

Processing Assurance Control Equipment (PACE), Evonik real-time data technology, helps clients better understand and manage their antimicrobial program. Paired with the safety benefits of the SPECTRUM[®] system, PACE ensures that an intervention program is operating efficiently and effectively by capturing detailed information in one location.

PACE 

PACE provides remote intervention monitoring, range management with a variety of user permission levels and instant notifications via email, text message or local alarm when parameters are out of range. This touchscreen technology maximizes efficiency and product quality while meeting performance standards.

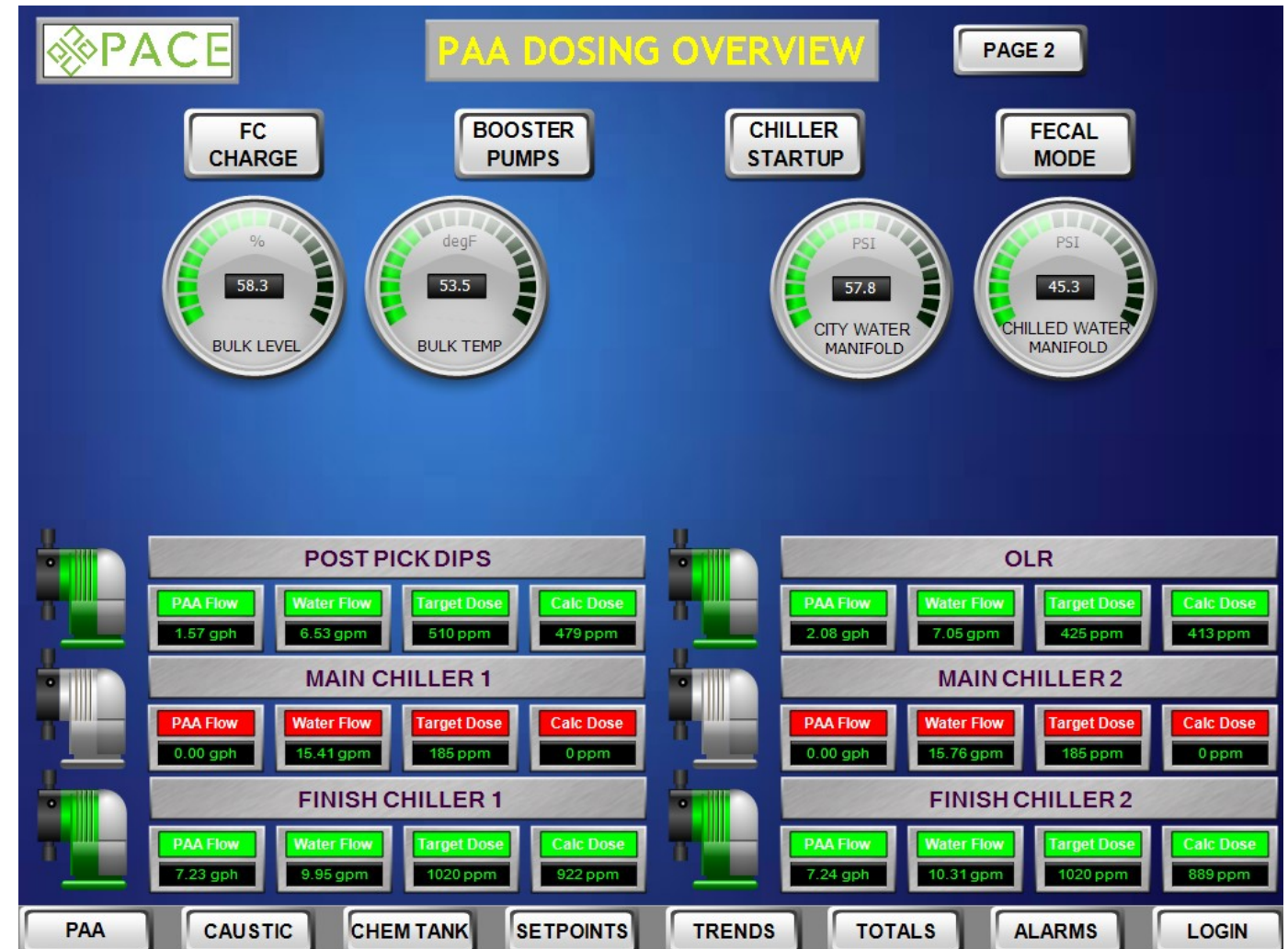
AUTOMATED DOSING

- Controlled dosage and dilution is managed through automated system
- System enables precise dosing and targeted concentrations
- Reduced manual adjustment results in fewer mistakes and fluctuations
- Secure login panel allows user to view the entire system prior to making changes
- Changes linked to individual user ensures proper personnel access and a record of adjustment

