



THE SCIENCE OF READYSM

Acrylic/Methacrylic Acid Transfer Monitoring Preliminary Air Sampling and Analysis Plan (SAP)

Version 1.1

Prepared on Behalf of:

**Miller
Environmental**

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Air Monitoring and Sampling Strategy

CTEH® is focusing on the mixtures and chemicals chosen below because they are among the most important and readily monitored hazards of an acrylic/methacrylic acid transfer. The possible hazards of this transfer may vary by the source and type of acrylic/methacrylic acid as well as with the environmental conditions associated with the transfer of this product. Monitoring and sampling for chemicals or indicators of the presence of acrylic/methacrylic acid will be conducted continuously for the duration of transfer operations.

The strategy is to utilize three broadly defined monitoring plans: **1) Worker Monitoring; 2) Community Monitoring; 3) Site Assessment.** Worker Activity Monitoring will generally take place in the presence of workers performing/supporting transfer operations. The readings will generally be taken at a height consistent with that of the sampler's breathing zone and in close proximity to workers without interfering or obstructing their work tasks. Community Monitoring may take place in those residential and commercial locations immediately surrounding the transfer work site, not necessarily currently occupied by members of the community. Unlike Worker Monitoring and Community Monitoring, Site Assessment does not necessarily represent ambient air monitoring near breathing zone level. Site Assessment may involve a variety of different monitoring tasks intended to provide information that may help to delineate the nature and extent of a potential release (e.g., fence line monitoring, worst case determination, container head space, ground level, etc.).

Free-roaming handheld real-time air monitoring may be conducted in a variety of areas based on levels of activity, proximity to operations, and site conditions. Radio-telemetry RAE Systems® AreaRAE/MultiRAE Pro units may be deployed near transfer operations to allow for continuous air monitoring in multiple areas during product displacement operations. AreaRAE/MultiRAE Pro readings may be received and monitored in a centralized location by CTEH® personnel to allow for recognition, communication, and response to changing conditions.

CTEH Site-Specific Action Levels

CTEH® site-specific action levels may be employed in all air monitoring plans to provide information for corrective action to limit potential exposures. These values do not replace occupational or community exposure standards or guidelines but are intended to represent a concentration limit that triggers a course of action to better address worker and public safety. Action level exceedances will be communicated to Incident Command (IC) and the CTEH Project Technical Director by the CTEH Project Manager (PM). Work practice may be assessed and then altered if necessary. Site-Specific Action Levels are not utilized for Site Assessment monitoring.

Plan 1: Worker Monitoring

Objective: Report air levels before they reach those requiring respiratory protection

Analyte	Action Level	Action to be Taken	Basis	Instrument	Detection Limit	Notes	Correction Factor
Total VOCs	0.2 ppm 5 min.	Report reading to PM and IC; Note odors; Assess for the presence of acrylic acid and methacrylic acid	To avoid over exposure to acrylic acid	MultiRAE PID AreaRAE PID	0.1 ppm	Range: 0.1 – 5,000 ppm	NA
Acrylic Acid	2 ppm 5 min.	Exit Area or don air purifying respirator; Report reading to PM and IC. Note odor*	ACGIH® TLV-TWA	MultiRAE PID AreaRAE PID 10.6 eV lamp	1.2 ppm	Range: 1.2 – 60,000 ppm	12
				Gastec tube #81	0.2 ppm	Range: 2 - 50 ppm Volume: See insert	1
Methacrylic Acid	20 ppm 5 min.	Exit Area or don air purifying respirator; Report reading to PM and IC. Note odor**	ACGIH® TLV-TWA	MultiRAE PID AreaRAE PID 10.6 eV lamp	0.15 - 0.35 ppm	Range: 0.15 - 17,500 ppm	2.5+/-1 (estimated)
				Gastec tube #81	0.2 ppm	Range: 1.8 - 45 ppm Volume: See insert	0.9

*Acrylic Acid has odor described as sharp and irritating with threshold at 0.06 to 1.0 ppm; **Methacrylic acid has an odor described as acrid and repulsive with threshold of 0.17 ppm

Flammability

Analyte	Action Level	Action to be Taken	Basis	Instrument	Detection Limit	Notes	Correction Factor
%LEL	1% 1 min.	Notify PM and IC	Elevated LEL	MultiRAE Sensor AreaRAE Sensor	1 %	Measuring range: 1 – 100%	NA
%LEL	10%	Exit Area and Notify PM and IC	10% LEL	MultiRAE Sensor AreaRAE Sensor	1 %	Measuring range: 1 – 100%	NA

*Acrylic acid has a lower explosive limit (LEL) of 2.4%

Plan 2: Community Monitoring

Objective: Report air levels before they reach those causing nuisance or health issues

