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## The automated solution to program your tubes and profiles cutting machines and robots

The Almacam Tube CAD/CAM software is able to interact with any kind of tubes and profiles cutting system (3, 4 or 5 axis machines with one or more rotative axes, robotized cells for cutting tubes).

It integrates all the steps in the programming process: CAD import or modeling of the tubes and profiles, management of manufacturing orders, automatic nesting of the tubes and profiles to cut, creation and automatic scheduling of trajectories, generation of ISO codes. The software functions automatically but lets the user manage specific situations in order to guarantee optimum execution of the programming.

Almacam Tube benefits from Alma's considerable expertise in programming 3D/Tubes machines and cutting robots, acquired thanks to the many installations it has carried out and its partnerships with several manufacturers.
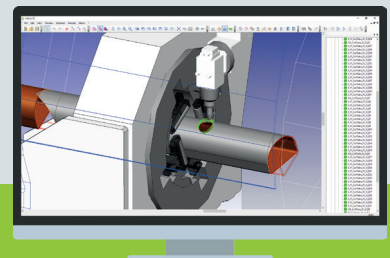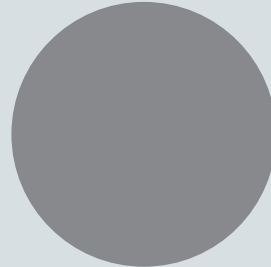
→ Advantages and benefits

✓ **CAD import of single parts or assemblies, with retrieval of the quantities.**

✓ **Possibility to add connections (e.g. pins, hooks) between tubes and profiles of an assembly.**

✓ **Automatic unfolding and unbending of tubes and profiles.**

✓ **Automatic generation of the trajectories and the program for cutting tubes and profiles.**

✓ **Ability to interact with any type and any brand of tubes and profiles-cutting system, without any limitation on the number of machine or robot axes.**

✓ **Management of specific functions or requirements related to tubes and profiles cutting machines.**

✓ **Management of machines combining laser cutting with mechanical units.**

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TUBE

Modeling

- 3D modeling of tubes and profiles of any kind of section.
- Library of predefined sections of tubes and profiles (international standards).
- Libraries of predefined shapes for the sections, holes, end cuts and folds.
- Possibility to define holes of any shape.
- Possibility to add bevels at the modeling stage, while complying to the technological constraints and machine limits.
- Possibility to set several types of machining to cutting contours (minimum and maximum material).

Import of parts and assemblies

- Import of 3D parts and assemblies in Parasolid®,STEP, IGES and SAT/ACIS® format.
- Import of 3D models in native formats (Catia® V4/V5, PTC Creo®/ProENGINEER®, Inventor®, Solid Edge®, SOLIDWORKS ®, Unigraphics®).
- Import of 3D models using formats specific to the design of metallic structures (IFC, DSTV).
- Automatic recognition of tube and profile sections during CAD import.
- Automatic recognition of geometrical properties of holes from imported CAD parts.
- Possibility to modify the geometry of imported CAD parts.
- Function to add connections (e.g. pins, hooks) between parts of an imported CAD assembly.
- Possibility to unfold an imported CAD part that consists of a folded tube.
- Possibility to unbend an imported CAD part that consists of a bent tube.
- Automatic recognition of any type of chamfered cutting and automatic calculation of cutting paths.

Launching order management and raw material stock management

- Automatic creation of launching orders and retrieval of quantities from the CAD models of tube assemblies.
- Preparation and management of launching orders with the possibility to manage the raw material stock.

Tube nesting

- Optimized multiple-part nesting on multiple bars.
- Management of different lengths for the bars.
- Analysis of the exact geometry of tube end cuts to save material.
- Analysis of complex cutting paths for profile nesting.
- Possibility to authorize the rotation of parts around their axis according to the section.

- Automatic check of gaps between parts and of margins at the bar extremities.
- Automatic management of complete or partial common cut between tube extremities.
- Operation in batch mode.

Programming of 3/4/5-axis machines equipped with mandrel(s) and robots

The programming of tube cutting is implemented within a 3D environment that enables a complete modeling of the machine and its environment, while managing all the machine kinematics aspects (speed, acceleration and specific points), regardless the number of machine or robot axes.

Main functions:
- Analysis of the various technological constraints for the automatic definition of the cutting paths.
- Automatic calculation of the cutting paths on the profiles with the possibility to take into account various machine rules and constraints.
- Gridlining function for the cutting of inner offcuts.
- Automatic creation of the cutting program thanks to the realistic simulation and control functions using visual anomaly indicators.
- Generation of NC programs using a postprocessor specific to the machine or robot used.

Support of advanced functions of tube cutting machines

- Coupling constraints for multi-mandrel machines.
- Automatic recognition of clamping rules of mandrel (chuck) jaws.
- Automatic programming of loading/unloading units.
- Tube handling by systems other than axis.
- Management of sensing (centering of holes, tube twisting etc.)
- Management of machines combining laser cutting with mechanical units (drilling, milling, filling, tapping etc.) with automatic allocation of mechanical tools.

Workshop document

- Generation of a workshop document containing all the information related to the cutting programs, nesting layouts and quantities of parts to cut.
- Accurate estimation of cutting times taking into account the technological parameters and kinematic characteristics of the machine (speed, acceleration of each axis).

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