REAL-TIME MONITORING AND REMOTE ACCESS

- Modify applications and monitor in plant using the convenient, centralized HMI screen
- Remotely view usage and concentrations in real time using website or mobile app
- Receive alarms and notifications via text, email, or locally when parameters are out of range so that immediate action can be taken
- Make changes remotely to applications if desired (administrative level only)

HMI screen showing overview of peracetic acid dosing in plant



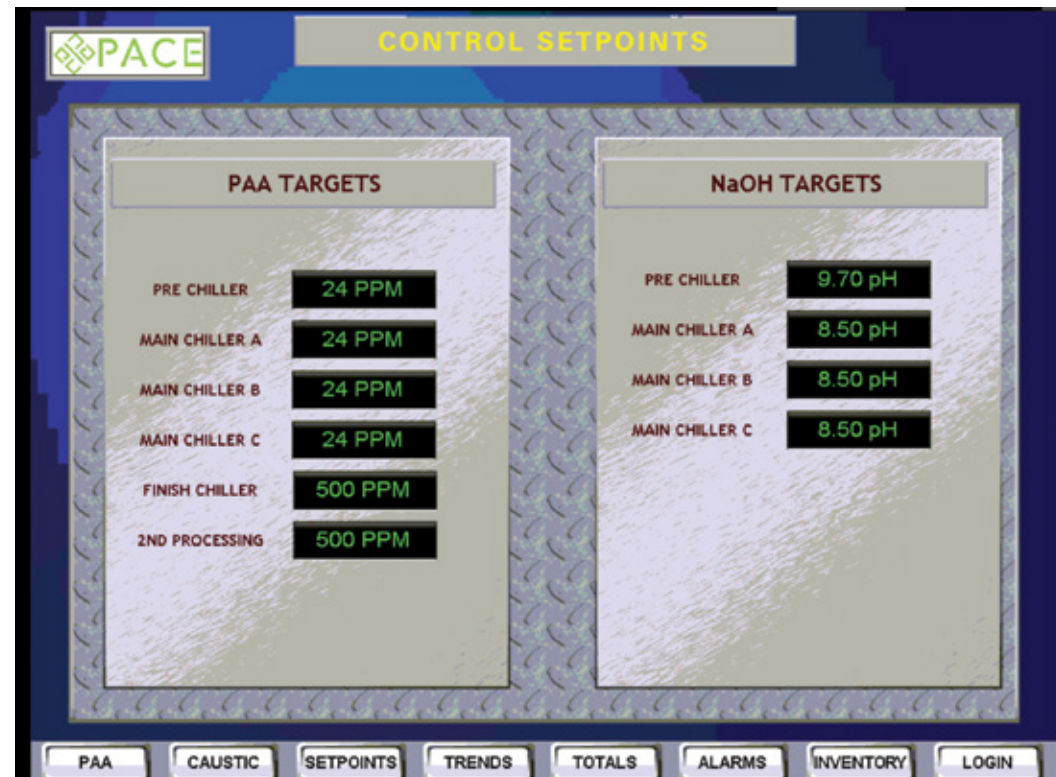
HMI screen showing peracetic acid usage totals by day