Analyte	Action Level	Action to be Taken	Basis	Instrument	Detection Limit	Notes	Correction Factor
Total VOCs	0.5 ppm 5 min.	Report reading to PM; Note odors; Assess for the presence of acrylic acid and methacrylic acid	Approximate background level	MultiRAE PID AreaRAE PID	0.1 ppm	Range: 0.1 – 5,000 ppm	NA
Acrylic Acid	Detection	Report reading to PM and IC	Inform PM/PTD of potential off-site issues	MultiRAE PID AreaRAE PID 10.6 eV lamp	1.2 ppm	Range: 1.2 – 60,000 ppm	12
				Gastec tube #81	0.2 ppm	Range: 2 - 50 ppm Volume: See insert	1
Methacrylic Acid	Detection	Report reading to PM and IC	Inform PM/PTD of potential off-site issues	MultiRAE PID AreaRAE PID 10.6 eV lamp	0.15 - 0.35 ppm	Range: 0.15 - 17,500 ppm	2.5+/-1 (estimated)
				Gastec tube #81	0.2 ppm	Range: 1.8 - 45 ppm Volume: See insert	0.9

*Acrylic Acid has odor described as sharp and irritating with threshold at 0.06 to 1.0 ppm; **Methacrylic acid has an odor described as acrid and repulsive with threshold of 0.17 ppm

Flammability

Analyte	Action Level	Action to be Taken	Basis	Instrument	Detection Limit	Notes	Correction Factor
%LEL	1% 1 min.	Notify PM and IC	Elevated LEL	MultiRAE Sensor AreaRAE Sensor	1 %	Measuring range: 1 – 100%	NA
%LEL	10%	Exit Area and Notify PM and IC	10% LEL	MultiRAE Sensor AreaRAE Sensor	1 %	Measuring range: 1 – 100%	NA

*Acrylic acid has a lower explosive limit (LEL) of 2.4%

Plan 3: Site Assessment

Objective: Characterize the nature and extent of a release

Analyte	Action Level	Action to be Taken	Basis	Instrument	Detection Limit	Notes	Correction Factor
Total VOCs	NA	Report reading to PM and IC	NA	MultiRAE PID AreaRAE PID	0.1 ppm	Range: 0.1 – 5,000 ppm	NA
Acrylic Acid	NA	Report reading to PM and IC	NA	MultiRAE PID AreaRAE PID 10.6 eV lamp	1.2 ppm	Range: 1.2 – 60,000 ppm	12
				Gastec tube #81	0.2 ppm	Range: 2 - 50 ppm Volume: See insert	1
Methacrylic Acid	NA	Report reading to PM and IC	NA	MultiRAE PID AreaRAE PID 10.6 eV lamp	0.15 - 0.35 ppm	Range: 0.15 - 17,500 ppm	2.5+/-1 (estimated)
				Gastec tube #81	0.2 ppm	Range: 1.8 - 45 ppm Volume: See insert	0.9

General Information on Procedures (Assessment Techniques) Used

Procedure	Description
Guardian Network	A Guardian network may be established with AreaRAEs equipped with electrochemical sensors at locations around the work zone perimeter and integrated into SafetySuite/VIPER. The AreaRAEs will be telemetering instantaneous data at 15-second intervals to a computer console. MultiRAE may also be used in the network. The data will be visible in real-time at the computer console and will be monitored 24 hours per day by CTEH personnel.
Real-Time Handheld Survey	CTEH staff members may utilize handheld instruments (e.g. MultiRAE, Gastec colorimetric detector tubes, etc.) to measure airborne chemical concentrations. CTEH will use these handheld instruments primarily to monitor the ambient air quality at breathing zone level. Additionally, measurements may be made at grade level, as well as in elevated workspaces, as indicated by chemical properties or site conditions. CTEH may also use these techniques to verify detections observed by the AreaRAE network.
Fixed Real-Time Monitoring locations	Multiple community locations may be identified and monitored at the same location at least once per hour using handheld instruments. This allows the use of statistical analysis more effectively than with a random approach.
Analytical sampling	Analytical sampling may be used to validate the fixed and handheld real-time monitoring data, or to provide data beyond the scope of the real-time instruments. Analytical samples may be collected as whole air samples in evacuated canisters or on specific collection media and sent to an off-site laboratory for further chemical analysis.

Quality Assurance/Quality Control Procedures

Method	Procedure
Real-Time	Real-time instruments may be calibrated in excess of the manufacturer's recommendations. At a minimum whenever indicated by site conditions or instrument readings. Co-located sampling for analytical analysis may be conducted, if necessary, to assess accuracy and precision in the field. Lot numbers and expiration dates will be recorded with use of Gastec colorimetric tubes.
Analytical	Chain of custody documents may be completed for each sample. Level IV data validation may be performed on the first sample group analyzed. Level II data validation may be performed on 20% of all samples. Level IV data validation may be performed on 10% of all samples.
Reporting	Daily data summaries may be provided for informational purposes using data that have not undergone complete QA/QC. Comprehensive reports of real-time and/or analytical data may be generated following QA/QC and may be delivered 60 days following receipt of validated results, if applicable.

Glossary

Term	Definition
Sustained	Instrument reading above the action level continuously for the listed time period.
Excursion Limit	Whenever a reading exceeds an ACGIH TLV by 5 times (if the chemical does not have a STEL- or Ceiling-based action level), exit the area and notify the PM
Breathing zone	The area within an approximate 10-inch radius of an individual's nose and mouth.
Ambient Air	That portion of the atmosphere (indoor or outdoor) to which workers and the general public have access.

Change from version 1.0 to 1.1

In the section titled: Addressed EPA comments

	Name/Organization	Signature	Date Signed
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Change from version 1.1 to 1.2

In the section titled:

	Name/Organization	Signature	Date Signed
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