

LA2001.SS .. Microflame Soldering System

a Comparison of Heat Sources for Soldering

Laser- / Light beam / Soldering iron / Induction / Spirflames®

| Heat source * | Laser | Light | Solder iron | Induction | SpirFlame®** |
|--|--|--|--|---|---|
| System composed of | Electronics, Laser & Optics. Complex system. High cost. | Lamp & Optics. Complex system. Medium cost. | Heating element & Solder tip. Very simple system. Low cost. | Induction coil. Relatively complex system. Medium cost. | Torch nozzle and gas generator. Relatively complex system. Medium cost. |
| Heat transferred by mechanical contact | No | No | YES | No | No |
| Heat transferred contactless | Yes | Yes | NO | Yes | Yes |
| Heat transfer / heat density | Energy rich, concentrated laser beam releases very high density energy burst. Extreme rapid. | Punctual heat release. Low energy density. No heat storage. Slow heating. | Basic heat energy is stored in tip copper mass. Slow heating. | Volumetric heat release. Part must be electric conductive. Quick heating. | Hydrogen - Oxygen (2H+1O) Flame. Punctual heat release. Quick heating. |
| Dosing of Heat energy | Yes | Yes | Yes | Yes | Yes |
| Heat transfer influenced by contact pressure | No | No | Yes | No | No |
| Heat transfer influenced by mechanical surface conditions | Yes | Yes | Yes | No | No |
| Heat transfer influenced by the material composition | Yes | Yes | Yes | Yes | No |
| Heat transfer influenced by variations of optical conditions of surface and light path | Yes, heavy influences by surface reflection factor and flux vapours (clouding) | Yes, heavy influences by surface reflection factor and flux vapours (clouding) | No | No | No |
| Heat transfer influenced by mechanical wear & tear of heat source | No | No | YES, heavy influences caused by tip oxidation (scaling) and mechanical wear | No | No |
| Other influences on heat transfer | No | No | YES, <i>solder deposit between tip and surface acts as heat transfer bridge. Very important influence.</i> | No | No |
| Cost of consumables for heat source | No significant "consumption" of spare parts. Lasers usually have a long life. | No significant "consumption" of spare parts. Lasers usually have a long life. | High mechanical wear of solder tip. Needs regular rework or replacement of tip and mechanical readjust of iron jig. | No significant "consumption" of spare parts. HF generator usually show a long life. | No significant "consumption" of spare parts. Nozzles stay cold in operation. DI water (about 4 oz /hour) is the fuel. |
| Technical complexity of heat source | High | Medium | Low | Medium | Medium |
| Handling / Accessibility to job with heat source | Beam splitting and mirroring give some flexibility to adapt. | Beam splitting and mirroring give some flexibility to adapt. | Hot heating cartridge and thermal allowable tip length somehow restrict access to tight spaces. | Somehow restricted. The part must protrude into coil area. | Flexible. For example the patented Flame Delivery Cylinder can easily move into cavities. |

* More details and links to be published on Web page. Ask for access code at info@spirig.com

* Real world applications Applications to be published on Web page. Ask for access code at info@spirig.com

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