	11/11	11/12	11/13	11/14	11/15	11/16	11/17
OLR	0.0	6.3	6.6	7.1	6.5	6.6	0.0
PRE CHILLER	0.0	27.5	21.9	24.0	22.7	23.3	0.0
MAIN CHILL ENT	0.0	20.7	24.9	24.4	23.7	24.0	0.0
MAIN CHILL EXT	0.0	25.8	26.9	28.5	26.3	25.8	0.0
FINISHING CHILLER	0.0	38.7	38.5	43.7	37.5	36.5	0.0
2ND PROCESSING	0.0	16.3	15.6	16.0	15.7	15.6	0.0
SALVAGE	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAY'S TOTAL	0.0 gal	135.4 gal	134.5 gal	143.7 gal	132.5 gal	131.9 gal	0.0 gal
CURRENT DAILY TOTAL	OLR 5.7 gal	PRE CHILLER 20.9 gal	MAIN CHILL ENT 19.9 gal	MAIN CHILL EXT 20.5 gal	FINISHING CHILLER 30.4 gal	2ND PROCESSING 10.8 gal	SALVAGE 0.0 gal

HMI screen showing record of alarm output

DATE	TIME	DESCRIPTION	VALUE	STATE	OPERATOR
11/28	09:11:50	IOBW PAA PUMP LOCKED OUT	OFF	ACK_RTN	CHEM_ROOM/None
11/28	09:11:50	IOBW PAA PUMP LOCKED OUT	OFF		CHEM_ROOM/None
11/28	09:09:56	IOBW PAA PUMP LOCKED OUT	ON	UNACK	CHEM_ROOM/None
11/28	09:09:56	IOBW PAA PUMP LOCKED OUT	ON		CHEM_ROOM/None
11/28	09:09:54	IOBW PAA PUMP LOCKED OUT	OFF	ACK_RTN	CHEM_ROOM/None
11/28	09:09:54	IOBW PAA PUMP LOCKED OUT	OFF		CHEM_ROOM/None
11/28	09:09:39	IOBW PAA PUMP LOCKED OUT	ON	UNACK	CHEM_ROOM/None
11/28	09:09:39	IOBW PAA PUMP LOCKED OUT	ON		CHEM_ROOM/None
11/28	09:09:34	IOBW PAA PUMP LOCKED OUT	OFF	ACK_RTN	CHEM_ROOM/None
11/28	09:09:34	IOBW PAA PUMP LOCKED OUT	OFF		CHEM_ROOM/None
11/28	09:08:53	CHEM ROOM OPERATOR	0		CHEM_ROOM/RICK
11/28	09:08:53	SOperator	None		CHEM_ROOM/RICK
11/28	09:08:24	PRE CHILLER 1 pH TARGET	9		CHEM_ROOM/RICK
11/28	09:08:04	MAIN CHILLER 2 pH TARGET	8		CHEM_ROOM/RICK
11/28	09:08:00	MAIN CHILLER 1 pH TARGET	8		CHEM_ROOM/RICK
11/28	09:07:20	MAIN CHILLER 2 PAA TARGET PPM	50		CHEM_ROOM/RICK
11/28	09:07:17	MAIN CHILLER 1 PAA TARGET PPM	50		CHEM_ROOM/RICK
11/28	09:07:08	CHEM ROOM OPERATOR	1002		CHEM_ROOM/RICK
11/28	09:07:08	SOperator	RICK		CHEM_ROOM/None
11/28	09:01:56	CAUSTIC MICROBULK TANK FILL COMMAND	OFF		CHEM_ROOM/None
11/28	09:01:45	IOBW PAA PUMP LOCKED OUT	ON	UNACK	CHEM_ROOM/None
11/28	09:01:45	IOBW PAA PUMP LOCKED OUT	ON		CHEM_ROOM/None
11/28	09:00:33	CAUSTIC MICROBULK TANK FILL COMMAND	ON		CHEM_ROOM/None
11/28	09:00:29	CHEMROMO PAA MICROBULK TANK FILL COMMAND	OFF		CHEM_ROOM/None
11/28	08:56:14	IOBW PAA PUMP LOCKED OUT	OFF	ACK_RTN	CHEM_ROOM/None
11/28	08:56:14	IOBW PAA PUMP LOCKED OUT	OFF		CHEM_ROOM/None

HMI screen listing set points



PACE ensures that interventions are operating efficiently and effectively by capturing detailed historical information in one location.

