



RJG's Customer Guided Validation Procedure

For CoPilot® Software Version 11.0.0
(Application Processor 4.0 (AP4.0)
Hardware), and The Hub® Version 11.0.0



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1. PURPOSE

The purpose of this document is to help RJG's customers validate the usage of CoPilot and The Hub as injection molding auxiliary hardware and software.

2. BACKGROUND

RJG Inc. wishes to aid the healthcare industries by providing a validation test plan used to help customers validate the CoPilot software version 11.0.0 (Application Processor 4.0 (AP4.0), and The Hub version 11.0.0. RJG has performed its own validation test plan that is much more comprehensive than this customer test plan will encapsulate. RJG insist that its customers should perform their own risk-based testing approach (GAMP®5) to ensure that the products perform as intended.

3. SCOPE

For scope and recommendations please see the Validation Summary Report. If a test listed below does not apply to your usage case, then feel free to document as N/A in the Pass/Fail field.

4. PRE-CONDITIONS

To execute the following tests the user may need to reference Pre-Conditions that will be located at the end of this document.

5. INSTALLATION QUALIFICATION (IQ)

Installation Qualification consists of multiple checklists to ensure that the products have been installed as intended. Once checklists are completed and expectations met, the IQ portion of this abbreviated validation can be signed off and you can move onto OQ Testing. If an item listed in the installation checklists below does not apply to your usage case, then feel free to document as N/A in the Completed By field and the Date field.



CoPilot® System Hardware Installation Checklist (Continued)

Use the following checklist to complete the CoPilot System application processor AP4.0 and Lynx™ hardware installation. Refer to the “CoPilot System Hardware Installation and Setup Guide” for complete, detailed instructions, warnings, and notes for installation and setup of the AP4.0 and Lynx hardware—available for download online at www.rjginc.com.

Machine Name _____ CoPilot System Serial Number _____
 Machine Serial Number _____

COPILOT SYSTEM APPLICATION PROCESSOR AP4.0 MOUNTING, POWER, AND NETWORKING

Refer to pages 20 & 21 in the “CoPilot System Hardware Installation and Setup Guide.”

Mounting

COMPLETED BY	DATE	ACTIVITY
_____	_____	Mount the AP4.0 to a solid surface with the Lynx sensor interface ports facing down to prevent fluids from entering a port or connection, with faceplate visible for easy location of Lynx port connectors located on the bottom of the AP4.0, using supplied mounting holes. Secure bolts tightly.

Power

COMPLETED BY	DATE	ACTIVITY		
_____	_____	Provide power to the AP4.0 24 V DC power supply from a 100–240 V AC (50–60 Hz) source separate from machine. Insert the power supply’s cable (PS-AP50W-12V) connector into the AP4.0 power port. RJG recommends that an uninterruptible power supply (UPS) is placed between the input power and AP4.0 power connection.		
_____	_____	Measure the ground potential between the machine chassis and earth ground with a voltmeter, and record the following: Record the AC Voltage Difference:(must be < 1 V AC)		
		Pass or Fail:(circle one)	PASS	FAIL
_____	_____	Record the DC Voltage Difference:(must be < 1 V DC)		
		Pass or Fail:(circle one)	PASS	FAIL

Networking

COMPLETED BY	DATE	ACTIVITY
_____	_____	The AP4.0 ethernet port 2 is provided for networking the CoPilot System with The Hub® Software; if The Hub software is used, insert a shielded Cat5e or Cat6 ethernet cable into port 2 for networking.
_____	_____	Attach the touchscreen cable to the DP++ connection on the AP4.0.
_____	_____	OPTIONAL: A standard USB keyboard can be attached to the AP4.0; the keyboard must not have programmable functions. Ensure connector is firmly installed in the receptacle.
_____	_____	OPTIONAL: A standard USB mouse can be attached to the AP4.0; ensure connector is firmly installed in the receptacle.

COPILOT SYSTEM TOUCHSCREEN, POWER, AND CONNECTIONS

COMPLETED BY	DATE	ACTIVITY
_____	_____	Mount touchscreen within 6.0' (1.8 m) of AP4.0 and machine controller, visible from cell entrances, main aisles, or floor overhead for visual screen alerts using the built-in mounting brackets on back of monitor. Secure bolts tightly. Ensure touchscreen to AP4.0 connections are secure and without strain if the moveable swing arm is utilized.
_____	_____	Power touchscreen from 100–240 V AC (50–60 Hz) source separate from machine. RJG recommends that an uninterruptible power supply (UPS) is placed between the input power and touchscreen power connection.
_____	_____	Attach the touchscreen cable to the DP++ connection on the touchscreen.
_____	_____	Attach the USB connection to the USB touchscreen and the AP4.0.

DIN RAIL, J-LX1 JUNCTION, AND MACHINE MODULES

The CoPilot System requires four machine sequence signals; Two of the following three: first stage, second stage, and injection forward, and screw run and mold clamped. Refer to pages 22–27 in the “CoPilot System Hardware Installation and Setup Guide.” **Machine module installation must be performed by a qualified maintenance professional.**

DIN Rail and J-LX1 Installation

Refer to page 27 in the “CoPilot System Hardware Installation and Setup Guide” for J-LX1 installation.

COMPLETED BY	DATE	ACTIVITY
_____	_____	Install the J-LX-1 feed through into the machine panel, allowing the CE-LX5 Lynx cable to exit the machine panel.
_____	_____	Securely mount a sufficient length of 0.89” (35 mm) DIN Rail for all the DIN Rail Mount sensors.
_____	_____	Mount modules on DIN rail and slide together so integrated amphenol connectors are securely inserted.
_____	_____	Attach a Lynx cable between the J-LX-1 and the ID7-M-SEQ inside the machine panel. Ensure the cable connection is fully inserted and secure.

Machine Sequence Input Module ID7-M-SEQ

ID7-M-SEQ Serial Number _____

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that first stage is wired to channel 1 of the ID7-M-SEQ, OR verify that injection forward is wired to channel 1 of the ID7-M-SEQ. Signal Interfaced: (circle one) Injection Forward First Stage
_____	_____	Verify with a voltmeter that channel 1 is receiving 18–36 V DC for the duration of first stage or injection forward.
_____	_____	Verify that second stage is wired to channel 2 of the ID7-M-SEQ, OR verify that first stage is wired to channel 2 of the ID7-M-SEQ. Signal Interfaced: (circle one) First Stage Second Stage
_____	_____	Verify with a voltmeter that channel 2 is receiving 18–36 V DC for the duration of second stage or first stage.
_____	_____	Verify that screw run is wired to channel 3 of the ID7-M-SEQ.
_____	_____	Verify with a voltmeter that channel 3 is receiving 18–36 V DC for the duration of mold clamped.
_____	_____	Verify that mold clamped is wired to channel 4 of the ID7-M-SEQ.
_____	_____	OPTIONAL Verify that mold opening is wired to channel 5 of the ID7-M-SEQ.
_____	_____	OPTIONAL Verify that mold closing opening is wired to any open channel of the ID7-M-SEQ. Specify Channel: _____
_____	_____	OPTIONAL Verify that machine in manual mode is wired to channel 6 of the ID7-M-SEQ.
_____	_____	Verify that the CoPilot System “Cycle Graph” draws a new cycle each time the machine cycles.
_____	_____	Verify that there are no errors being produced by the CoPilot System while cycling.

ANALOG INPUT MODULE IA1-M-V

Analog Input Module for Injection Pressure

IA1-M-V Serial
Number _____

COMPLETED BY	DATE	ACTIVITY
_____	_____	Attach the 0 V (white) wire of the C-IA1-M-3M cable to the common terminal of the injection molding machine 0–10V I/O card.
_____	_____	Attach the 0–10V (blue) wire of the C-IA1-M-3M cable to the plus voltage terminal of the injection molding machine 0-10V I/O card.
_____	_____	Attach the C-IA1-M-3M cable to the IA1-M-VI module. Verify that the cable connection is fully inserted and secure.

Analog Input Module for Stroke Data

IA1-M-V Serial
Number _____

COMPLETED BY	DATE	ACTIVITY
_____	_____	Attach the 0 V (white) wire of the C-IA1-M-3M cable to the common terminal of the injection molding machine 0–10V I/O card.
_____	_____	Attach the 0–10V (blue) wire of the C-IA1-M-3M cable to the plus voltage terminal of the injection molding machine 0-10V I/O card.
_____	_____	Attach the C-IA1-M-3M cable to the IA1-M-VI module. Verify that the cable connection is fully inserted and secure.

DUAL-RELAY OUTPUT MODULE OR2-M

Dual-Relay Output Module for Part Sorting

OR2-M Serial Number _____

COMPLETED BY	DATE	ACTIVITY
_____	_____	Determine the input voltage required for the specific part removal device. Part Removal Device: _____ Required Input Voltage: _____
_____	_____	Attach a 24 V DC source from the machine I/O or part removal device to the C-OR2-M-3M common (black) wire. Attach the C-OR2-M-3M normally open (brown) wire to the machine I/O card for part sorting or the part removal device.
_____	_____	Attach the C-OR2-M-3M cable to the OR2-M module. Verify that the cable connection is fully inserted and secure.

Dual-Relay Output Module for Excessive Rejects

OR2-M Serial Number _____

COMPLETED BY	DATE	ACTIVITY
_____	_____	Determine the input voltage required for the I/O, light tree, or part removal device to be activated when the specified number of rejects are counted. Device: _____ Required Input Voltage: _____
_____	_____	If the device requires 24 V DC: Attach a 24 V DC source from the machine I/O or part removal device to the C-OR2-M-3M common (black) wire. Attach the C-OR2-M-3M normally open (brown) wire to the machine I/O card for part sorting or the part removal device.
_____	_____	Attach the C-OR2-M-3M cable to the OR2-M module. Verify that the cable connection is fully inserted and secure.

NOTE: Some devices do not require 24 V DC source. Some require a dry contact between terminals on the Machine or device I/O card excessive rejects.

Dual-Relay Output Module for V→P Transfer

OR2-M Serial Number _____

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that the machine I/O requires a 24 V DC signal to cause transfer. If the machine requires 0-10 V DC to cause transfer, see the Analog Output Module for V→P Transfer section.
_____	_____	Attach a 24 V DC source from the machine I/O to the C-OR2-M-3M common (black) wire
_____	_____	Attach the C-OR2-M-3M normally open (brown) wire to the machine I/O card for external transfer.
_____	_____	Attach the C-OR2-M-3M cable to the OR2-M module. Verify that the cable connection is fully inserted and secure.

NOTE: Some machines do not require 24 V DC source. Some require a dry contact between terminals on the Machine I/O card for external transfer

ANALOG OUTPUT MODULE OA1-M-V

Analog Output Module for V→P Transfer

OA1-M-V Serial Number _____

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that the machine I/O requires a 0–10 V DC signal to cause transfer. If the machine requires 24 V DC to cause transfer, see the Dual-Relay Output Module for V→P Transfer section.
_____	_____	Attach a 0 V DC from the machine I/O to the C-OR2-M-3M common (black) wire
_____	_____	Attach the 0–10 V DC from the machine I/O to the C-OR2-M-3M positive (brown) wire.
_____	_____	Attach the C-OR2-M-3M cable to the OR2-M module. Verify that the cable connection is fully inserted and secure.

NOTE: Some machines do not require 0–10 V DC source. Some require a dry contact between terminals on the Machine I/O card for external transfer

MACHINE INTERFACE SENSORS

Lynx 3,000 or 5,000-psi Hydraulic Sensor LS-H-1/4NPT-3/5K

Refer to page 31 in the "CoPilot System Hardware Installation and Setup Guide."

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that machine power is off and that the hydraulic system is depressurized before proceeding.
_____	_____	Attach male quick disconnect to the machine's hydraulic system in a position that the sensor can read injection pressure from the cylinder. DO NOT attach the male quick disconnect to the machine system pressure.
_____	_____	Attach the Lynx Hydraulic Sensor to the male quick-disconnect.
_____	_____	Attach a lynx cable between the Lynx Hydraulic sensor and the AP4.0 and or Lynx junction box.
_____	_____	Verify that the cable connection is fully inserted and secure.
_____	_____	Verify that there is enough strain relief to account for the movements of the injection unit.

Lynx 50-Inch Stroke/Velocity Encoder LE-R-50-REVB

Refer to pages 29 & 30 in the "CoPilot System Hardware Installation and Setup Guide."

COMPLETED BY	DATE	ACTIVITY
_____	_____	Mount the stroke encoder on the injection sled near the back of the injection unit so that it detects movement of the screw and not the movement of the sled.
_____	_____	Ensure that the stroke encoder will not be impacted by movements of the injection sled or injection unit.
_____	_____	Ensure that placement does not allow the stroke encoders cable to extend more than 50" (127 cm).
_____	_____	Verify that the cable enters the cable bushing straight to prevent wear on the cable.
_____	_____	Attach a Lynx cable between the stroke encoder and the AP4.0 and or Lynx junction box. Verify that the cable connection is fully inserted and secure.
_____	_____	Verify that there is enough strain relief to account for the movements of the injection unit.

JUNCTION BOXES AND LYNX CABLES

J-LX2-CE, J-LX5-CE, & J-LX9-CE

Refer to pages 27, 28, & 32 in the “CoPilot System Hardware Installation and Setup Guide.”

COMPLETED BY	DATE	ACTIVITY
_____	_____	The AP4.0 has two Lynx Ports installed. Install J-LX-5 or J-LX-9 junction boxes as needed.
_____	_____	Connect individual Lynx cable(s) to the junction box(es).
_____	_____	Connect the junction box(es) to the AP4.0.
_____	_____	Machine sensors typically are attached to one or more junction boxes separate from the machine sensors.

Temperature Control Unit Interface (TCU)

COMPLETED BY	DATE	ACTIVITY
_____	_____	Attach the C-TCU-USB cable to the TCU serial connection.
_____	_____	Attach the C-TCU-USB to the CoPilot System USB connection.

NOTE: Not all TCUs support the serial interface. Some TCUs will need an SPI Interface Kit order from the manufacturer.

DOCUMENT THE CONFIGURATION

COMPLETED BY	DATE	ACTIVITY
_____	_____	Document the sensor serial numbers, assignments, and configurations.

Tested By:	Date:	Pass/Fail:



CoPilot® System and The Hub® Software Networking Checklist

Use the following checklist to complete the installation of hardware and cabling of the RJG, Inc. The Hub® Software network. **This checklist must be completed by a qualified IT professional.**

PREREQUISITES

The CoPilot System hardware has been installed per the "CoPilot System Hardware Installation Checklist."

Machine Name _____ CoPilot System Serial Number _____

NOTE: *The IP address of each Copilot System must be unique.*

THE HUB SOFTWARE SERVER INSTALLATION

Completed By _____ Date _____

ETHERNET CABLE INSTALLATION

COMPLETED BY	DATE	ACTIVITY
_____	_____	Ensure that the Ethernet cable and connectors are shielded throughout.
_____	_____	Install cable(s) between the CoPilot System(s) and the network switch(es).
_____	_____	Verify that a single continuous Ethernet Cable connects each CoPilot System to the network switch.
_____	_____	Ensure that the longest cable between the CoPilot System(s) and The Hub Software is less than 300 ft. (91 m).
_____	_____	Verify that Ethernet cables are clear of any sources of EMI including but not limited to high voltage, solenoids, electric/servo motors, and/or static-generating devices.
_____	_____	Verify the integrity of each Ethernet cable with an Ethernet cable tester.



CoPilot® System and The Hub® Software Networking Checklist (Continued)

COPILOT SYSTEM(S) TESTING ON THE NETWORK

COMPLETED BY	DATE	ACTIVITY
_____	_____	Document the Hub Network Address _____.
_____	_____	On each CoPilot System "Network Settings Card", select the network configuration DHCP .
_____	_____	On each CoPilot System "Network Settings Card", enter the The Hub Software network address.
_____	_____	Start a job on each CoPilot System. Verify that the CoPilot System is displayed on The Hub Software's "Machines" page.

Tested By:	Date:	Pass/Fail:

Analog Input Module IA1-M-V for Injection Pressure

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that the Analog Input Module IA1-M-V is assigned to "Plastic Pressure: Injection" on the CoPilot System "Machine Inputs" card.
_____	_____	Enter and record the Maximum Pressure: _____
_____	_____	Enter and record the Voltage at Maximum Pressure: _____
_____	_____	Enter and record the Voltage at Minimum Pressure: _____
_____	_____	Verify that the CoPilot System injection pressure matches the machine injection pressure.
_____	_____	Machine Peak Injection Pressure: _____
_____	_____	CoPilot System Peak Injection Pressure: _____
_____	_____	Percent Difference: _____
_____	_____	Pass or Fail: (circle one) PASS FAIL
_____	_____	Measurement Type: (circle one) Hydraulic Pressure Plastic Pressure

Analog Input Module IA1-M-V for Stroke Data

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that the Analog Input is assigned as "Screw: Stroke Position" and "Screw: Velocity" on the CoPilot System "Machine Inputs" card.
_____	_____	Enter and record the Maximum Position: _____
_____	_____	Enter and record the Voltage at Maximum Position: _____
_____	_____	Enter and record the Voltage at Minimum Position: _____
_____	_____	Verify that the CoPilot System stroke data matches the machine's stroke data.
_____	_____	Maximum Machine Shot Size: _____
_____	_____	CoPilot System Shot Size: _____
_____	_____	Machine Cushion: _____
_____	_____	CoPilot System Cushion: _____
_____	_____	Percent Difference: _____
_____	_____	Pass or Fail: (circle one) PASS FAIL

Dual-Relay Output Module OR2-M for Part Sorting Checkout

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that an OR2-M module is assigned as "Sorting: Good Control" on the Copilot System "Machine Outputs" card.
_____	_____	Verify that the green indicator light on the OR2-M module is illuminated when output test is selected on the CoPilot System "Machine Outputs" card.
_____	_____	Verify the desired sorting output rules on the CoPilot System "Sorting Options" card to ensure the parts are sorted properly.
_____	_____	Verify that the parts are sorted when output test is selected.
_____	_____	When the green light on the OR2-M is illuminated, parts go to the "good" location, when the green light is not illuminated (output test is deselected), parts go to the "reject" location.
_____	_____	Set alarm limits; ensure that the data is within the alarm limits.
_____	_____	Verify that parts go to the "good" location.
_____	_____	Change alarm limits; ensure that the data is outside of the upper and lower alarm limits. Verify the parts go the "reject" location.

Dual-Relay Output Module OR2-M for Excessive Rejects Checkout

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that an OR2-M module is assigned as "Sorting: Excessive Rejects" on the Copilot System "Machine Outputs" card.
_____	_____	Verify that the green indicator light on the OR2-M module is illuminated when output test is selected on the CoPilot System "Machine Outputs" card.
_____	_____	Setup the desired excessive reject settings on the CoPilot System "Control Options" card.
_____	_____	Verify that the excessive rejects output is "on" when the conditions are met. Intentionally force alarms until the excessive rejects conditions are met.
_____	_____	Verify that the excessive rejects output can be reset.

Dual-Relay Output Module OR2-M for V→P Transfer

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that an OR2-M module is assigned as "Control: V→P Transfer" on the Copilot System "Machine Outputs" card.
_____	_____	Verify that the green indicator light on the OR2-M module is illuminated when output test is selected on the CoPilot System "Machine Outputs" card.
_____	_____	Verify that the machine transfers from first stage to second stage when output test is selected.
_____	_____	Verify that the machine transfers from first stage to second stage when a V→P transfer rule is set and enabled for a cavity pressure setpoint.
_____	_____	OPTIONAL: Verify that the machine transfers from first stage to second stage when any of the V→P transfer rules are set.

Analog Output Module OA1-M-V for V→P Transfer

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that the IA1-M-V module is assigned as "Control: V→P Transfer" on the CoPilot System "Machine Outputs" card.
_____	_____	Verify that the IA1-M-V module reads 10 V DC when the test output is selected on the CoPilot System "Machine Outputs" card.
_____	_____	Verify that the machine transfers from first stage to second stage when output test is selected.
_____	_____	Verify that the machine transfers from first stage to second stage when a V→P transfer rule is set and enabled for a cavity pressure setpoint.
_____	_____	OPTIONAL: Verify that the machine transfers from first stage to second stage when any of the V→P transfer rules are set.

MACHINE SENSOR CHECKOUT

Lynx 3,000 or 5,000-psi Hydraulic Sensor LS-H-1/4NPT-3/5K

(If using RJG Lynx™ 3,000/5,000 psi Hydraulic Pressure Sensor LS-H-1/4NPT-3/5K, otherwise see Analog Input Module IA1-M-V for Injection Pressure)

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify the correct intensification ratio (RI) is set on the CoPilot System "Machine Setup" card. RI for this machine is: _____
_____	_____	Verify that the injection pressure is properly zeroed on the CoPilot System "Machine Setup" card. <i>The machine should be idle with the controller and pumps on.</i> Ensure that the CoPilot System injection pressure matches the machine injection pressure. Machine Peak Injection Pressure: _____ CoPilot System Peak Injection Pressure: _____ Percent Difference: (circle one) PASS FAIL Measurement Type: (circle one) Hydraulic Pressure Plastic Pressure

Lynx™ 50-Inch Stroke/Velocity Sensor LE-R-50-REVB

(If using RJG Lynx™ 50-Inch Stroke/Velocity Sensor LE-R-50-REVB, otherwise skip to Analog Input Module IA1-M-V for Stroke Data)

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify the correct screw diameter is entered on the CoPilot System "Machine Setup" card. Screw diameter for this machine is: _____
_____	_____	Verify that the stroke data is properly zeroed. An accurate screw run input is required for the Lynx™ Machine Sequence Module ID7-M-SEQ and CoPilot System. <ol style="list-style-type: none"> Set the machine's decompress setting to 0. Place the cycle graph cursor at the end of the screw run sequence data. Verify that the stroke data reads zero at that position.

SENSOR CHECK

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify all connections to machine sensors and modules are fully inserted, tightened and connected to the AP4.0.
_____	_____	Verify all sensors and modules are displayed on the CoPilot System "Machine Inputs" card.

DOCUMENT THE CONFIGURATION

COMPLETED BY	DATE	ACTIVITY
_____	_____	Document the sensor serial numbers, assignments and configurations.

Tested By:	Date:	Pass/Fail:

Use the following checklist to verify the installation and function of mold-mounted sensors for use with the CoPilot® System.

PREREQUISITES

The CoPilot System has been installed per the "CoPilot System Hardware Installation Checklist".

Mold Name _____

Mold Serial Number _____

PHYSICAL SENSOR CHECK

All Sensors

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that the maximum number of sensors connected to one AP4.0 Lynx™ port does not exceed 30; this includes both mold <i>and</i> machine sensors.
_____	_____	Verify all connections to mold sensors and modules are fully inserted, tightened, and connected to the AP4.0.

MOLD SENSOR AND MODULE IN-SOFTWARE CHECK

Ejector or Transfer Pin Cavity Pressure Sensors

COMPLETED BY	DATE	ACTIVITY
_____	_____	All sensors are displayed on the CoPilot System "Mold Inputs" card.
_____	_____	Verify that each sensor serial number is assigned to a location with a unique ID (if the same location is used multiple times) on the CoPilot System "Mold Inputs" card.
_____	_____	Verify that a sensor model is assigned to each sensor serial number.
_____	_____	Verify that the ejector pin size for each sensor is assigned on the CoPilot System "Ejector Pin Details" card.
_____	_____	Verify that all sensor assignments are visible on the CoPilot System "Cycle Graph".
_____	_____	Verify that there are no sensor errors (over-range or under-range errors) present on the CoPilot System "Dashboard".

Flush-Mount Cavity Pressure Sensors

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that each sensor serial number is assigned to a location with a unique ID (if the same location is used multiple times) on the CoPilot System "Mold Inputs" card.
_____	_____	Verify that a sensor model is assigned to each sensor serial number.
_____	_____	Verify that all sensor assignments are visible on the CoPilot System "Cycle Graph".
_____	_____	Verify that there are no sensor errors (over-range or under-range errors) present on the CoPilot System "Dashboard".

Mold Temperature Sensors

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that each sensor serial number is assigned to a location with a unique ID (if the same location is used multiple times) on the CoPilot System "Mold Inputs" card.
_____	_____	Verify that a sensor model is assigned to each sensor serial number.
_____	_____	Verify that all sensor assignments are visible on the CoPilot System "Cycle Graph".
_____	_____	Verify that there are no sensor errors (over-range or under-range errors) present on the CoPilot System "Dashboard".

TEMPERATURE CONTROL DATA

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that the Temperature Control Unit (TCU) is connected to the CoPilot System AP4.0 with the RJG, Inc. C-TCU-USB adapter cable.
_____	_____	Verify that TCU channels are displayed on the CoPilot System "Mold Inputs" card.
_____	_____	Verify that all TCU sensor assignments are visible on the CoPilot System "Cycle Graph".

COPILOT SYSTEM SOFTWARE CONFIGURATION

COMPLETED BY	DATE	ACTIVITY
		<ol style="list-style-type: none"> 1. Verify that the Fill Time is being recorded using the "Set Fill Volume at Cursor" tool. 2. Display the "Machine Sequence Fill Trace" on the "Cycle Graph." 3. Verify that the start of the "Fill Trace" aligns with the stroke crossing the zero line. 4. Verify that the end of the "Fill Trace" aligns with the selected fill volume.
		<p>Ensure that the CoPilot Injection Pressure matches the Mold Injection Pressure.</p> <p>Measurement Type (circle one): Hydraulic Pressure Plastic Pressure</p> <p>Mold Peak Injection Pressure: _____</p> <p>CoPilot System Peak Injection Pressure: _____</p> <p>Percent Difference: _____</p> <p>Pass or Fail (circle one): PASS FAIL</p>

COPILOT SYSTEM ALARM CONFIGURATION

COMPLETED BY	DATE	ACTIVITY
		<p>Verify that upper and lower limits are set in accordance with the part quality specifications.</p> <p>Print the initial "Job Audit Report" for your records from The Hub software.</p>

COPILOT SYSTEM PROCESS TEMPLATES

COMPLETED BY	DATE	ACTIVITY
		<p>Verify that template for the ideal process setup is saved on the CoPilot System "Cycle Graph". Record the template name for your records.</p> <p>Template Name: _____</p> <p>Date Stamp: _____</p>

V→P TRANSFER CONFIGURATION

COMPLETED BY	DATE	ACTIVITY
_____	_____	Verify that control setpoints for V→P transfer are entered and enabled.
_____	_____	Verify that safety backups are set on the machine controller.
_____	_____	Record the V→P transfer settings for your records.

DOCUMENT SENSOR CONFIGURATION(S)

COMPLETED BY	DATE	ACTIVITY
_____	_____	Record the "Mold Setup Summary" page for your records.

Tested By:	Date:	Pass/Fail:

IQ Comments:

Conclusion IQ

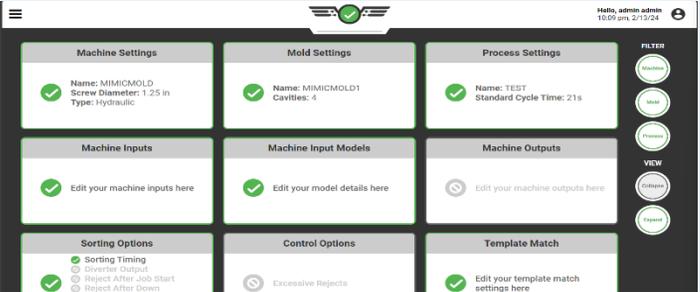
Acceptance Criteria	All the testing documented in this section (Installation Qualification) met the acceptance criteria.		
Overall Test Status	Satisfactory <input type="checkbox"/>	Satisfactory with Deviation <input type="checkbox"/>	Unsatisfactory <input type="checkbox"/>
Test Approved by Quality	Name	Signature	Date

6. OPERATIONAL QUALIFICATION (OQ)

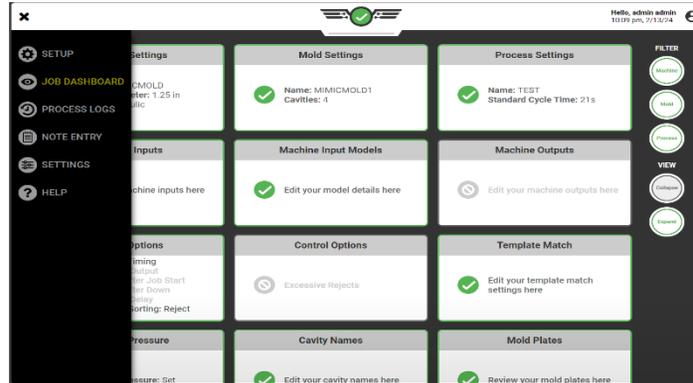
Operational Qualification verifies that the software and hardware worked as intended. Please note that this plan will not capture all the products User Requirement Specifications. Customers are encouraged to perform these tests below in addition to any other features not covered by this test plan, to ensure the products adequacy for RJG's customers usage case. Once the above are completed and expectations met, the OQ portion of this abbreviated validation can be signed off and you can move onto PQ testing.

OQ Test 1: FC-24354 (While running job: force an alarm for a minimum of 30 cycles, make a note, compare a cycle and later view process logs.)

Preconditions: FC-9556, FC-10207, FC-9982, FC-9983, FC-9984, FC-9990, FC11198

	Step	Data	Expected Result
1	Login to the CoPilot as a User with a Processing Engineer role.	N/A	<p>User is logged in to the CoPilot and at the setup screen.</p> 

2 Click the Menu and Job Dashboard.



User is taken to the Job Dashboard.



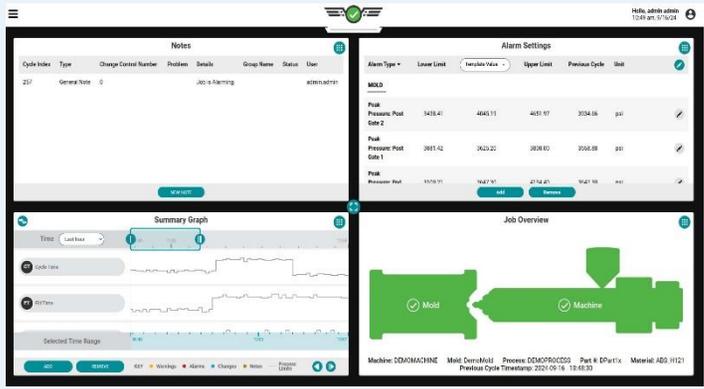
3 Verify the following widgets are displayed:

Summary Graph
Alarm Settings
Notes
Job Overview

If not, replace the current widgets by clicking the 9-dot display view button on the top right of the widget and selecting them.

