Vintech RCAM-Pro

CAM system for true shape nesting and NC programming

Vintech RCAM-Pro is a CAM system, specially designed for true shape nesting and programming of CNC machines for thermal and jet cutting of sheet parts.
The system has been developed for more than 20 years.

Main benefits

The implementation of Vintech RCAM-Pro leads to:

- Decrease in production expenses,
- economy of used metals and full control of the usable remnants,
- increase in productivity and reducing the load of the equipment,
- possibility for programming all available CNC machines for thermal cutting using a single CAM system,
- easy transfer of NC programs from one machine to another,
- constant achievement of high quality of the produced parts,
- high quality programming of CNC machines for thermal and jet cutting.

Characteristics

Vintech RCAM-Pro is 64/32 bit technological software for Windows or Linux.
The CAM system is based on original algorithms for tight step-by-step nesting with optimisation and **on-line** control against overlapping, without shape or size restrictions of the working area and parts.
It automatically and interactively creates true shape nesting with advanced technology for thermal and jet cutting.

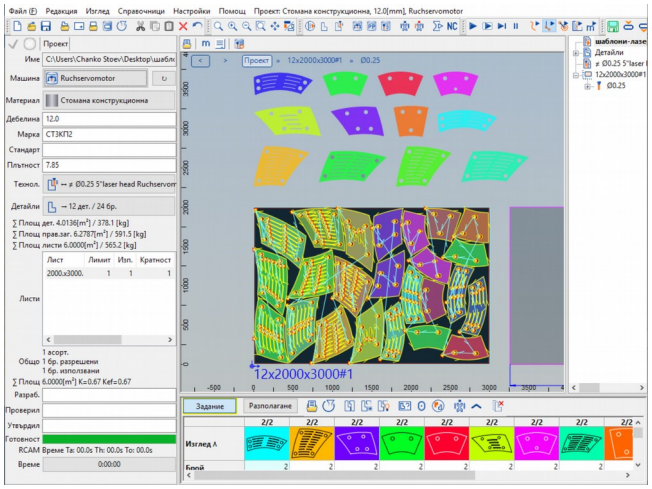


Fig.1: Automatic nesting with Vintech RCAM-Pro 10

Usability

Vintech RCAM-Pro has user interface with integrated methods for nesting and processing technology management.

Configuration

Vintech RCAM-Pro is a fully-functional CAM system for programming of CNC machines for true shape nesting, which allows for:

- Import of the geometry and attributes of the parts for nesting,
- specifying the technological environment by a selection from datasets – machine, cutting type, plates and material,
- automatic and interactive nesting of parts and blocks; nesting parts from orders according to priorities.
- application of the processing technology, according to the cutting type,
- generation of NC programs and documents for processing,
- calculation of processing duration, cost price and preparation of offers.

Vintech RCAM-Pro can work with ViNES Manager, ViNES Warehouse SM and ViNES Production in MES systems for true shape nesting production management.

Bundle

The **Vintech RCAM-Pro** bundle includes:

- Vintech RCAM-Pro – CAM system for true shape nesting and NC programming,
- Libraries: Parametric parts; Vintech rPipe – parts from cylindrical pipe connections; Vintech rJet – water-jet cutting technology; Vintech rAMT - variable count and spacing between parallel torches; Vintech rLaser – laser cutting technology;
- Library Vintech rSales - Pricing and offering on nesting layouts,
- Vintech NCV – System for verification of NC programs for thermal cutting.

Optional Libraries

- Library Vintech rBevel – bevel cutting technology.
- Library Vintech rDrill – Drilling, boring and milling technology.
- Library Vintech rBI - batch import of parts by specification from XSLX or CSV file.

Technological datasets in Database

The system supports the nesting information in the SQL database. The DB can be single-user or network multi-user. Vintech RCAM-Pro supports specific technology knowledge in accessible for overview and editing Technological Datasets in the DB.

