# Da Vinci Smart Manufacturing

## BRD S08.03 _Lab Analysis_Tap Analysis

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

# 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 -

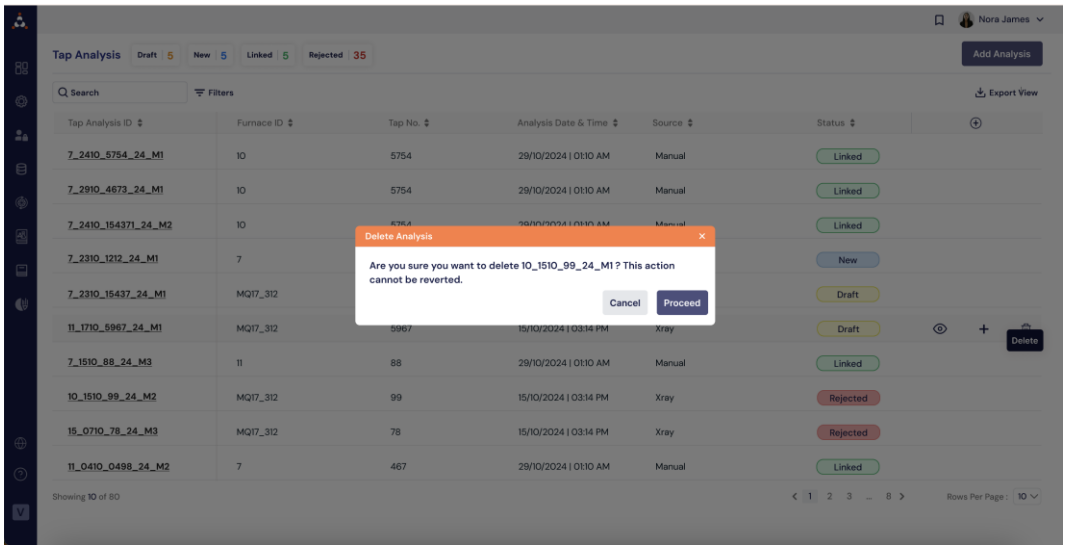
        - Multiselect Dropdown
        - Values: New/Draft/Linked/Rejected
    - Tap No.
        - Multiselect Dropdown:
        - All Tap No.s entered associated with Tap Analysis Ids
    - Source
        - Multiselect Dropdown:
        - Values: Manual/Xray
    - Clear Filter - This will clear all the applied 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