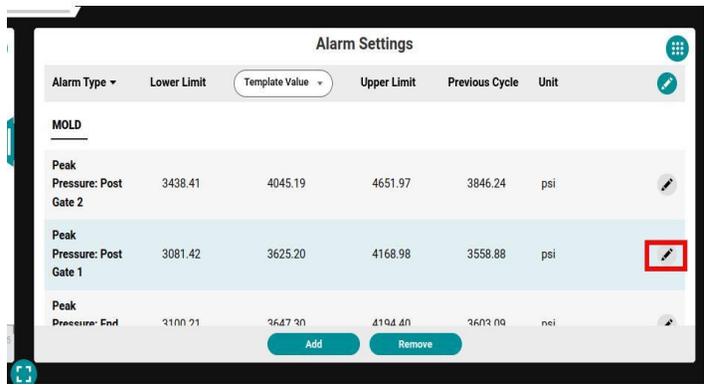
N/A

Summary Graph, Alarm Settings, Notes and Job Overview widgets are present on the Job Dashboard.



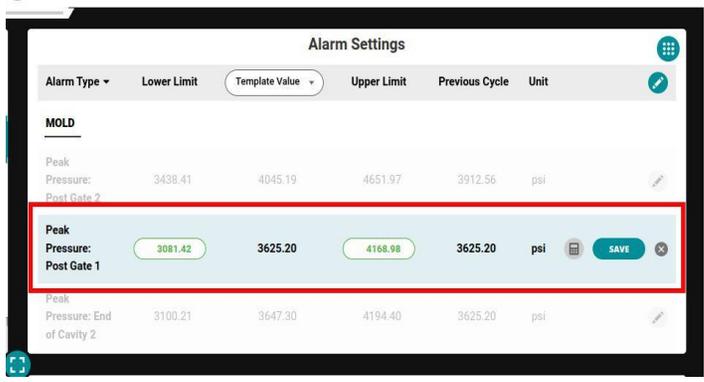
4 From the Alarm Settings Widget:

Select the Pencil icon next to the Cavity Alarm that was created as part of the Precondition requirements.



Alarm Type	Lower Limit	Template Value	Upper Limit	Previous Cycle	Unit	
MOLD						
Peak Pressure: Post Gate 2	3438.41	4045.19	4651.97	3846.24	psi	
Peak Pressure: Post Gate 1	3081.42	3625.20	4168.98	3558.88	psi	
Peak Pressure: End of Cavity 2	3100.21	3647.30	4194.40	3625.20	psi	

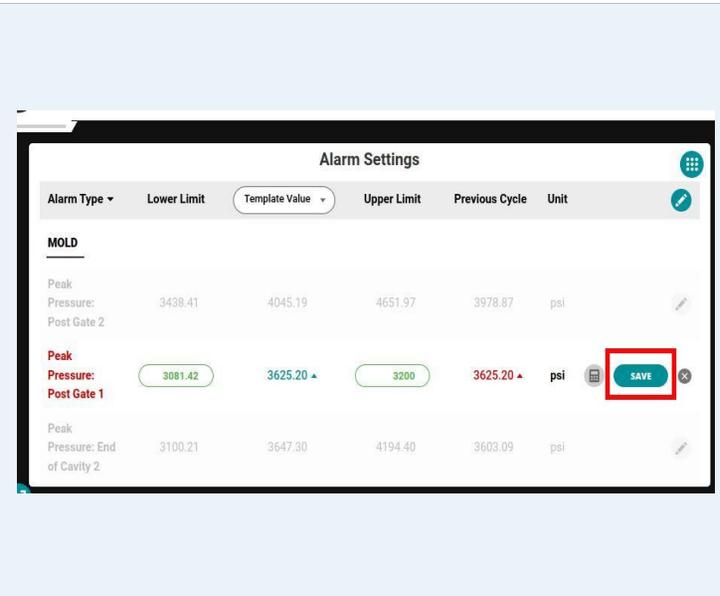
Alarm can be modified.



Alarm Type	Lower Limit	Template Value	Upper Limit	Previous Cycle	Unit	
MOLD						
Peak Pressure: Post Gate 2	3438.41	4045.19	4651.97	3912.56	psi	
Peak Pressure: Post Gate 1	3081.42	3625.20	4168.98	3625.20	psi	SAVE
Peak Pressure: End of Cavity 2	3100.21	3647.30	4194.40	3625.20	psi	

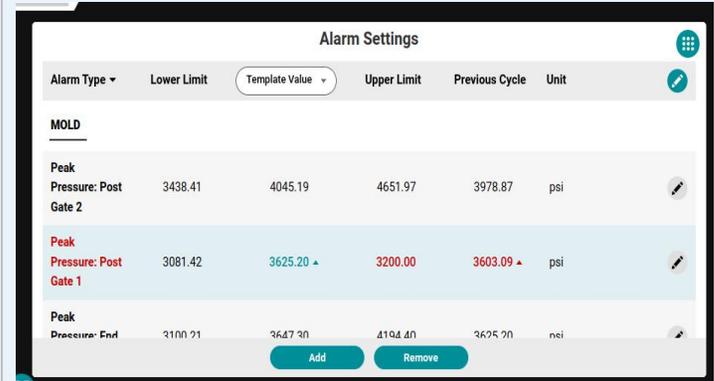
5 From the Alarm Settings Widget:
Select the Upper Limit field and modify the value so it is significantly less than the Previous Cycle Value.

Select Save.



The Upper Limit change is saved.

Mold alarm name and Previous Cycle value will turn red, indicating the current cycle is outside of the alarm limit.

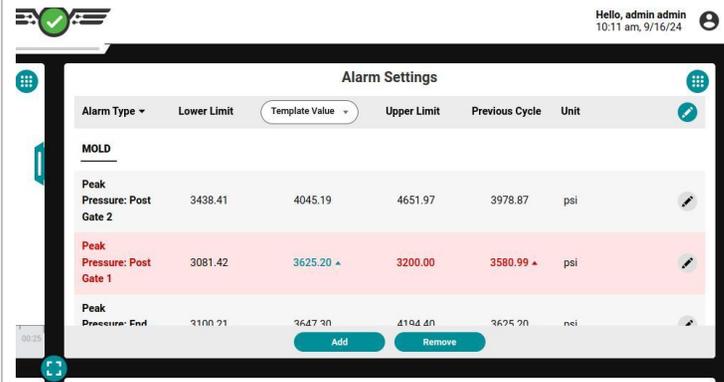


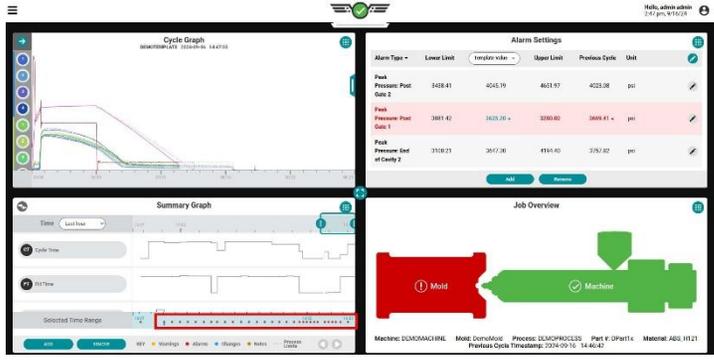
6 From the Alarm Settings Widget:

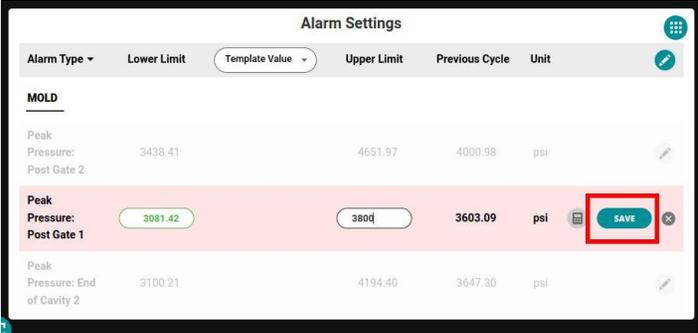
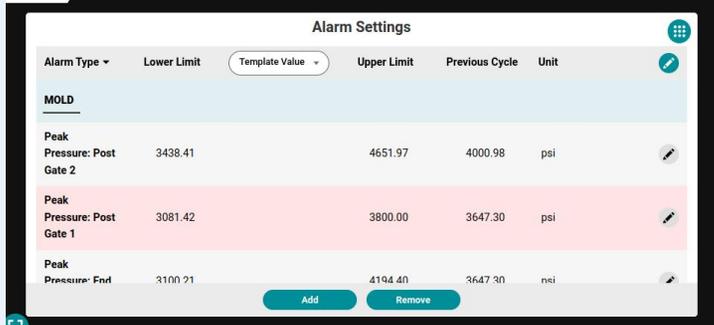
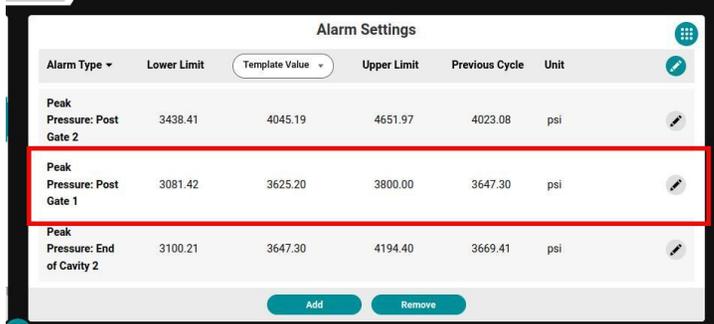
Wait for the next cycle to complete.

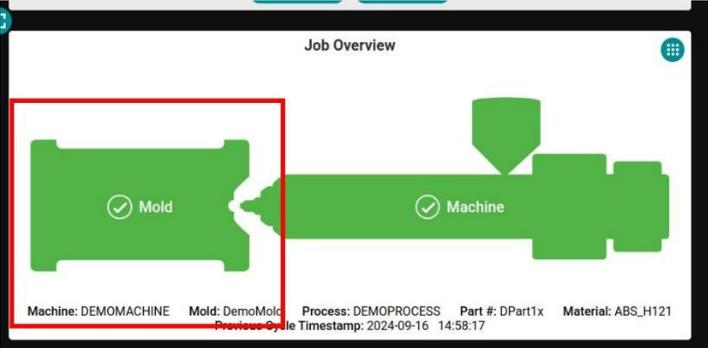
N/A

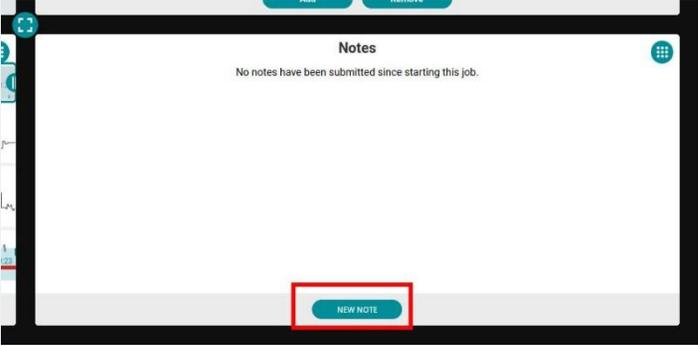
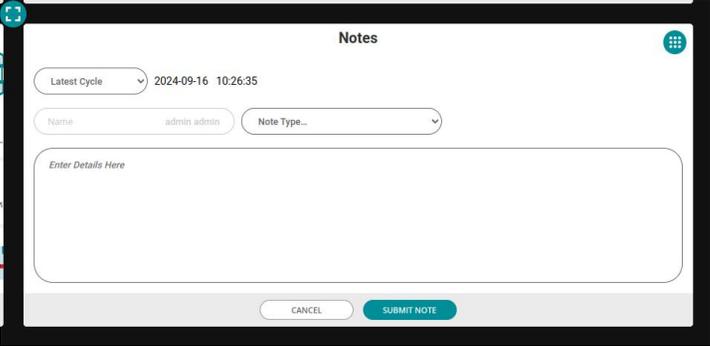
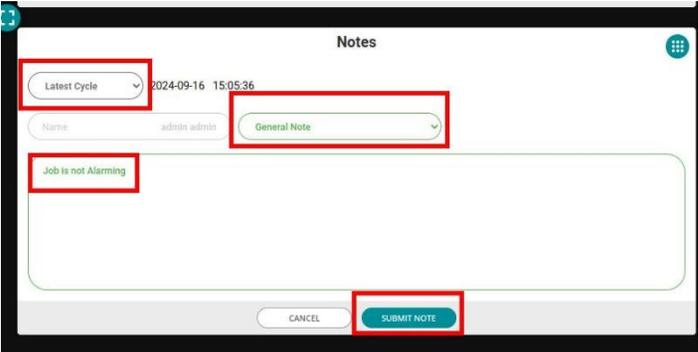
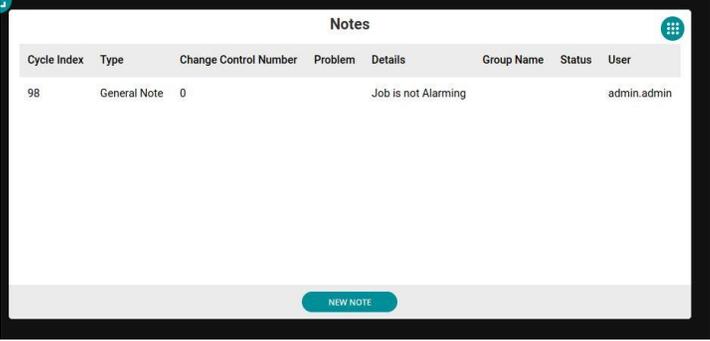
Mold variable will turn completely red.

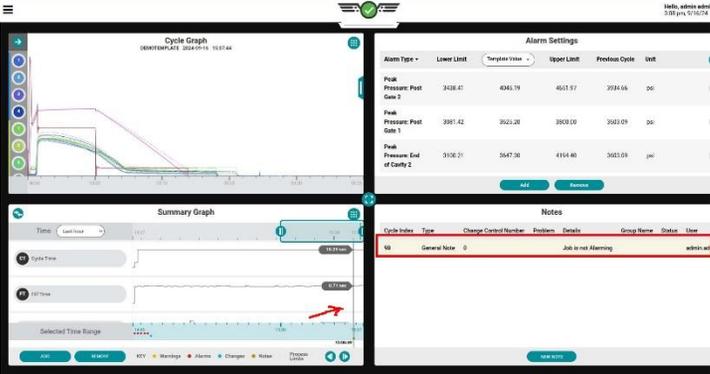
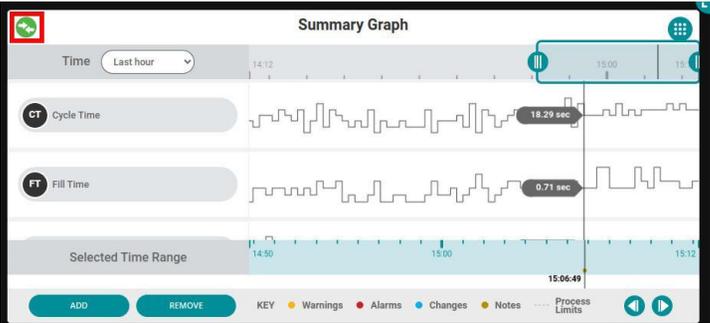


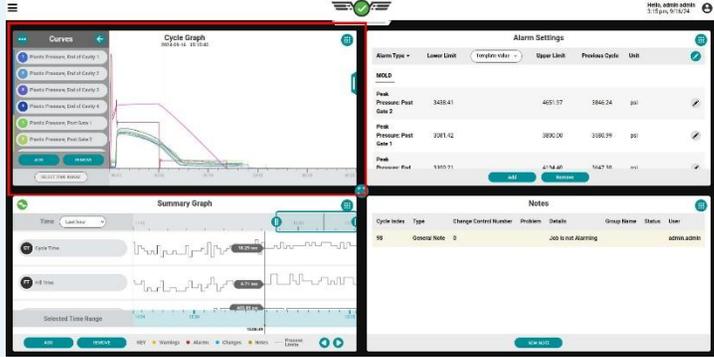
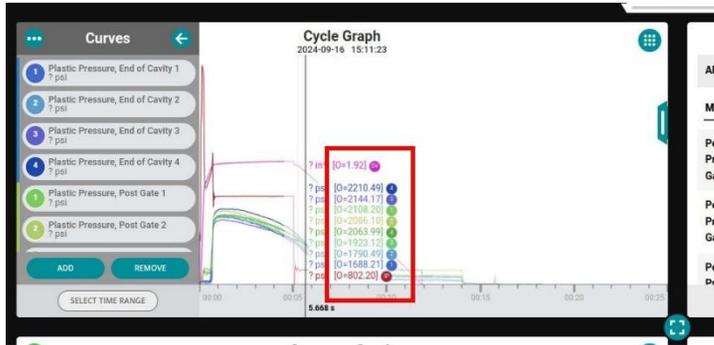
<p>7</p>	<p>From the Job Overview Widget: View the Job Overview Widget.</p>	<p>N/A</p>	<p>The Mold symbol will be colored red.</p>  <p>The screenshot shows the 'Job Overview' widget with a red 'Mold' icon and a green 'Machine' icon. The 'Alarm Settings' table is also visible, showing pressure points for Cavity 1 and Cavity 2.</p> <table border="1"> <caption>Alarm Settings</caption> <thead> <tr> <th>Alarm Type</th> <th>Lower Limit</th> <th>Upper Limit</th> <th>Previous Cycle</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>Peak Pressure Point Cavity 1</td> <td>3281.42</td> <td>3625.00</td> <td>3226.38</td> <td>psi</td> </tr> <tr> <td>Peak Pressure End of Cavity 2</td> <td>3180.21</td> <td>3647.00</td> <td>4196.40</td> <td>psi</td> </tr> <tr> <td>Peak Pressure End of Cavity 1</td> <td>3156.57</td> <td>3713.62</td> <td>4370.66</td> <td>psi</td> </tr> </tbody> </table>	Alarm Type	Lower Limit	Upper Limit	Previous Cycle	Unit	Peak Pressure Point Cavity 1	3281.42	3625.00	3226.38	psi	Peak Pressure End of Cavity 2	3180.21	3647.00	4196.40	psi	Peak Pressure End of Cavity 1	3156.57	3713.62	4370.66	psi
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<p>8</p>	<p>Let the job continue to Alarm for at <u>least</u> 30 cycles</p>	<p>N/A</p>	<p>Alarm Settings and Job Overview page will remain red during 30 or more cycles.</p> <p>30 or more red dots can be observed on the Summary Graph after the alarm change took place.</p>  <p>The screenshot shows the 'Summary Graph' with a red box highlighting 30 red dots on the cycle time line. The 'Job Overview' widget also shows a red 'Mold' icon.</p> <table border="1"> <caption>Alarm Settings</caption> <thead> <tr> <th>Alarm Type</th> <th>Lower Limit</th> <th>Upper Limit</th> <th>Previous Cycle</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td>Peak Pressure Point Cavity 2</td> <td>3418.41</td> <td>4045.19</td> <td>4621.87</td> <td>psi</td> </tr> <tr> <td>Peak Pressure Point Cavity 1</td> <td>3381.42</td> <td>3625.00</td> <td>3388.80</td> <td>psi</td> </tr> <tr> <td>Peak Pressure End of Cavity 2</td> <td>3718.21</td> <td>3617.00</td> <td>4561.40</td> <td>psi</td> </tr> </tbody> </table>	Alarm Type	Lower Limit	Upper Limit	Previous Cycle	Unit	Peak Pressure Point Cavity 2	3418.41	4045.19	4621.87	psi	Peak Pressure Point Cavity 1	3381.42	3625.00	3388.80	psi	Peak Pressure End of Cavity 2	3718.21	3617.00	4561.40	psi
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Peak Pressure End of Cavity 2	3718.21	3617.00	4561.40	psi																			

<p>9</p>	<p>From the Alarm Settings Widget:</p> <p>Revert the Upper Limit modification from Step 5 so the value is significantly greater than the Previous Cycle Value.</p>		<p>Mold alarm name and Previous Cycle value will turn black, indicating the current cycle is within the alarm limit.</p> 
<p>10</p>	<p>From the Alarm Settings Widget:</p> <p>Wait for the next cycle to be completed.</p>	<p>N/A</p>	<p>Mold variable will no longer be red.</p> 

<p>11</p>	<p>From the Job Overview Widget: View the Job Overview Widget</p>	<p>N/A</p>	<p>The Mold symbol will be colored green.</p> 
<p>12</p>	<p>Let the job run without any alarms for at <u>least</u> 30 cycles</p>	<p>N/A</p>	<p>Alarm Settings and Job Overview page will not be red during 30 or more cycles.</p> <p>No red dots can be observed on the Summary Graph after the alarm change took place.</p> 

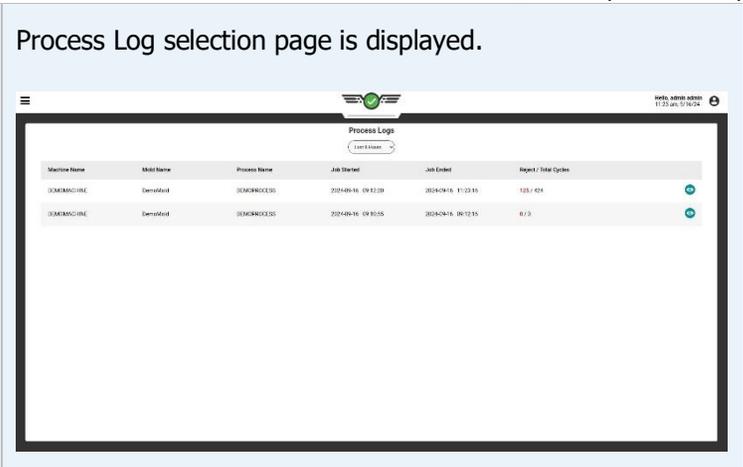
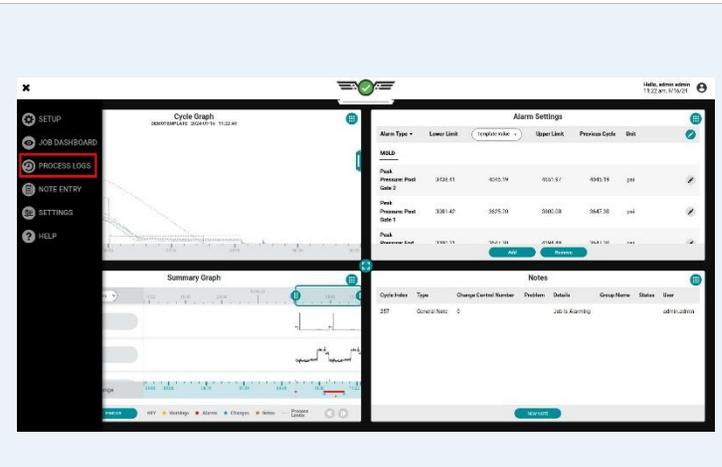
<p>13 From the Notes Widget: Select New Note from the Notes widget.</p>		<p>Note detail page is displayed.</p> 																
<p>14 From the Notes Widget: Select Latest Cycle Select Note Type Select General Note Input note details: "Job is not alarming" Select Submit Note</p>		<p>Note is saved and visible on the Notes widget.</p>  <table border="1" data-bbox="1297 824 1965 885"> <thead> <tr> <th>Cycle Index</th> <th>Type</th> <th>Change Control Number</th> <th>Problem</th> <th>Details</th> <th>Group Name</th> <th>Status</th> <th>User</th> </tr> </thead> <tbody> <tr> <td>98</td> <td>General Note</td> <td>0</td> <td></td> <td>Job is not Alarming</td> <td></td> <td></td> <td>admin.admin</td> </tr> </tbody> </table>	Cycle Index	Type	Change Control Number	Problem	Details	Group Name	Status	User	98	General Note	0		Job is not Alarming			admin.admin
Cycle Index	Type	Change Control Number	Problem	Details	Group Name	Status	User											
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<p>15</p>	<p>From the Notes Widget: Select the Note created in steps 13-14.</p>	<p>N/A</p>	<p>From the Summary Graph Widget: The corresponding cycle is automatically selected on the Summary Graph.</p> 
<p>16</p>	<p>From the Summary Graph Widget: Select the Compare button located in the top left corner of the Summary Graph.</p>	<p>N/A</p>	<p>Compare button turns green.</p> 

<p>17</p>	<p>Click the 9-dot display view button located in the top right of any widget other than the Summary Graph.</p> <p>Select Cycle Graph.</p>	<p>N/A</p>	<p>Cycle Graph is visible on the Job Dashboard</p> 
<p>18</p>	<p>From the Cycle Graph Widget:</p> <p>Long Click / Press within the Cycle Graph.</p>	<p>N/A</p>	<p>The Overlay curves from the selected cycle are visible along with associated [O]: cursor values.</p> 

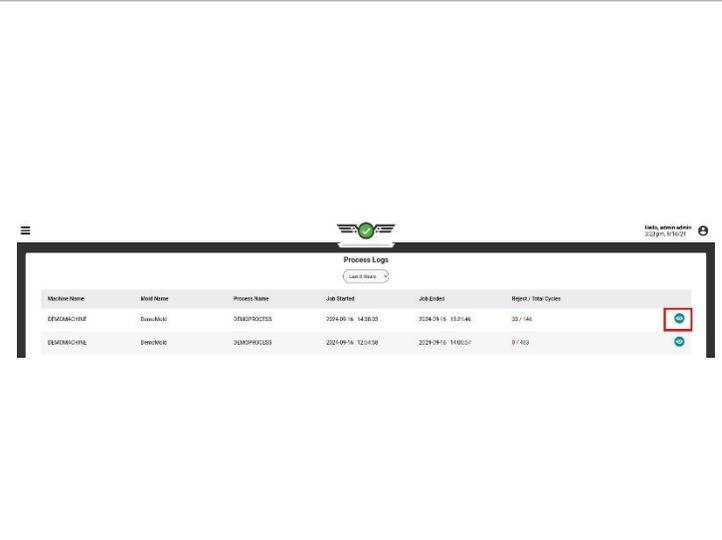
19 Select the Menu button on the top left corner.

Select Process Logs.



20 From the Process Logs Page:

Select the Eye button, next to the current running Job for which this test is being performed.



The following Process Log details are present:

Reject Total ≥ 30 .
Total Cycles ≥ 60 .
The Forced Alarm Type from Steps 4-5 Above Limit ≥ 30
The Note created during Step 14 is present.

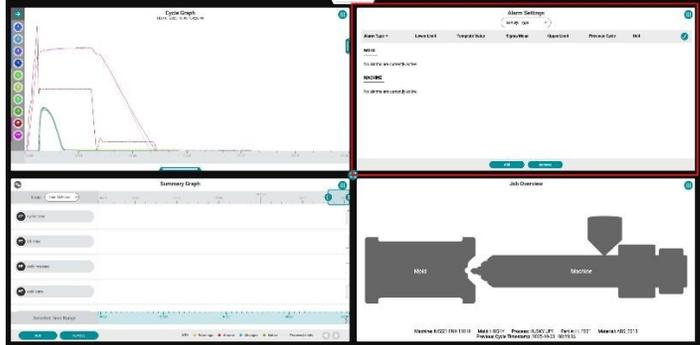
Tested By:

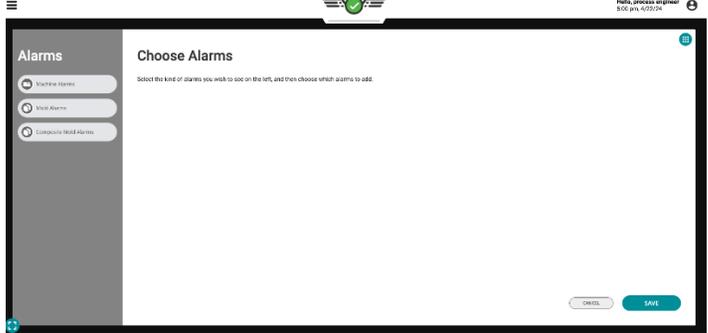
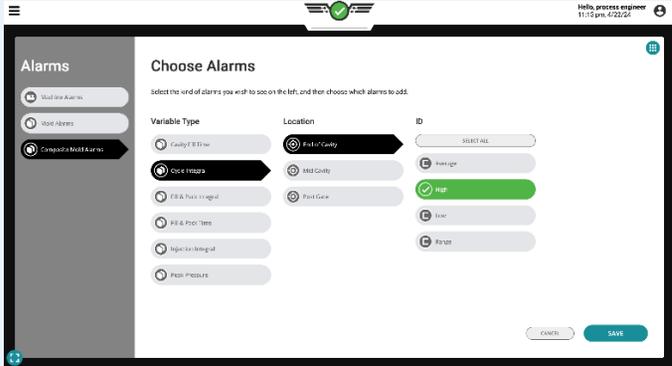
Date:

Pass/Fail:

OO Test 2: FC-21667 (When a Composite Cycle Integral Alarm triggers, the sorting output is activated.)

Preconditions: FC-9982, FC-9983, FC-9984, FC-9990, FC-10752

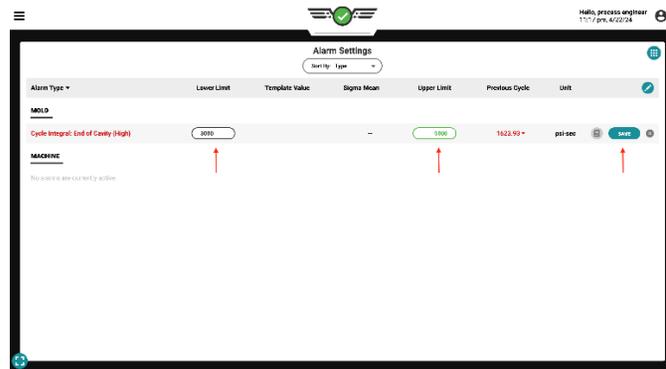
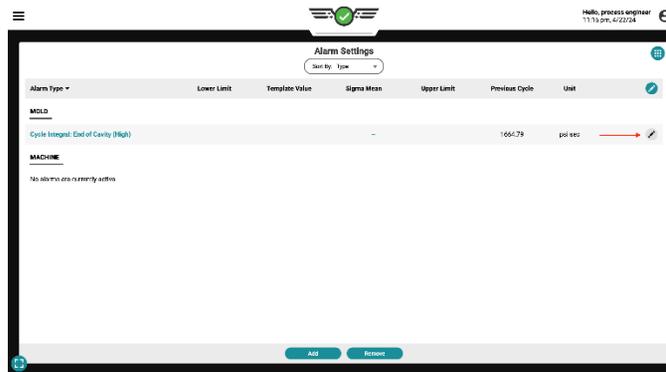
Step	Data	Expected Result
<p>1 Set up a machine, mold, and process.</p> <p>Ensure you have a Machine Output assigned to Sorting Reject Control.</p> <p>Ensure you have at least two cavities with an End of Cavity sensor on each.</p> <p>Start the job.</p>	<p>N/A</p>	<p>You have a job running and the Job Dashboard can be viewed.</p>
<p>2 Verify the Alarm Settings widget is displayed on the Job Dashboard.</p> <p>If not, replace a current widget by clicking the 9-dot display view button located at the top right of a widget and selecting Alarm Settings.</p>	<p>N/A</p>	<p>Alarm Settings are now displayed in your job dashboard.</p> 

<p>3</p>	<p>Double tap the Alarm Settings widget so it goes into full screen mode.</p>	<p>N/A</p>	<p>The Alarm Settings widget is in full screen mode.</p>
<p>4</p>	<p>Click Add at the bottom of the widget.</p>		<p>The Choose Alarms slide is presented.</p> 
<p>5</p>	<p>Select: Composite Mold Alarms Cycle Integral End of Cavity High Then click SAVE.</p>		<p>Cycle Integral: End of Cavity (High) alarm is added to the Alarm Settings widget.</p>

6 Select the Pencil button next to the Alarm added from Step 4.

Look at the Previous Cycle Value and Input an Upper and Lower that is outside the range of the Previous Cycle Value to purposely make the Alarm activate.

