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PTR - Pressure Test Report

Pressure Test Management Application

Technical and Commercial Overview

Pressure Test Report organises pressure test recording and the preparation of test reports in a consistent process, from assembly identification to PDF documentation. The solution brings together data from test benches, procedure parameters and the information required to identify the tested product.

For production and quality departments, the main value is reducing manual report preparation and maintaining a clear link between the product, measurements, procedure and test result.

A Common Application for Multiple Test Bench Types

The solution aims to provide a consistent interface for various test bench types, such as Italcontrol, Resato and Haskel Robojobs, while retaining the characteristics of each data source. Import, measurement interpretation and checks are adapted to the bench type and applicable procedure.

The application can also be adapted to other test bench types.

Benefits for Day-to-Day Operations

- Less manual transcription through measurement import and automatic completion of some identification information.
- Control over test acceptance through checks, warnings and rules linked to the test procedure.
- Consistent documentation through the generation of charts and test reports in PDF format.
- Protection of completed records through editing locks, with unlocking restricted to the supervisor.
- Finding tests by operational criteria such as order, part number or valve type.

Users and Uses

Operators record and complete tests, quality staff consult measurements and documentation, and supervisors manage special access for unlocking records. The resulting reports support internal checks and documentation supplied to the customer.

Recording and Processing Tests

The application structures the test report around the assembly and the operations actually performed. A common template supports the same working approach on different benches without requiring operations that do not apply to the product.

Assembly Identification

When starting a test, the order, serial number, test procedure, valve type, rated pressure and other report information are entered. The basic workflow allows one or two serial numbers. Some fields, such as the operator or part number, are completed automatically depending on the available data and configured integration.

Test Template

The template defines the sequence of operations for the assembly components. The operator can remove items that are not tested, such as BODY2, so that the report reflects the test configuration.

Examples of tests include: BODY1, BODY2, SEAT P1, SEAT P2, SEAT P3, SEAT N1, SEAT N2, SEAT N3, SEAT P LOW, SEAT N LOW, TORQUE P and TORQUE N.

From Measurements to Results

Stage	Functionality	Operational Benefit
Import	Importing measurements according to the test bench workflow.	Reduces repeated data entry.
Processing	Charts and calculation of start, end, pressure difference and duration values.	Provides the information required for evaluation.
Verification	Validation and warnings specific to the test and procedure.	Flags situations requiring review.
Reporting	Determining the result and generating Pressure test charts in PDF.	Prepares test documentation in a consistent format.

A Workflow Adapted to the Operator's Activity

In the basic workflow, the test is initialised at the start of the operation. Once information is completed and data imported, validation is performed, the result determined and the report generated. For benches that supply the complete dataset at the end, application initialisation and import take place afterwards.

Test Bench Integration

The data import method respects the organisation of each bench. Identification by component serial number and the use of recipes link measurements to the information required for reporting.

Examples:

Bench Type	Import Method and Timing	Parameters and Checks
Italcontrol	Import from Microsoft SQL Server or an FTP server by component serial number when testing is complete.	Importing PASS tests without recalculating pressure and time validation in the application. Alternatively, calculation and validation in the application according to the test rules.
Resato	Dataset from a predefined location, identified by component serial number. Importing all tests when testing is complete.	Recipe identified by the operator. Importing tests marked PASS and revalidating pressures and times in the application.
Haskel Robojobs	Import after each tested component or operation.	Identifying the recipe through the specification file. Importing tests marked PASS and revalidating pressures and times in the application.

Parameters Retrieved from Recipes

For recipe-based workflows, information includes the test procedure number, procedure revision and PSL. The recipe must be available in the designated location. If the recipe and bench differ, the operator can correct the relevant values in the application.

Charts for Two-Line Configurations

The extensions provide for charts with two markers on the data series and the display of two serial numbers when two lines are tested. The presentation retains the characteristics of the data supplied by the equipment.

Integrating New Test Bench Types

This extension is at the technical proposal stage. The exact source, available fields and import mechanism are finalised after detailed analysis of access to bench data.

Validation and Parameter Calculation

A useful report must present measurements together with the rules used to evaluate them. The application includes checks and warnings for test acceptance, general conditions and exceptions relating to duration, and procedure-specific rules.

Pressure Drop Control

Max Drop Pressure checks the maximum pressure drop, expressed in psi, against the value defined for the test procedure. The limit is configured in a separate parameter field so it can be managed by procedure.