Nesting Geometry

Vintech RCAM-Pro reads CAD files with DXF, DWG, SVG, ESSI or DSTV formats and imports CAD geometry for parts and multi-parts. The CAD geometry can contain arcs, segments, ellipses, splines, point sets and text.

- Automatically recognises one or multiple parts from the input geometry
- The system intelligently corrects geometric defects and marks the locations of the remaining errors.
- Defines the contour type in the parts as: outer and inner closed contour, hole, slit, marking geometry and point sets.

Management

Vintech RCAM-Pro saves the data during the nesting process in a project file in a folder of the operating system.
To manage the design process the system uses Job, Nesting queue, Project navigator, Project tree and galleries – Parts, Blocks and Nesting layouts.

Plates for nesting in project

Vintech RCAM-Pro nests on multiple whole plates or usable remnants (UR).

Creating technology at any time

A distinctive characteristic of Vintech RCAM-Pro is that it can create or change the Processing technology for the whole layout

© VINTECH CADCAM
Bulgaria
9027 Varna, 6 Jan Hunyadi Blvd.

http:// www.vintech.bg
E-mail: sales@vintech.bg
tel: +359 52 757 221

or for a part of it at any time without changing the location of the parts.

Automatic and interactive nesting

Vintech RCAM-Pro nests with high efficiency. It uses algorithms for tight step-by-step nesting with **on-line** control against overlapping, which does not allow nesting an object on top of the already nested ones.
Vintech RCAM-Pro allows interruption of the automatic nesting, interactive action and resumption of the automatic nesting, at any moment.

The interactive nesting can be with true shape or in a pattern, controlled by the corresponding "handles". Using the cursor the parts can be dragged, pushed or manipulated until they are placed close to the desired position on the plate. After dropping them, the algorithms for on-line control against overlapping, nest them tightly to the already nested objects on the plate.

Unlimited part-in-part nesting

Vintech RCAM-Pro nests parts in a hole of another part. The nesting levels are unlimited.

Special nesting methods

Vintech RCAM-Pro provides functions which take into account the characteristics of CNC machines like: nesting on the edge of the plate; common cut nesting; parallel nesting with fixed spacing between the torches and additional nesting after the parallel nesting; parallel nesting with variable spacing and torches count.

Working with blocks

Vintech RCAM-Pro includes a large number of functions for working with groups of nested parts – blocks.

Technology

Cutting paths and route of rapid moves

Vintech RCAM-Pro provides powerful tools for managing the cutting paths and route of rapid moves.

The paths can be created automatically or interactively, with on-line control against overlapping, in correspondence with material, contours' type and length. Vintech RCAM-Pro uses the information from the Technological Datasets to create the paths.

The system finds space for the path elements, so that they do not overlap neighbouring objects, using the **on-line** control against overlapping.

The route of rapid moves defines the order of processing the separate paths in a part and in a nesting layout. It is generated automatically or interactively. Defines and controls the processing sequence according to the nesting level of each part.

Automatic creation of paths

Vintech RCAM-Pro automatically creates paths and path elements, such as: Start/End points; Gaps; Loops and sharp corner operations; paths with control of speed and acceleration in corners (with or without small radius); paths for marking and engraving; paths for accurate plasma cutting of holes, when the plasma source allows turn-off control; chain cutting with circumventing.

Interactive creation of paths

Vintech RCAM-Pro creates: Common cuts; Cutting with bridges; including corner and negative bridges; Paths of parts nested on the edge of the plate; Paths with "eyelets" for Lead-In from adjacent path; "L-locks" on the path; Pseudo-bridges with leading line, including on top of common cuts,

Interactive editing

Changes the place of Start/End point or Gap by dragging along the path, edits the slope and length of Lead-In and Lead-Out by dragging the relevant „handles", changes the type of Lead-In/Out using „halos".

Transferring a nesting layout between machines

Vintech RCAM-Pro supports powerful **functions for transfer** of NC programs between different types of machines.

Vintech RCAM-Pro allows automatic change of machine, cutting regime, technology, kerf and post-processor in the project at any time.