HISTORICAL DATA

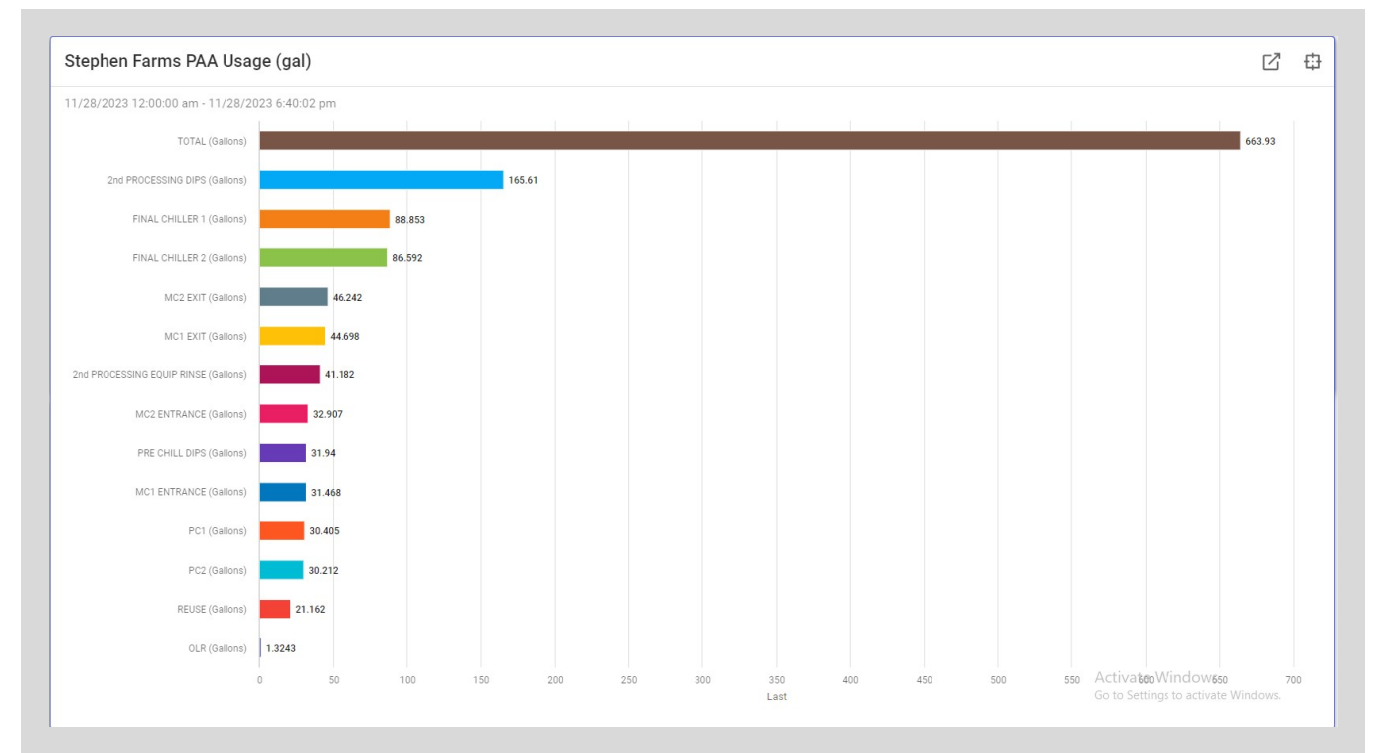
The following standard graphs are provided for each location:

- PAA and caustic usage (hourly, daily, monthly and more)
- PAA concentration levels and dosing status
- pH levels and dosing status
- PAA flow (gph)
- Water flow to applications (gpm)
- Pump status
- Tote levels