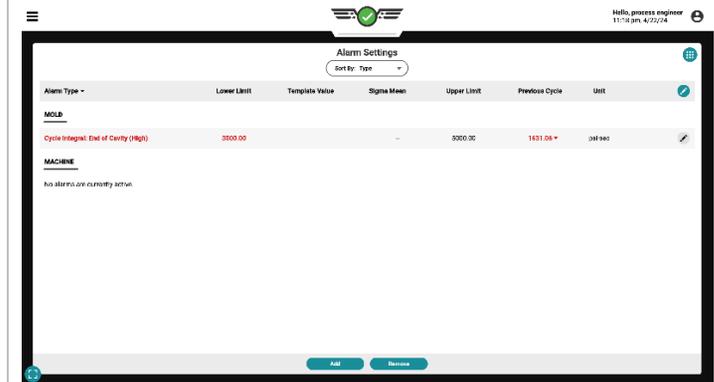
Then click Save.



Composite variable will have an Upper and Lower Limit value applied and visible on the Alarm Widget.

After a complete cycle is run AND the Previous Cycle Value is still outside of the Upper and Lower Limits:

Variable will turn red.

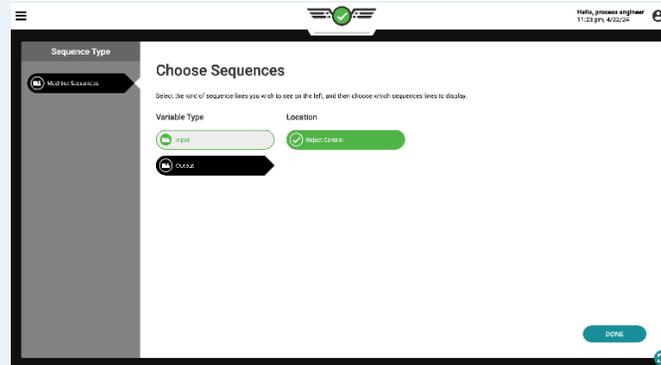
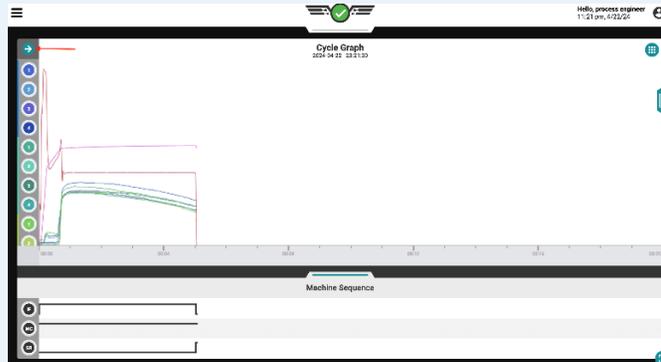


<p>7 If the Alarm Settings widget is still in full screen mode, double tap the widget to return to the Job Dashboard with 4 widgets visible.</p> <p>Then double tap the Cycle Graph widget to put it in full screen mode.</p>	<p>N/A</p>	<p>The Cycle Graph widget is in full screen mode.</p> 
<p>8 Drag up on the Tab along the bottom of the Cycle Graph to expose the Machine Sequence graph.</p>		<p>Machine Sequence graph will be visible.</p> 

9 Click the Right Arrow button on the top left side of the widget.

Select Add on the Machine Sequence graph and then select Output.

Select Reject Control then click DONE.



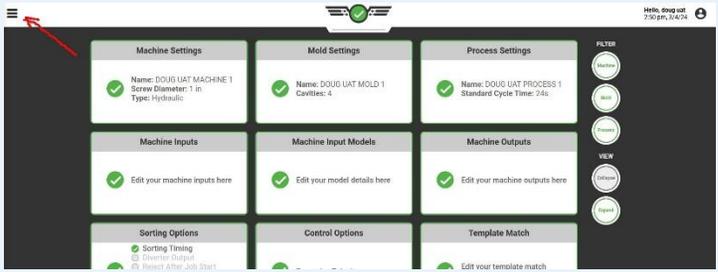
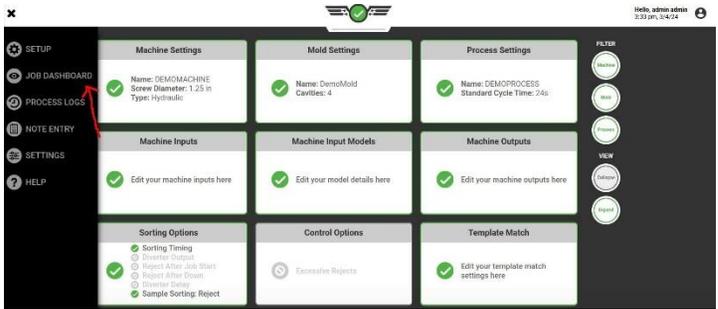
Reject Control signal is displayed on the Machine Sequence Graph.



<p>10 Watch the Reject Control as the machine cycles.</p>		<p>If the Alarm from step 4-5 is still triggering. Reject Sorting output will be coming on.</p> <p>By default, the sorting output will be activating at the end of Mold Closed (When the Mold starts to open).</p>
<p>Tested By:</p>	<p>Date:</p>	<p>Pass/Fail:</p>

OQ Test 3: FC-21571 (The status light turns on when Velocity to Pressure Control is triggered while using an Analog output module.)

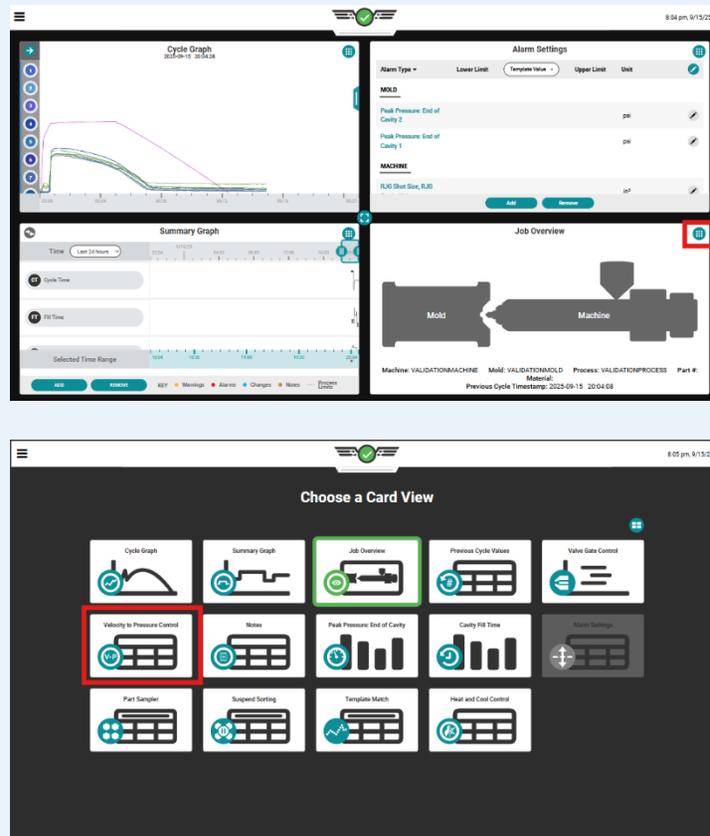
Preconditions: FC-18641, FC-9982, FC-10028, FC-9983, FC-9984, FC-9990

Step	Data	Expected Result
<p>1 Select the Menu on the upper left corner.</p>		<p>The Menu will open.</p>
<p>2 Select Job Dashboard from the Menu.</p>		<p>User is taken to the Job Dashboard.</p>

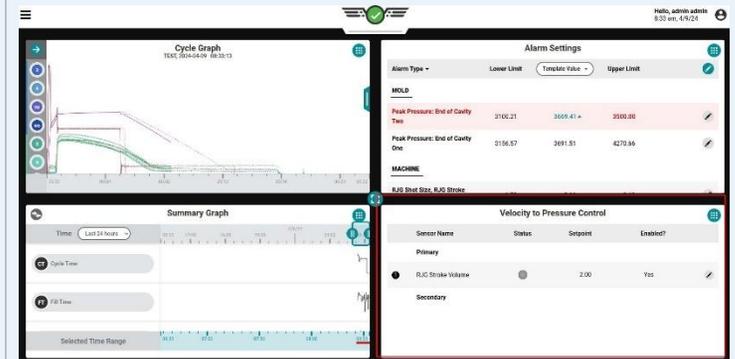
3 Verify the Velocity to Pressure Control widget is displayed.

If not:

Replace a current widget by clicking the 9-dot display view button on the top right of a widget and selecting Velocity to Pressure Control.

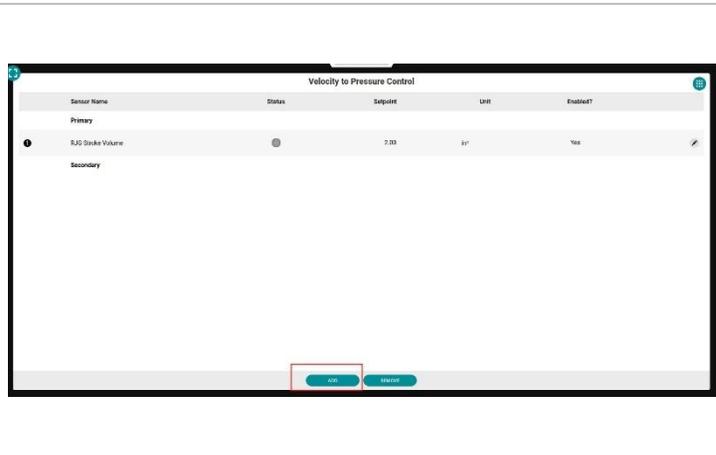


Velocity to Pressure Control is now displayed in your job dashboard.

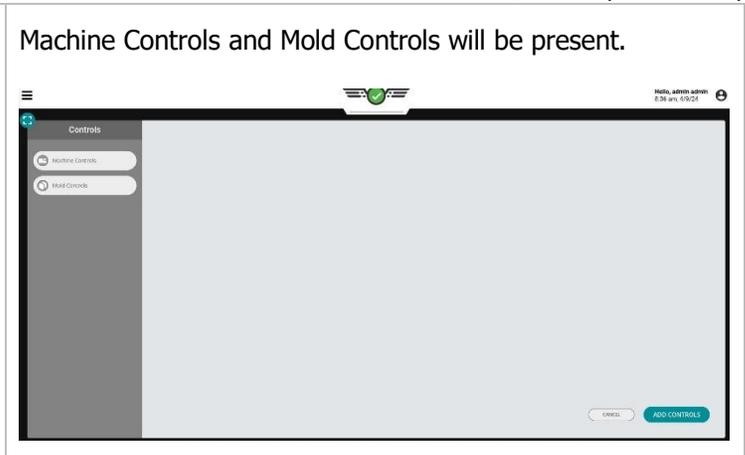


4 Double Tap Velocity to Pressure Control to expand the widget to full screen view.

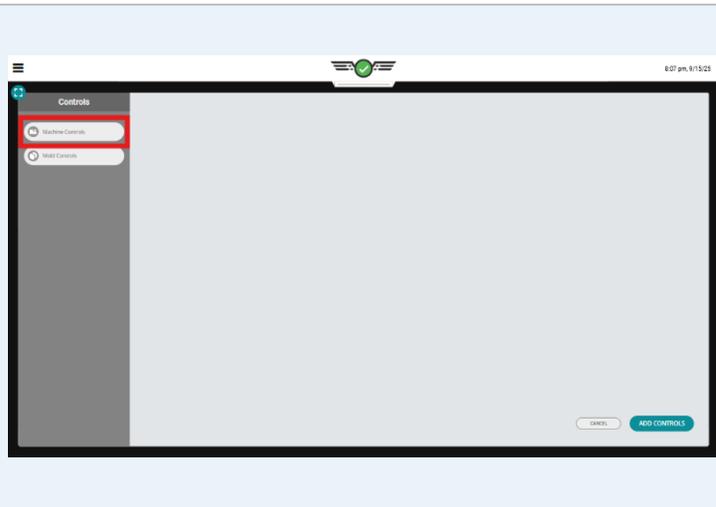
Select Add



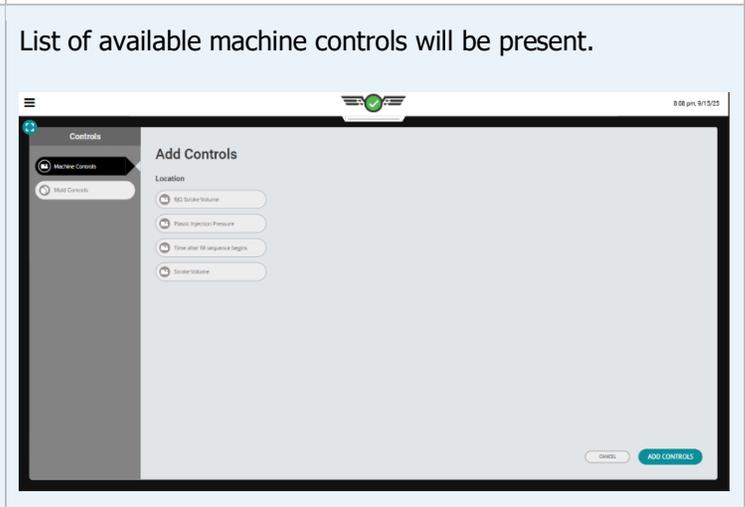
Machine Controls and Mold Controls will be present.



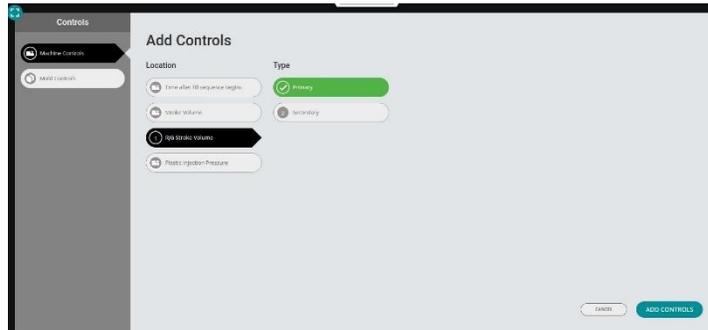
5 Select Machine Controls.



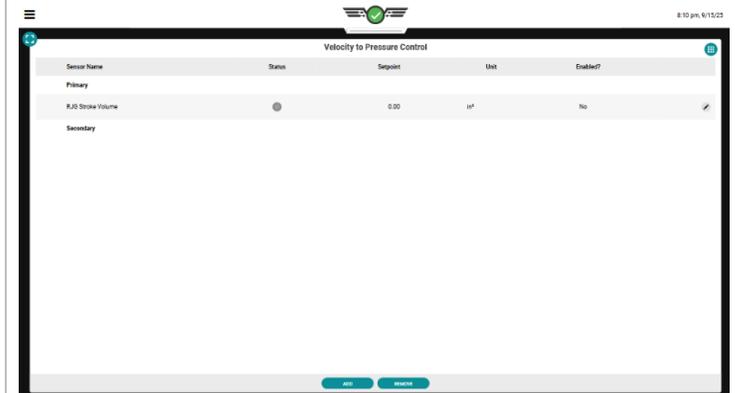
List of available machine controls will be present.



- 6 Select RJG Stroke Volume:
Type: Primary
Add Controls button



RJG Stroke Volume will now be available on the Velocity to Pressure Control Widget.

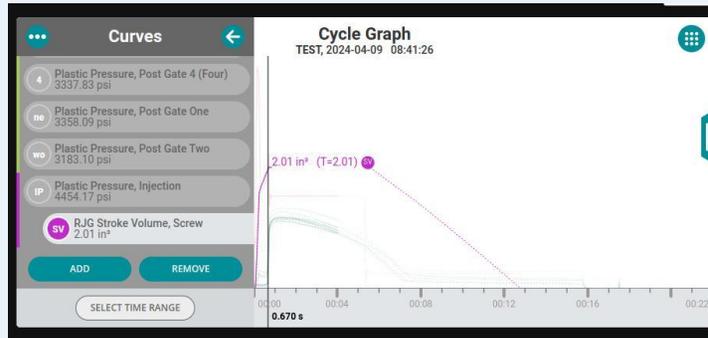
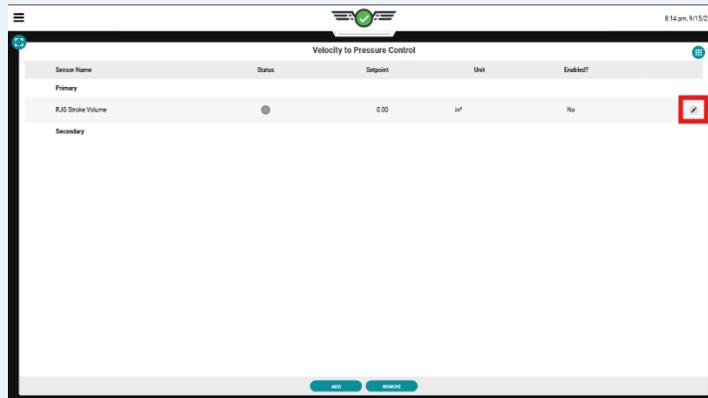


7 Select the Pencil Icon next to the control and input a value into the set-point field.

This value should be in the range of your current RJG Stroke before switching to Transfer.

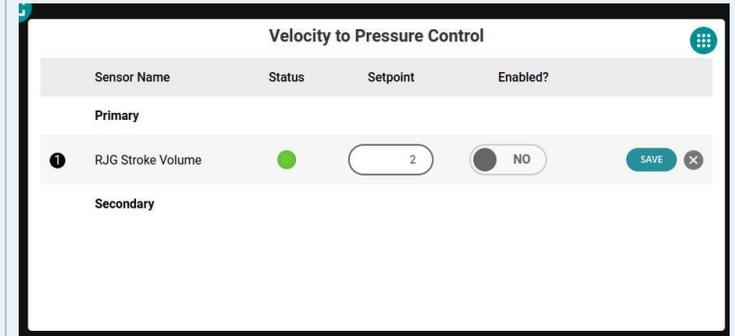
This can be done by viewing the RJG Stroke curve on the cycle graph.

Setpoint is 2.00 based on the Cycle Graph value for RJG Stroke Volume as seen below.

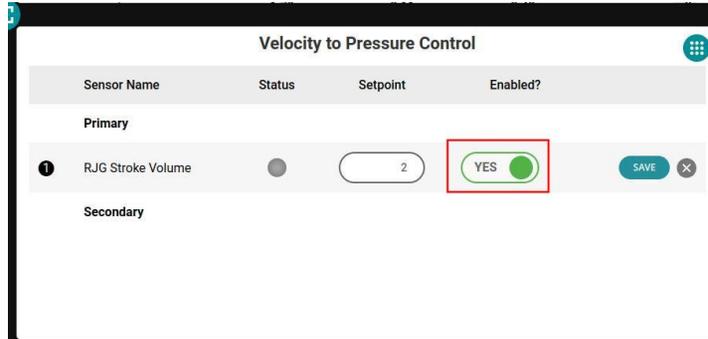
Sensor Name	Status	Setpoint	Unit	Enabled?
Primary				
RJG Stroke Volume	●	0.00	in ³	No 
Secondary				

Setpoint value is added to its corresponding input field.



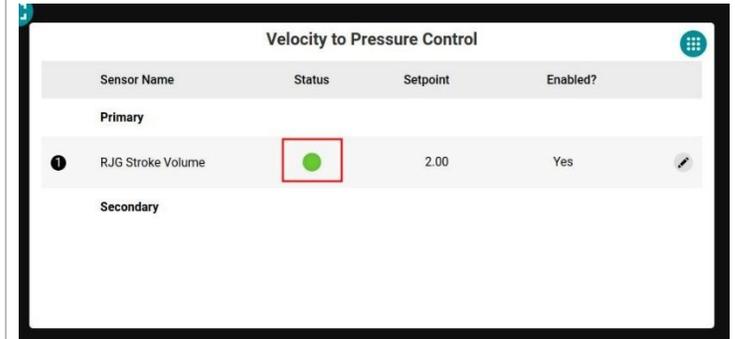
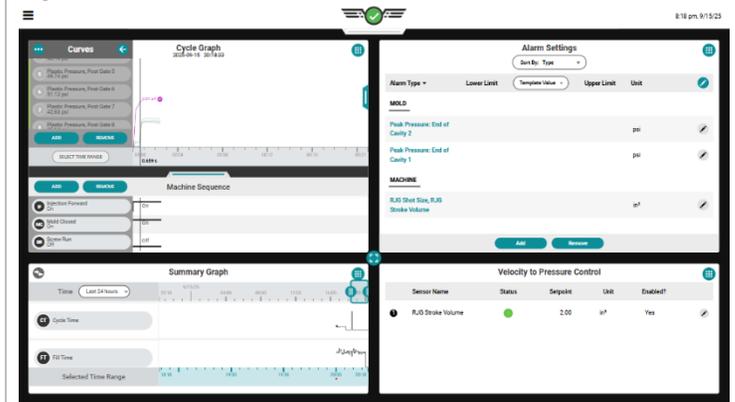
Sensor Name	Status	Setpoint	Enabled?
Primary			
RJG Stroke Volume	●	2	NO <input type="button" value="SAVE"/>
Secondary			

8 Select Enable and then Save.



Set-Point input field can no longer be changed.
Upon the next cycle, the status light will illuminate when the current RJG Stroke Volume hits your Set-Point value during injection forward.

Light will turn off once screw run starts.



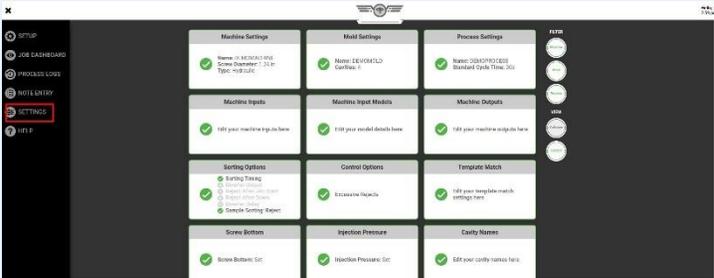
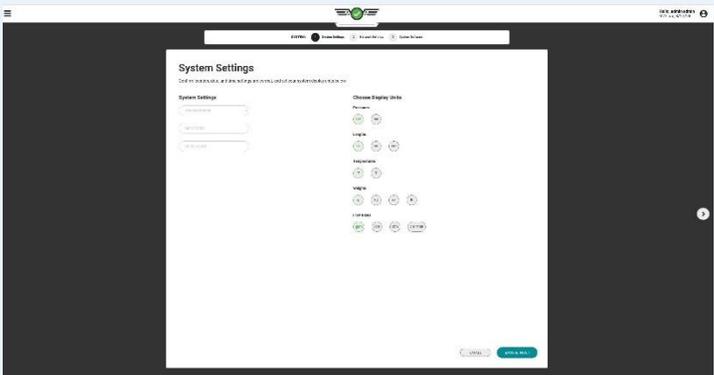
Tested By:

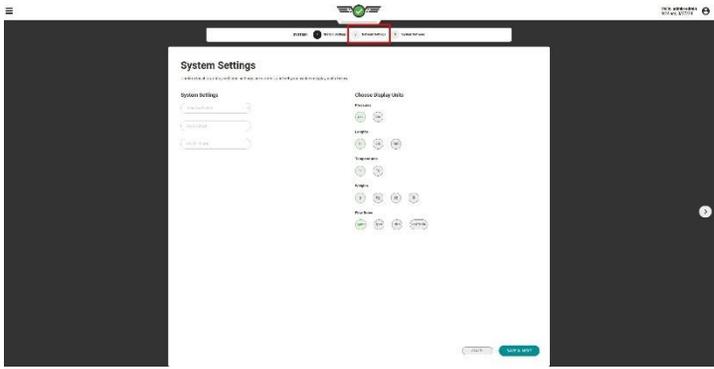
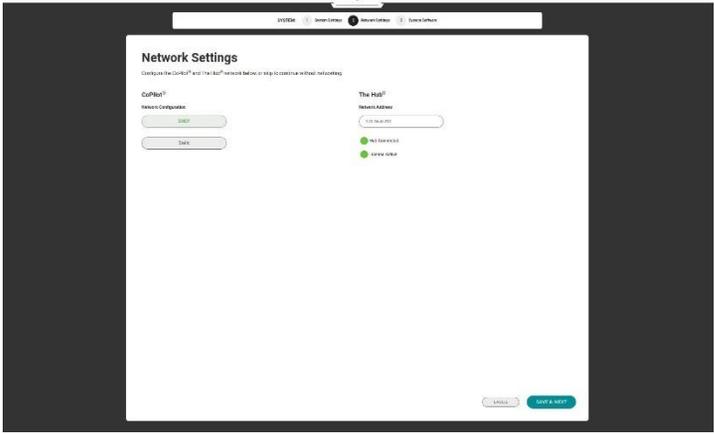
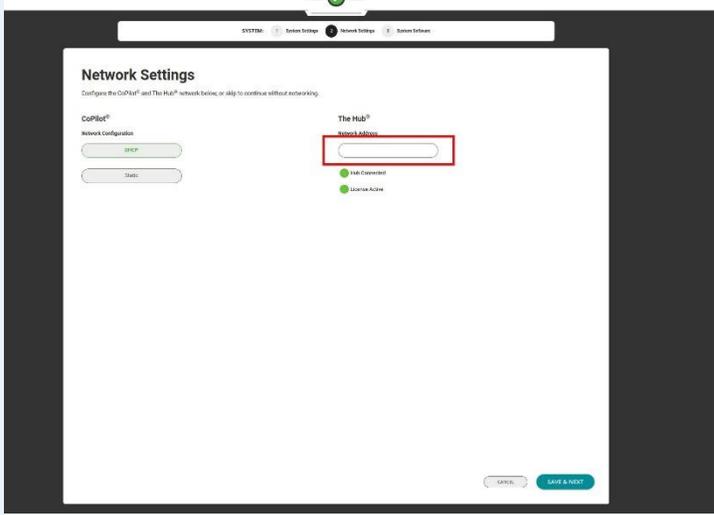
Date:

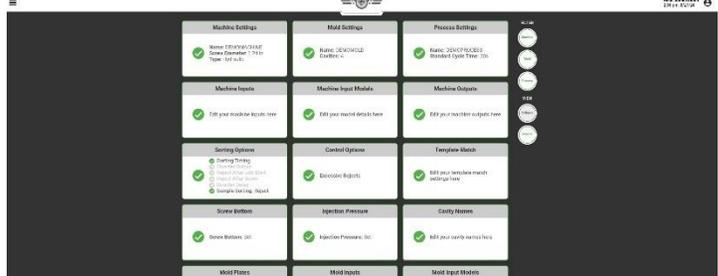
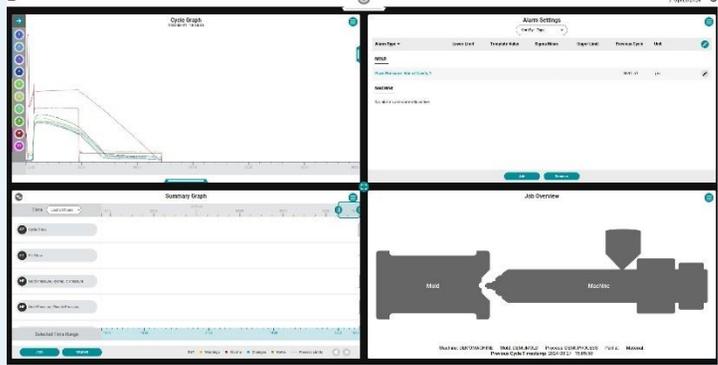
Pass/Fail:

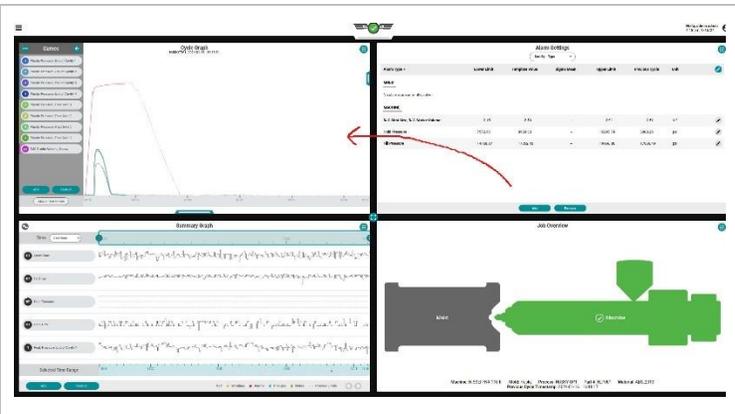
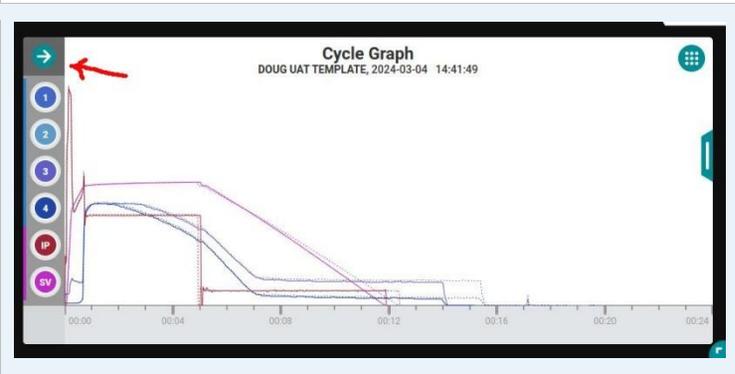
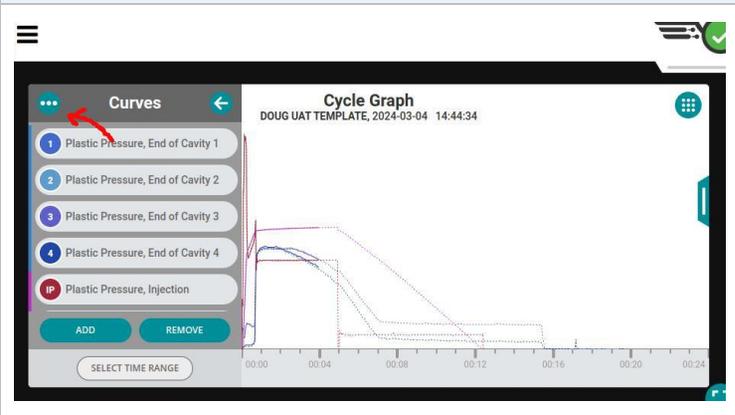
OQ Test 4: FC-24108 (Template values are available to the User on The CoPilot, when the CoPilot is disconnected from The Hub.)