Test Revalidation

For certain bench types, the solution provides for importing tests marked PASS in the dataset and revalidating pressures and times in the application. Report evaluation therefore goes beyond the acceptance flag supplied by the bench.

Determining the Relevant Interval

An extension introduces a choice between mathematical determination of the pressure plateau and calculation based on Isolate and Bleed markers when these are available in the dataset.

Parameter	Rule Specified for Marker-Based Calculation
Start Time and End Time	Retrieved from the last Isolate marker in the data series.
Start Pressure	Average of the values within the second identified by Start Time.
End Pressure	Last value before the End Time second.
Marker Position	Pressures are determined from the retrieved times regardless of the marker's position in the series.

Adaptation to the Procedure and Data Source

Validation and calculation rules are defined for each integration. For a new bench, for example, the proposal may retain pressure and time validation at bench level; this characteristic must be retained when defining the final configuration.

Traceability and Test Documentation

Pressure Test Report links assembly identification information to the resulting measurements and documents. This organisation facilitates test consultation and preparation of documentation for checks and customer communication.

ERP Data

Where data access permits integration, the application can retrieve the part number and description from the production order, and the part number and customer from the delivery note. This reduces repeated entry of information already held in the management system.

Gauge Traceability

For Gauge Traceability, data is retrieved directly from the bench where technical access is possible. If retrieval is unavailable, information is entered and maintained in the application. The specific mechanism depends on the data supplied by the equipment.

PDF Reports and Charts

- Generating Pressure test charts documents for recorded tests.
- Graphical representation of pressures for the tested operations and items.
- Including information specific to the bench and report configuration, such as drift dimensions or test medium.
- Searching records by order, part number, valve type and other application criteria.

Report Versioning

The solution provides for test report versioning. In the drift dimension extension, new information appears on reports for the period following implementation of the change; older reports retain the structure applicable to them.

Change Control

Records can be closed and locked against editing, with unlocking restricted to the supervisor’s special access. The specified audit records creation and last save. During simultaneous use, locking a record being edited prevents concurrent changes.

Extensions for Specific Requirements

The application configuration can be supplemented with functionality adapted to test benches and reporting requirements. The following extensions cover information entered by the operator, data processing and the content of issued documents.

Centrally Managed Drift Dimensions

A single list of drift dimensions, maintained in the parameters and used across all benches, standardises the values selected by operators. Entry of a special dimension is provided for situations where the required dimension is not in the list.

Reports are adapted to reflect the selected or entered dimensions while retaining the versions applicable to older documents.

Test Medium Selection

The Test Medium Override attribute determines whether the bench requires explicit test medium selection. The described configuration enables this requirement for designated benches and disables it for the others.

- The list of test media is managed through the application parameters.
- Selection is visible only for benches with the attribute enabled.
- Before saving, the application checks that the test medium has been selected.
- The selected medium is recorded in Notes and printed on the report.

Extending the Recorded Information

A dedicated extension provides for increasing the attributes recorded during testing. Their specific configuration is defined within the implementation requirements.

Customer Value

These adaptations reduce variation in data entry, reflect test-specific characteristics in the report and concentrate list management in the application configuration. Functionality is selected according to the benches used, applicable procedures and information required in the final documentation.

Solution Architecture and Configuration

The architecture has three layers: user interface, application logic and database. This separation supports test data processing and information management in a multiuser application.

Component	Technology or Mechanism
User Interface	Windows application with a JavaFX interface.
Application Logic	Java SE for data processing and functional rules.
Persistence	Microsoft SQL Server.
Identity and Access	Domain authentication and authorisation; authorised access at form level.
Simultaneous Use	Multiuser access with locking of records being edited.
Connectivity	An active database connection is required for application operation.

Technical Implementation Requirements

Implementation requires database availability and access to test bench data sources. File-based integrations require export locations and corresponding recipes; SQL access requires definition of the data structure and read permissions. Retrieving SAP information depends on available integration options.

Defining the Customer Configuration

Configuration begins with an inventory of benches and identification of measurement sources and recipes, followed by definition of procedures, validation limits and report formats. Users, permissions and record closure rules are defined.

Representative datasets and comparison of calculated results against procedure requirements are recommended for configuration verification. For a new bench type, data interface analysis precedes final definition of the solution and implementation effort.

Technical and Commercial Discussion

A demonstration using representative data can clarify the operator workflow, report content and required adaptations. The agreed configuration then defines the included integrations and extensions, technical responsibilities and implementation stages.