Special tasks for true shape nesting,

- Common cuts: by pairs, in matrix of rectangular parts, in multitudes of variable parts, common cut of nested parts
- avoiding collisions by reorientation of Start/End points according to the order of contour processing;
- Automatic circumvention of cut areas with rapid moves.
- creating nesting layouts with continuous cutting and lead-in from the edge of the plate,
- slicing the scrap skeleton,
- cutting of gaps after the main processing,
- transformation of rapid moves into cutting paths for chain cutting with circumventing.
- creating technologies for processing by frames (with repositioning) for plates longer than the work stroke of the machine,
- automatically splitting a nesting layout into successive settings for two machines in two ways:

1. First setting: drilling, boring processing of parts from a nesting layouts on a vertical machining center; Second setting: cutting the contours on a thermal cutting machine.
2. First setting: cutting the contours on a thermal cutting machine; second setting: part by part drilling, boring processing on a vertical machining center;

- **post-marking** on the machine. Marking the heat № of the current plate on particular parts from the nesting layout.

Generating reports and documents

Saves HTML, PDF and DXF documents for a single layout or all layouts in the project.

Generating NC programs in ISO / EIA, ESSI and other command systems

Vintech RCAM-Pro creates NC programs using Universal or External postprocessor. It generates programs for:

- All thermal cutting types,
- water-jet cutting,
- bevel cutting
- drilling, boring with tool change from tool magazine,
- cutting with tangential knife or band,
- vector and text marking,
- cutting with different systems for automatic cutting regime control.

© VINTECH CADCAM
Bulgaria
9027 Varna, 6 Jan Hunyadi Blvd.

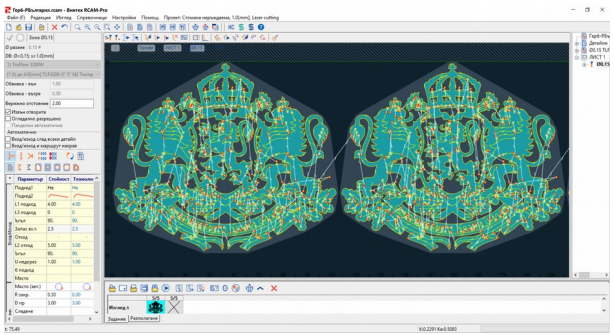
http:// www.vintech.bg
E-mail: sales@vintech.bg
tel: +359 52 757 221

Vintech RCAM-Pro

Thermal cutting solutions

Laser cutting

Vintech RCAM-Pro has advanced functionality for programming modern laser cutting machines with specific technological tables for the type of machine. Creates nesting and cutting technology with a wide range of features for laser processing taking into account material, contour type and length. Programs cutting, cleaning and engraving. Generates NC code with rotation and translation of subroutines.



Фиг.1: Programming of laser cutting and engraving of complex parts

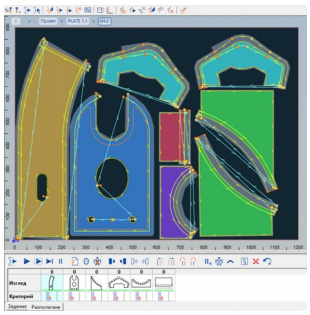
Plasma and oxy-fuel cutting

Vintech RCAM-Pro has advanced functionality for programming plasma and oxy-fuel cutting machines. It nests and creates cutting technology for plasma cutting of thin metals and for oxy-fuel or plasma cutting for thick metals. Programs thermal cutting combined with dust, impact or jet marking, plasma etching or pre-drilling with size tool.

Generates NC code, including for control of automatic gas consoles and programmable plasma sources.

Bevel cutting

Vintech RCAM-Pro creates bevels and NC programs for plasma and oxy-fuel **bevel** cutting through the optional library **Vintech rBevel**.