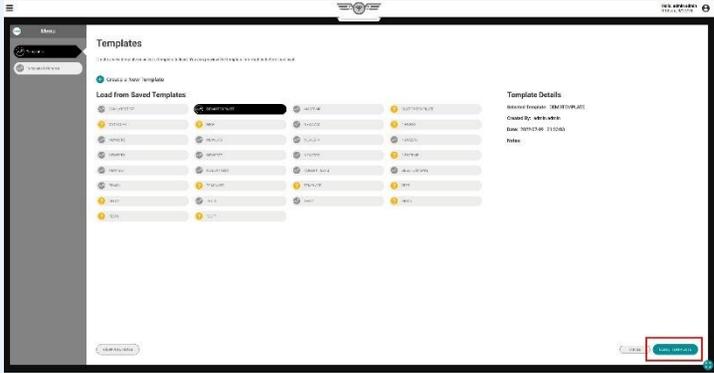
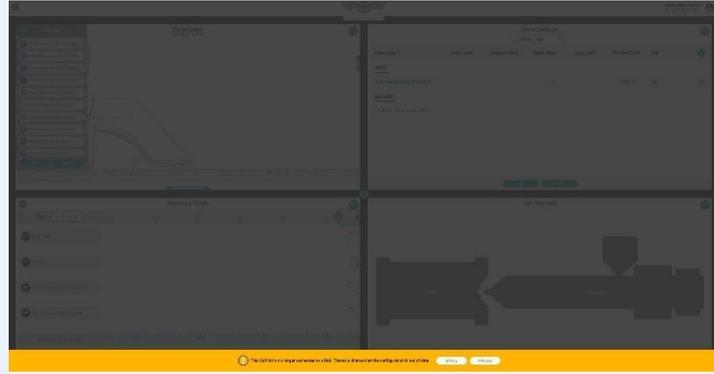
Preconditions: FC-10207, FC-9556, FC-9982, FC-9983, FC-9984, FC-9990, FC-12019

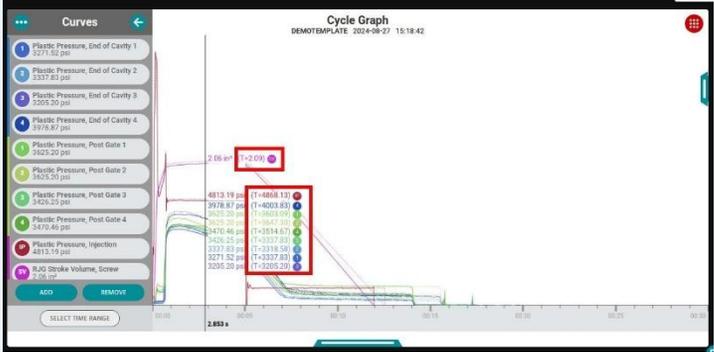
Step	Data	Expected Result
<p>1 Select the Menu in the upper left corner of the CoPilot's dashboard.</p> <p>Select Settings.</p> 		<p>You are viewing the CoPilot's settings.</p> 

<p>2 Tap/Click on Network Settings in the System Settings bar at the top of the screen.</p>		<p>You are now viewing the network settings for the CoPilot.</p> 
<p>3 Clear the text from the input field for the Hub's network address.</p> <p>Click Save & Next.</p>		<p>The network address changes are saved.</p> <p>The System Software page is displayed.</p>

<p>4 Select Save and Finish.</p> 	<p>N/A</p>	<p>The CoPilot logo changes to a "disconnected" logo.</p> 
<p>5 Select the Menu Button and then Job Dashboard.</p>		<p>Job Dashboard is displayed.</p> 

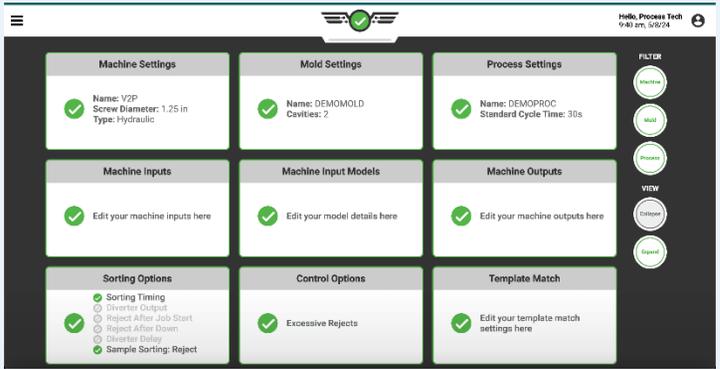
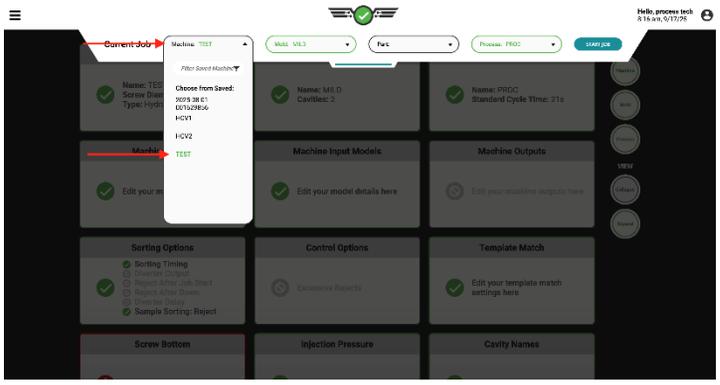
<p>6</p>	<p>Double Tap the Cycle Graph.</p>		<p>Cycle Graph is expanded to full screen view.</p>
<p>7</p>	<p>Select the Right Arrow along the top left corner of the cycle graph widget.</p>		<p>Curve selection menu is expanded.</p>
<p>8</p>	<p>Select the ... button along the top left corner of the cycle graph.</p>		<p>Templates page is displayed.</p>

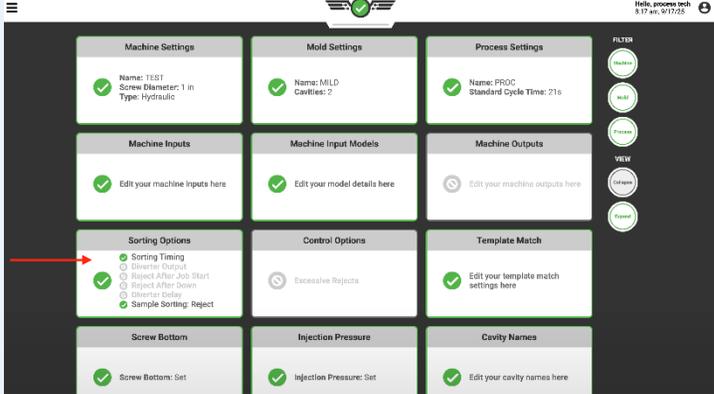
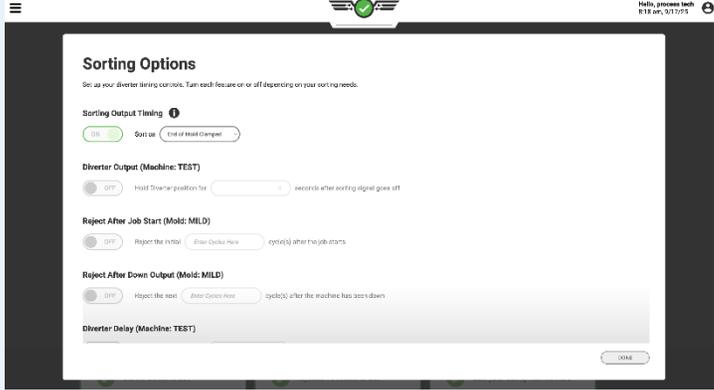
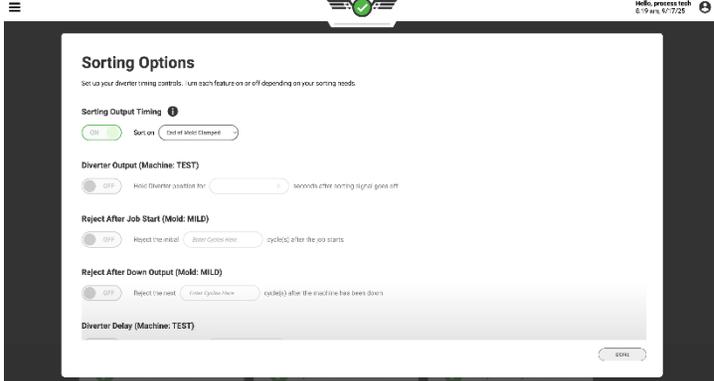
<p>9</p>	<p>Select DEMOTEMPLATE and then Load Template.</p>		<p>A confirmation prompt is displayed.</p> 
<p>10</p>	<p>Select Proceed.</p>	<p>N/A</p>	<p>DEMOTEMPLATE appears on the top of the Cycle Graph and the template is loaded.</p> 

11	Tap/Click + Hold on the Cycle Graph.	N/A	<p>Cursor Values are displayed for the Template.</p> 
Tested By:		Date:	Pass/Fail:

OO Test 5: FC-21673 (Verify as a user without process engineer permissions, I cannot change Diverter Output settings.)

Preconditions: FC-23141, FC-14408, FC-17052, FC-9982, FC-9983, FC-9984

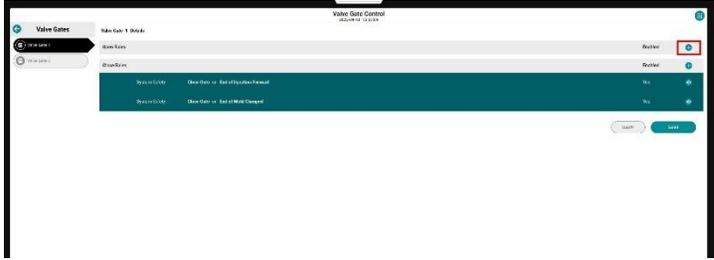
Step	Data	Expected Result
<p>1 Via a user with only Process Tech permissions:</p> <p>Navigate and login to the CoPilot.</p>		<p>User is logged in to the CoPilot.</p>
<p>2 If a job is not already running:</p> <p>From the setup page, select the copilot logo.</p> <p>Select a desired machine, mold, and process.</p>		<p>A machine, mold, and process are loaded and the sorting options card is available on the setup page.</p>

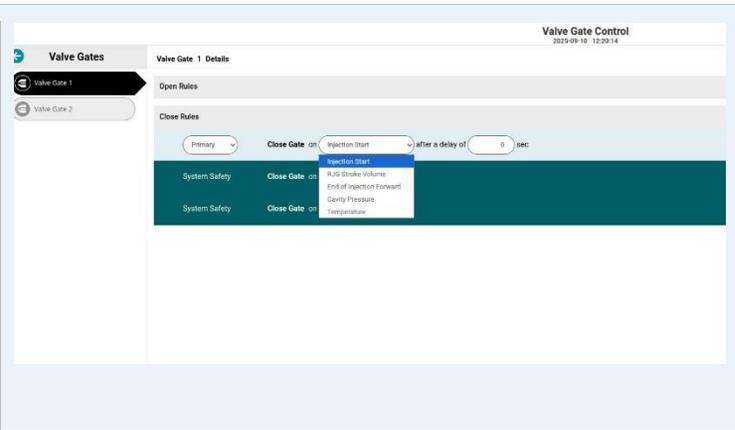
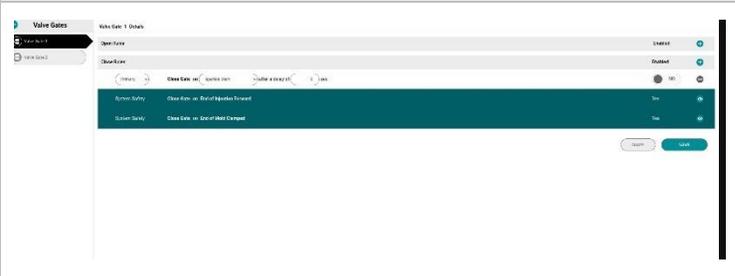
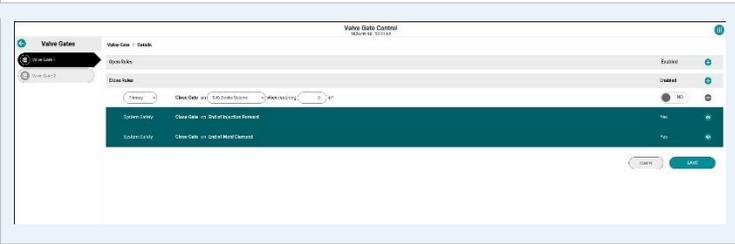
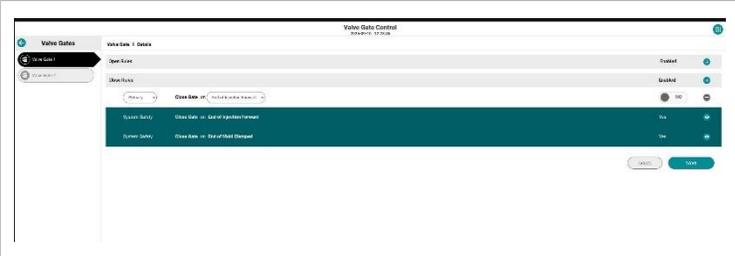
<p>3 From the setup page, select the sorting options card.</p>		<p>User is taken to the sorting options screen.</p> 
<p>4 Attempt to toggle the Diverter Output setting on.</p>		<p>As a user with Process Tech permissions, I cannot modify the Diverter Output settings, and the toggle is pale.</p>
<p>Tested By:</p>	<p>Date:</p>	<p>Pass/Fail:</p>

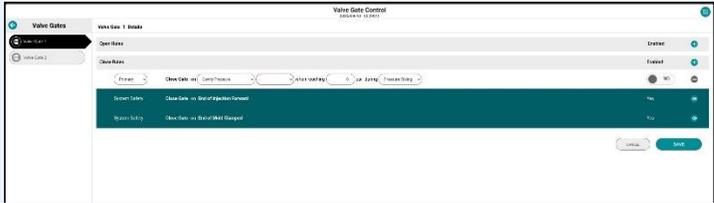
OQ Test 6: FC-21559 (Verify a user can select the Close Gate On drop down selections.)

Preconditions: FC-9982, FC-22161, FC-11723, FC-9984, FC-9990

Step	Data	Expected Result
<p>1 Assign some valve gates to your mold.</p> <p>Start a job as described in the preconditions.</p>	<p>N/A</p>	<p>You are at the Job Dashboard with your job running.</p>
<p>2 Verify the Valve Gate Control widget is displayed.</p> <p>If not, replace a current widget by clicking the 9-dot display view button on the top right of a widget.</p> <p>Select Valve Gate Control.</p>		<p>The Valve Gate Control widget is displayed on the Job Dashboard.</p> <p>You may end up in full screen mode of the Valve Gate Control widget if you first add the widget.</p>

<p>3</p>	<p>If not already:</p> <p>Maximize the Valve Gate Control widget by double tapping the widget.</p>	<p>N/A</p>	<p>The Valve Gate Control chart will be displayed.</p>
<p>4</p>	<p>Click/touch on the valve gate row that you'd like to edit.</p>		<p>The Valve Gate Detail window will be displayed.</p>
<p>5</p>	<p>Ensure you have selected the correct valve gate.</p> <p>Click/touch the Edit Pencil button.</p>		<p>The window will be in edit mode.</p>
<p>6</p>	<p>Click the teal + button on the right side of the Close Rules row.</p>		<p>Details for a Primary close gate rule will be shown.</p>

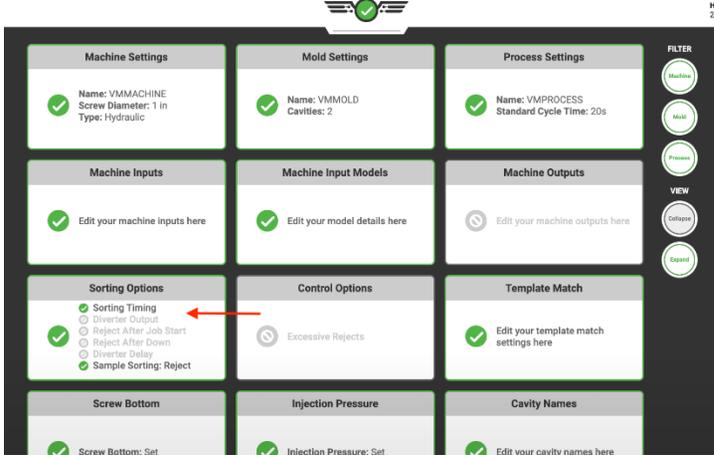
<p>7</p>	<p>Select the Close Gate on drop down field.</p>		<p>The list of options will be:</p> <ul style="list-style-type: none"> Injection Start RJG Stroke Volume End of Injection Forward Cavity Pressure Temperature.
<p>8</p>	<p>Select Injection Start from the drop down list.</p>		<p>Injection Start will remain selected in the Close Gate on field with addition verbiage of after a delay of 0 sec with "0" being in a text box.</p>
<p>9</p>	<p>Repeat step 7 and select RJG Stroke Volume.</p>		<p>RJG Stroke Volume will remain selected in the Close Gate on field with additional verbiage of when reaching 0 in with "0" being in a text box.</p>
<p>10</p>	<p>Repeat step 7 and select End of Injection Forward.</p>		<p>End of Injection Forward will remain selected in the Close Gate on field.</p>

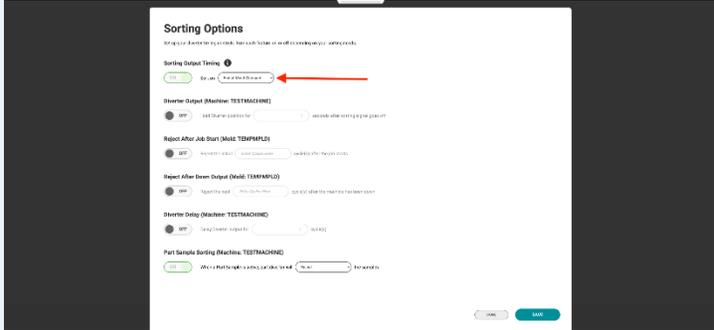
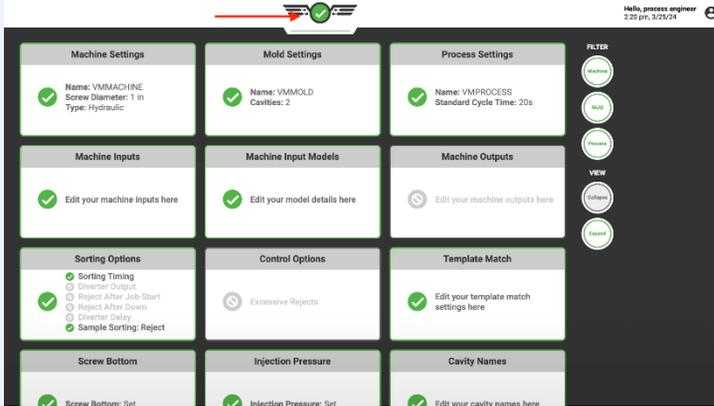
<p>11 Repeat step 7 and select Cavity Pressure.</p>		<p>Cavity Pressure will remain selected in the Close Gate on field with additional verbiage of another drop down field that is initially blank for sensor location, when reaching 0 psi during Pressure Rising, with "0" being a text box and Pressure Rising being in a drop down list.</p>
<p>12 Click the drop down menu next to Cavity Pressure to select a sensor location.</p>		<p>Another drop down menu appears to the right for the user to select a cavity.</p>
<p>13 Click the drop down menu next to your sensor location selected in step 12.</p>		<p>Your rule now has a sensor location and cavity location selected.</p>
<p>14 Click the last drop down at the end of the rule and select Pressure Falling.</p>		<p>Pressure Falling remains in the field.</p>

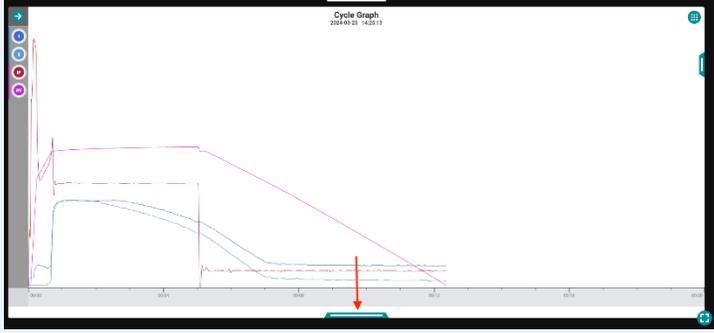
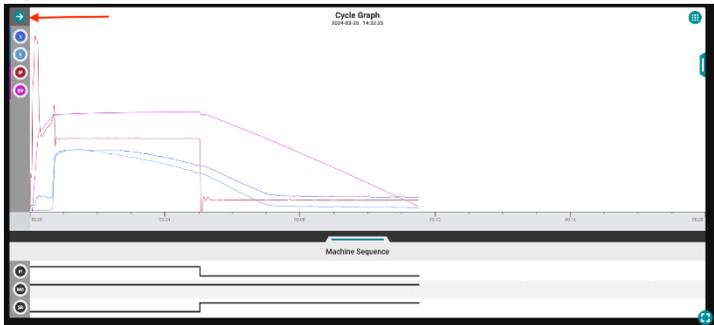
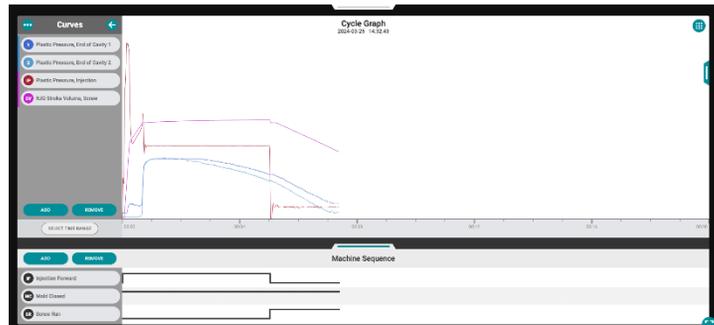
15	Repeat step 7 and select Temperature	N/A	<p>Temperature will remain selected in the Close Gate on field.</p> <p>You will have additional verbiage will include another dropdown to select you temperature location as well as a text box for temperature level and one for RJG Stroke Volume (when "sensor location" rises 0 F plus an additional 0 in3 of RJG Stroke Volume).</p>
Tested By:		Date:	Pass/Fail:

OQ Test 7: FC-21545 (Sorting Output Timing - Sorting output timing occurs by default at the End of Mold Clamped.)

Preconditions: FC-9982, FC-9983, FC-9984, FC-10752

Step	Data	Expected Result
<p>1 Create a machine, mold, and process as described in the preconditions.</p> <p>Ensure you have sorting assigned to a machine output.</p>	<p>N/A</p>	<p>You are at the Setup Dashboard with a machine, mold, process loaded.</p>
<p>2 Click the Sorting Options card.</p>	 <p>The screenshot shows a grid of settings cards. The 'Sorting Options' card is highlighted with a red arrow pointing to the 'Sorting Timing' option. Other cards include Machine Settings, Mold Settings, Process Settings, Machine Inputs, Machine Input Models, Machine Outputs, Control Options, Template Match, Screw Bottom, Injection Pressure, and Cavity Names. A 'FILTER' sidebar is visible on the right.</p>	<p>You are brought to the Sorting Options slide.</p>

<p>3 View the Sorting Output Timing section.</p>		<p>The button should be defaulted to ON and the dropdown should be defaulted to End of Mold Clamped.</p>
<p>4 Click Save.</p>	<p>N/A</p>	<p>You are brought back to the Setup Dashboard.</p>
<p>5 Click the drop down menu and then click START JOB.</p>		<p>The job starts and you are brought to the Job Dashboard.</p>

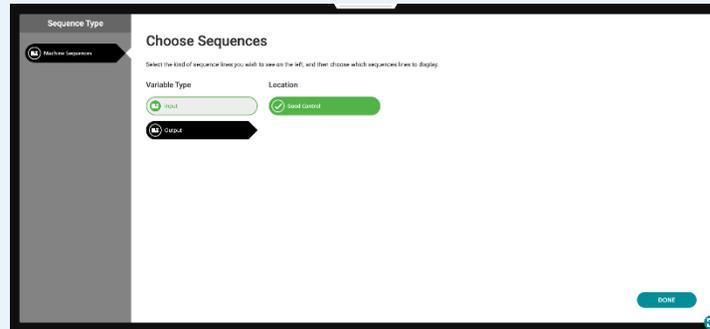
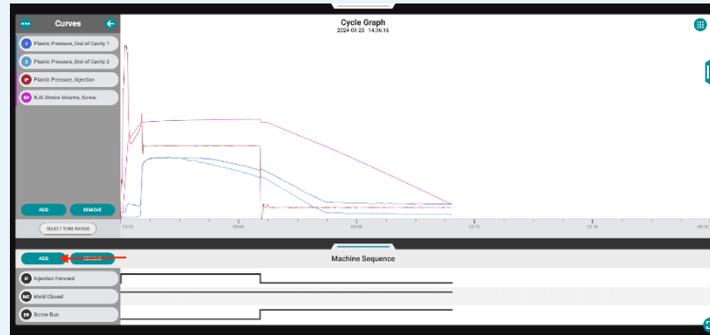
<p>6 Double click the Cycle Graph widget to expand it to full screen mode.</p>		<p>The Cycle Graph is in full screen.</p>
<p>7 Expand the sequence lines by clicking and dragging the bottom tab, located under the cycle graph.</p>		<p>The Machine Sequence graph is visible below the Cycle Graph.</p>
<p>8 On the Cycle Graph widget: Click the arrow point on the left side to expand the side menu of the Cycle Graph and Machine Sequence.</p>		<p>The names of curves and machine sequences are shown on the left side.</p> 

9 Add the sorting output to your Machine Sequences graph.

On the Machine Sequences graph click the Add button.

Click Output → Good Control.

Click Done.



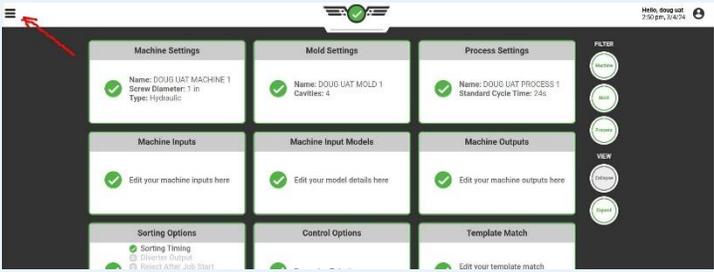
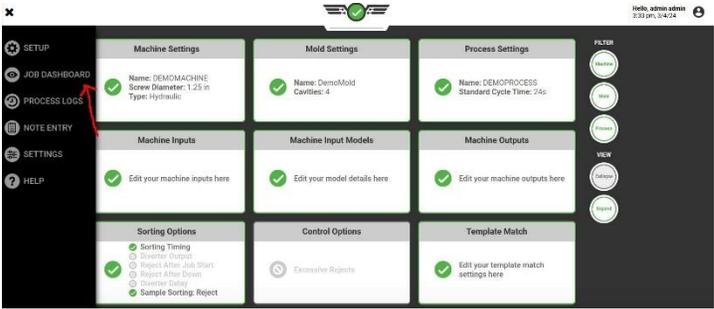
The Good Control output is shown in the Machine Sequences graph.

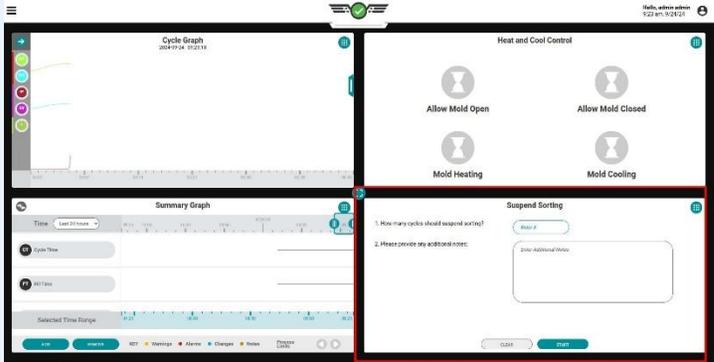
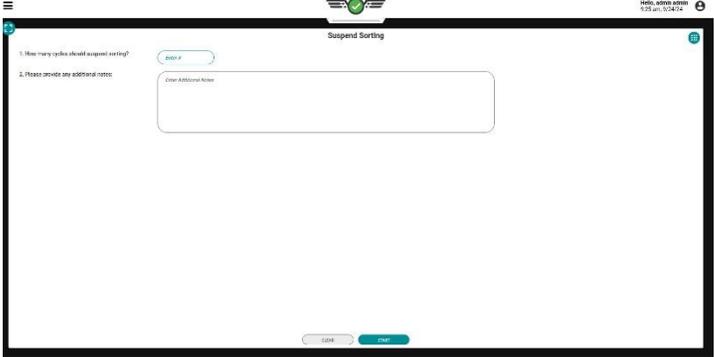


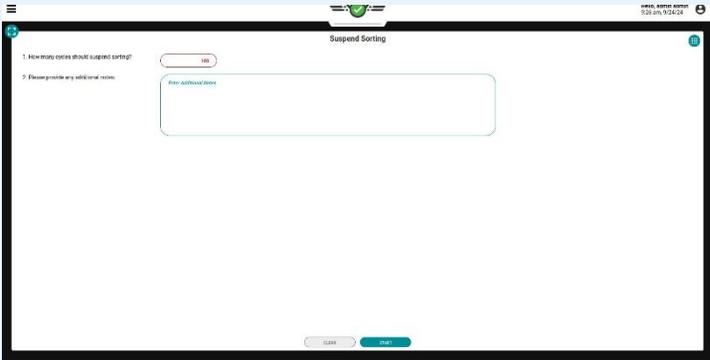
<p>10</p>	<p>On the Machine Sequence graph: Verify sorting occurs at the end of mold clamped.</p>		<p>The sorting is turning on.</p> <p>Good Control sequence line goes high when the end of mold clamped occurs, if no alarms are being triggered.</p> <p>Mold Closed sequence lines goes low.</p>
<p>Tested By:</p>		<p>Date:</p>	<p>Pass/Fail:</p>

OQ Test 8: FC-24452 (Suspend Sorting cannot be started with a cycle value greater than 99.)

