

Material Utilization

LAW[®]: 100% of the material is used during processing

LAP[®]: <1 to >90% utilization is widely dependent upon parameters

Porosity

LAW[®]: Parameters can typically be developed to minimize porosity

LAP[®]:

- Common gas atomized powder can contain some amount of trapped gas within the powder particles themselves
- Amount of trapped gas will vary between manufacturers and products
- Rotary atomized powder is not prone to trapped gas, but is more costly and less available than gas atomized powder. It is possible to achieve a fully dense clad using rotary atomized powder

Heat Input

LAW[®]:

- In order to melt the wire a minimum heat input is required for a given wire size and feed rate
- Lower power inputs demand small wire diameters. As the wire diameter decreases, it becomes more difficult to feed reliably

LAP[®]:

- Minimum heat input is only limited by the minimum laser spot size and tolerable powder efficiencies.
- Joining Technologies is able to clad using less than 100 watts

Geometry

LAW[®]:

- Well suited to simple, regular surfaces, such as round part ODs, flat surfaces, and wear grooves due to being a unidirectional process
- Minimum feature size is a function of wire diameter. Rule of thumb is 1.5 to 2 times wire diameter. Lower wire diameters are less available, more expensive and harder to manipulate

LAP[®]:

- Multi-directional and therefore well suited to complex geometries

Filler Material Cost

1. Gas atomized powder is less expensive per pound than wire, however powder efficiency may push the relationship in terms of cost per pound of clad material
2. Rotary atomized powder is more expensive than wire per pound of raw material in addition to powder efficiency losses