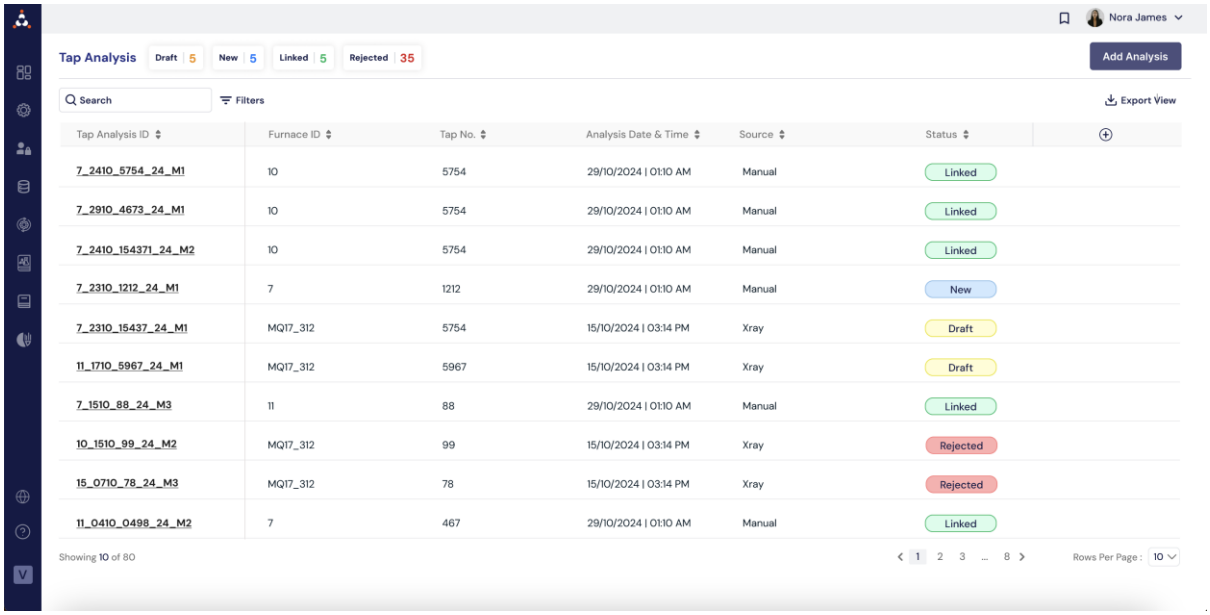



    - View – Record details can be viewed in non-editable mode
  - **New**:
    - View – Record details can be viewed in non-editable mode
    - Edit – Record details can be edited
    - Mark as Rejected – Record status can be changed to Rejected
  - **Linked**:
    - View – Record details can be viewed 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.




## 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:*

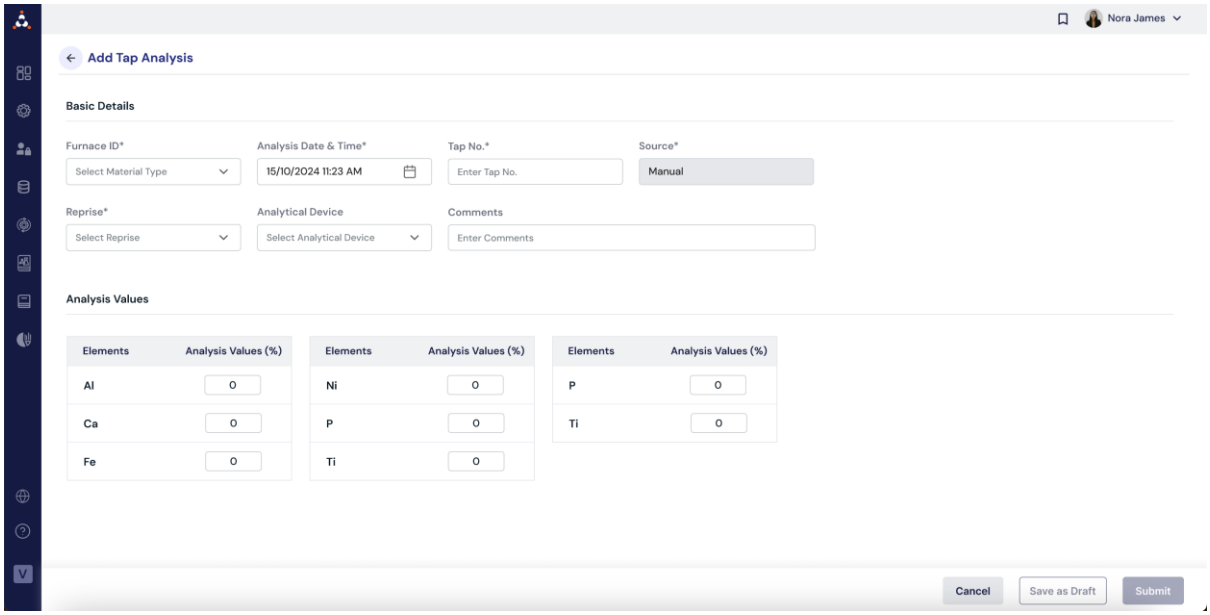
- This section allows user to input detailed analysis values, which include a standard set of elements.
- Mandatory - No
- Default value: 0.0000
- Field Validation - Max 100 as it is in %. upto 4 decimal points eg., 100.0000%
    - **Al (%):** Users input the percentage of Aluminium.
    - **Fe (%):** 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.




