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Issue 26

Xpert CUT 2500: The New Generation



■ The new Xpert-CUT 2500 with vertical cutting wires, swivelling axis and software controlled portal adjustment.

The Yacht Werft Wedel company was able to be provided with two Xpert-Series machines at the beginning of the year.

In addition to an Xpert-3D milling machine with a 2700 x 1500 x 500 mm working range, the company also received the first machine of the New Xpert-CUT Generation. Yacht Werft Wedel uses these machine to manufacture shaped parts for composite components of luxury yachts. The machine concept of this Xpert-CUT 2500 is also

based upon our patented integral feed system. This made it possible to realise a machine that provides both extreme rigidity and precision operation.

A special feature of the system is provided by the machine chassis, which is designed as a self-feeding system with respective drives. This construction allows the distance of the portals to be varied fully automatically with the aid of software. The wire length or tensile load is thereby constantly, electronically checked and always kept within the

**Information for
customers and
prospective
customers**

Editorial



Developing the advantage...

In spite of the international economic situation, we won't lose courage and a number of plans for 2009. Our drive to achieve new goals is undiminished. Particularly in the field of hot wire cutting, the new Xpert-CUT series marks the beginning of a new era. The well launched Xpert milling machines have caused quite a stir over the past months and have quickly established themselves a leading market position. Quality has the cutting edge. Read what else has been going on at Step-Four and what our users have been up to. Have fun reading.

By the way, don't miss our competition on page 10. You can win a dream weekend in beautiful Mondsee.

ideal range. This provides an extremely fast adjustment to the most diverse work piece dimensions and cutting tasks.

In addition to the horizontal cutting wire, which is controlled via four axes, the system is also equipped with two other vertical cutting wires, so that the raw material blocks can be trimmed down to precision dimensions. The swivelling axis, which is also integrated into the machine, also makes it possible to process the work piece in various angular positions. A total of three cutting wires are controlled via software over nine axes. This allows any number of possibilities, which are provided by hot wire cutting in modern mould de-

sign, to be realised in a ideal and most efficient manner.

Wire cooling included

Another standard feature integrated within this system is the active wire cooling performed via high-performance fans. The cutting wire is cooled by these fans in the external ranges, where it doesn't enter into the material. This allows a setting of higher current intensities, without the wire breaking prematurely due to overheating in the external ranges.

High cutting speed

Due to the application of the high-performance titanium cutting wire, cutting speeds of up to 1500 mm/min can be achieved. However, a



■ The software controlled portal adjustment allows an extremely fast adjustment of the portal distance to the work piece dimension.

Masthead

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■ The wire tensioning system with motor or sensor unit ensures constant wire tension irrelevant of the portal distance and angular position. The fans for active wire cooling in the external range can also be seen clearly.

necessary precondition for this is a precise current and temperature regulation for wire lengths ranging from a few centimetres to up to several metres.

This is achieved by the application of another newly developed feature, which is the process controlled, cutting current supply. This cutting transformer operates absolutely linearly across the entire output voltage range and is equipped with comprehensive safety circuits, such as wire break detection, protection against restarting or under-voltage detection.

Incidentally, this new Xpert cutting transformer will also soon be available as an independent device for the smaller cutting systems or for retrofitting.



■ Extremely large working range.



■ Test cut of a spherical shape on the Xpert CUT 2500.



■ The spherical shape is created by step-by-step rotation and repeated cutting.

New team members

Since last October, **Christian Mayer** has been employed as a media technician for the advertising design, as well as for the video and photo department. He ensures that the Step-Four products are also presented to the public in accordance with their high level of quality. As almost all of our employees, Christian also really loves to fly model aircraft.



Since the beginning of February, **Andreas Leitner** has taken responsibility of tasks concerning production preparation and stock management. With the experience that he was able to gather while working for renowned companies, he will be able to shape up our production. He is a passionate football fan in his free time.



Why hot wire cutting?

Undreamed of potential creates advantages over competitors

While the application of hot wire cutting systems for shaping and model making mostly deals with low piece numbers, the systems are practically in continuous operation when it comes to manufacturing rotor blades for wind turbines. Individual structural parts made from XPS foam elements are pieced together, which are coated with glass fibre reinforced plastic, and subsequently fitted into rotor blade shells.

Hot wire cutting in continuous operation

Due to the numerous segments, such hot wire cutting systems often run almost around the clock for months. Another example clearly points out that the production of models can not only be performed in a cost-effective and rational manner with the aid of hot wire cutting system, but that this method also provides competitive advantages.

The freeform trend

Modern architecture focuses more and more on curved freeform surfaces. Appropriate concrete frameworks are required for this. The more complex the forms are, the more expensive these frameworks become. They sometimes can't be manufactured with traditional methods. Therefore, since investing in a



■ Amongst other things, rotor blades are manufactured for wind turbines with the aid of HWC systems.

hot wire cutting system, an Austrian concrete framework manufacturer now focuses on complex frameworks, which has helped the manufacturer to win a large number of new customers. Similar success stories also come from the packaging and automotive industry suppliers, the mould design and construction industry for sand core moulds and from the aviation industry.

