

Vintech RCAM 11 is a CAM system, specially designed for true shape nesting and programming of CNC machines for laser, plasma, oxy-fuel, water-jet and other types of cutting of sheet parts. The system is being developed for more than 22 years.

Vintech RCAM performs the following:

- supports the geometry and data in Database of parts by orders,
- imports geometry and attributes of parts for nesting,
- sets the machine, cutting type, plates and material by choosing from Technological Datasets,
- automatically and interactively nests parts and blocks, nests parts of orders according to their priority,
- applies processing technology according to the material, the machine and the type of cutting,
- generates NC programs and processing documents,
- calculates the processing time, the prime cost and creates offers.

Vintech RCAM 11 can work together with the system for management of the technological preparation Vintech Manager, with the MES system for management of the true shape nesting production VINES as well as to work as part of complex systems for management of the company.

Main benefits

The implementation of Vintech RCAM 11 leads to:

- Decrease in production expenses,
- economy of used metals and full control of the usable remnants,
- increase in the productivity and the load of the equipment,
- possibility for programming all CNC machines for thermal cutting available in the workshop 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.

Configuration

The Vintech RCAM 11 bundle includes:

- Vintech RCAM 11 – 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 orders of multi-plate 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 iKG – on-line import of parts for nesting from KOMPAS-Graphic assembly drawings;
- Multi-user Database for Vintech RCAM.

Characteristics

Vintech RCAM 11 is 64 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.

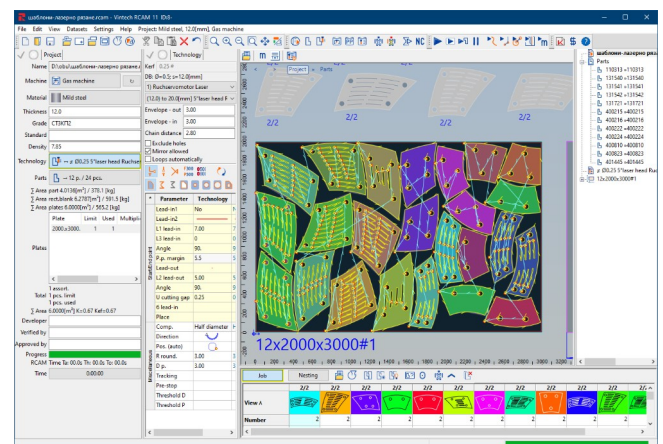


Fig.1: Automatic nesting with Vintech RCAM 11

Usability

Vintech RCAM 11 has user interface with integrated up-to-date methods for nesting and processing technology management.

Technological datasets

The Technological Datasets (TD) store settings and specific parameters for thermal and jet cutting, which are accessible for overview and applying. In the main Vintech RCAM bundle, the system uses single-user SQL DB in order to support the Technological Datasets.

Nesting Geometry

Vintech RCAM 11 imports geometry from CAD files in the following formats: DXF, DWG*, SVG, ESSi, DSTV, CDW*, FRW*, PSM*.

The CAD geometry can contain arcs, segments, ellipses, splines, point sets and text.

- Vintech RCAM intelligently corrects geometric defects and marks the locations of the remaining errors while importing.
 - reads values of attributes from the CAD file and saves them to attributes of nesting parts.
- From the input geometry it automatically defines the contour type in the parts as: outer and inner closed contour, hole, slit, marking geometry, text and point sets.
 - Automatically recognises one or multiple parts.
- From the input geometry that contains CAD blocks, imports selected details.

Management

Vintech RCAM 11 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 11 nests on multiple whole plates or usable remnants (UR)

Creating technology at any time

Vintech RCAM 11 offers powerful instruments for management of the technology consisting of cutting paths and route of rapid moves.

A distinctive characteristic of Vintech RCAM 11 is that it can create or change the Processing technology for the whole layout or for a part of it at any time without changing the location of the parts.

Automatic and interactive nesting

Vintech RCAM 11 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 11 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 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 11 nests parts in a hole of another part. The nesting levels are unlimited.

Special nesting methods

Vintech RCAM 11 provides functions which take into account the characteristics of CNC machines such as: 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 11 includes a large number of functions for working with groups of nested parts – blocks.

Cutting paths and route of rapid moves

Paths can be created automatically or interactively, with on-line control against overlapping, in accordance with material, contours' type and length. Vintech RCAM 11 uses the information from the Technological Datasets to create the paths.

The paths can be with or without kerf, with or without corrections in the NC program.

The Start/End points of the cutting paths as well as the different types of gaps, bridges, corner processings are path elements.

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. The route is generated automatically or interactively. It defines and controls the processing sequence according to the nesting level of each part.

Automatic creation of paths

Vintech RCAM 11 automatically creates paths and path elements, such as: Start/End points; Gaps; Loops and other sharp corner operations; paths with control of speed and acceleration in corners (with or without small radius); paths for marking or engraving; paths for accurate cutting of holes, when the plasma source allows turn-off control; chain cutting with circumventing.