## 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

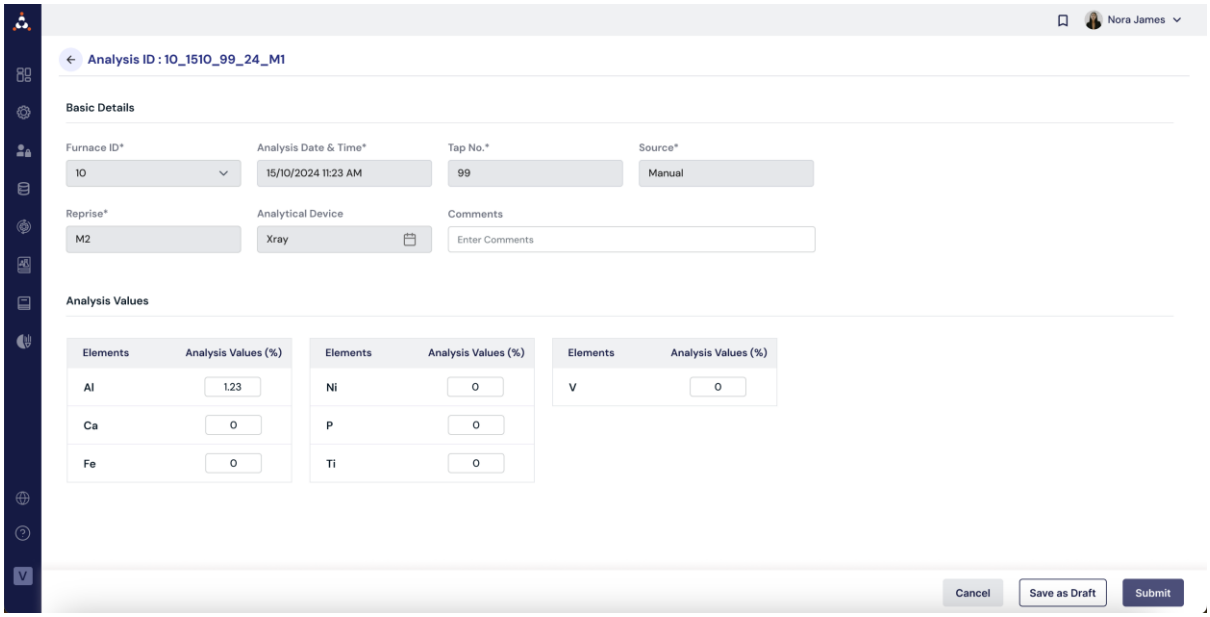
- **Analysis Date and Time**:
  - Non-editable and pre-populated with the existing value.
  - Default value- Current Date and time will be displayed as default.
  - Mandatory: Yes
- **Tap No.**
  - Non-editable and pre-populated with the existing value.
  - Default value- None
  - Mandatory: Yes
- **Source**:
  - 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




## 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”.

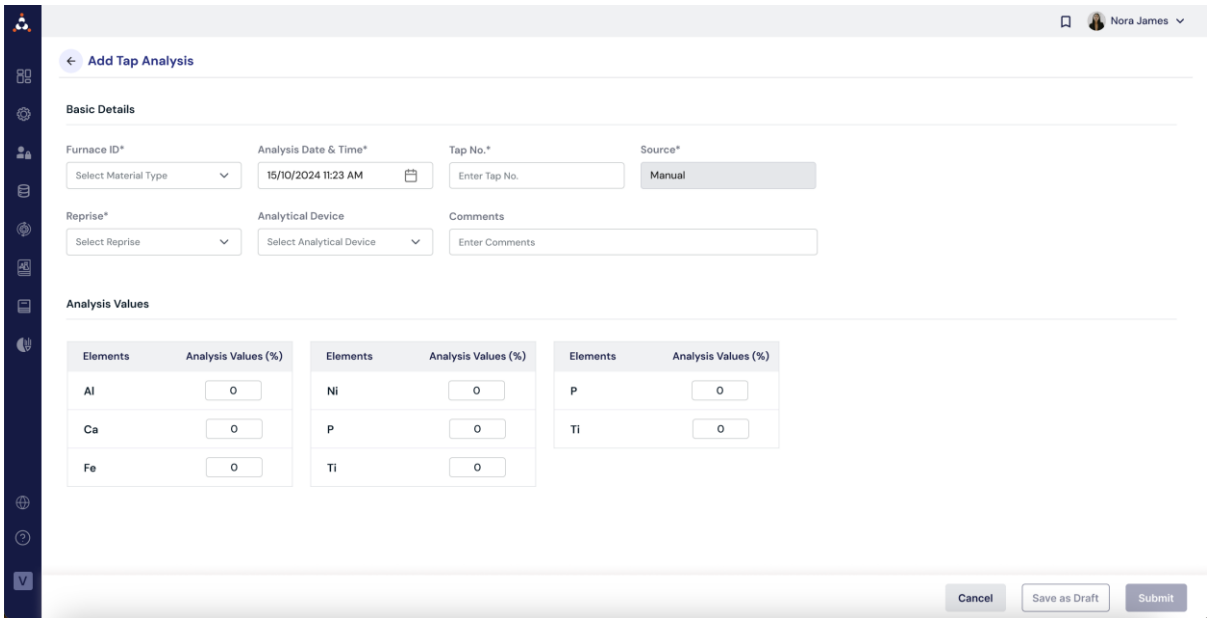
    - Mandatory: Yes
- **Analytical Device**:
    - Non-editable and pre-populated with the existing value.
    - Mandatory: No
    - Default value - None
- **Comments**:
    - Editable and pre-populated with the existing value.
    - Default value - None
    - Mandatory: No
    - Field Validation All (Including 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