Preconditions: FC-9982, FC-9983, FC-9984, FC-9990

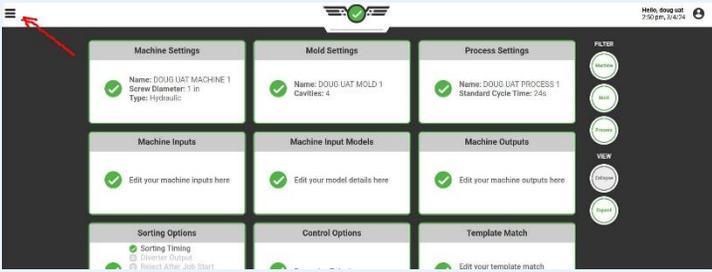
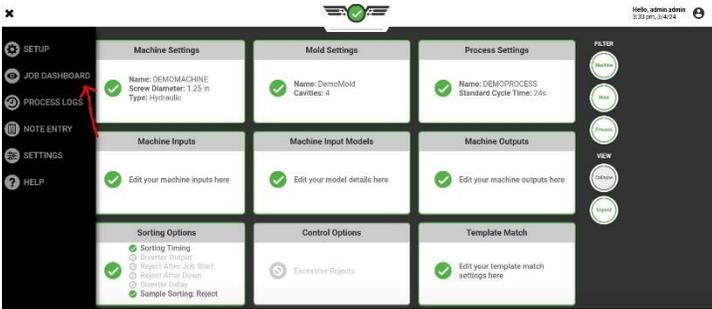
Step	Data	Expected Result
<p>1 Select the Menu on the upper left corner.</p>		<p>The Menu will open.</p>
<p>2 Select Job Dashboard from the Menu.</p>		<p>User is taken to the Job Dashboard.</p>

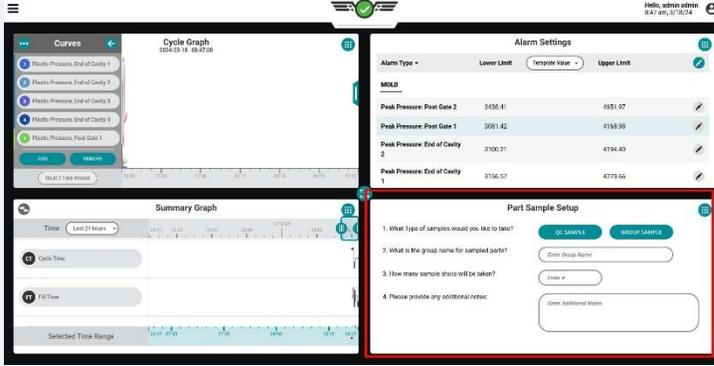
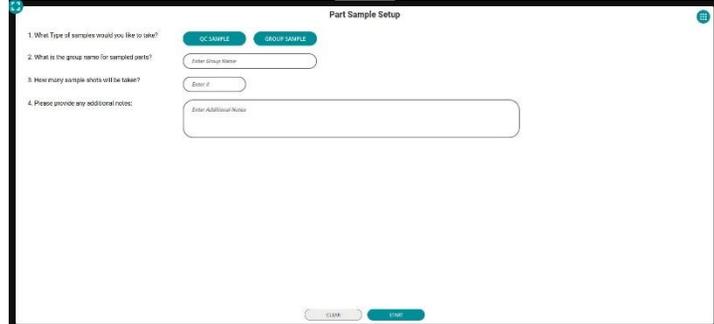
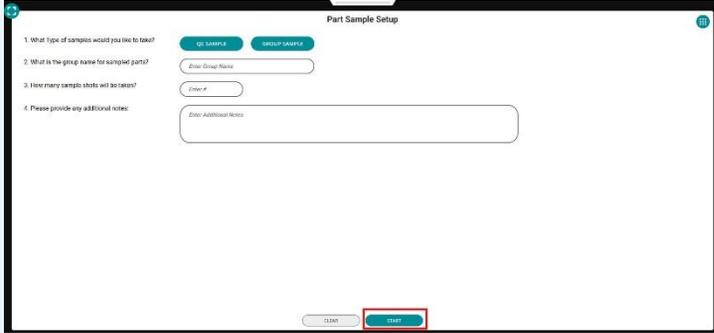
<p>3</p>	<p>Verify the Suspend Sorting widget is displayed.</p> <p>If not, replace a current widget by clicking the 9-dot display view button on the top right of a widget and selecting Suspend Sorting.</p>		<p>Suspend Sorting is now displayed in your job dashboard.</p>
<p>4</p>	<p>Double-Tap / Click the Suspend Sorting widget.</p>	<p>N/A</p>	<p>The Suspend Sorting widget is now full screen and the Start button is visible.</p> 

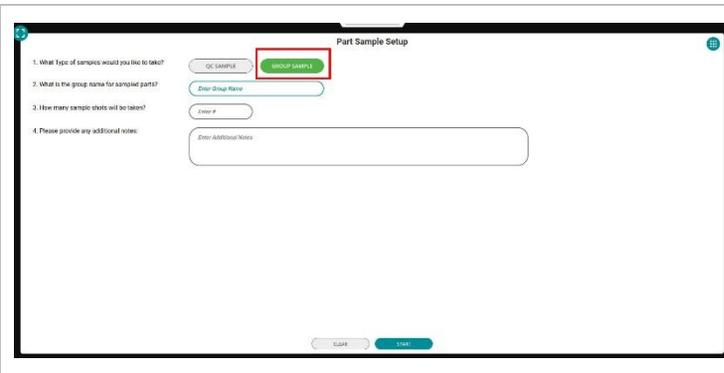
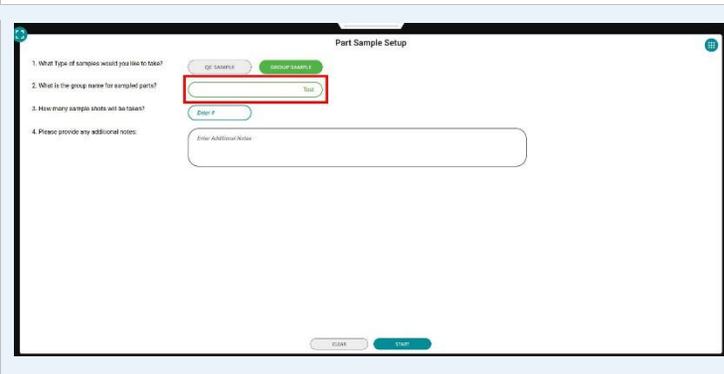
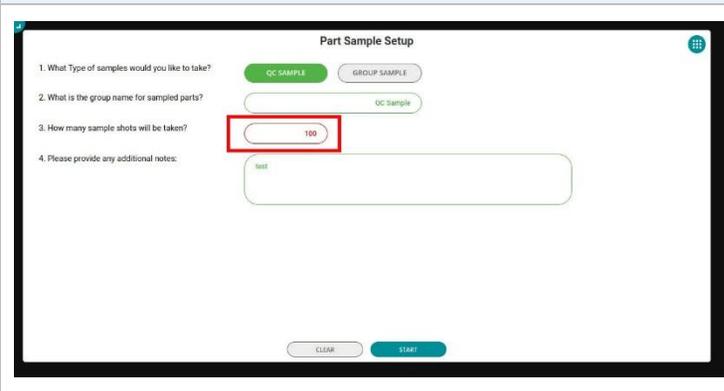
<p>5</p>	<p>Input a Cycle quantity as 100 Select Start.</p>		<p>Suspend Sorting does not start.</p>
<p>6</p>	<p>Input a Cycle quantity as 99 Select Start.</p>		
<p>Tested By:</p>		<p>Date:</p>	<p>Pass/Fail:</p>

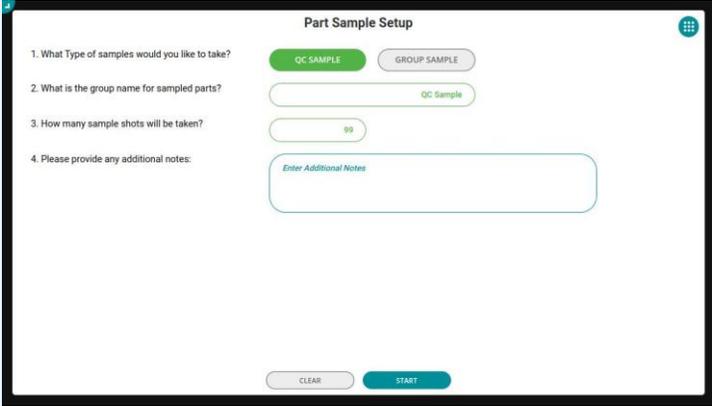
OQ Test 9: FC-21398 (A Part Sample cannot be started without "Sample Type, Group Name, and Number of Shots" filled in.)

Preconditions: FC-17123, FC-9982, FC-9983, FC-9984, FC-9990

Step	Data	Expected Result
<p>1 Select the Menu on the upper left corner.</p>		<p>The Menu will open.</p>
<p>2 Select Job Dashboard from the Menu.</p>		<p>User is taken to the Job Dashboard.</p>

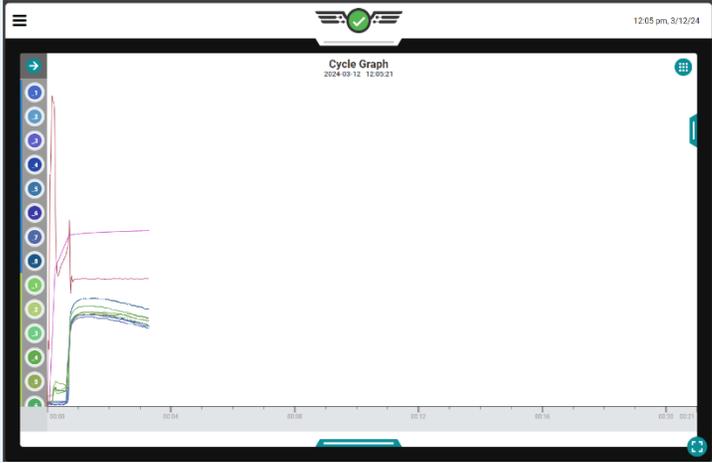
<p>3 Verify the Part Sampler widget is displayed.</p> <p>If not, replace a current widget by clicking the 9-dot display view button on the top right of a widget and selecting Part Sampler.</p>		<p>Part Sampler is now displayed in your job dashboard.</p>
<p>4 Double-click the Part Sampler widget.</p>	<p>N/A</p>	<p>The Part Sampler is now full screen and the Start button is visible.</p> 
<p>5 Select the Start button.</p>		<p>Part Sampling cannot start.</p>

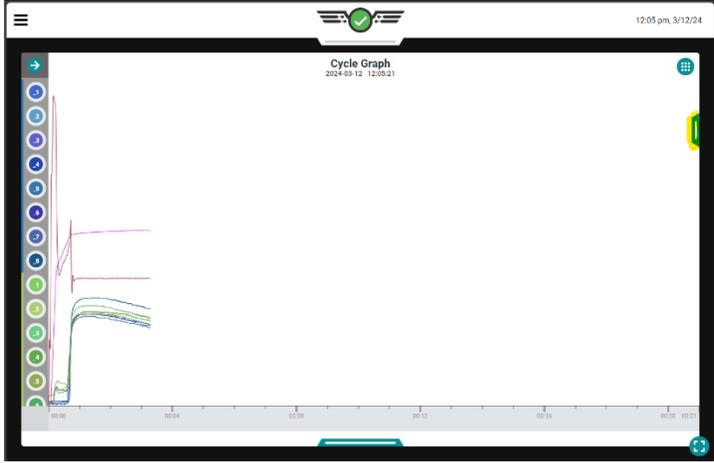
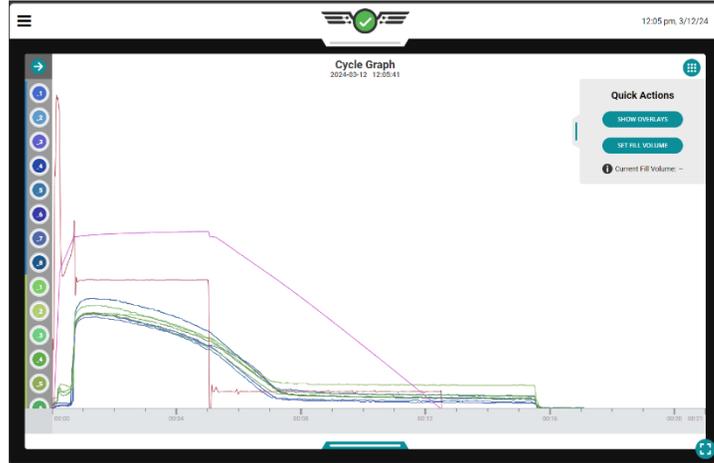
<p>6</p>	<p>Select Group for sample type. Select Start.</p>		<p>Part Sampling cannot start.</p>
<p>7</p>	<p>Input a Group Name as Test Select Start.</p>		<p>Part Sampling cannot start.</p>
<p>8</p>	<p>Input a Shot quantity as 100 Select Start.</p>		<p>Part Sampling cannot start.</p>

<p>9</p>	<p>Input a Shot quantity as 99 Select Start.</p>		<p>Part Sampling begins.</p>
<p>Tested By:</p>		<p>Date:</p>	<p>Pass/Fail:</p>

OQ Test 10: FC-21408 (Clicking the Set Fill Volume button produces a message that the action was successful along with the set value.)

Preconditions: FC-9982, FC-9983, FC-9984, FC-9990

	Step	Data	Expected Result
1	Double tap/click the center of the Cycle Graph widget.	N/A	<p>The widget will expand to fill the entire screen.</p> 

<p>2 On the right-hand side:</p> <p>Look for the Quick Actions thumbnail.</p> <p>Click/touch and drag to the left to expand the menu.</p>		<p>Quick Actions should now be visible.</p> 
<p>3 Touch/click and hold on the Cycle Graph for a least one second, wherever you'd like to set your fill volume.</p>	<p>N/A</p>	<p>A vertical line will appear relative to the spot you are targeting.</p> 

4 Click/touch Set Fill Volume on the Quick Actions menu to set the fill volume at the spot selected.



The Set Fill Volume button will change to Reset Fill Volume and the **volumetric measurement will be displayed**.

Additionally, a green toast message should appear at the top left of the screen that reads **You have successfully set your Fill Volume to <value> in³**



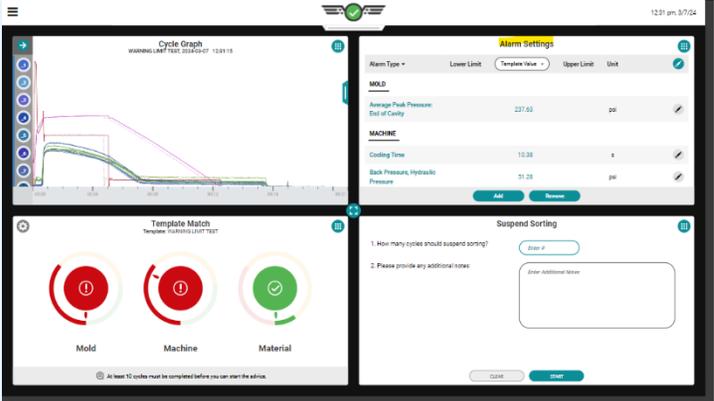
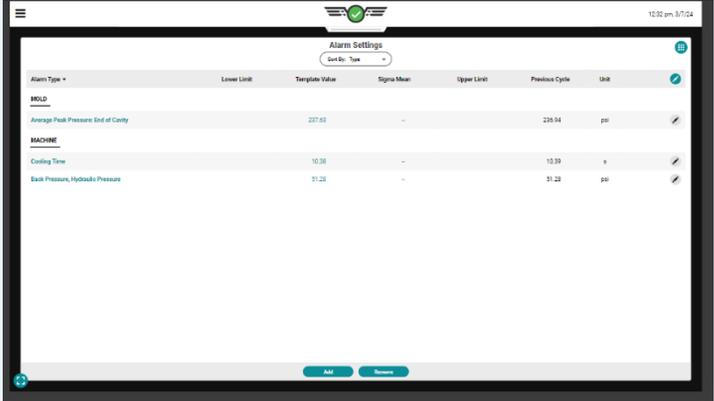
Tested By:

Date:

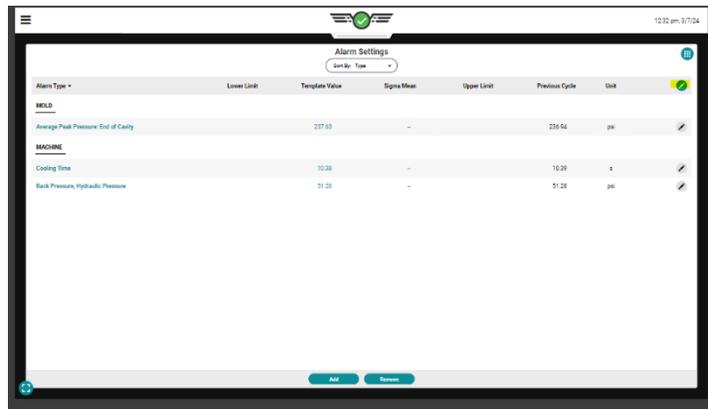
Pass/Fail:

OQ Test 11: FC-21419 (Verify when a Warning Limit value is within the limit it's in the warning state.)

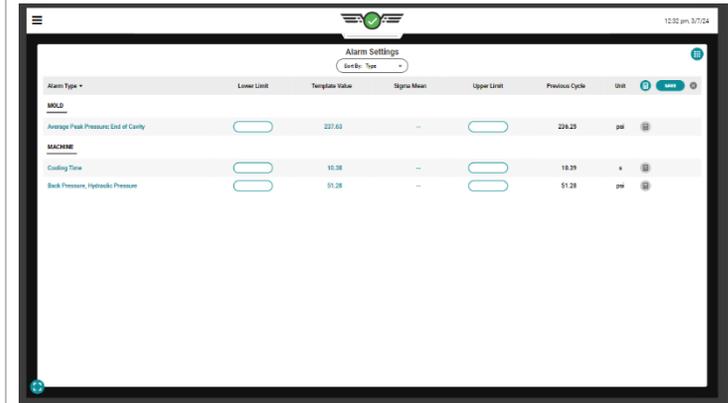
Preconditions: FC-17123, FC-9982, FC-9983, FC-9984, FC-9990, FC-11180, FC-11198, FC-12019, FC-26113

Step	Data	Expected Result
<p>1 Expand the Alarm Settings widget by double tapping it.</p>		<p>The widget will fill the screen.</p> 

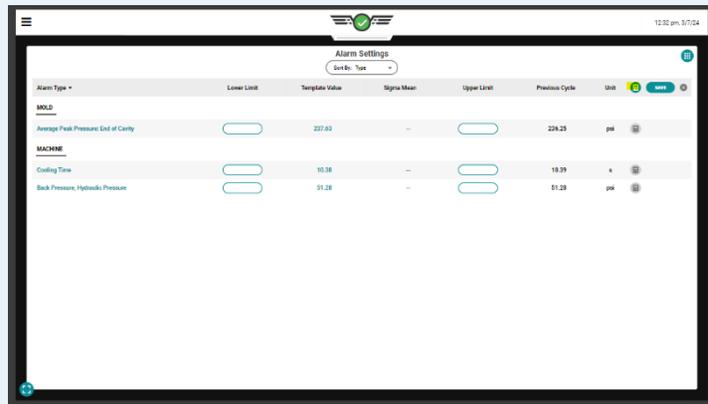
2 Select the teal Pencil icon in the top right corner of the widget.



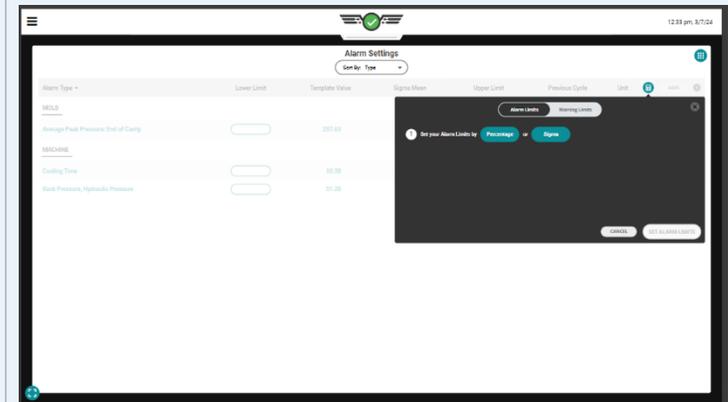
The Alarm Settings widget will be in **Edit** mode.



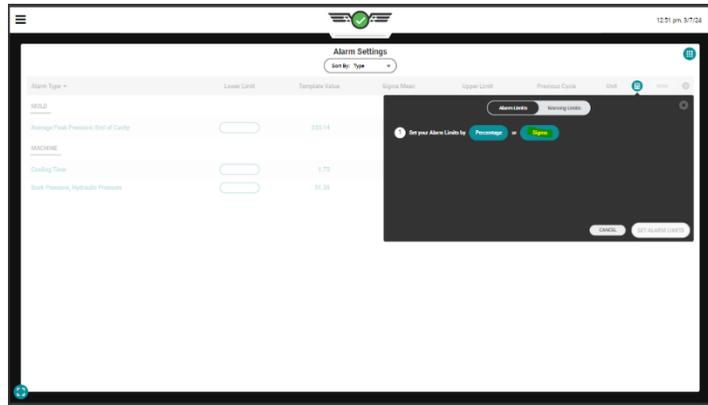
3 Select the teal Calculator icon in the top right corner of the widget.



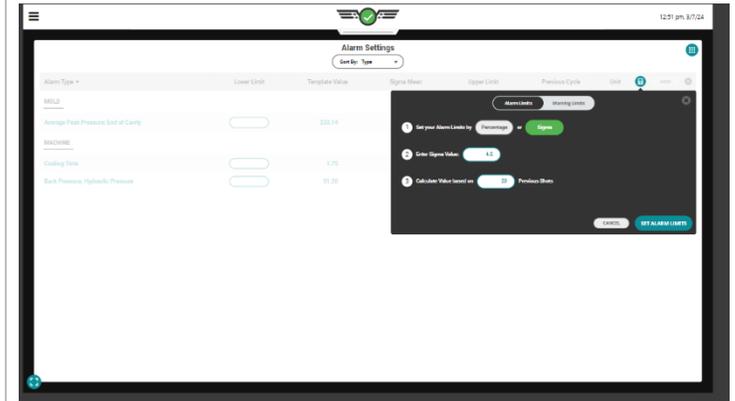
The Alarm Limits window will be displayed.



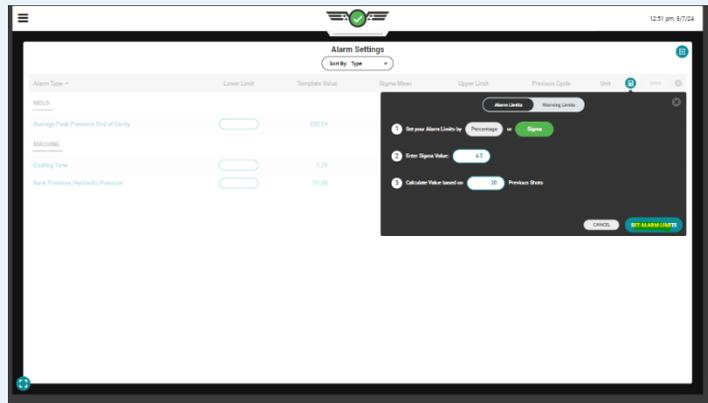
4 Select the Sigma option.



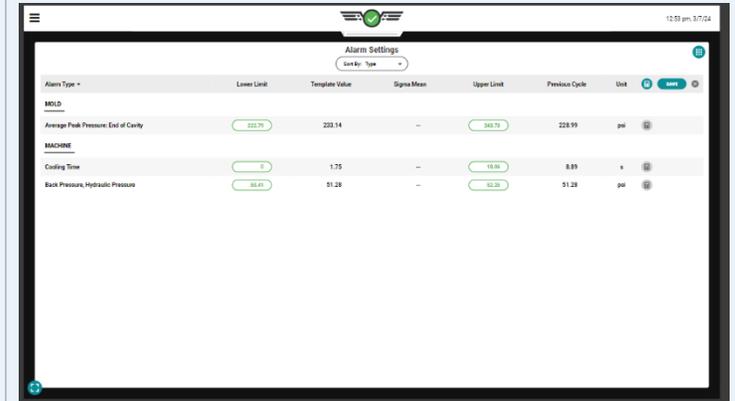
The sigma value and previous shots input fields appear.



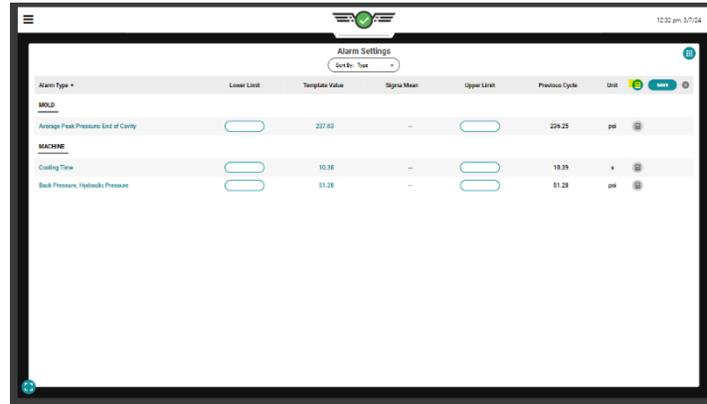
5 Wait until 20 cycles have been taken, click the set alarm limits button.



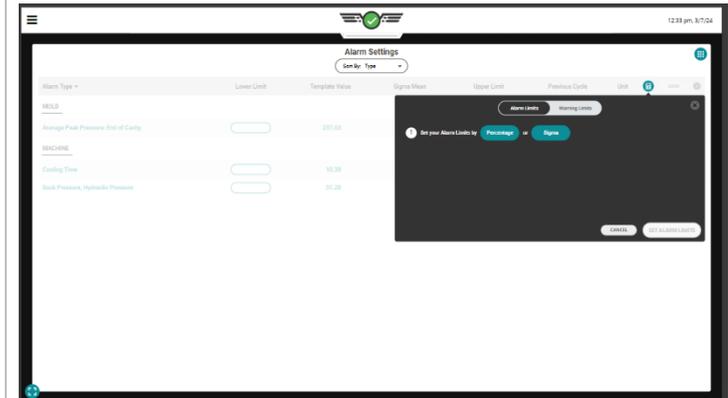
The upper and lower limits fields will automatically populate.



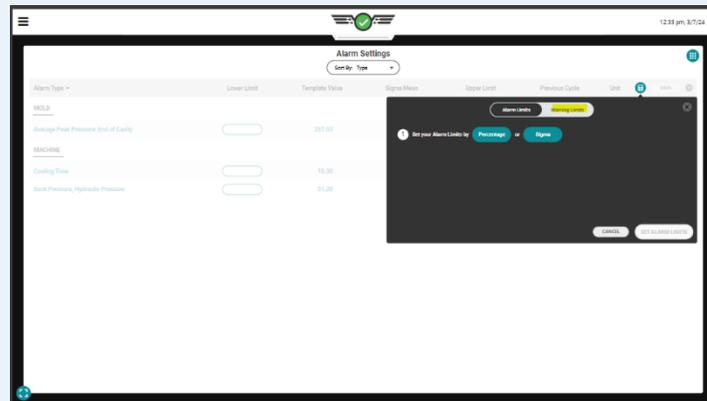
6 Select the teal Calculator icon in the top right corner of the widget.



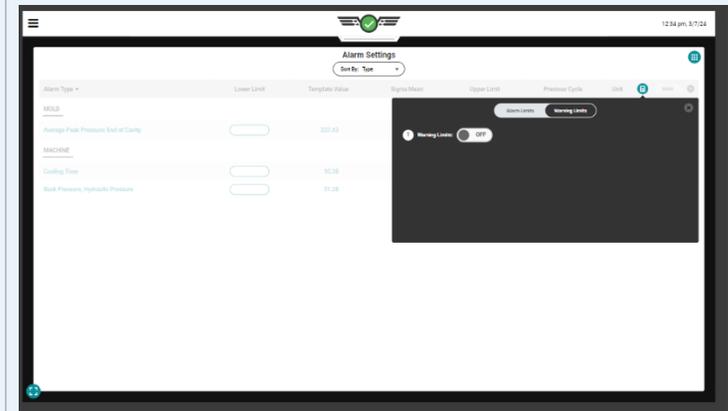
The Alarm Limits window will be displayed.



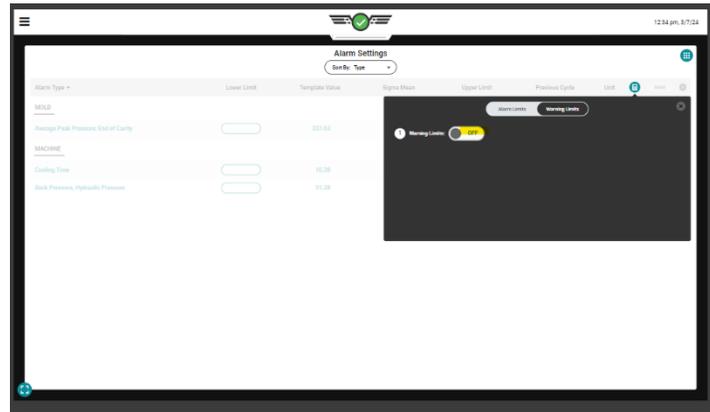
7 Select the Warning Limits tab.



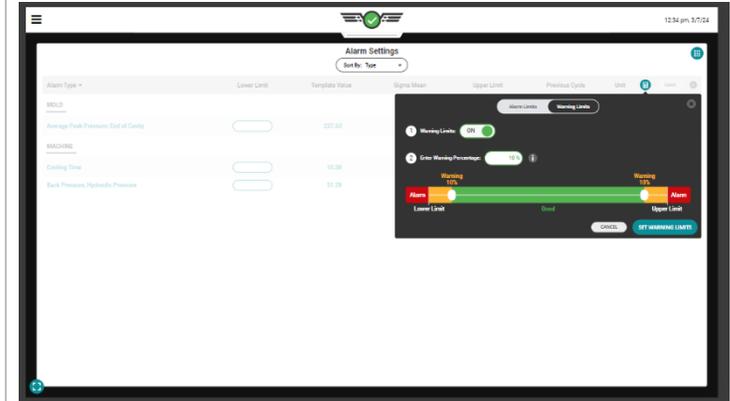
The Warning Limits window will be displayed.



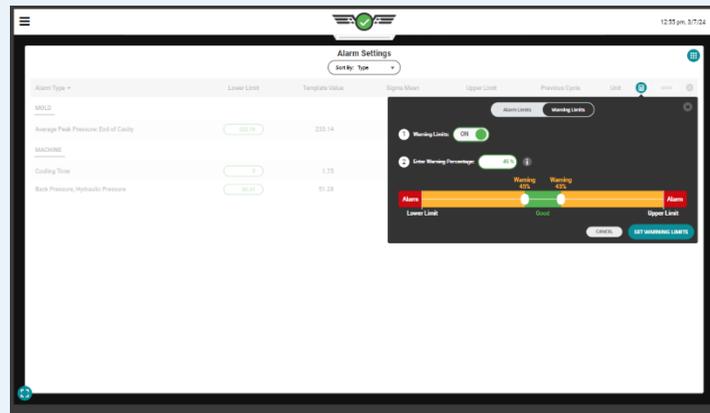
8 If Warning Limits is Off:
Select the Warning Limits toggle button to turn it On.