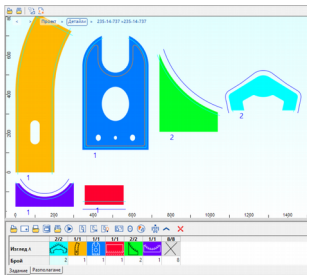


Fig.2: Parts – right and bevel layout - left

- The library provides flexible tools for creating nesting layouts with bevel cutting. It can be used to manage interactively:
  - Single and complex, constant and variable bevels and chamfers on whole contours or contour segments, without limitation,
  - technology for bevel paths, according to the capabilities of the CNC machine, the bevel head and the tracking system,
  - specific path elements, including Technology Points for auxiliary bevel cutting functions management,
  - different types of processing of sharp corners: with separate paths, loop, rounding, sweep, point; of corners at external and internal paths,
  - angular transitions between similar or different bevel paths, between bevel and vertical paths.
- provides advanced capabilities for control of dimensional accuracy in bevel parts, using NC program or CNC controller,

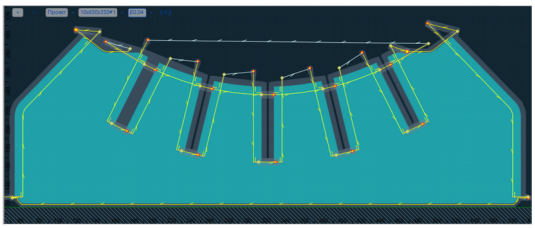


Fig.3: Part with complex bevels: project(up) and test part(down)

- Creates NC programs for bevel cutting with different bevel heads constructions with 4 and 5 - axis control with movements along axis XYCA, XY45°CA, XYAB, XYZAB.

Library Vintech rDrill

Vintech RCAM-Pro creates technology for drilling, boring and milling combined with thermal cutting using the optional library **Vintech rDrill**:

- Defines complex processing of step holes and 2D milling contours on the geometry of flat parts,
- supports drilling, boring amd milling tools and relevant cutting regimes,
- assigns the sequence of the tools from the NC program in the tool magazine,
- creates NC programs for thermal cutting combined with drilling, boring and milling with tool change from the tool magazine.

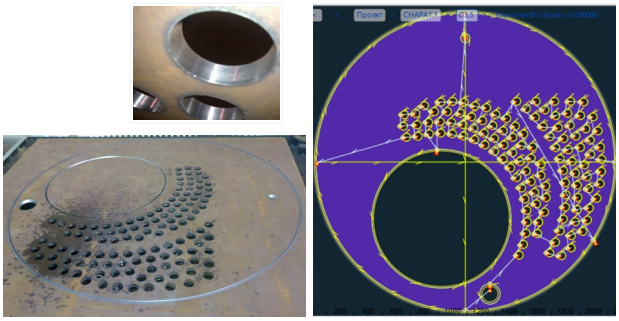


Fig.4: Project (right) and tubular mesh (left) processed with combined plasma bevel cutting and boring holes

© VINTECH CADCAM
Bulgaria
9027 Varna, 6 Jan Hunyadi Blvd.

http:// www.vintech.bg
E-mail: sales@vintech.bg
tel: +359 52 757 221

Library Vintech rPipe

Vintech RCAM-Pro creates a geometry of a flat pattern of a part from a pipe connection by executing a parametric macro-part from the Vintech rPipe library, and:

- shows a 2D general arrangement draft, a draft of the flat pattern and a 3D image of the processed part,
- creates structural elements, such as slots and assembly markers on the flat pattern; the flat pattern takes into account how the connection is assembled,
- creates matrix-nested round or rectangular openings on a pipe part using the Single pipe macros.