## 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.

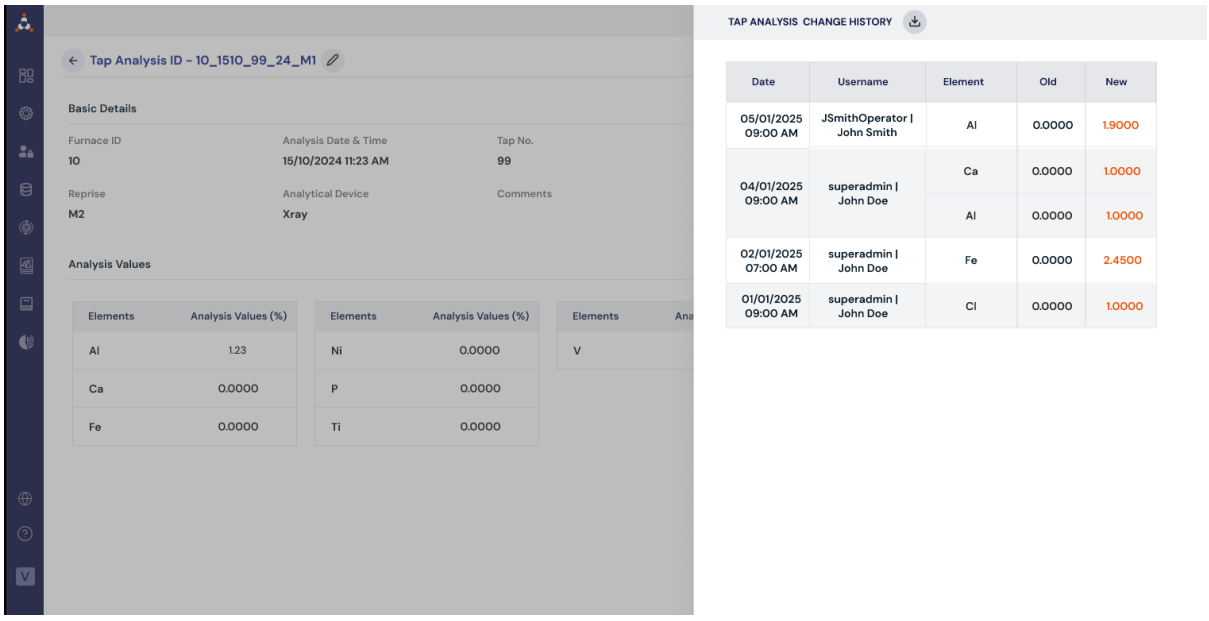
### *1.5.1. Header Actions*

- 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".**




### *1.5.2. Basic Information Section (Read-Only)*

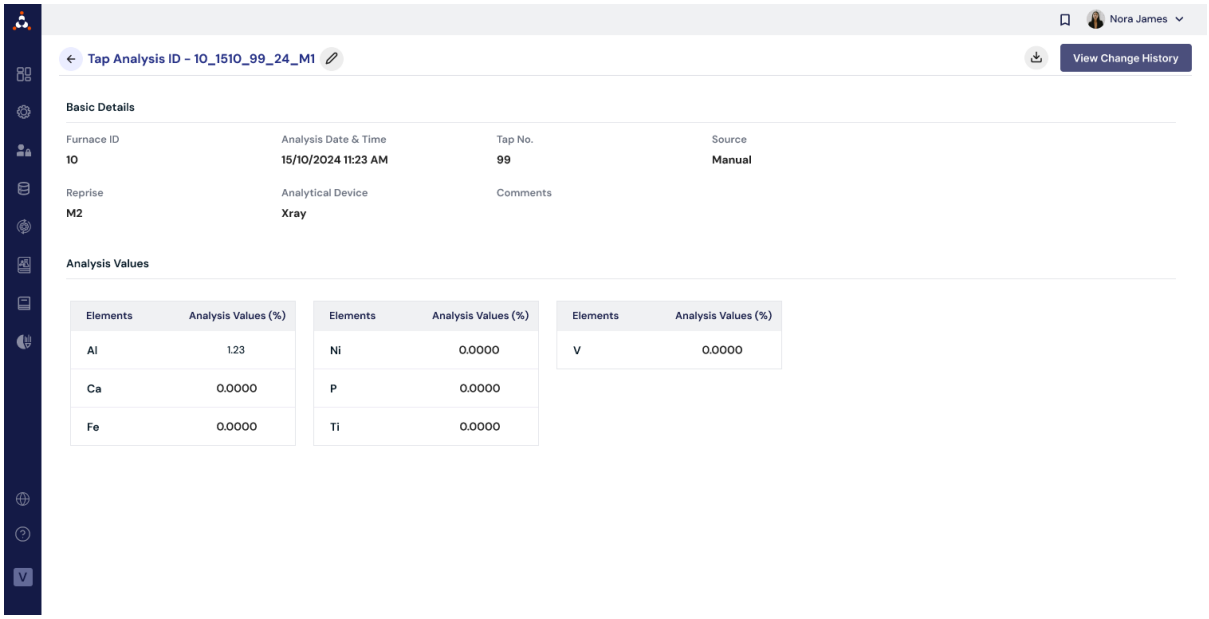
- **Furnace ID**: Displays the selected furnace from which the sample was taken.

- **Analysis Date and Time**: Shows the timestamp when the analysis was conducted.