Interactive creation of paths

Vintech RCAM 11 creates: Common cuts; including without kerf, with compensations by the NC program; 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, changes 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 11 supports powerful functions for transfer of NC programs between different types of machines.

Vintech RCAM 11 allows automatic change of machine, cutting regime, technology, kerf and post-processor in the project at any time. When the kerf is not changed, the system keeps the paths with common cuts.

Special tasks for true shape nesting

- common cuts: by pairs, in matrix of rectangular parts, in multitudes of variable parts, common cut snap of nested parts,
- avoiding collisions by reorientation of Start/End points according to the order of contour processing;
- automatically circumventing the cut areas with rapid moves,
- automatically or interactively changing the paths and the route of the nested parts for "processing to the material",
- creating nesting layouts only with continuous cutting and lead-in from the edge of the plate,
- slicing the scrap skeleton,
- automatically cutting gaps after the main processing,
- transforming 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,
- possibility for automatically splitting of a nesting layout into successive settings for two machines in two ways:
 1. First setting: drill-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 drill-boring processing on a vertical machining center;
- post-marking on the machine: Automatically programming the marking of 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 for all layouts in the project.

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

Vintech RCAM 11 creates NC programs using Universal or External postprocessor. It generates programs for:

- All thermal cutting types,
- water-jet cutting,
- bevel cutting,
- drilling, boring processing with tool change from tool magazine,

- milling processing of flat contours,
- cutting with tangential knife or band,
- vector marking,
- laser or jet marking of texts with constant or random orientation of the marking head.
- cutting with different systems for automatic cutting regime control.

Thermal cutting solutions

Laser cutting

Vintech RCAM 11 has advanced functionality for programming modern laser cutting machines with specific technological tables for the type of the machine. Creates nesting and cutting technology with a wide range of features for laser processing taking into account the material and contour type and length. Programs cutting, cleaning and engraving. Generates NC code with rotation and translation of subroutines.

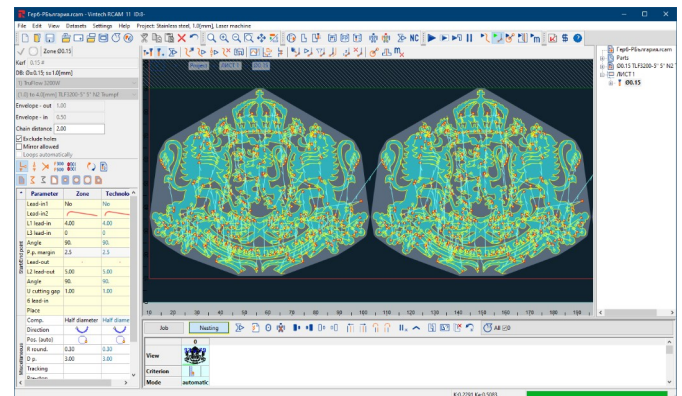


Fig.2: Nesting layout of laser cutting and engraving of complex part

Plasma and oxy-fuel cutting

Vintech RCAM 11 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.

The system programs thermal cutting combined with:

- preliminary dust, percussion, plasma or jet marking of vector geometry with a special tool,
- preliminary or part-by-part marking of texts with text-printing heads,
- preliminary or part-by-part marking/engraving of vector geometry with plasma cutter.

The system programs thermal cutting together with cutting with sized tool in advance. It drills start holes for piercing but it does not drill start holes when piercing from the edge or from already cut contour. Generates NC code, including for controlling the automatic gas consoles and programmable plasma sources.

Bevel cutting

Vintech RCAM 11 creates bevels and NC programs for plasma and oxy-fuel **bevel** cutting through the optional library **Vintech rBevel**.

The library provides flexible tools for creating nesting layouts with bevel cutting. It can be used to interactively create and manage:

- Single bevels – lower, upper, lower and upper chamfer,
- complex - Y, K, X, bevels,
- variable bevels and chamfers,
- bevels on whole contours or parts of contours, without limitations,

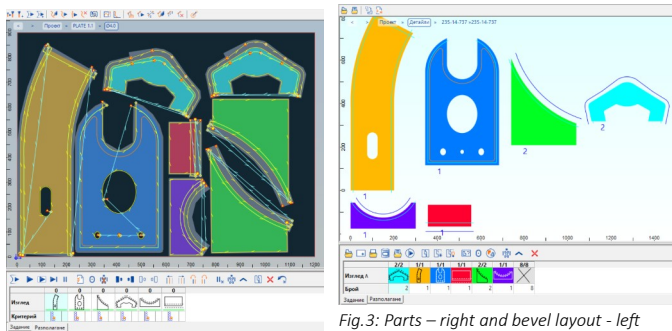


Fig.3: Parts – right and bevel layout - left

The system creates a technology for bevel paths, according to the capabilities of the CNC machine, the bevel head and the tracking system by controlling:

- specific path elements, including Technological Points for auxiliary bevel cutting functions management,
- different types of processing with bevel paths of corners: with separate paths, loop, rounding, sweep, point; of corners at external and internal paths,
- angular transitions between paths with equal or with different angle of the bevel,
- transitions between bevel and vertical paths,

