

## Types of Cleaners

Cleaner	Forms/Description	Mode of action	Advantages	Disadvantages
<b>Surfactants</b>	<ul style="list-style-type: none"> <li>• Soaps</li> <li>• Detergents                             <ul style="list-style-type: none"> <li>• Non-ionic (neutral charge)</li> <li>• Anionic (negative charge)</li> <li>• Cationic (positive charge)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Increases penetration of cleaning solution by reducing surface tension.</li> <li>• Emulsifies and suspends soils so they are more easily dispersed into solution.</li> </ul>	<ul style="list-style-type: none"> <li>• Effective against fats, oils, and greases</li> <li>• Cationics also have disinfectant properties</li> </ul>	<ul style="list-style-type: none"> <li>• Soaps form insoluble precipitates in hard water</li> <li>• Anionics and cationics tend to form hard to rinse foams</li> </ul>
<b>Alkaline cleaners</b>	<ul style="list-style-type: none"> <li>• Strong alkalis                             <ul style="list-style-type: none"> <li>• Sodium hydroxide (caustic soda) or tri-sodium phosphate (TSP)</li> </ul> </li> <li>• Moderately strong alkalis                             <ul style="list-style-type: none"> <li>• Sodium, potassium and ammonium salts of phosphates, silicates and carbonates</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Disrupts and swells soil particles and disperses them into solution</li> <li>• Reacts with insoluble fat molecules to form soluble soap</li> <li>• Chemically breaks down large molecules into smaller, more soluble pieces</li> </ul>	<ul style="list-style-type: none"> <li>• Effective against proteins, fats, and oils</li> </ul>	<ul style="list-style-type: none"> <li>• Caustic solutions may be hazardous to workers</li> <li>• Strongly caustic cleaners may damage metal and ceramic surfaces unless corrosion inhibitors added</li> <li>• May form mineral films when used with hard water</li> </ul>
<b>Acid cleaners</b>	<ul style="list-style-type: none"> <li>• Strong acids                             <ul style="list-style-type: none"> <li>• Phosphoric acid, nitric acid, sulfamic acids</li> </ul> </li> <li>• Weak acids                             <ul style="list-style-type: none"> <li>• Hydroxyacetic acid, citric acid, lactic, gluconic acid</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Dissolves mineral deposits</li> <li>• Chemically breaks down large molecules in smaller soluble pieces</li> </ul>	<ul style="list-style-type: none"> <li>• Regular use prevents build up of mineral deposits</li> <li>• Breaks down fats and carbohydrates</li> <li>• May be used as an acid rinse after alkaline cleaning</li> </ul>	<ul style="list-style-type: none"> <li>• Strong acid cleaners are hazardous to workers</li> <li>• Corrosive to metal surfaces</li> <li>• May form hard to remove protein deposits on surfaces</li> </ul>
<b>Oxidizing agents</b>	<ul style="list-style-type: none"> <li>• Sodium hypochlorite, sodium perborate, sodium percarbonate, hydrogen peroxide.</li> </ul>	<ul style="list-style-type: none"> <li>• Chemically breaks down large molecules in smaller soluble pieces</li> </ul>	<ul style="list-style-type: none"> <li>• Effective for removing protein deposits</li> </ul>	<ul style="list-style-type: none"> <li>• High alkalinity may cause mineral films to form in hard water</li> <li>• Some require high temperatures to be effective</li> </ul>
<b>Enzymes</b>	<ul style="list-style-type: none"> <li>• Protease (proteins)</li> <li>• Lipase (fats)</li> <li>• Amylase (Carbohydrates)</li> </ul>	<ul style="list-style-type: none"> <li>• Highly specific reactions break down large molecules in smaller soluble pieces</li> </ul>	<ul style="list-style-type: none"> <li>• Effective against proteins, fats and oils, and carbohydrates</li> </ul>	<ul style="list-style-type: none"> <li>• Activity is strongly dependent on pH and temperature</li> <li>• Inactivated at high temperatures</li> <li>• More expensive than other cleaners</li> </ul>