- **Tap No.** Displays tha 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 |




## 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.

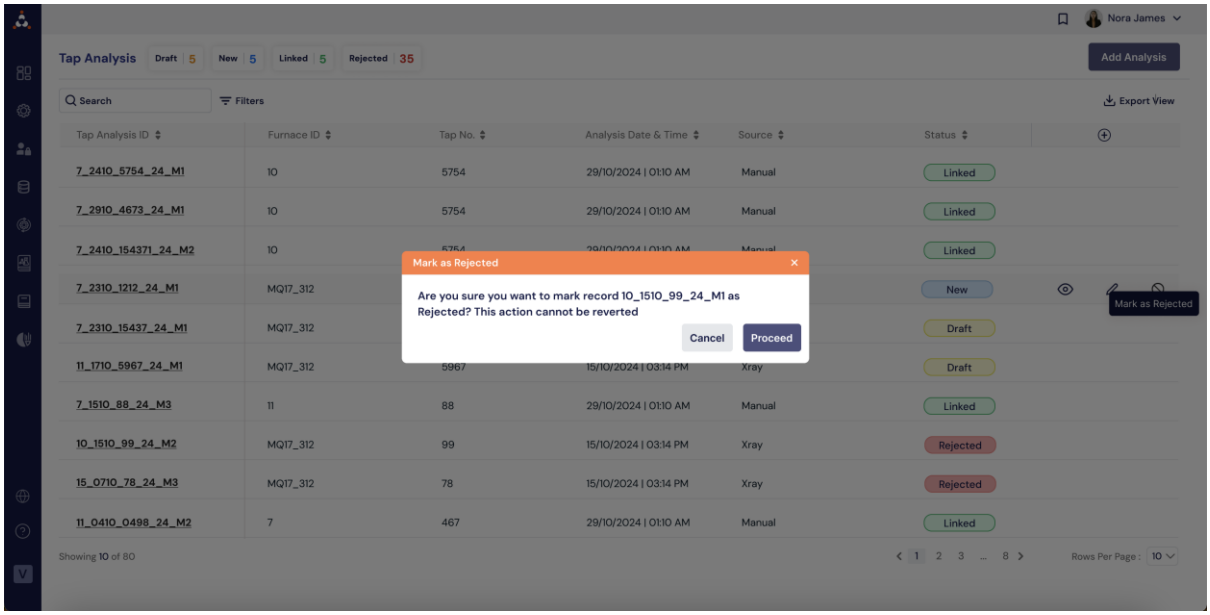
When selected, a confirmation popup will appear with the message:

**“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.**




*** 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.**