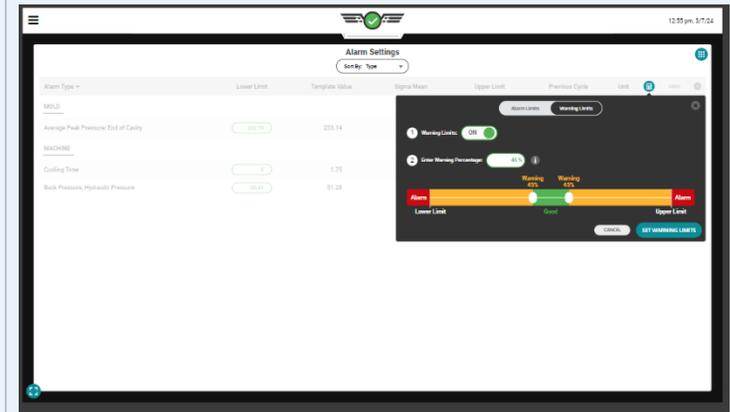
The Warning Limits toggle will display On and be highlighted in green.
The warning limit percentage input and bar will appear.



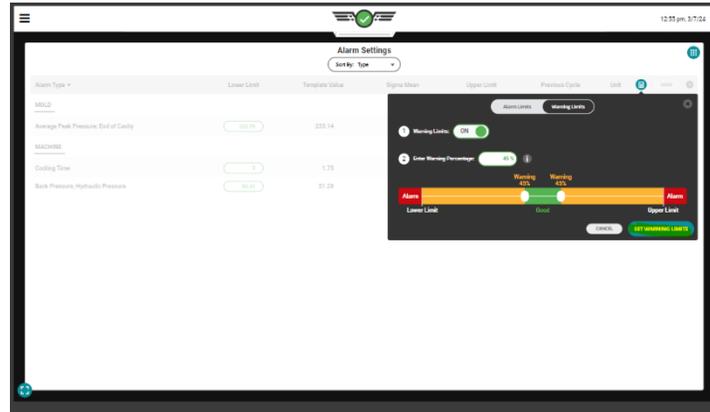
9 Enter a value of 45 into the **Enter Warning Percentage** field.
Percentage = 45.



The value will be displayed inside the field.

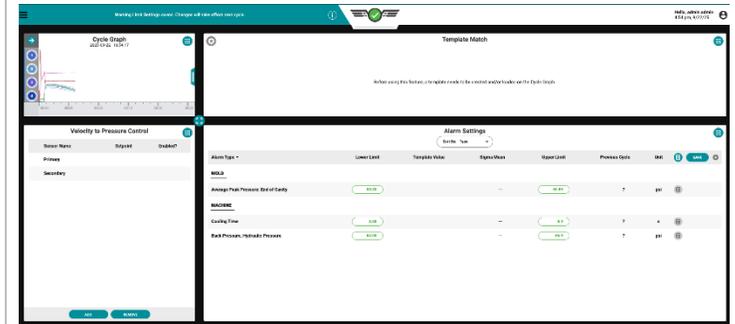


10 Select the Set Warning Limits button.

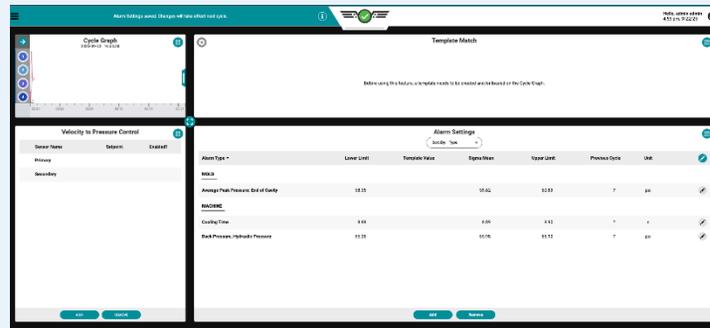


The window will close and a toast message will display that says: Warning Limit Settings Saved.

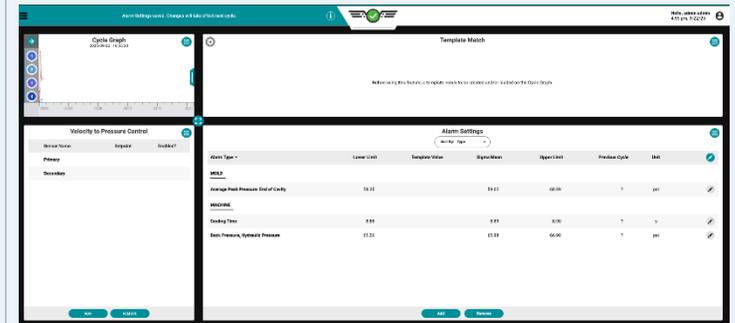
This change will take effect next cycle.

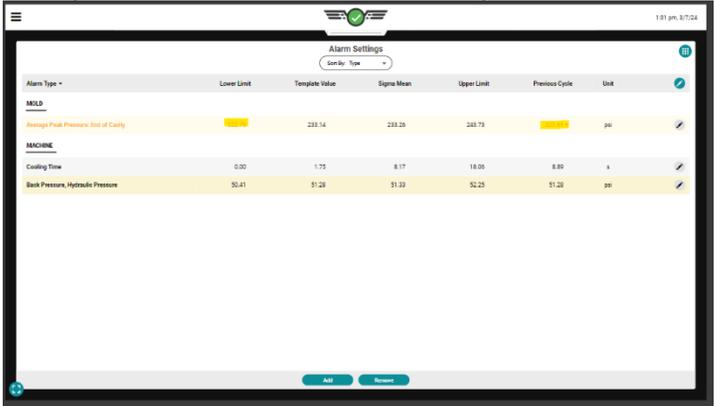


11 Click the teal save button on the top right corner of the widget.



Alarm settings are changed and a toast message notifies user that the alarm settings are saved, and changes will take place next cycle.



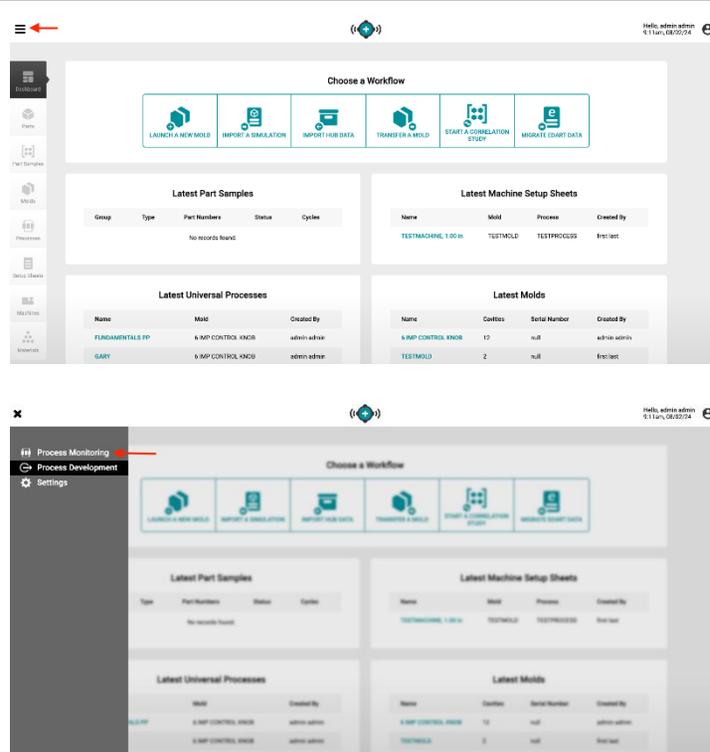
12	<p>Verify when a value is within the warning limit of 45%:</p> <p>The value on the alarm widget enters a warning state and turns yellow.</p>	N/A	<p>A value on the alarm widget enters a warning state and turns yellow when it is within the warning limit of 45%.</p> 
Tested By:		Date:	Pass/Fail:

OQ Test 12: FC-21933 (Verify that data from the CoPilot shows up on the Hub.)

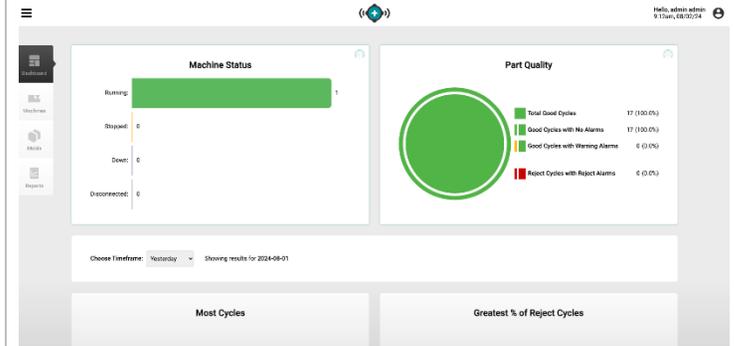
Preconditions: FC-9982, FC-9983, FC-9984, FC-9990, FC-10207, FC-14406, FC-12019

Step		Data	Expected Result
1	<p>Before proceeding, complete the preconditions:</p> <p>Connect a CoPilot to your Hub.</p> <p>Start a job and create/load a template.</p>	N/A	You have a job running with a template loaded.

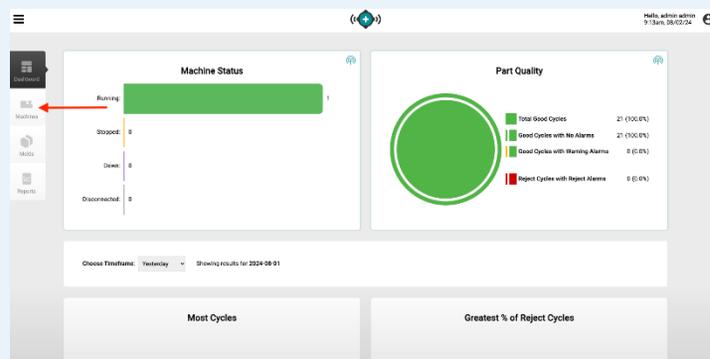
2 On the Hub frontend:
Click the menu button and choose Process Monitoring.



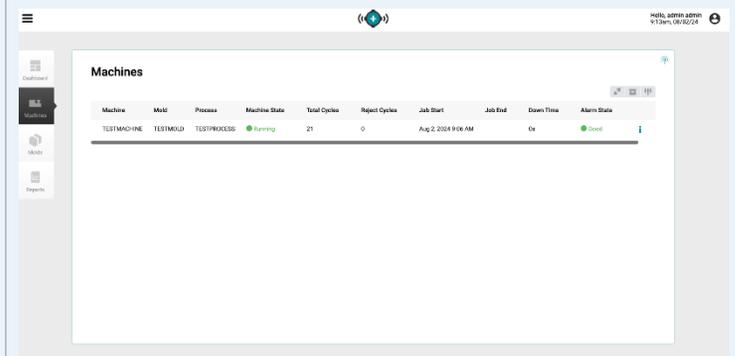
The Process Monitoring dashboard is displayed.



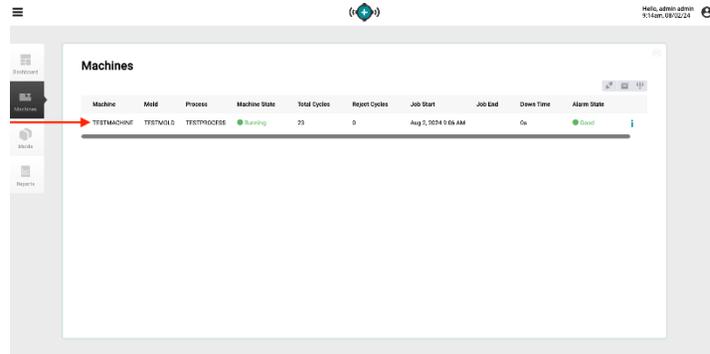
3 Select Machines Tab located along the left side bar.



List of connected machines will be displayed.



4 Select your machine.

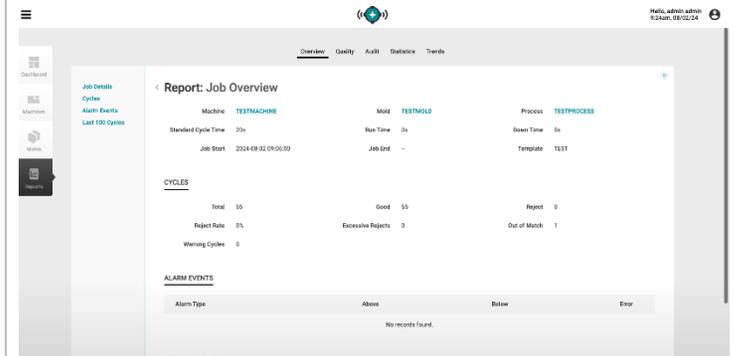


Job Details will be displayed.

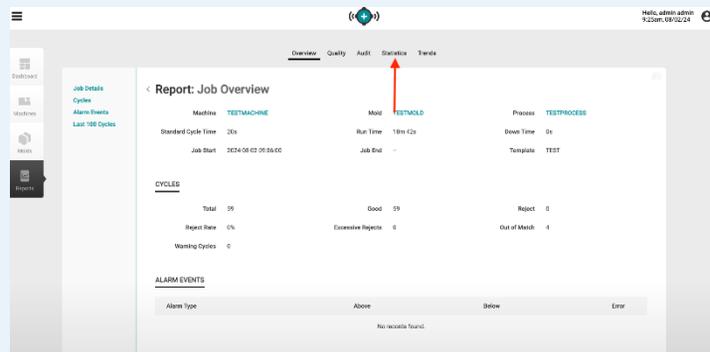
Total Cycles, Good Cycles and Reject Cycles will be populated.

Other various info will be populated, such as Standard Cycle Time, Job Start, and Run Time.

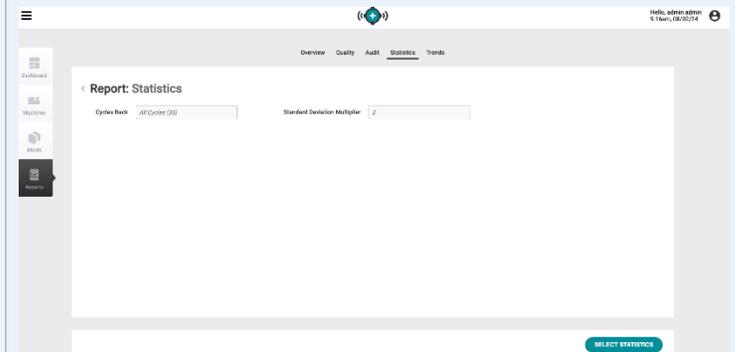
Last 100 Cycles should have some cycles shown.



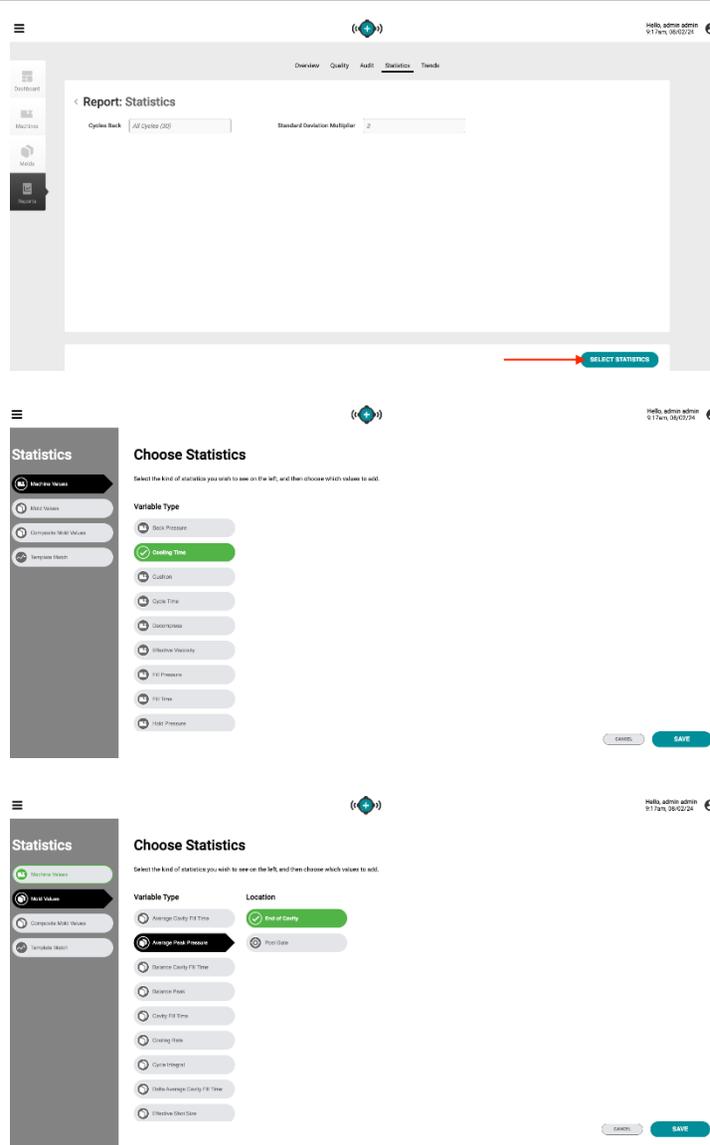
5 Select the Statistics Tab.



The Report: Statistics slide is shown.

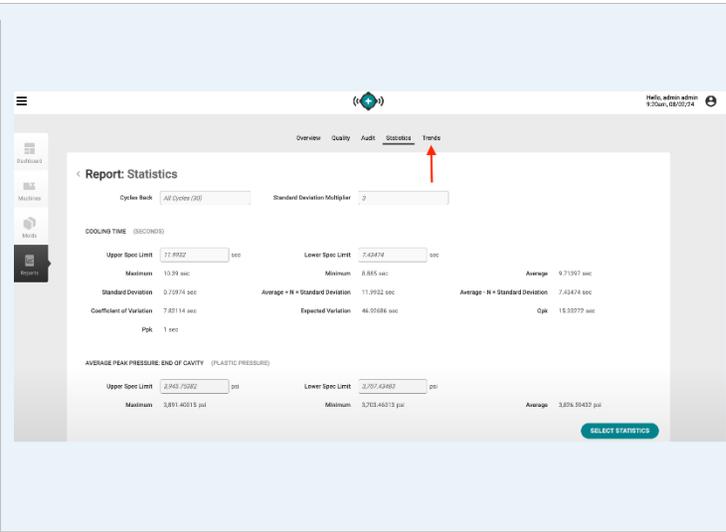


- 6 Click Select Statistics:
- Select at least one machine and mold variable.
- Click Save



- The variables you selected will be shown.
- Information you filled in such as will be visible including:
- Maximum
 - Minimum
 - Average
 - Standard Deviation

7 Select the Trends Tab.



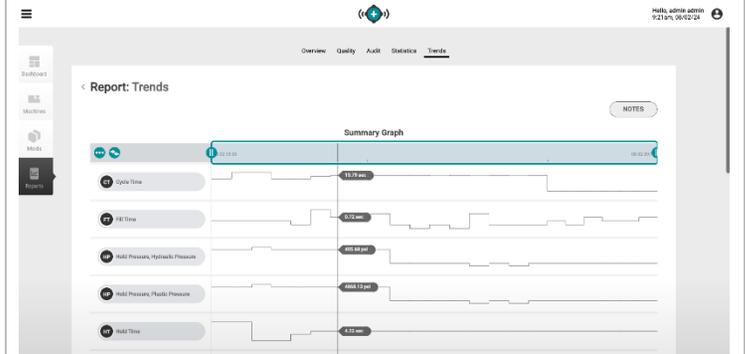
Summary and cycle graph will be visible.
Summary graph trend lines will be populated with data.



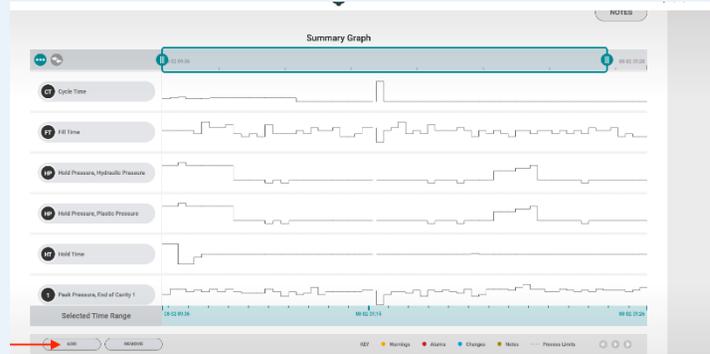
8 Click and hold an area of the summary graph to display cursor values.

N/A

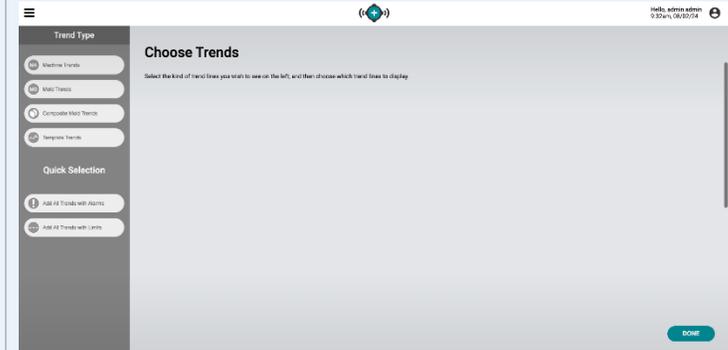
Cursor Values will be displayed along with the cycle graph for the selected time stamp.



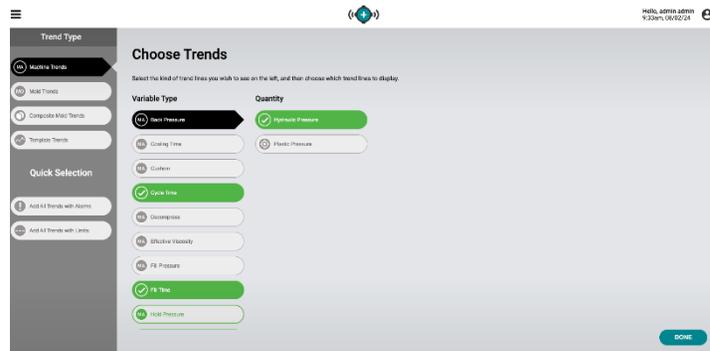
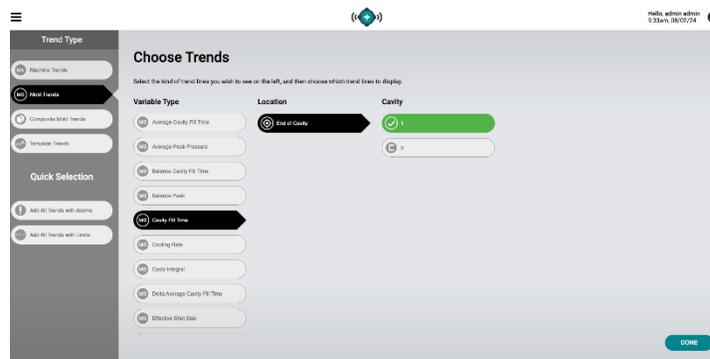
9 On the Summary Graph select the Add Button on the bottom.



Machine and Mold Trends Type chooses are available.



10 Select at least one Machine and Mold trend. Click Done.

The values you just added will be visible on the Summary Graph.



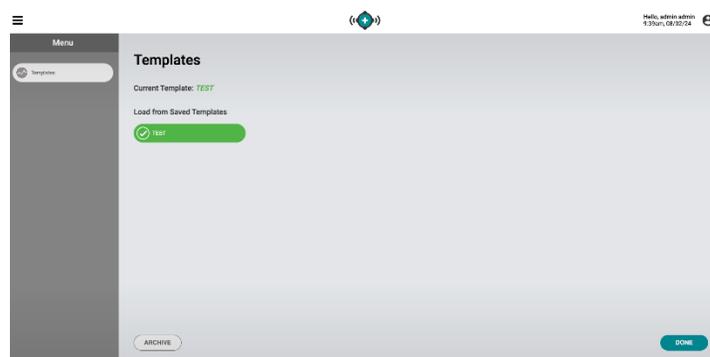
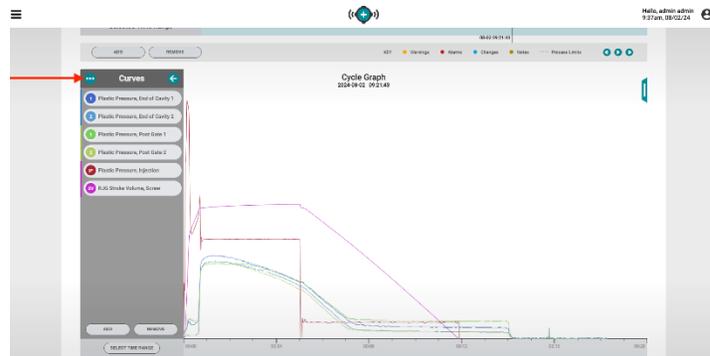
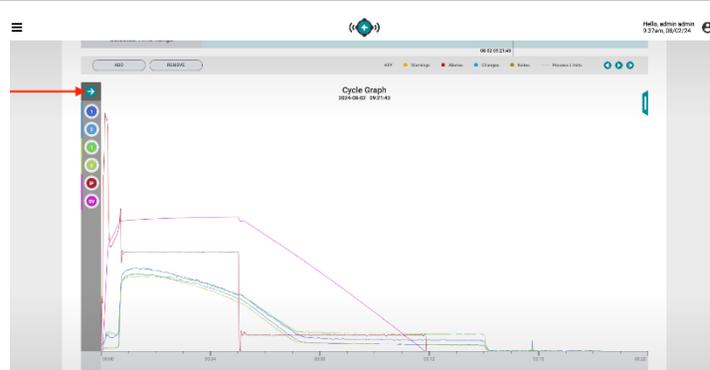
<p>11</p>	<p>Click and hold on the summary graph to bring up cursor values.</p>	<p>N/A</p>	<p>All selected variables from step 10 will be present and will display cursor values.</p> 
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12 With a cycle selected on the summary graph:

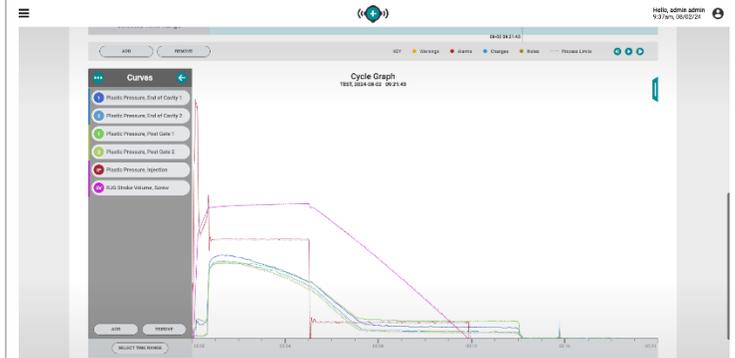
Go to the Cycle Graph and click the right arrow.

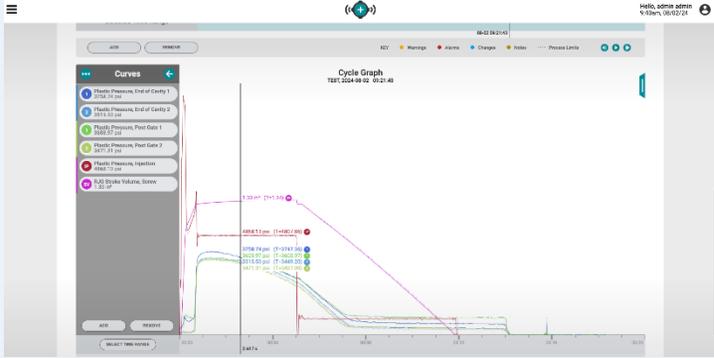
Click the `{{...}}` button to bring up the templates slide.

Select your template and click Done.



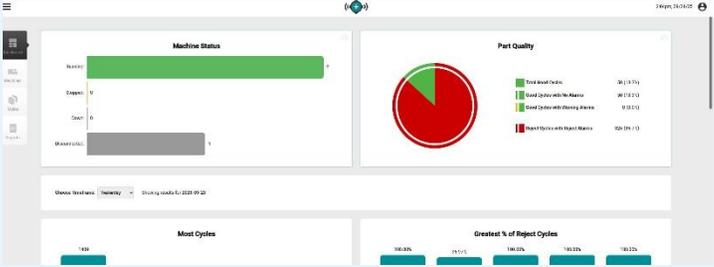
Your template is loaded on the Cycle Graph as dotted lines, behind the solid line of the cycle selected.



13	Click and hold a location on the Cycle Graph.		Cycle and template values will be shown where you clicked.
14			
Tested By:		Date:	Pass/Fail:

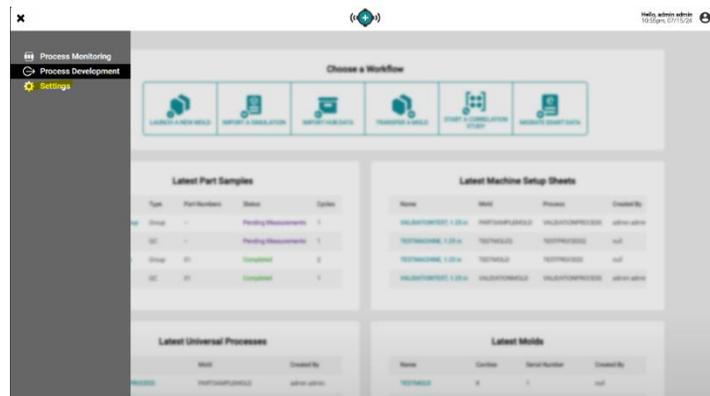
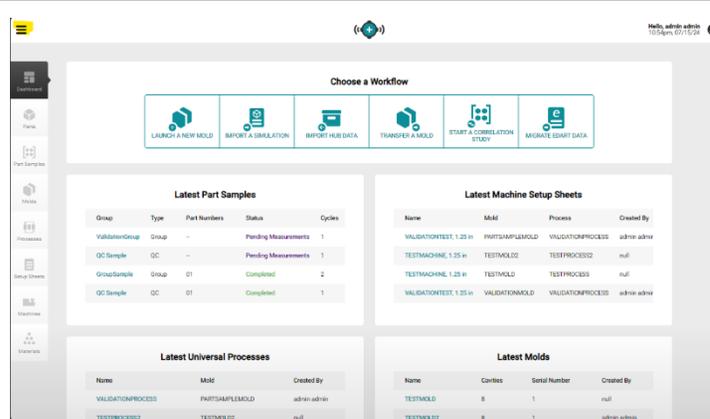
OQ Test 13: FC-24479 (A Hub user is denied access to a feature when the associated permission is disabled for their custom role.)

