



## LOCTITE MULTICORE HF 212

Recognizing the unique requirements of larger printed circuit boards (PCBs) used for many industrial and automotive applications, Henkel has designed a halogen-free solder paste that withstands the thermal demands inherent with

larger assemblies. High reliability and a wide reflow process window are at the foundation of this material, ensuring its outstanding performance for the most demanding high value PCB applications – all in a halogen-free formula.



PRODUCT ATTRIBUTE	PROCESS BENEFIT
Halogen-free	LOCTITE MULTICORE HF 212 solder paste meets all the current "definitions" of halogen-free <ul style="list-style-type: none"> <li>• No added halogen</li> <li>• Measured &lt;900 ppm Chlorine and Bromine and &lt;1,500 ppm total by Oxygen (O<sub>2</sub>) bomb test</li> </ul>
Halide-free	<ul style="list-style-type: none"> <li>• Flux classification ROLO in accordance to J-STD-004B</li> </ul>
Application	<ul style="list-style-type: none"> <li>• Designed for printing, pin-in-paste and enclosed head print capability</li> <li>• Excellent wetting to a broad range of metallization</li> <li>• Compatible with existing halogen-free solutions</li> <li>• Suitable for medium to large board assemblies</li> </ul>
Technology Printing Advantages	<ul style="list-style-type: none"> <li>• Wide process window for printing and minimal slump</li> <li>• Fine pitch capability and reduction in solder bridging</li> <li>• Suited for high throughput production, where yield consistency on print deposits is key</li> <li>• Abandon time of up to 4 hours; work life &gt; 8 hours</li> </ul>
Technology Reflow Advantages	<ul style="list-style-type: none"> <li>• Optimize for long soak reflow profiles</li> <li>• Improved fine pitch coalescence</li> <li>• Excellent humidity resistance</li> <li>• Excellent solderability on challenging surface finishes</li> </ul>
Low Voiding	<ul style="list-style-type: none"> <li>• Low void levels increases solder joint reliability</li> <li>• New chemistries allow pursuit of low void levels (&lt;5%)</li> <li>• Low voiding on industry surface finishes: ENIG, Copper OSP, CuNiZn and Imm Ag</li> <li>• Low voiding in CSP</li> </ul>
Residues	<ul style="list-style-type: none"> <li>• Clear, transparent and colorless</li> <li>• Pin testable residues</li> </ul>

	HALOGEN-FREE		HALIDE-FREE		
Drivers for Classification	REACH Non-Government Organization (NGOs)		High reliability solder interconnects with international standards		
Definition	No international halogens added to flux Complies with international standards (see below)		No flux corrosivity or dendritic growth detection Specific requirements to give ROLO classification		
Test Procedures	New-O <sub>2</sub> bond on flux Ion Chromatography on flux		Well established quantitative halide test performed by Ion Chromatography (IC)		
International Standards	JPCA-ES-01-1999	Bromine <900 ppm Chlorine <900 ppm	IPC J-STD-004B, IPC-TM-650	Copper Mirror	No penetration
	IEC 61249-2-21	Bromine 900 ppm max. Chlorine 900 ppm max. Total halogens 1,500 ppm max		Silver Chromate	No discoloration
				Fluoride test	No color change
IPC-401B	Bromine 900 ppm max. Chlorine 900 ppm max. Total halogens 1,500 ppm max	Chloride and Bromide	<0.005%		
			Flux corrosion	No pitting No color change	
			Surface Insulation Resistance (SIR)	No discoloration No dendritic growth No corrosion >10 <sup>9</sup> Ω	

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