Provides advanced capacities for control of dimensional accuracy in bevel parts, using NC program or CNC controller,

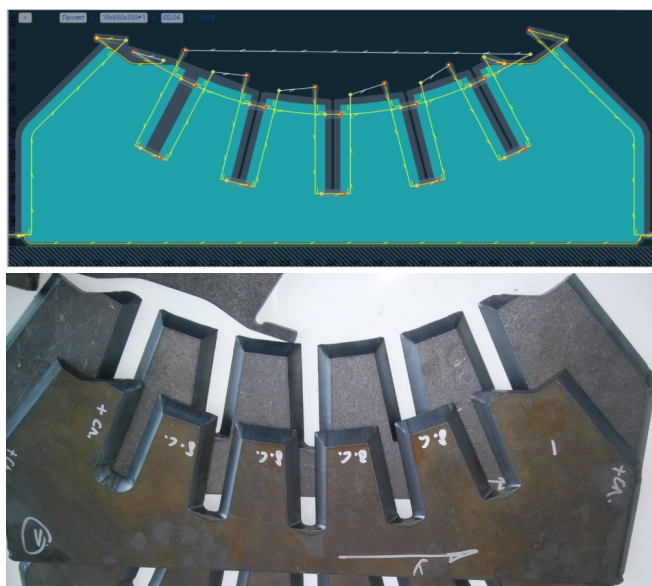


Fig.4: Part with complex bevels: project(up) and test part(down)

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 11 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 and milling tools and the relevant cutting regimes,
- assigns the sequence of the tools in the tool magazine by the NC program,
- creates NC programs for thermal cutting combined with drilling, boring and milling with tool change from the tool magazine.

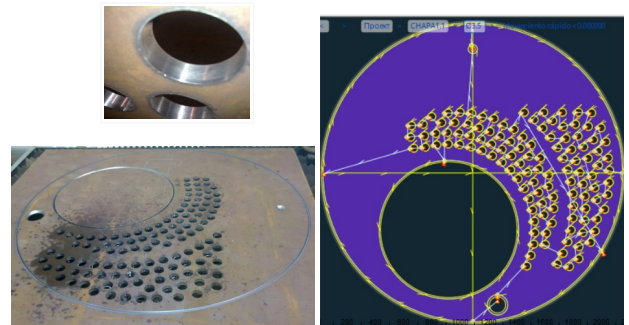


Fig.5: Project (right) and tubular mesh (left) processed with combined plasma bevel cutting and boring holes

Pricing and offering

Vintech RCAM 11 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.

It calculates cost price 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.

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

It 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 types of reports.

It allows the documents to be generated for sales:

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

Module Vintech rAMT

Vintech RCAM 11 creates true shape nesting and NC programs for plasma or oxy-fuel cutting machines with the functionality for 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.

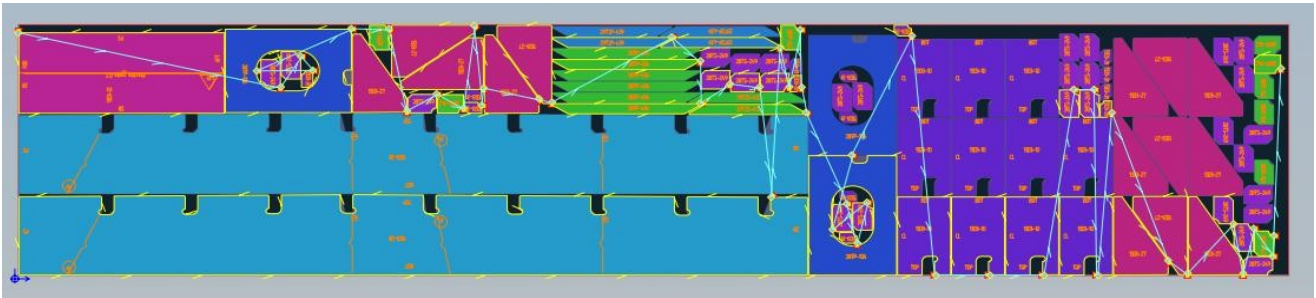


Fig.7: True shape nesting with AMT. The parallel cutting with variable number of torches and distance between them in the example can control up to three cutters. Cutting paths (yellow lines) and rapid moves (blue lines) for parallel cutting are shown only for the leading cutter. True shape nesting with AMT can be applied to parts located in holes as well.

*- in case the respective CAD system or a universal translating software are installed.

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

VINTECH is the author and the creator of the **Vintech** CAM system - a system based on IT excellence and more than 40 years of experience in the integration of effective CNC/CAM solutions.

Vintech RCAM 11

CAM system for true shape nesting and NC programming,

Vintech Pipe

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

Vintech Duct

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

Vintech NCV

Verifier of NC programs for thermal cutting,

Vintech Manager

CAPP system for management of the technological preparation of true shape nesting production,

VINES

MES system for management of the technological preparation, warehouse and true shape nesting production

We create software for managing Your future.

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