

## Risks Associated with common passivation practices

### Safety

- Hazardous waste
- Chemical burns
- Chemical spills
- Pallets of fifty-pound bags of acids and bases
- Hoses through doors, hallways and stairwells

### Time and Money

- Over Budget
- Unexpected change orders
- Unnecessary process steps
- Turn key project durations of days or weeks
- Delayed or cancelled product campaign
- Floor stains or damage
- Long rinse times

### Quality

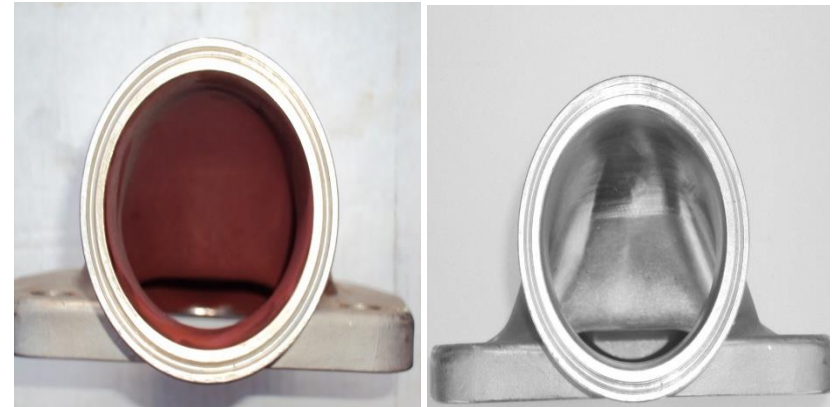
- Residual chemical or particulates left behind
- Equipment damage due to severe etching
- Severe rouge production
- Insufficient Cr/Fe ratio
- Unknown chemical concentration and/or formulation



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**Average contact time:**

**30-minutes**

<b>SAFETY Antidotes</b>			
<b>1</b>	<b>Non-Hazardous Waste</b>	No heavy metals in effluent	Effluent can go directly to most municipalities
<b>2</b>	<b>Low Chemical Concentration</b>	Low chemical concentration (Less than 0.8%)	Low risk potential to employees
<b>3</b>	<b>pH Neutral</b>	NO neutralization required	Simple disposal of effluent
<b>4</b>	<b>Safe to use</b>	Low risk potential to employees	No damage to floors or ancillary equipment
<b>5</b>	<b>Flow not required</b>	No skids or return hoses required	Minimally invasive to system
<b>6</b>	<b>Small footprint</b>	Minimal equipment/personnel required	No hoses through doors, hallways or stairwells
<b>7</b>	<b>Practical packaging</b>	Light weight containers (Max 10-pounds)	No bulk 50-pound bags of acids and bases
<b>TIME AND MONEY Antidotes</b>			
<b>8</b>	<b>On Budget</b>	Very predictable Pricing	No dreaded change orders
<b>9</b>	<b>Short process time</b>	Process time between 30 and 120-minutes	Low chemical concentration (less than 0.8%)
<b>10</b>	<b>Substrate Compatibility</b>	Compatible with all elastomers	Will not damage Floors or pump seals
<b>11</b>	<b>Instrumentation Friendly</b>	Does not require removal of flow, conductivity, temperature or other instrumentation	
<b>12</b>	<b>Ease of use</b>	Reliable procedures designed for the end user	Sprayable without a nitrogen purge
<b>PRODUCT QUALITY Antidotes</b>			
<b>13</b>	<b>Residue Free</b>	No residual residue or particulates left behind	Chelated rinse with NO risk of precipitation
<b>14</b>	<b>Non-Etching</b>	Does NOT etch stainless steel	No heavy metals removed
<b>15</b>	<b>Enhanced Cr/Fe ratio</b>	Iron only affinity	Works through preferential chemical reaction
<b>16</b>	<b>Reduced Rouge Rate</b>	Stabilized surface finish	Prolongs return of rouge
<b>17</b>	<b>Predictable chemistry</b>	Known chemical constituent concentration	Reliable SOP and detailed protocol