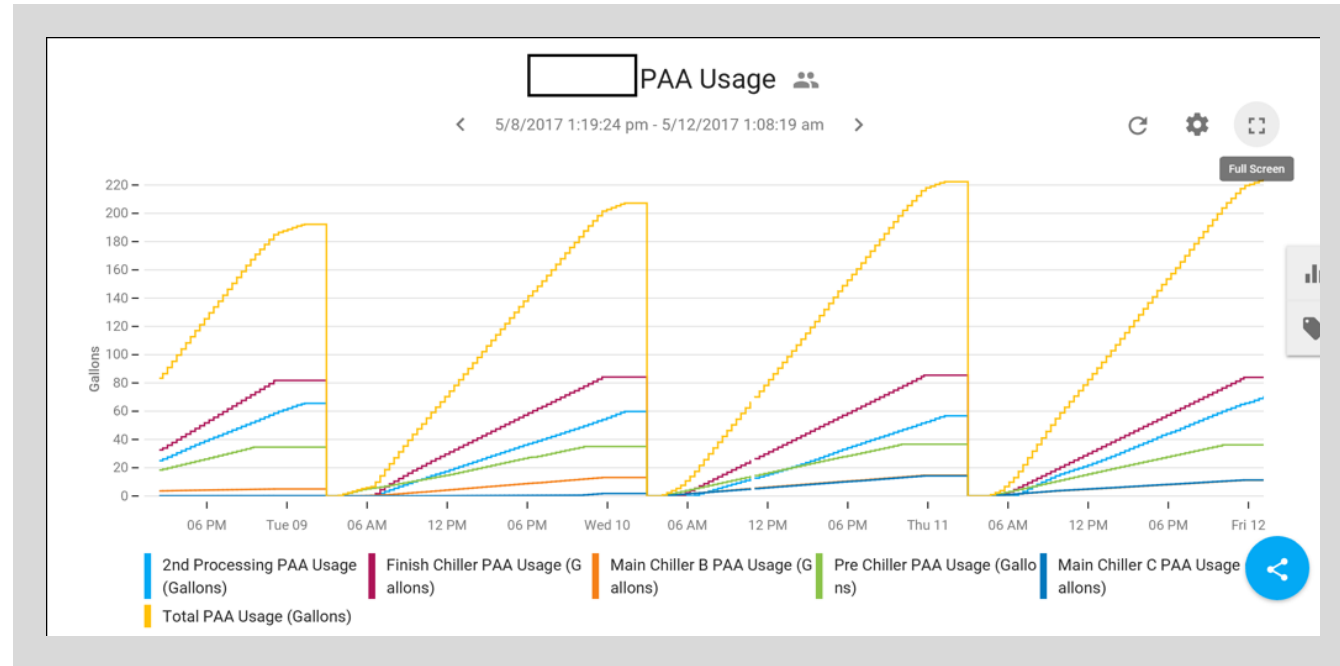
Review the historical data to identify the concentration levels, verify pump operation and water flows, and correlate the data with the timepoint of interest. Usage data is beneficial in helping locations understand their patterns and improve efficiency.

Evonik tailors the user's dashboard to a specific location or group of plants; from there, a selected plant can be examined in closer detail. The following screenshots are examples of the data that plants may find useful.