Preconditions: FC-9556

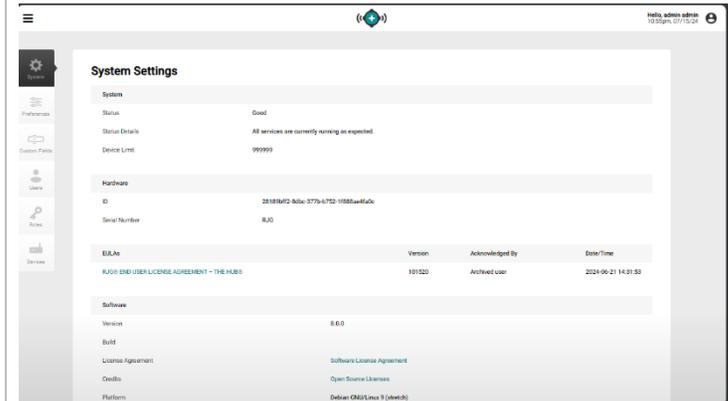
Step		Data	Expected Result
1	<p>Navigate to The Hub's Dashboard by inputting the Hub's IP-Address into a web-browser.</p> <p>Log in with supplied Username and Password that has Admin permissions.</p>	N/A	<p>Hub Dashboard is displayed.</p> 

2 Select the Menu on the top left corner of the Hub's Dashboard.

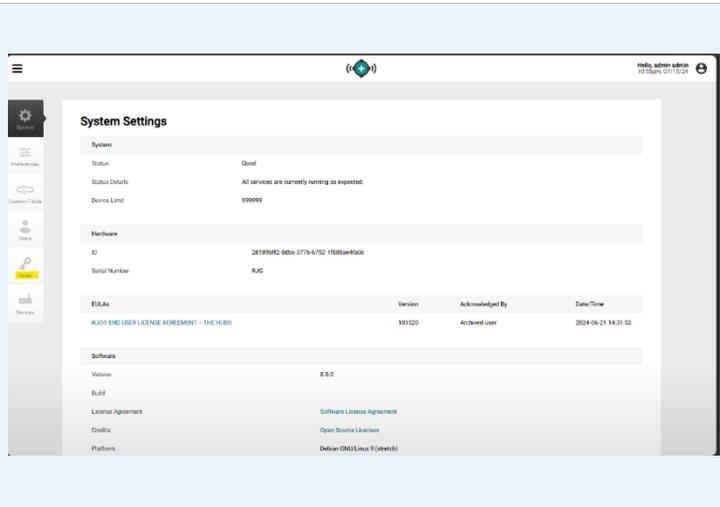
Select Settings.



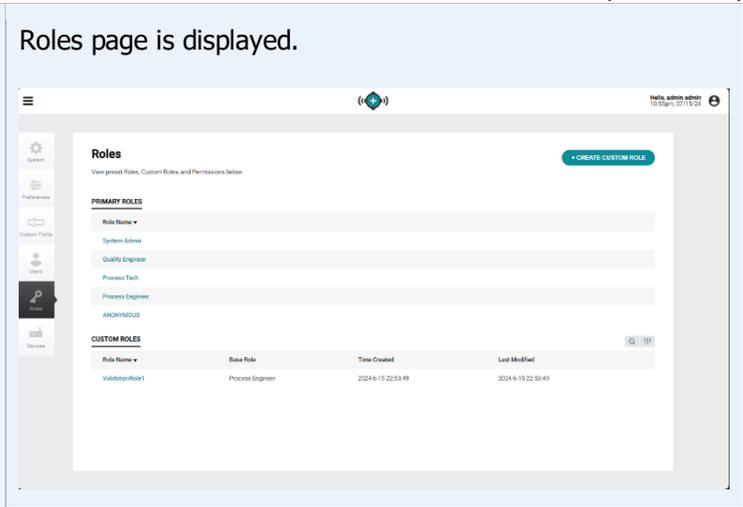
System Settings page is displayed.



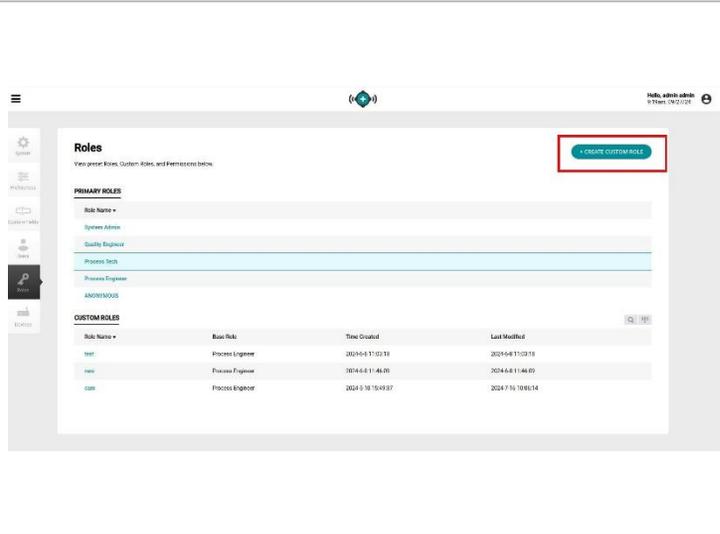
3 Select Roles from the menu on the left side of the Settings page.



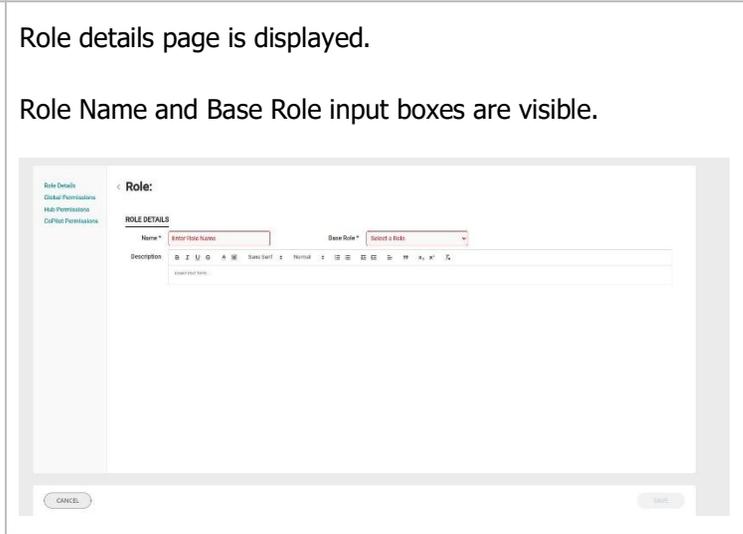
Roles page is displayed.



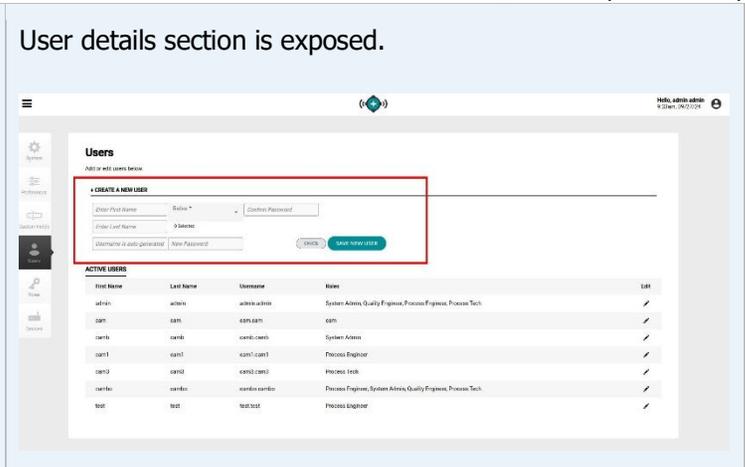
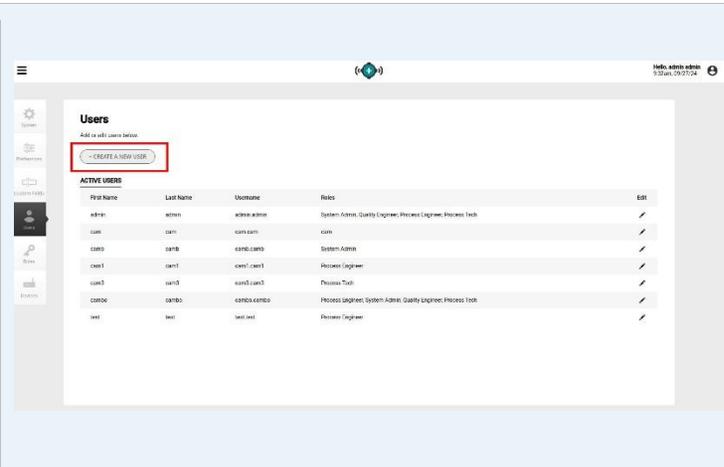
4 Select Create Custom Role.



Role details page is displayed.
Role Name and Base Role input boxes are visible.



7 Select Create a New User.



8 For the following input fields:

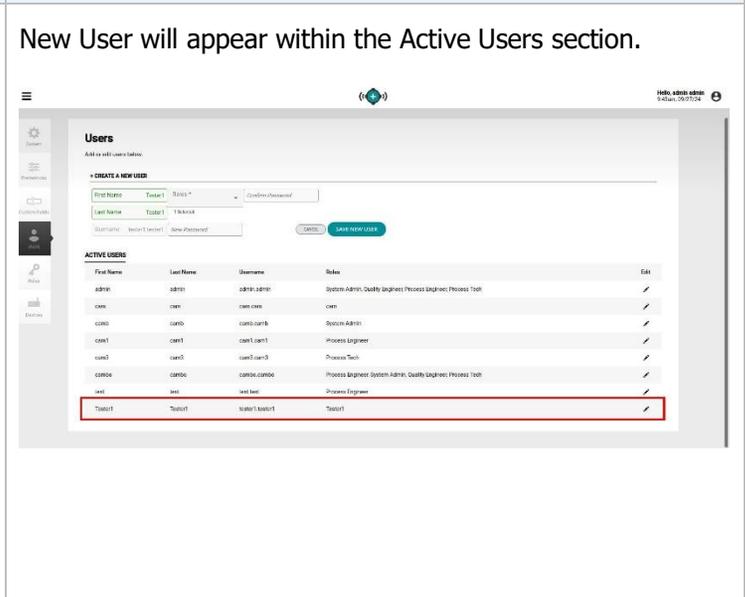
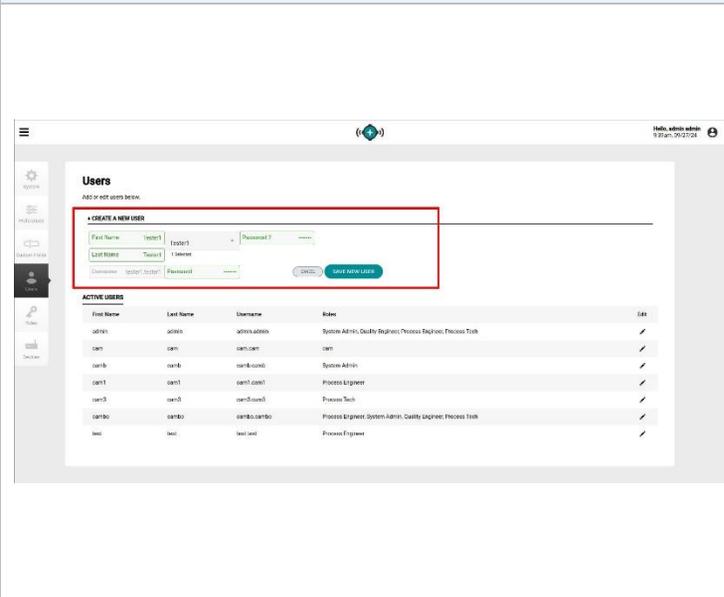
Enter First Name: Tester
First Name

Enter Last Name: Tester
Last Name

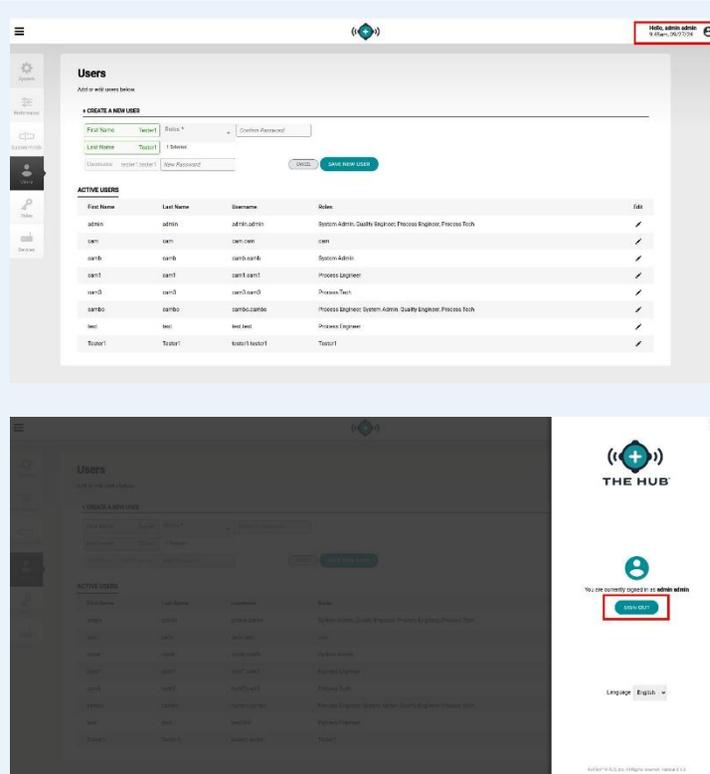
Roles: Role created from step 5

Password: Password

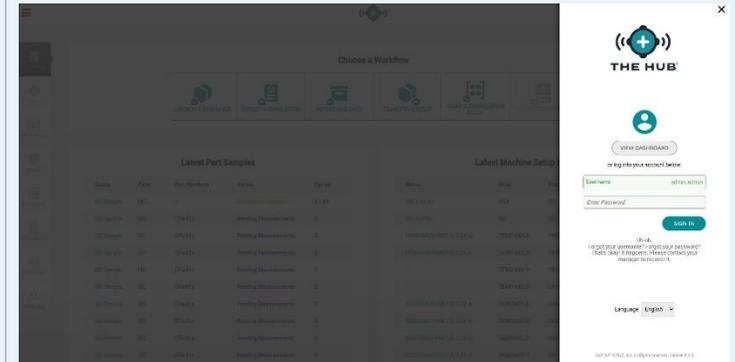
Select Save New User



- 9 Select the User Account button on the top right corner.
Select Logout.



Username and Password input boxes are visible:



10 Input the following:

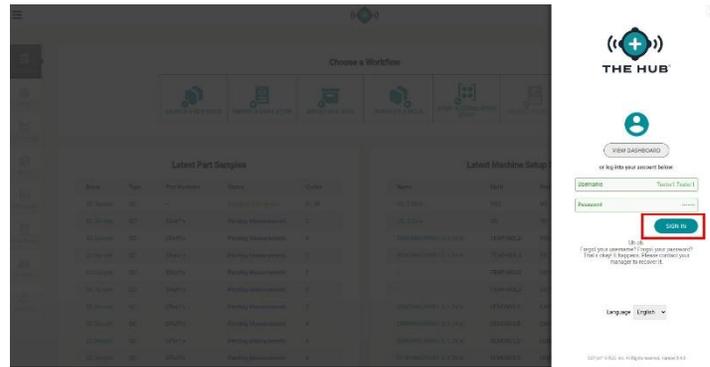
Username:

Tester First Name.Tester Last Name (created from step 8)

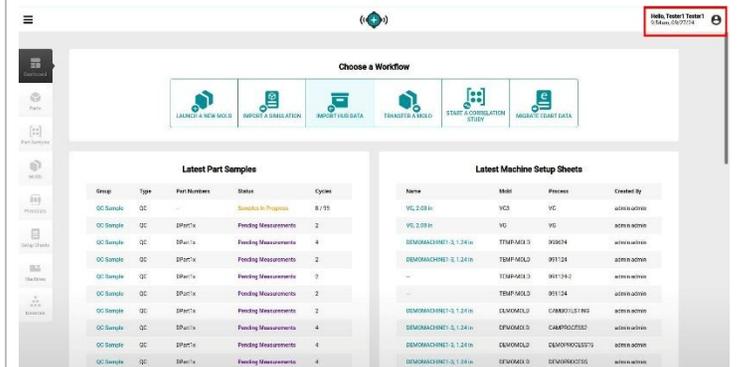
Password:

Password (created from step 8)

Select Sign In

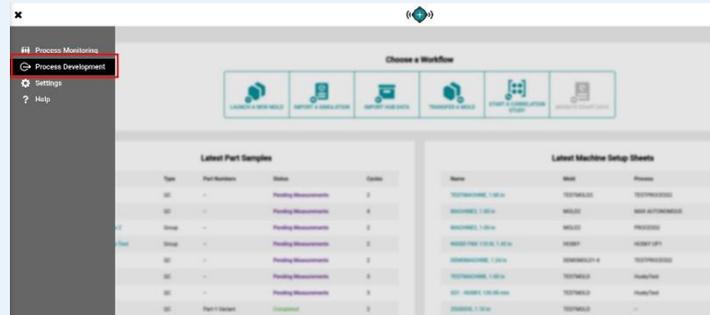


User is logged in. Username is displayed along the top right corner and the Hub Dashboard is visible.



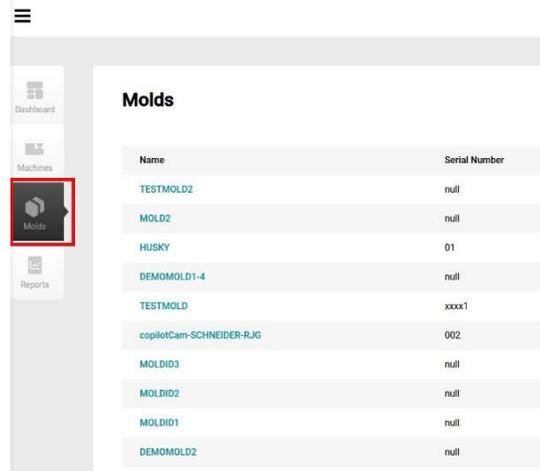
11 Select the Menu button, on the top left corner.

Select Process Development.



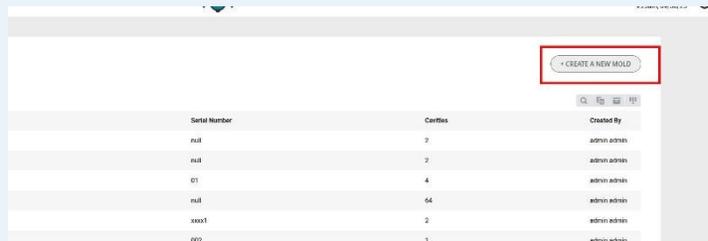
Process Development Dashboard is displayed.

12 Select Molds from the left side menu.

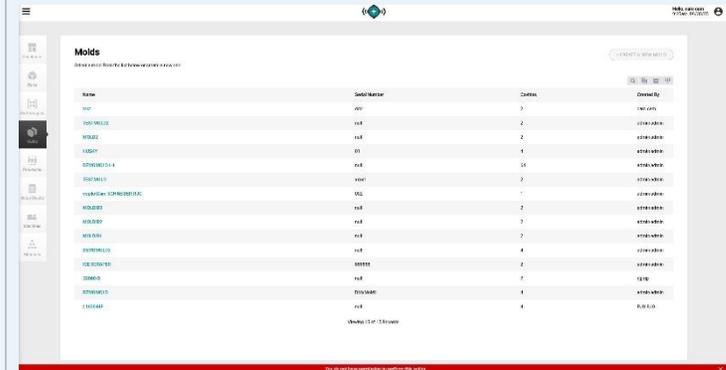


Molds list is displayed.

13 Select Create a New Mold.



Mold cannot be created. A Permission is denied message is displayed.



Tested By:

Date:

Pass/Fail:



OQ Test 14: FC-21846 (As a Quality Control Engineer verify that I can manually enter part measurements on the Hub for Samples that have been collected on the Copilot.)

Preconditions: FC-9077, FC-9556, FC-9982, FC-9983, FC-9984, FC-9990, FC-10207, FC-14296, FC14601, FC-15147, FC-15154

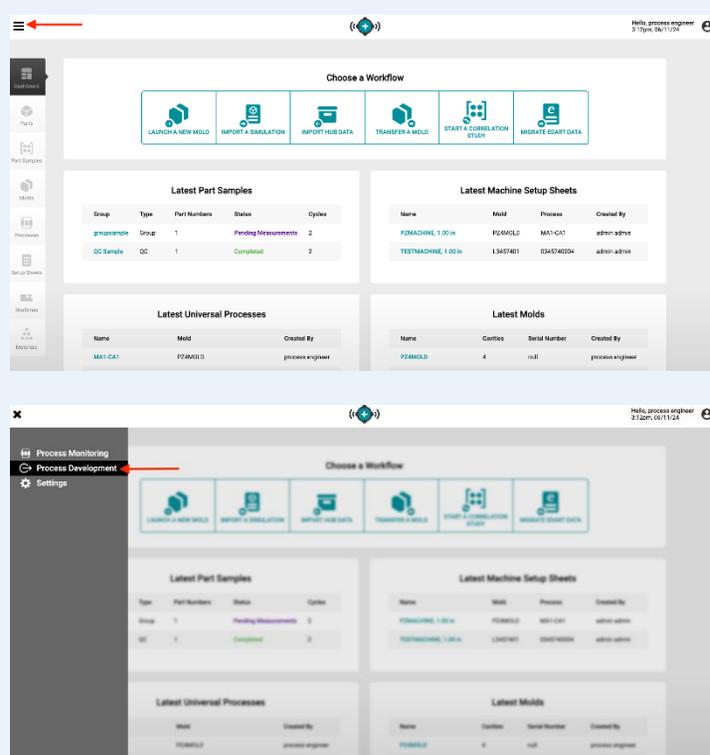
	Step	Data	Expected Result
1	Verify that you had completed the preconditions: Specifically taking a Part Sample	N/A	You have a CoPilot connected to your Hub and have taken a Group or QC Sample.

2 Login to the Hub as a Quality Engineer.



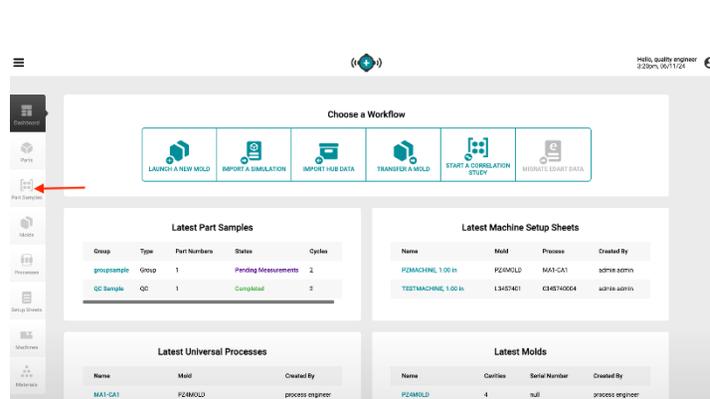
User is logged in and taken to the Hub Dashboard.

3 Select the menu along the top left corner of the dashboard and then select Process Development.

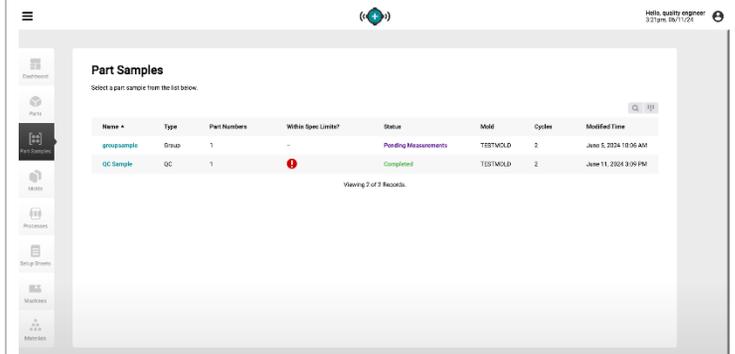


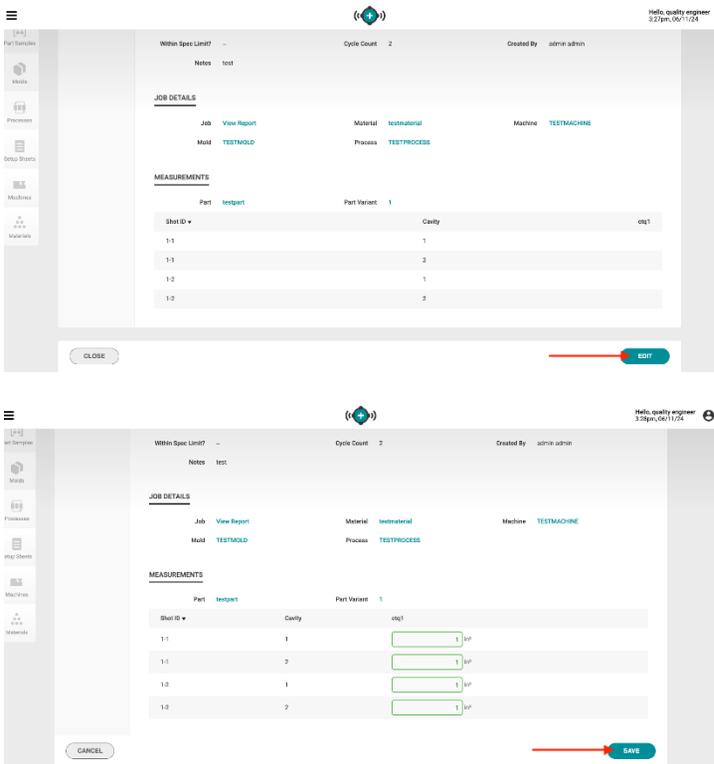
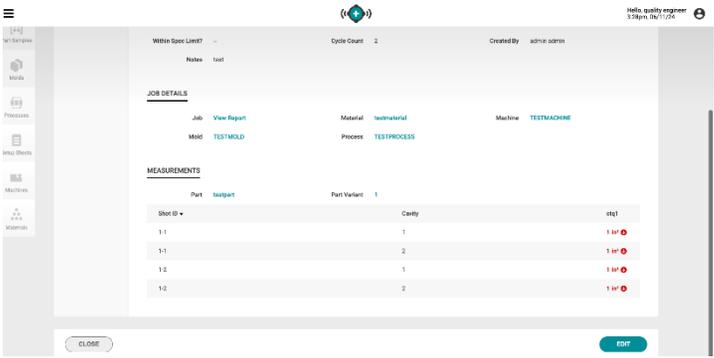
Process Development is displayed.

4 Select Part Samples from the menu on the left side of the dashboard.



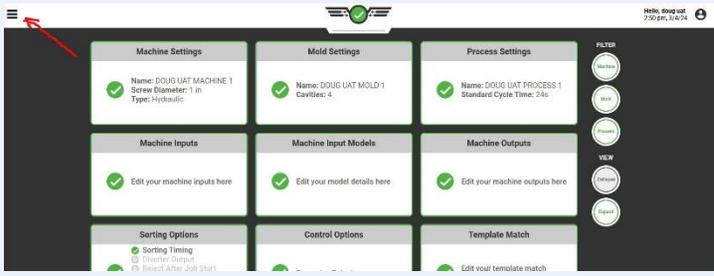
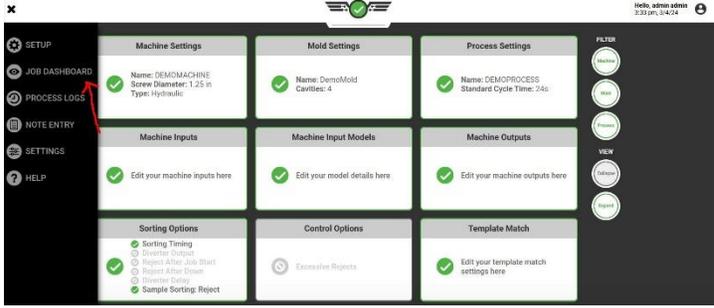
List of part samples are displayed.



<p>5</p>	<p>Select the Part Sample that was created during the preconditions.</p>	<p>N/A</p>	<p>Part Sample details are displayed.</p>
<p>6</p>	<p>Click Edit.</p> <p>Enter in your measurements in the Measurements table under your CTQ column.</p> <p>Click Save.</p>		<p>Filled in measurements turn green to indicate change.</p> <p>User is able to save manually entered measurements for the samples.</p> 
<p>Tested By:</p>		<p>Date:</p>	<p>Pass/Fail:</p>

OQ Test 15: FC-21855 (Selecting the info button on the Set Fill Volume toast message displays an information text box at the bottom of the screen.)

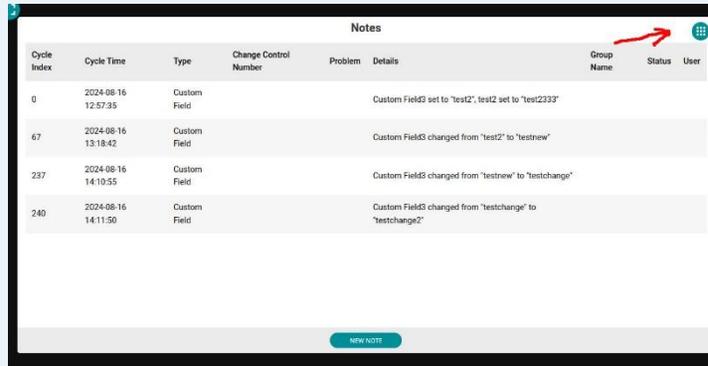
Preconditions: FC-9982, FC-9983, FC-9984, FC-9990

Step	Data	Expected Result
<p>1 Select the Menu on the upper left corner.</p>		<p>The Menu will open.</p>
<p>2 Select Job Dashboard from the Menu.</p>		<p>The user is at the Job Dashboard.</p>

3 Verify the Cycle Graph is displayed.

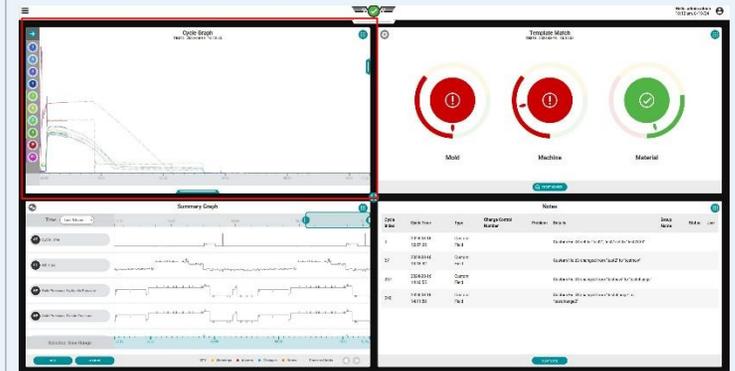
If not, replace a widget by clicking the 9-dot display view button on the top right of the widget.

