

**3.2 Medical Requirements Overview****TABLE 3.2: MEDICAL REQUIREMENTS OVERVIEW**

<b>MRID# and Title:</b>	MR037L Toxicological Assessment Using Formaldehyde Monitoring Kit (FMK)
<b>Sponsor:</b>	Medical Operations
<b>Discipline:</b>	Environmental Health
<b>Category:</b>	Medical Requirements
<b>References:</b>	ISS Medical Operations Requirements Document SSP 50260
<b>Purpose/Objectives:</b>	To determine and assess crew exposure to airborne formaldehyde on ISS.
<b>Measurement Parameters:</b>	Formaldehyde levels
<b>Deliverables:</b>	Postflight report evaluating the concentration of formaldehyde in the spacecraft air based on the collection and analysis of archival samples.
<b>Flight Duration:</b>	≥ 30 days
<b>Number of Flights:</b>	Every ISS Increment
<b>Number and Type of Crew Members Required:</b>	Two crewmembers are trained in Environmental Health System (EHS) activities. One crewmember performs the in-flight activity.
<b>Other Flight Characteristics:</b>	N/A

**3.3 Preflight Training**

**TABLE 3.3: PREFLIGHT TRAINING**

<b>Preflight Training Activity</b>	<b>Description:</b> FMK training will include sampling location and the recording of results. Two crewmembers will be trained in EHS activities			
	<b>Schedule:</b>			
	<b>Duration:</b>	<b>Schedule:</b>	<b>Flexibility:</b>	<b>Personnel Required:</b>
	EHS Toxicology Operations: Experienced CM - 30 min Inexperienced CM - 60 min	L-12 months	N/A	Instructors/ Crewmembers
<b>Ground Support Requirements Hardware/Software</b>	<b>Preflight Hardware:</b>		<b>Preflight Software:</b>	<b>Test Location:</b>
	Formaldehyde Monitoring Kit Class III		N/A	U.S.
<b>Training Facilities</b>	<b>Minimum Room Dimensions:</b>	<b>Number of Electrical Outlets:</b>	<b>Temperature Requirements:</b>	<b>Special Lighting:</b>
	8' x 10'	None	Ambient	N/A
	<b>Hot or Cold Running Water:</b>	<b>Privacy Requirements:</b>	<b>Other:</b>	
	N/A	Private room free from distractions	1 table, 6-8 chairs	
<b>Constraints/Special Requirements:</b>	None			
<b>Launch Delay Requirements:</b>	Refresher training is conducted at crewmember request.			
<b>Notes:</b>	<ul style="list-style-type: none"> <li>Experienced CM – had training within the last 1½ yrs.</li> <li>EHS Toxicology Operations includes training for GSC, CSA-CP, FMK, CDMK, and DST.</li> </ul>			

**3.4 Preflight Activities - None**

3.5 In-Flight Activities

TABLE 3.5.1: IN-FLIGHT ACTIVITIES

<b>In-Flight Activity</b>	<b>Description:</b>	One crewmember will be operator. Formaldehyde monitors are unstowed and deployed in duplicate in each of the designated locations as defined in the in-flight schedule. On the face of the monitor, a space has been provided for recording sampling start/stop times and sampling location. After 48-hours of unattended continuous sampling, the exact date and time is recorded on each monitor label. The monitors are removed from the area and stowed in the return "Used" bag inside the FMK.				
	<b>Schedule:</b>	<b>Activity:</b>	<b>Duration:</b>	<b>Schedule:</b>	<b>Flexibility:</b>	<b>Personnel Required:</b>
		FMK Archival Sampling – Includes unstow, deploy, retrieval, and stow.	10 min. unstow and deploy (for both locations)  48 hrs unattended continuous sampling  10 min. retrieve and stow (for both locations)	Once/month in Lab and SM  New Module shortly after ingress within 4 hours	N/A	1 Operator
		Contingency FMK Archival Sampling	5 min unstow & deploy (per location)  48 hrs unattended continuous sampling  5 min retrieve & stow (per location)	As needed	N/A	1 Operator
	Photos of Formaldehyde Sampling Activity	5-10 min depends upon camera location	During contingency situation	N/A	1 Operator	
<b>Procedures:</b>	Procedures are located in the Systems Operations Data File (SODF) Med Ops book: Photo/TV - Generic					
<b>Constraints / Special Requirements:</b>	<ul style="list-style-type: none"> <li>• Samples are collected in duplicate</li> <li>• Monitors must be set-up side-by-side, 5-10 cm apart</li> <li>• Deployment sites must permit air to move freely over the monitor surface</li> <li>• Monitors will measure levels unattended for 48 hrs</li> <li>• FMK sampling should be coordinated with GSC and VOA during common sampling sessions</li> <li>• Photo of activity should be at a distance to give reasonable perspective of sampling area.</li> </ul>					