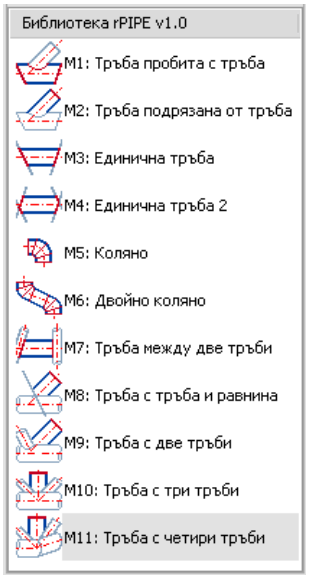


Fig.5: Library Vintech rPipe

Module Vintech rAMT

Vintech RCAM-Pro creates true shape nesting and NC programs for plasma or oxy-fuel cutting machines with the functionality of changing the number of parallel torches and the distance between them (Advanced Multi Torch) with the module Vintech rAMT:

- Creates nesting layouts with automatically or interactively positioned groups of parts for parallel processing,
- creates cutting paths and a route of rapid moves,
- visualises and traces parallel processing,
- interactively creates nesting and technology for multi-torch processing of long parts with parallel edges.

Pricing and offering

Vintech RCAM-Pro defines prices from the nesting layouts in a project and creates commercial documents using the library Vintech rSales.

The library accurately calculates the spent metal and time based on the cutting, marking and cleaning program, and distributes them by parts, layouts, nesting jobs and orders. Calculates cost based on norms from Datasets by:

- Length or time for processing
- weight (or area) of the parts in the order, usable remnants, remnants to order and waste scrap.

Adds profit or discount, additional costs and factory expenses in the calculations.

Creates:

- commercial documents such as Pro-forma invoice or offer
- document sets, such as list of plates and usable remnants, nesting layouts, specifications or other reports

Allows the documents to be generated for sales:

- in national currency, with or without VAT,
- in foreign currency, in multiple languages.

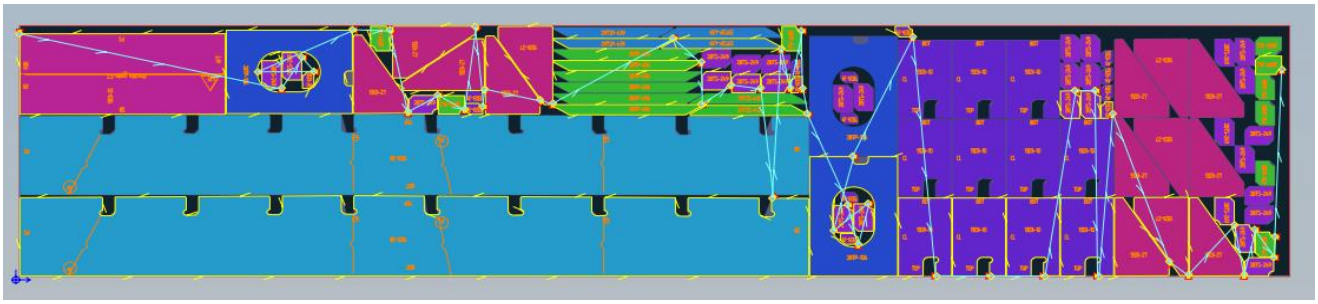


Fig.6: True shape nesting with AMT. The parallel cutting with variable torch count and distance between them in the example can control up to three cutters. Cutting paths (yellow lines) and rapid moves (blue lines) for parallel cutting are shown only for the leading cutter. True shape nesting with AMT can be applied to parts located in holes.

VINTECH - Your partner for CNC thermal and jet cutting of sheet material!

VINTECH is author and creator of the CAM system **Vintech**:

Vintech RCAM-Pro
CAM system for true shape nesting and NC programming,

Vintech Pipe
CAD/CAM system for NC programming of 2D pipe cutting machines,

Vintech NCV
Verifier of NC programs for thermal cutting,

Vintech Duct
CAD/CAM system for parametric design and NC programming of orders for flat patterns of fittings of HVAC systems,

ViNES
MES system for warehouse and true shape nesting production management

The development of the CAM system **Vintech** is based on IT excellence and more than 39 years of experience in the integration of effective CNC/CAM solutions. We create software for managing Your future!

© VINTECH CADCAM
Bulgaria
9027 Varna, 6 Jan Hunyadi Blvd.

http:// www.vintech.bg
E-mail: sales@vintech.bg
tel: +359 52 757 221