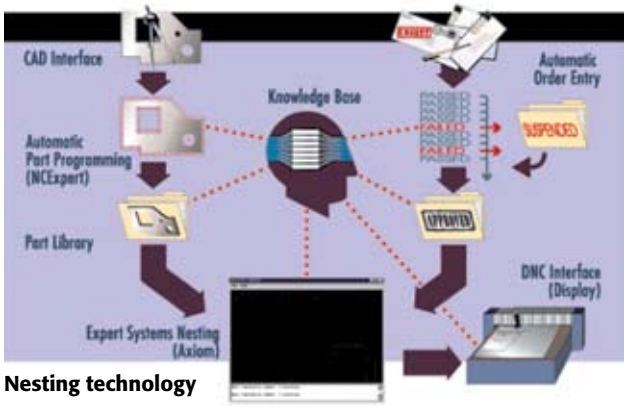

# Nesting solutions for metal fabricators

Multi-dimensional combinatorial nesting technology provides efficiency for metal fabricators using laser machines, writes **Thomas R Cutler**

Michael D Lundy, P.E. and CEO of Optimation, opines, "There are very few powerful automated nesting and NC Programming software package for fabricators using laser machines (flying or fixed optic, hybrid)." The nesting solutions for fabricators must work with part designs. CAD drawings along with pertinent pre-programmed inputs and manufacturing attributes must be imported into nesting solutions software. Lundy adds, "Compatibility with a wide range of CAD formats is essential with any nesting software."



**Nesting technology**

## MDCN

Multi-Dimensional-Combinatorial-Nesting technology (MDCN) is a new technology, which transcends previous nesting methods. Previously, most nesting algorithms were simple heuristics, and did not consider the alternatives; this new methodology guarantees the highest efficiency while insuring that production schedule and priorities are optimized.

Standard heuristics crash badly when presented with real world problems. MDCN looks at many different dimensions affecting cost. Schedule, hot parts, material efficiency, order completion, tool optimisation, common cutting, torch load, and other costs make finding the optimal nest multi-dimensional. Unlike heuristics, the combinatorial nesting approach uses fathoming to eliminate infeasible solutions and the sub-optimal solutions. MDCN converges, learning as it works to find the optimal solution.

Each new solution becomes the benchmark to best when comparing alternative combinations of parts; any solution that is not better or cannot improve on the best solution found, is not considered.

The ability to use several intelligent tools to create the nest is a primary advantage of this new technology and enables metal fabricators to get the parts needed, when they are needed, in exact quantities, at the lowest cost.

Metal fabricators cutting flat material using a flat bed laser in a 2D process; they cut flat material into irregular shapes. There are many other laser processes that are not cutting parts from the material; laser marking being the most common. Since the laser head is very close to the material when it is cutting, if the material touches the laser head it will cause the machine to go into an emergency stop to prevent damage to the head.

An emergency stop is time consuming and may cause higher scrap. Collisions must be avoided at all cost. Common cutting increases the possibility of a collision because the laser head is moving nearer to adjacent parts; if those parts have been cut free, they may bow up and collide with the head.

Utilising a collision avoidance expert system in order to optimise the toolpath (by maintaining a head-down position during rapid traverse whenever possible, avoiding tipped-up pieces) is a reasonable quality expectation. Providing a full-featured approach that allows the user to specify which parts can be common edge cut when a part is libraried is also required, yet difficult to find in many nesting and laser software solutions. Reading and applying key manufacturing information marks for bend lines, weld lines, grain direction, part numbers, order numbers, or anything needed with geometric marking and text etching should be on the fabricators product expectation list. 2.0

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