

## Vacuum Operations with liquid hydrocarbon

WHEN TO COMPLETE – Before the start of any Vacuum Operation activities

Confirm each control / safeguard below before starting work	Guidance for confirming each control / safeguard	Person(s) Performing Work	Start-Work Verifier
<b>I HAVE CONFIRMED:</b>			
<b>1</b> Required gas tests completed and exclusion zone established.	<ul style="list-style-type: none"> <li>Confirm area gas testing requirements have been completed and understood.</li> <li>Confirm exclusion zone is established as needed to restrict personnel and vehicle traffic within potential flammable zones including exhaust location.</li> </ul>		
<b>2</b> Material is verified compatible with equipment and clear of potentially incompatible materials and vapors.	<ul style="list-style-type: none"> <li>Confirm that the vacuum equipment is compatible with material to be onboarded.</li> <li>Any residual materials have been evaluated for compatibility to avoid hazardous reactions.</li> <li>Confirm that transfer equipment, including hoses, do not contain incompatible residual material.</li> </ul>		
<b>3</b> Low flash combustibles or flammables shall be bottom loaded, and operator located at or near controls.	<ul style="list-style-type: none"> <li>Confirm flammables and light combustibles are routed to bottom inlet of tank and initial flow of flammables restricted (transfer nozzle covered) to reduce agitation/static generation.</li> <li>Vacuum truck operator located at or near controls</li> </ul>		
<b>4</b> Equipment is confirmed to be grounded to an acceptable grounding location	<ul style="list-style-type: none"> <li>Approved ground point used.</li> <li>Mobile Ground Verification (MGV) green light properly achieved (Red light on prior to setting clamp).</li> <li>Confirm that continuity exists between the grounding clamp, grounding point, and the connection measures <math>\leq 10</math> ohms</li> <li>Ground points do not include painted surfaces</li> <li>Grounding equipment is in good working condition</li> </ul>		
<b>5</b> Systems continuity testing was successful for both the liquid and vent hose systems.	<ul style="list-style-type: none"> <li>Test and confirm continuity of liquid <b>and</b> vent systems from hose end, through hose(s), and truck frame to ground.                             <ul style="list-style-type: none"> <li>Circuit test liquid and vent systems from open end to ground and confirm less than 10,000 Ohms, <b>or</b></li> <li>Circuit test individual component connections and confirm less than the following Ohm limits:                                     <ol style="list-style-type: none"> <li>Each hose (end to end): less than 100 Ohms</li> <li>All hose connections: less than 10 Ohms (hose to hose, source, suction tools, truck and scrubber)</li> <li>Suction tree to truck frame: less than 10 Ohms</li> </ol> </li> </ul> </li> </ul>		
<b>6</b> Exhaust system is configured to vent to a safe location	<ul style="list-style-type: none"> <li>Vent hose routed downwind of truck and other ignition sources, and away from personnel.                             <ul style="list-style-type: none"> <li>If a scrubber is used <b>and</b> vent could be affected by a nearby ignition source(s), a hydrocarbon monitoring plan for scrubber exhaust is needed</li> </ul> </li> <li>A scrubber used for flammable vapors must have a flame arrestor installed upstream of the scrubber</li> </ul>		
<b>7</b> Liquid hose end properly connected to source or managed to reduce static hazards	<ul style="list-style-type: none"> <li>Liquid hose end submersed where possible or bonded to pan.</li> <li>Hose end managed by helper if not connected to source. (MOC and/or procedure may be needed before attaching vacuum equipment directly to equipment)</li> <li>Where helper(s) are assigned, confirm communication plan is in place, understood, and agreed by all workers.                             <ul style="list-style-type: none"> <li>Agree on emergency stop signal during pre-job meeting and demonstrate understanding.</li> </ul> </li> </ul>		
<b>Confirm these controls / safeguards are in place and verified prior to starting work. Stop and seek help if anything changes.</b>			

	Printed Name & Role	Signature	Date
Start Work Verifier			

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