/2024 01:10 AM	Manual	Linked	
7_2310_1212_24_M1	7	1212	29/10/2024 01:10 AM	Manual	New	
7_2310_15437_24_M1	MQ17_312	5754	15/10/2024 03:14 PM	Xray	Draft	
11_1710_5967_24_M1	MQ17_312	5967	15/10/2024 03:14 PM	Xray	Draft	
7_1510_88_24_M3	11	88	29/10/2024 01:10 AM	Manual	Linked	
10_1510_99_24_M2	MQ17_312	99	15/10/2024 03:14 PM	Xray	Rejected	
15_0710_78_24_M3	MQ17_312	78	15/10/2024 03:14 PM	Xray	Rejected	
11_0410_0498_24_M2	7	467	29/10/2024 01:10 AM	Manual	Linked	

1.2. Add Tap Analysis Screen

The "Add Tap Analysis" screen will allow users to input and manage analysis records, organized 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 Tap 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
- **Tap No.***
 - User input value
 - Mandatory - Yes
 - Default value - No
 - Field Validation - Numeric only, Min 1, max 6 digits
- **Source*:**
 - Auto populated as "Manual" for manual addition of records.

- Mandatory - Yes
 - Default Value - “Manual” auto populated
 - Validation It cannot be edited.
- **Reprise*:**
 - User selects from a single select Dropdown list
 - Mandatory - Yes
 - Default Value - No
 - Field Type - Single Select Dropdown Values: M1 | M2 | M3 | M4 | M5)
 - Validation: None
- **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)
- **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 Aluminium.
 - **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

1.2.4. Validation:

- **New Tap Analysis Creation** with a different reprise for the same tap number that has been marked as Grading Finalized / Tap Linked in Production.
- **Manual Creation of Tap Analysis**
 - **If the Tap ID is in “Tap Linked” status:** The new analysis will be created with “Linked” status.
 - **If the Tap ID is in “Grading Finalized” status:** Creation **will not be allowed**. The system should display an error message indicating that a new analysis cannot be created after grading finalization.
- **Automation Pulled Tap Analysis**
 - **If the Tap ID is in “Tap Linked” status:** The new analysis will be created with “Linked” status.
 - **If the Tap ID is in “Grading Finalized” status:** The new analysis will be created with a “Marked as Rejected” status. The system should automatically flag the analysis as rejected based on the finalized tap.

The screenshot displays the 'Add Tap Analysis' form. At the top, there's a header bar with a back arrow, the title 'Add Tap Analysis', and a user profile icon for 'Nora James'. On the left, a vertical sidebar contains icons for navigation. The main form is divided into sections: 'Basic Details' (Furnace ID dropdown, Analysis Date & Time (15/10/2024 11:23 AM), Tap No. input, Source dropdown), 'Reprise' (Select Reprise dropdown, Select Analytical Device dropdown, Comments input), and 'Analysis Values' (a grid showing elements Al, Ca, Fe, Ni, P, Ti and their corresponding analysis values in percent, all currently set to 0). At the bottom right are three buttons: 'Cancel', 'Save as Draft', and 'Submit'.

1.3. Edit Tap 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 | Tap Analysis ID : “101_1905_123_25_M1”

1.3.1. Basic Details:

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
- **Tap No.**
 - Non-editable and pre-populated with the existing value.
 - Default value- None
 - Mandatory: Yes
- **Source:**
 - Non-editable and pre-populated with the “Manual”.
 - Mandatory: No
- **Reprise:**
 - Non-editable and pre-populated with “M”.
 - 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 'Add Details' screen for an analysis record with ID 10_1510_99_24_M1. The interface includes a sidebar with various icons, a header with a back button, user info (Nora James), and a title bar. The main area has sections for 'Basic Details' and 'Analysis Values'. In 'Basic Details', fields include Furnace ID (10), Analysis Date & Time (15/10/2024 11:23 AM), Tap No. (99), Source (Manual), Reprise (M2), Analytical Device (Xray), and Comments (Enter Comments). In 'Analysis Values', there are three tables showing element analysis percentages: Al (1.23%), Ni (0%), P (0%), Fe (0%), Ti (0%), and V (0%). At the bottom are 'Cancel', 'Save as Draft', and 'Submit' 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. 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.

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

Header: Back Icon | Tap Analysis ID : “101_1905_123_25_M1”

1.4.1. 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
- **Tap No.**
 - Non-editable and pre-populated with the existing value.
 - Default value- None
 - Mandatory: Yes
- **Source:**
 - Non-editable and pre-populated with the “Manual”.
 - Mandatory: No
- **Reprise:**
 - Non-editable and pre-populated with “M”.