**TABLE 3.5.1: IN-FLIGHT ACTIVITIES (cont'd)**

<b>Photo / TV Requirements:</b>	Photo documentation is required during contingency situations. Photo of activity should be at a distance to give reasonable perspective of sampling area.
<b>Cold Stowage Requirements:</b>	N/A
<b>Mission Extension Requirements:</b>	N/A
<b>Landing Wave-Off Requirements:</b>	N/A
<b>Data Delivery</b>	<b>Data/Report to Designated Recipients (Nominal/Contingency):</b>
	N/A

**TABLE 3.5.2: IN-FLIGHT HARDWARE**

Hardware/Software Name	P/N
Formaldehyde Monitoring Kit (FMK)	SDD46108168-XXX

**3.6 Postflight Activities**

**TABLE 3.6: POSTFLIGHT ACTIVITIES**

<b>Postflight Activity</b>	<b>Description:</b>	See Constraints, Early Destow, and notes
<b>Constraints/Special Requirements:</b>		Stowage temperatures during transport of returned samples to JSC Toxicology Laboratory should not exceed 110 degrees F.
<b>Early Destow / Early Return:</b>		The FMK needs to be returned to JSC for analysis within R+2 days.
<b>Notes:</b>		EB is responsible for the early return of samples to JSC.
<b>Data Delivery</b>	<b>Data/Report to Designated Recipients (Nominal/Contingency):</b>	
		<ul style="list-style-type: none"> <li>• If the analysis of formaldehyde levels indicates an elevation or trend, then toxicology will notify the Contingency Action Team, which includes the ISS Lead Surgeon.</li> <li>• A preliminary report will be provided within 1 week of sample receipt on samples obtained following a contingency event (including, but not limited to, crew symptoms).</li> <li>• A final report including assessment of formaldehyde levels on ISS will be posted to the Toxicology Website no later than 3 months after the return of the samples.</li> </ul>

**3.7 Summary Schedule**

**TABLE 3.7: SUMMARY SCHEDULE**

ACTIVITY	DURATION	SCHEDULE	FLEXIBILITY	PERSONNEL REQUIRED	CONSTRAINTS
<b>Preflight Training</b>					
EHS Toxicology Operations	Experienced CM – 30 min Inexperienced CM - 60min	L-12 months	N/A	Crewmembers/Instructors	None
<b>Preflight: N/A</b>					
<b>In-Flight</b>					
FMK Archival Sampling – includes unstow, deploy, retrieval, and stow	10 min. unstow and deploy (for both locations)  48 hrs unattended continuous sampling  10 min. retrieve and stow (for both locations)	Once/month in Lab and SM  New Module shortly after ingress within 4 hours	N/A	1 Operator	-Samples are collected in duplicate -Monitors must be set-up side-by-side, 5-10 cm apart -Deployment sites must permit air to move freely over the monitor surface -Monitors will measure levels unattended for 48 hrs. -FMK sampling should be coordinated with GSC and VOA during common sampling sessions
Contingency FMK Archival Sampling	5 min unstow & deploy (per location)  48 hrs unattended continuous sampling  5 min retrieve & stow (per location)	As needed	N/A	1 Operator	As requested by the Crew Surgeon

**TABLE 3.7: SUMMARY SCHEDULE (cont'd)**

ACTIVITY	DURATION	SCHEDULE	FLEXIBILITY	PERSONNEL REQUIRED	CONSTRAINTS
<b>In-Flight (cont'd)</b>					
Photos of Formaldehyde Sampling	5-10 min Depends upon camera location	During contingency situation	N/A	1 Operator	-Photo of activity should be at a distance to give reasonable perspective of sampling area.
<b>Wheels-Stop: N/A</b>					
<b>Postflight: N/A</b>					
<b>Postflight</b>					
Debrief	No extra time	~R+30	N/A	Crewmembers/ Toxicology Team	Included as part of the MedOps overall debrief