Select the Cycle Graph.



Notes							
Cycle Index	Cycle Time	Type	Change Control Number	Problem	Details	Group Name	Status
0	2024-08-16 12:57:35	Custom Field			Custom Field2 set to "test2", test2 set to "test2333"		
67	2024-08-16 13:18:42	Custom Field			Custom Field2 changed from "test2" to "testnew"		
237	2024-08-16 14:10:55	Custom Field			Custom Field2 changed from "testnew" to "testchange"		
240	2024-08-16 14:11:50	Custom Field			Custom Field2 changed from "testchange" to "testchange2"		

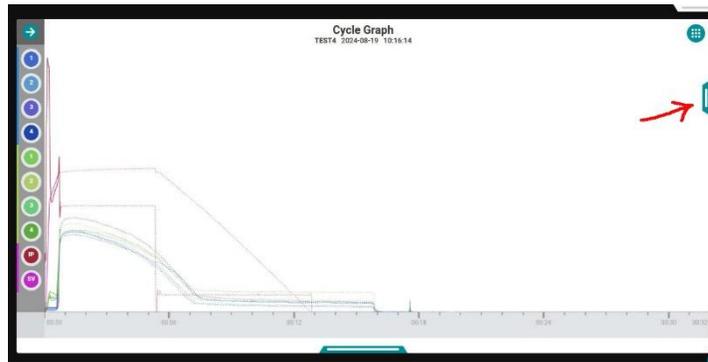
Cycle Graph widget is displayed on the Job Dashboard.



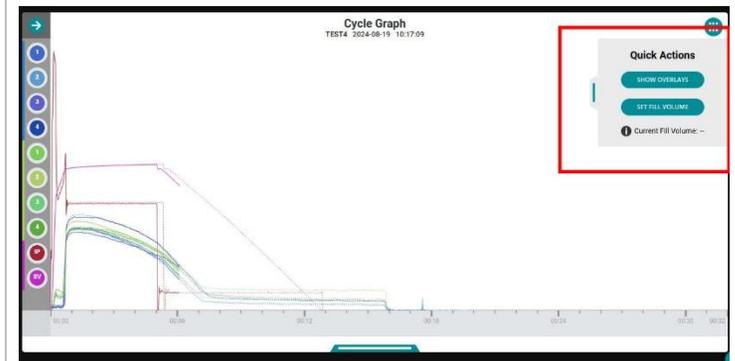
4 On the right-hand side of the Cycle Graph:

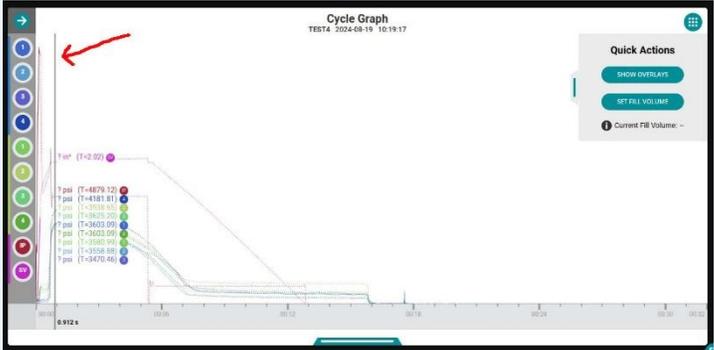
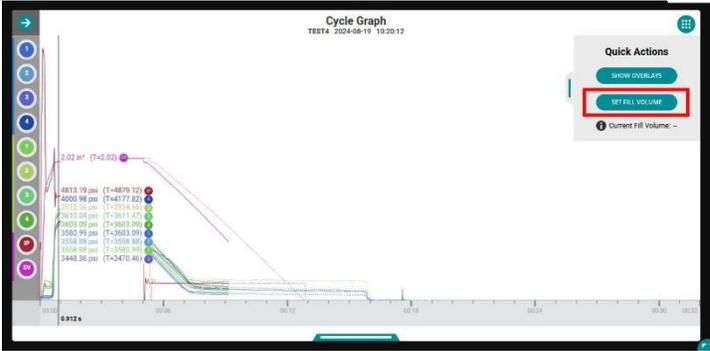
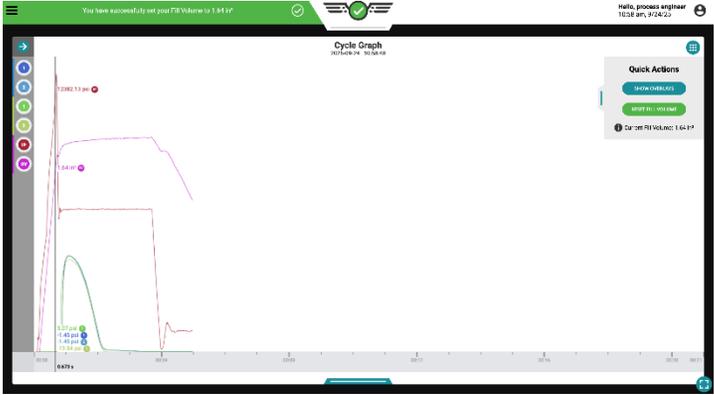
Look for the Quick Actions thumbnail.

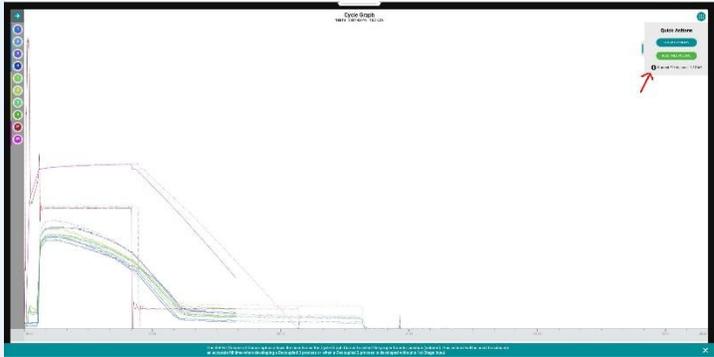
Click/touch and drag to the left to expand the menu.



Quick Actions should now be visible.



<p>5</p>	<p>Touch/click and hold on the Cycle Graph for a least one second, wherever you'd like to set your fill volume.</p>	<p>N/A</p>	<p>A vertical line will appear relative to the spot you are targeting.</p> 
<p>6</p>	<p>Click/touch Set Fill Volume on the Quick Actions menu to set the fill volume at the spot selected.</p>		<p>The Set Fill Volume button will change to Reset Fill Volume and the volumetric measurement will be displayed.</p> <p>Additionally, a green toast message should appear at the top left of the screen that reads:</p> <p>"You have successfully set your Fill Volume to <value> in³"</p> 

<p>7 Press the i button next to the Current Fill Volume.</p>		<p>An RJG-branded toast message will be displayed with the following text:</p> <p>“The Set Fill Volume at Cursor option allows the user to use the Cycle Graph Cursor to select the proper transfer position (volume).</p> <p>This volume will be used to calculate an accurate fill time when developing a Decoupled 3 process or when a Decoupled 2 process is developed without a 1st Stage Input.”</p>
<p>Tested By:</p>	<p>Date:</p>	<p>Pass/Fail:</p>



OQ Comments:

CONCLUSION OQ

Acceptance Criteria	All the testing documented in this section (Operational Qualification) met the acceptance criteria.		
Overall Test Status	Satisfactory <input type="checkbox"/>	Satisfactory with Deviation <input type="checkbox"/>	Unsatisfactory <input type="checkbox"/>
Test Approved by Quality	Name	Signature	Date

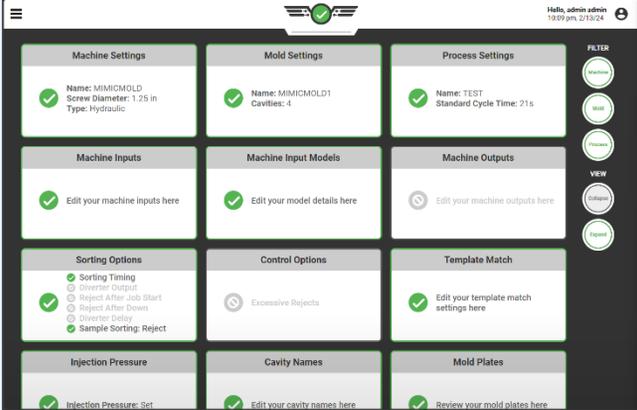


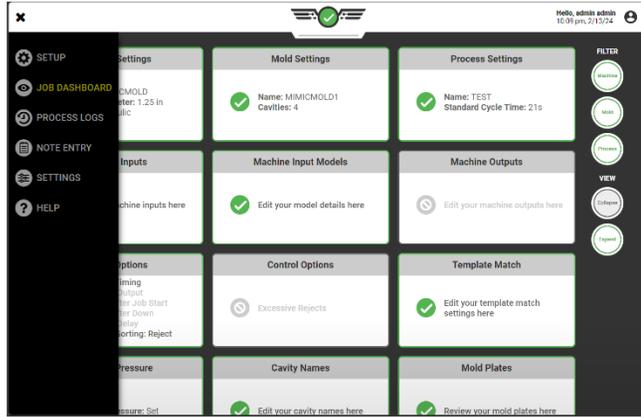
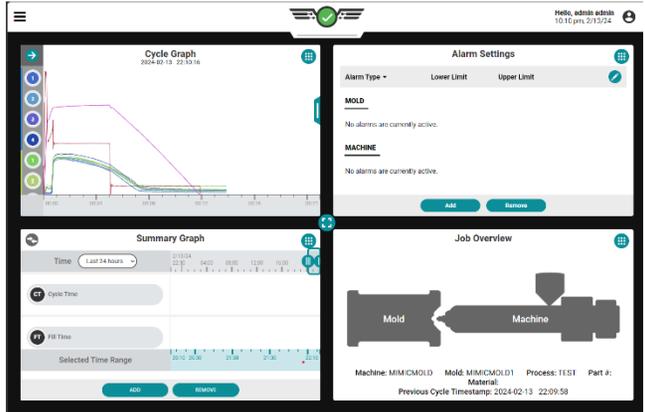
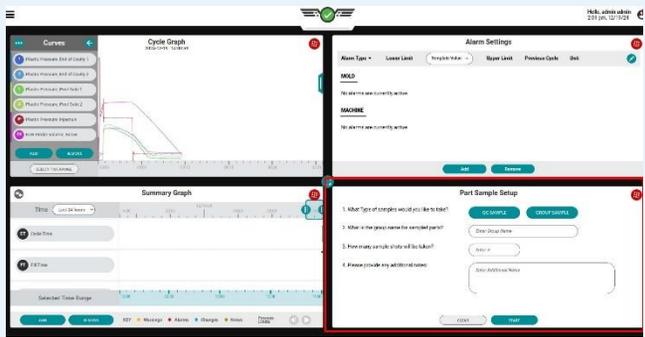
7. PERFORMANCE QUALIFICATION (PQ)

The Performance Qualification testing, listed below will be performed to evaluate the long-term consistency of the CoPilot and The Hub to meet predetermined specifications and acceptance criteria. Once these PQ tests are completed and expectations met, for the PQ portion of this abbreviated validation can be signed off and you can close out this validation test plan and review the conclusion of this document.

PQ Test 1: FC-24356 (A note that was created during a job with a minimum of 300 completed cycles can be viewed from The Hub.)

Preconditions: FC-9556, FC-9982, FC9983, FC-9984, FC9990, FC10207

Step	Data	Expected Result
<p>1 <u>From The CoPilot:</u></p> <p>Login to the Copilot as a User with a Processing Engineer role.</p>	<p>N/A</p>	<p>User is logged in to the CoPilot and at the setup screen.</p> 

<p>2</p>	<p><u>From The CoPilot:</u></p> <p>Click the Menu and Job Dashboard.</p>		<p>You are taken to the job dashboard.</p> 
<p>3</p>	<p><u>From The CoPilot:</u></p> <p>Verify the Part Sampler widget is displayed.</p> <p>If not, replace a widget by clicking the 9-dot display view button on the top right of the widget and selecting Part Sampler.</p>	<p>N/A</p>	<p>Part Sampler Widget is visible on the Job Dashboard:</p> 

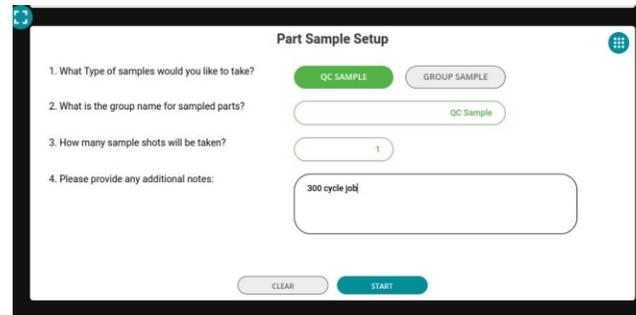
4 From the CoPilot:

From the Part Sampler page, make the following selections:

- Type: QC Sample
- Name: QC Sample
- Sample Shot #: 1

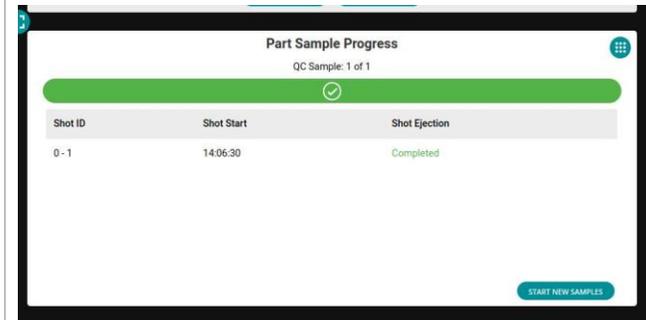
For additional notes, input: 300 cycle job.

Select Start.



Part Sampler will begin when the next cycle starts and complete once the cycle is over.

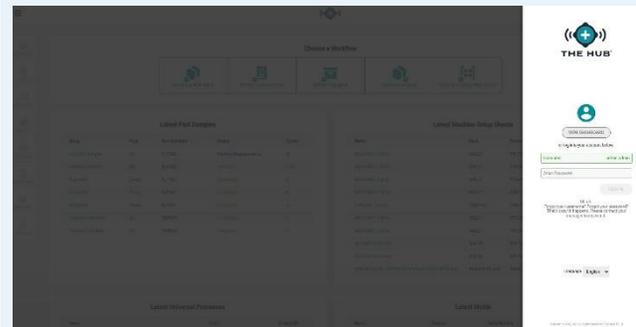
Shot Ejection will say Completed.



Shot ID	Shot Start	Shot Ejection
0-1	14:06:30	Completed

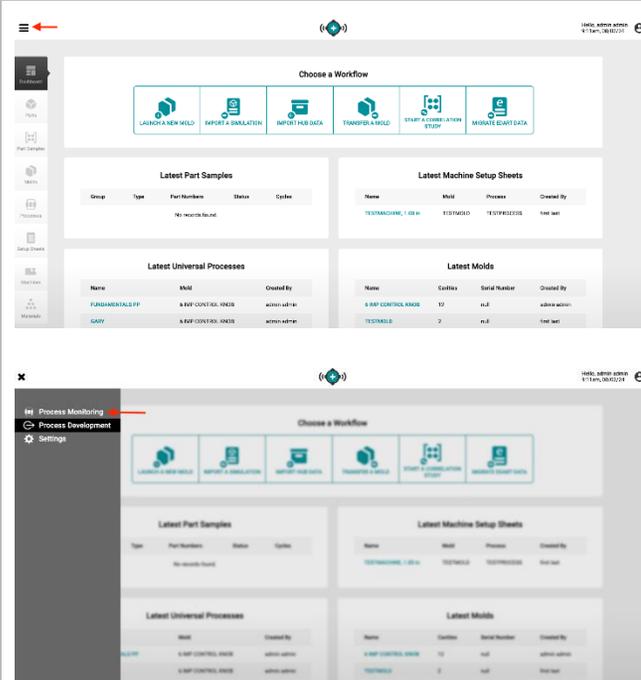
5 From The Hub:

Input the Hub's IP Address into a web-browser and login with supplied Username and Password.

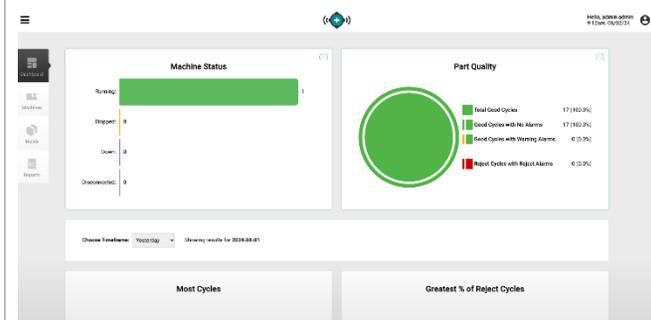


Hub Dashboard is displayed.

6 From The Hub:
On the Hub frontend, click the menu button.
Choose Process Monitoring.



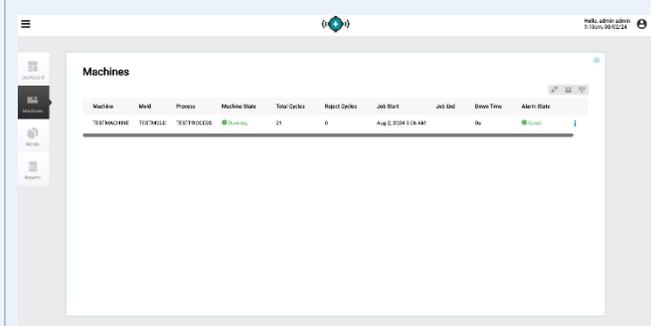
Process Monitoring dashboard is displayed.

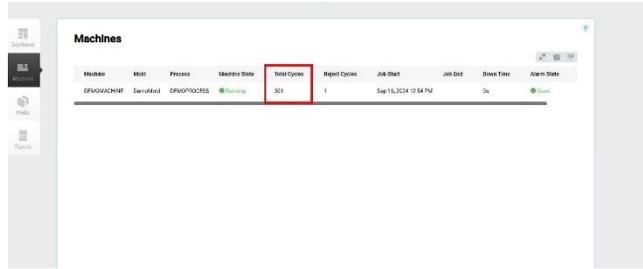
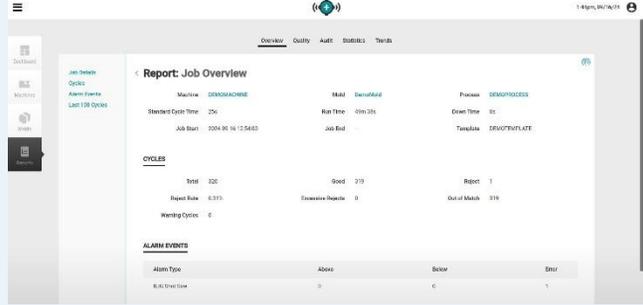


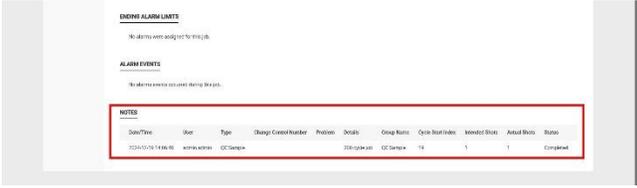
7 From The Hub:
Select Machines Tab located along the left side bar.



List of connected machines will be displayed.



<p>8</p>	<p><u>From The Hub:</u></p> <p>Find your Machine and view the current Total Cycle count.</p> <p>Wait for the <u>Total Cycle</u> Count to be > 300.</p>		<p>Total Cycles will show 300 or more.</p> 
<p>9</p>	<p><u>From The Hub:</u></p> <p>Select your Machine.</p>	<p>N/A</p>	<p>Job Overview page is displayed.</p> 

10	<p><u>Form The Hub:</u></p> <p>Select the Audit Tab, along the top of the overview page.</p>	N/A	<p>Job Audit page is displayed. A note created from the Part Sample during step 4 is present.</p> 
Tested By:		Date:	Pass/Fail:



PQ Comments:

CONCLUSION PQ

Acceptance Criteria	All the testing documented in this section (Performance Qualification) met the acceptance criteria.		
Overall Test Status	Satisfactory <input type="checkbox"/>	Satisfactory with Deviation <input type="checkbox"/>	Unsatisfactory <input type="checkbox"/>
Test Approved by Quality	Name	Signature	Date

8. PRE-CONDITION QUALIFICATION

FC-9077: Create a Hub Material

1. From The Hub
2. Select Materials from the Process Development Dashboard
3. Select Create a New Material
4. Input for Name: Material-1
5. Select Save

FC-9556: Creating a Hub User Account

1. Select the "Burger Menu", located in the top left corner of the hub dashboard.
2. Select "Settings"
3. Select "Users"
4. Select "Create New user"
5. Input: First Name, Last Name, Process Engineer and Administrator, Password and Confirm Password
6. Select "Save New user"

FC-9982: Create a New Machine

1. Connect copilot to a machine
2. Select the "CoPilot Logo" along the top
3. Select the "Machine" drop down menu
4. Select "Create New"
5. Input "Machine Name = DemoMachine" , "Screw Diameter of machine" and the type of machine "Electric or Hydraulic" and Select "Next"
6. Assign connected machine input signals and then select "Next"
7. Proceed through workflow, assigning required fields until you arrive to the last slide. Select "Next"

FC-9983: Create a New Mold

1. Connect some cavity pressure sensors to a Copilot
2. Select the "CoPilot Logo" along the top
3. Select the "Molds" drop down menu
4. Select "Create New"
5. Input a Mold Name = "DemoMold" and number of cavities of the Mold Contains. Select "Next"
6. Assign Default Cavity Names and select "Next"
7. Verify Attached Plates if connected. Select "Next"
8. Assign attached sensors to correct Cavity Locations. Select "Next"
9. Assign Models to sensors if required. Select "Next"
10. Assign correct Ejector Pin Size to each sensor if required. Select "Next"
11. Verify sensor assignments on "Setup Summary". Select "Next"

FC-9984: Create a New Process

1. Select the Process Drop Down menu, located on the "Job Notch"
2. Select "Create New"
3. Input the Following:
 - a. Process Name = "DemoProcess"
 - b. Standard Cycle Time = "Appropriate time in seconds"
 - c. TCU = "NO"
4. Select Next
5. Leave default: "Sorting Options"
6. Select Next
7. Leave default: "Control Options": Excessive Rejects
8. Select Next
9. Leave default: "Template Match Options"
10. Select Next

FC-9990: Start a Job

1. Select the Menu button in the top left corner of the screen
2. Select Setup
3. Select the CoPilot logo in the center top section of the screen
4. Confirm that a Machine, Mold, and Process are selected in their corresponding fields
5. Select the Start Job button

FC-10028: Assigning Velocity to Pressure Control to an Analog Output Module

1. Select the Machine Output setup dashboard Card
2. Select "Analog Output"
3. Select Sensor associated with the Analog Output
4. Select "Control" type
5. Select "V2P"
6. Save & Done

FC-10207: Connect a CoPilot to a Hub

1. Select the Burger Menu on the upper left corner.
2. Select Settings
3. Select Network Settings
4. Type in the HUB IP address into the Network Address field located under The Hub
5. Select Next
6. Select Done
7. Login with your Username and Password when prompted

FC-10752: Assign Sorting to an Output

1. Select the Machine Outputs on the setup dashboard
2. Select the output relay that will be used for sorting.
3. Select the Sensor Channel that will be used for sorting
4. Select Sorting type
5. Select Good Control or Reject Control
6. Select Save
7. Select Done

FC-11180: Adding Machine Alarms

1. Double Tap on the "Alarm" Widget located on the job dashboard
2. Select "Add"
3. Select "Machine Alarms"
4. Select a desired Pressure, Length, Volume, Time and Integral alarm variable.
5. Select "Save"
6. Select the "pencil" located next to each alarm to input a lower and upper limit"
7. Select "Save"

FC-11198: Adding a Mold Alarm

1. Double Tap on the "Alarm" Widget located on the job dashboard
2. Select "Add"
3. Select "Mold Alarms"
4. Select a desired Pressure, Time, Temperature or Integral alarm variable.
5. Select "Save"
6. Select the "pencil" located next to each alarm to input a lower and upper limit"
7. Select "Save"

FC-11723: Assigning Temperature Sensors

1. Select "Mold Input" on the setup dashboard
2. Select a J or K type Input adapter (depending on what type you have connected)
3. Select a Sensor
4. Choose a Location and ID of sensor assignment
5. Select "Next"
6. Choose Model for each temperature sensor
7. Select "Next"
8. Skip the Pin Selection and select "Next"
9. Select "Next" on the Summary Slide

FC-12019: Create a Template

1. Double tap on the "Cycle Graph"
2. Select the Right Arrow on the upper left corner of the "Cycle Graph"
3. Select the ... button to bring up the templates page>Select Create New Template
4. Input DEMOTEMPLATE into "Enter New Template Name Here" box
5. Select Save
6. Select Done

FC-14296: Create a CTQ

1. Select the "Burger" Menu on the top left corner of the Dashboard
2. Select "Process Development"
3. Select "Parts"
4. Select a desired "Part"
5. Select the "Quality" Tab
6. Select "Edit"
7. Input data into "Name", "Quantity", "Unit", "Lower", "Nominal" and "Upper"
8. Select "Save"

FC-14406: Create a User Account with the Admin Role on The Hub

1. Select the "Burger" Menu, on the top left corner of The Hub Dashboard
2. Select "Settings"
3. Select "Users"
4. Select "Create a New User"
5. Input a "Name", "Last Name", "Password" and "Confirm Password"
6. Select "Roles" and check "Admin"
7. Select "Save User"

FC-14408: Create a Process Tech Account on The Hub

1. Select the "Burger" Menu, on the top left corner of The Hub Dashboard
2. Select "Settings"
3. Select "Users"
4. Select "Create a New User"
5. Input a "Name", "Last Name", "Password" and "Confirm Password"
6. Select "Roles" and check "Process Tech"
7. Select "Save User"

FC-14601: Create a Hub Part Variant

1. Select Process Development from the Burger menu, on the upper left corner of the dashboard.
2. Select Parts from the menu on the left side.
3. Select Part-1
4. Select Edit
5. Under the "Part Variant" section, Input:
 - a. Part Number: 0001
 - b. Name: Part-1-Variant
 - c. Material: Material-1
6. Select Save

FC-15147: Take a Part Sample

1. Select a desired "Part Variant" from the "Part Selection Menu" from the CoPilot Job notch.
2. Select "Start Job"
3. Select the "Part Sampler" Job dashboard widget
4. Select "Start New Sample"
5. Select either "QC Sample" or "Group Sample"
6. Input "Group Name"
7. Input "Sample Shot #"
8. Input "Notes" if desired
9. Select "Start" and wait for the sample to be taken.

FC-15154: Create a Part Parent

1. Select the "Burger Menu"
2. Select "Process Development"
3. Select "Parts" from the left side menu
4. Select "Create New Part"
5. For Name, Input: DemoPart
6. Select "Save"

FC-17052: Login as a Process Tech

1. Login to Hub as Administrator
2. Create or Confirm a User with only a Process Tech role exists
3. Access Login screen on CoPilot
4. Enter Username and Password
5. Select Sign In

FC-17123: Login as a Process Engineer

1. Login to Hub as Administrator
2. Create or Confirm a User with only a Process Engineer role exists
3. Access Login screen on CoPilot
4. Enter Username and Password
5. Select Sign In

FC-18641: Create a Hydraulic Machine

1. Connect copilot to a Hydraulic Machine
2. Select the job notch along the top
3. Select the Machine drop down menu
4. Select Create New
5. Input Machine Name , Screw Diameter and the type of machine Hydraulic and Select Next
6. Assign connected machine input signals and then select Next
7. Proceed through workflow, assigning required fields until you arrive to the last slide. Select Finish

FC-22161: Create a Mold with Valve Gates

1. Connect some cavity pressure and valve gate sensors to a Copilot
2. Select the Mold drop down menu from the "Job Notch". Select "Create New"
3. Input a Mold Name = "DemoMold" and number of cavities of the Mold Contains.
4. Input number of valve gates and then Select "Next"
5. Assign Default Cavity Names and select "Next"
6. Assign default Valve Gate Names and select "Next"
7. Assign each valve gate to a cavity and select "Next"
8. Verify Attached Plates if connected. Select "Next"
9. Assign attached sensors to correct Cavity Locations. Select "Next"
10. Assign Models to sensors if required. Select "Next"
11. Assign correct Ejector Pin Size to each sensor if required. Select "Next"
12. From the Output Relay Module, assign each valve gate sensor to an assigned valve gate
13. Click "Open" or "Close" at the bottom to determine if the OR2s open or close the valve gate. Select "Next".
14. Verify sensor assignments on "Setup Summary". Select "Finish"

FC-23141: Connect a CoPilot to a Hub

1. On the CoPilot frontend, click the menu button and select Settings
2. Click the Network Settings tab at the top of the slide
3. In the Network Address text box, enter the IP address of the Hub
4. Click SAVE & NEXT
5. If prompted, enter in user credentials for username and password and click SIGN IN

FC-26113: Manipulate Peak Pressure [or Average] to an Alarm/Warning State using Lynx Simulator

1. With a started Job and a Copilot connected to a data replay simulator, navigate to the Job Dashboard page
2. Navigate to the Alarm Settings widget > Add > Mold Alarms > Variable Type > Choose the needed Variable (Ex. Average Peak Pressure or Peak Pressure) > Choose the needed location (Ex. End of Cavity)
3. Click Save
4. Enter Alarm as needed for chosen variable
5. Navigate to the Setup page
6. Navigate to the Mold Inputs card
7. Identify the Input/Sensor/Location and Cavity of the variable for the Alarm chosen in step 2. (Ex. Input = SG/LX8-S-ID (8), Sensor = 1/1603900002, Location = EOC, Cavity 1)
8. In the Lynx Simulator, navigate to the correct Copilot and ensure data is being replayed
9. Expand the ports and find the correct sensor identified by the serial number in step 6 (Ex. 603900002)
10. Find the correct channel as identified in the sensor prefix in step 6 (Ex. 1)
11. In the Scale field adjust the scale value by .5 by clicking the arrow up or down
12. Navigate back to the Copilot > Job Dashboard > Alarm Settings
13. Verify value has adjusted to alarm state
14. If value has not reached alarm state, navigate back to the Lynx Simulator and adjust by .5 until state is reached



9. CONCLUSIONS

Please ensure that Installation, Operational, and Performance Qualification are completed prior to the usage of CoPilot and The Hub in a production environment. Once the abbreviated test plans are complete to the satisfaction of RJG's Customer the product is ready.

Inasmuch as RJG®, Inc. has no control over the use of which users use these products, it does not guarantee that the same results as those described herein will be obtained. Each user of the product should make their own tests to determine the suitability of this product.



10. REVISION HISTORY

Revision	Revision Date	Revision Made By	Revision Summary
A	10/22/2025	Cory Hoepner	Initial Document
B	02/12/2026	Cory Hoepner	Updated for use with V11.0.0