- 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:

- 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

Basic Details

Furnace ID*	Analysis Date & Time*	Tap No.*	Source*
Select Material Type	15/10/2024 11:23 AM	Enter Tap No.	Manual

Reprise*

Select Reprise	Select Analytical Device	Comments
		Enter Comments

Analysis Values

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

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

Elements	Analysis Values (%)
P	0
Ti	0

Cancel **Save as Draft** **Submit**

1.5. View Tap 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 Actions

- Back Icon | Tap Analysis ID : 101_1905_123_25_M1 | **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:
 - Tap Analysis ID
 - “Results”
 - Example: 101_1905_123_25_M1_Results

Element	Analysis Values (%)	Modified By	Modified At	Created By	Created At
Al	56.4645	pchakwate Pradnya Chakwate	16/05/2025 11:57 AM	labuser Lab User	16/05/2025 10:30 AM
Ca	2.2323	pchakwate Pradnya Chakwate	16/05/2025 11:57 AM	labuser Lab User	16/05/2025 10:30 AM
Fe	2.2323	pchakwate Pradnya Chakwate	16/05/2025 11:57 AM	labuser Lab User	16/05/2025 10:30 AM
Ni	6.6765	pchakwate Pradnya Chakwate	16/05/2025 11:57 AM	labuser Lab User	16/05/2025 10:30 AM

P	2.3453	pchakwate Pradnya Chakwate	16/05/2025 11:57 AM	labuser Lab User	16/05/2025 10:30 AM
Ti	7.5464	pchakwate Pradnya Chakwate	16/05/2025 11:57 AM	labuser Lab User	16/05/2025 10:30 AM
V	6.4564	pchakwate Pradnya Chakwate	16/05/2025 11:57 AM	labuser Lab User	16/05/2025 10:30 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.**
 - Export Icon - Downloads the records in CSV format, the tooltip should read “Download CSV”.**

The screenshot shows the DaVinci software interface for a Tap Analysis record. On the left, there's a sidebar with various icons. The main area displays "Basic Details" for a tap analysis ID (10_1510_99_24_M1). It includes fields for Furnace ID (10), Analysis Date & Time (15/10/2024 11:23 AM), Tap No. (99), Reprise (M2), Analytical Device (Xray), and Comments. Below this is the "Analysis Values" section, which lists elements (Al, Ca, Fe) and their corresponding analysis values (1.23, 0.0000, 0.0000). To the right, a modal titled "TAP ANALYSIS CHANGE HISTORY" is open, showing a table of changes made to the record. The table has columns for Date, Username, Element, Old value, and New value. The changes listed are:

Date	Username	Element	Old	New
05/01/2025 09:00 AM	JSmithOperator John Smith	Al	0.0000	19.0000
04/01/2025 09:00 AM	superadmin John Doe	Ca	0.0000	1.0000
02/01/2025 07:00 AM	superadmin John Doe	Fe	0.0000	2.4500
01/01/2025 09:00 AM	superadmin John Doe	Cl	0.0000	1.0000

1.5.2. Basic Information Section (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.
- **Tap No.** Displays the Tap No.
- **Reprise:** Displays “M” for manual addition.
- **Source:** Displays “Manual” | “Xray”
- **Analytical Device:** Displays the device used for analysis.
- **Comments:** Displays any user-provided notes, supporting special characters (max 100 characters)

1.5.3. Analysis Values Section (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

Elements	Analysis Values (%)	Elements	Analysis Values (%)	Elements	Analysis Values (%)
Al	1.23	Ni	0.0000	V	0.0000
Ca	0.0000	P	0.0000		
Fe	0.0000	Ti	0.0000		

1.6. Mark Tap Analysis record as Rejected

On the list screen, users can mark a records with the status “**New**” as a rejected sample if the analysis values are incorrect and should not be considered for any calculations. This can be done by clicking on the “Mark as Rejected” icon list view.

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

“Are you sure you want to mark record 10_1510_99_24_M1 as Rejected? This action cannot be reverted.”

Additionally, when one Tap analysis (with the same Furnace ID, Date, and Tap No.) is **linked** in the production screen, all other records with the same Furnace ID, Date, and Tap No.—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.

The screenshot shows a table of tap analysis records with columns: Tap Analysis ID, Furnace ID, Tap No., Analysis Date & Time, Source, Status, and a Link button. Record 10_1510_99_24_M1 is selected and highlighted with an orange border. A modal dialog box titled "Mark as Rejected" is displayed over the table, containing the message: "Are you sure you want to mark record 10_1510_99_24_M1 as Rejected? This action cannot be reverted." It has "Cancel" and "Proceed" buttons.

Tap Analysis ID	Furnace ID	Tap No.	Analysis Date & Time	Source	Status
7_2410_5754_24_M1	10	5754	29/10/2024 01:10 AM	Manual	Linked
7_2910_4673_24_M1	10	5754	29/10/2024 01:10 AM	Manual	Linked
7_2410_154371_24_M2	10	5754	29/10/2024 01:10 AM	Manual	Linked
7_2310_1212_24_M1	MQ17_312				New
7_2310_154371_24_M1	MQ17_312				Draft
11_1710_5967_24_M1	MQ17_312	5967	15/10/2024 03:14 PM	Xray	Draft
7_1510_88_24_M3	11	88	29/10/2024 01:10 AM	Manual	Linked
10_1510_99_24_M2	MQ17_312	99	15/10/2024 03:14 PM	Xray	Rejected
15_0710_78_24_M3	MQ17_312	78	15/10/2024 03:14 PM	Xray	Rejected
11_0410_0498_24_M2	7	467	29/10/2024 01:10 AM	Manual	Linked

* Across the system, time is stored in the database in UTC format and presented on the frontend in the plant's time zone. It is assumed that the time displayed in the X-ray files is also in the plant's time zone.