Daily snapshot of plant usage



Usage over past seven days



Caustic concentration

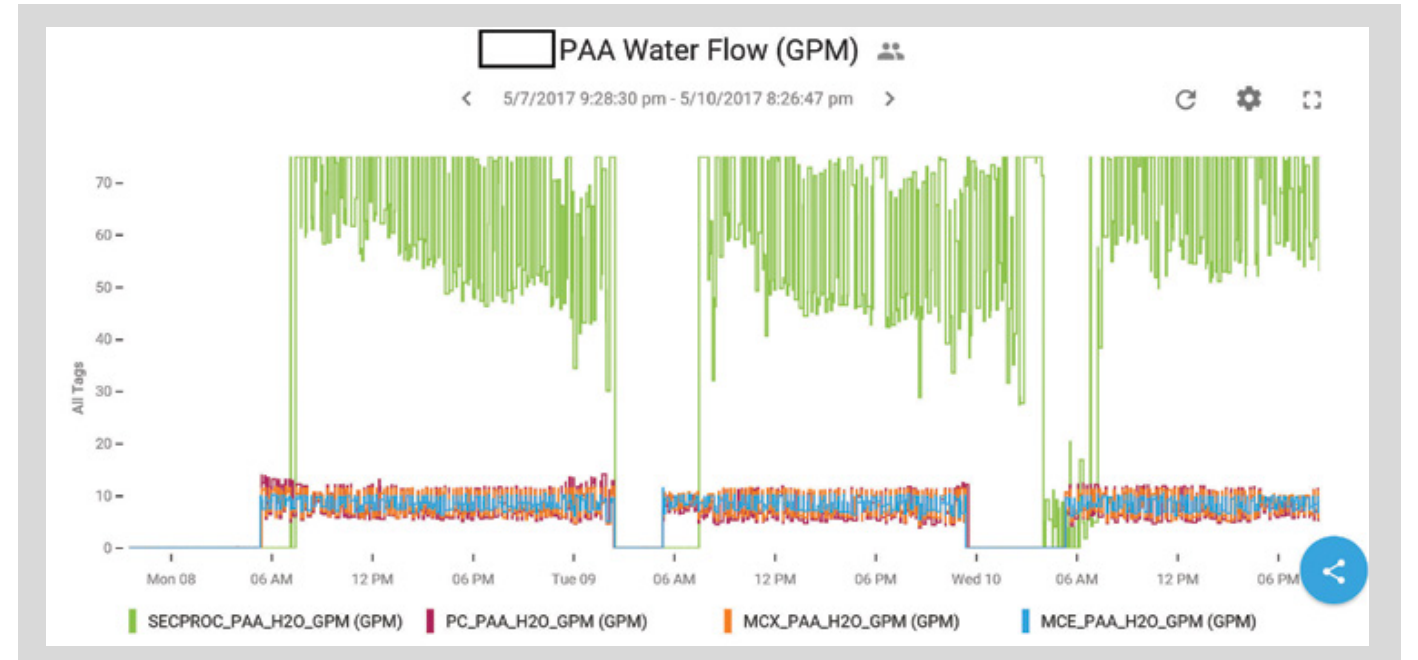


Peracetic acid concentration by application over hours, days, etc

PAA Dosing (PPM)
5/11/2017 12:00:00 am - 5/11/2017 11:46:14 am

Time	Column 1	Column 2	Column 3	Column 4	Column 5
5/11/2017 4:00:00 am	0	0	0	0	
5/11/2017 5:00:00 am	0	0	15.308	13.975	13.
5/11/2017 6:00:00 am	0	290.1	29.411	26.921	26.
5/11/2017 7:00:00 am	299.7	517.8	29.51	27.014	27.
5/11/2017 8:00:00 am	485.3	518.1	29.544	26.794	26.
5/11/2017 9:00:00 am	485.5	518.2	29.551	26.805	26.
5/11/2017 10:00:00 am	485.7	518.4	29.537	23.675	23.
5/11/2017 11:00:00 am	486	518.5	29.429	19.719	19.

Water flow to application (GPM)



Evonik is committed to safety and standard features of the SPECTRUM® system that remain the cornerstone of the antimicrobial intervention program.

PACE AUTOMATION

- Automated system greatly reduces manual operation, virtually eliminating visits to pumps
- Alarms alert users when applications are out of range
- Automated tote change function allows a plant to switch to a full tote automatically without handling the tote valve again after the initial hookup

REMOTE EQUIPMENT PLACEMENT

- Concentrated chemical is mixed and diluted before delivery to application points, preventing workers from being exposed to chemistry at high concentrations
- Locate totes and dispensing equipment remotely outdoors or in well-ventilated indoor non-production areas

CONTAINMENT

- Place pumping cabinets and totes in-use on appropriate containments with large enough capacity to handle full tote volume

CHEMICAL DISPENSING

- Enclosed cabinets
- Contained system
- Dedicated pumps for application(s)
- Flow sensor on every pump provides alarm tie-in option to customer for each application

MULTIPLE TOTE HEADER MANIFOLD

- Safer tote changes with less time constraints
- More effective dosing of multiple pumps with one tote

INJECTION MANIFOLD

- Centralized dosing location where concentrated chemical is diluted with water to target application concentrations
- Proper water pressure regulation
- Proper water flow settings
- Standardized location to turn ON/OFF water supply

CONSTRUCTION MATERIALS

The proper construction materials **MUST** be used with the concentrated product; otherwise chemical leaks will occur over time and create hazardous and costly situations. The list of approved materials is extensive, and we take care to ensure that our equipment and delivery systems comply.

AIR QUALITY MONITORING

Upon installation or the addition of new applications, the SPECTRUM® team takes air samples to ensure that air quality is not negatively impacted and that levels are within acceptable ranges. As one component of the SPECTRUM® Intervention Program—which includes installation and startup, product supply, technical support and on-site maintenance, among other services—PACE delivers features beyond the standard automation systems currently available on the market.

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