HWC for auto manufacturers

Even a premium class, German auto manufacturer works with a HWC system made by Step-Four. These references prove that it's high time for compa-

nies to heck out the advantages of this process. In particular because the acquisition and running costs of such a hot wire cutting system are within reasonable limits. The hot wire, with a diameter between 0.2 and 0.6 mm, is hardly subjected to wear and is reasonably priced.

More information and contact

If you would you like more information about hot wire cutting system applications, just give us a call.

Phone: +43 (0)662/45 93 78-0. Or you can send us an e-mail to office@step-four.at. It's our pleasure to be of assistance!

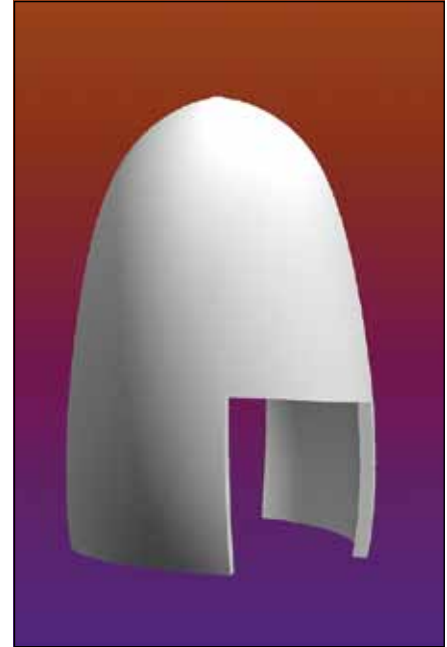
Technology with a future (Part 2)

In the second part of this series we would like to present you with examples of the application possibilities of hot wire cutting technology in the building and construction industry.

Even the more traditional sectors of the building industry are now discovering the possibilities of HDS. The latest example is an enormous, so-called, BLOB object (consisting of biomorphic freeform surfaces) constructed for the interior of a hotel, which has been built within an old monastery in Holland. This object, almost 7 m in height and with a base area of around 6 x 5 m, was made out of EPS panels by 3EL Company. It is intended for office facility use.



■ Freeform object under construction



■ CAD data of the freeform object

Image: Milk bv

Fitting out public facilities

Public facilities have also discovered the advantages provided by HWC technology. The design of a large skating facility in Koog-aan-de-Zaan in the Netherlands was a great challenge to the imagination and the capabilities of the responsible building company.

The shape of the facility is exceptionally complex and needed to have a core made of a light material such as EPS. The solution was found in the form of HWC technology. The facility measuring 15 x 15 x 1,5 m was cut as a prefabricated jigsaw, using HDS. The

result was extremely precise and, thus, was installed on site in only two days.

The assembled parts were then coated with reinforced concrete, and the facility was enthusiastically received and is now used by youngsters from all around the region.



■ CAD data of the pool area within the Skating Park

Image: 3EL Company, Enschede



■ Segment parts in construction



■ Skating Park in use

Image: Carve, Amsterdam

2 new DVDs by Step-Four

New customers



Holz im Flugmodellbau (wood application in aircraft modelling)

Tools - materials – applications and lots of tips and tricks.

Two professionals, Hannes Schmalzer from Step-Four and Hans-Jörg Bayer from CNC-Modellbautechnik, demonstrate their model making expertise in an easy-going, understandable manner on this 120 minute DVD.



TurboCAD Training

Hans-Jörg Bayer, the TurboCAD trainer, introduces viewers to the basics of drawing with TurboCAD. Practical examples are used to deal with the following:

- Introduction to the user interface
- Basics of construction
- Basic tools and their application
- Paper / model tasks
- Structuring of drawings



Yacht-Werft Wedel, one of the “top addresses” where boat building is concerned, recently equipped themselves with an Xpert 3D milling machine and the completely new Xpert PC-CUT hot wire cutting system. You can check out more details about this innovative company by taking a look at www.yacht-werft.de.

The world-famous SONY company, now uses our systems at two of their plants.



Maintenance set

In order to keep our milling mechanisms or cutting systems in good condition, we recommend that you should use our maintenance set. The maintenance set is a part of the scope of delivery of our systems and includes Service Oil Plus for lubrication of the steel shafts, Assembly Cleaner R3000 for cleaning

all kinds of mechanical parts and a tube of Super Lube, a synthetic grease that we use to grease trapezoid threads and ball screws.

You can also order the maintenance set from our Internet Shop under www.step-four.at.

Workshops 2009

Milling in the model making field

From the drawing to the finished work piece

This year we will once again present workshops on the topic of milling in the model making field. We have planned two dates for these activities. For interested model makers, who have not yet been able to gain experience with a PC controlled milling machine, but are contemplating using them to build their models, Step-Four is offering a workshop for beginners. The objective of the workshop is to demonstrate the basics of milling technology.

Dates:

- Friday, 3rd of July 2009 (registration closing date: 15th of June 2009)
- Friday, 16th of October 2009 (registration closing date: 28th of September 2009)

Attendance fee: € 210.00

Max. 6 participants per workshop.

Detailed information and registration details can be gathered directly from Step-Four.

Further
informations:
www.step-four.at

3D processing

From the 3D construction to the finished work piece

For interested model makers, who are already familiar with 3D construction programmes and now want to realise their constructions with the aid of milling technology. Experience with 3D construction is essential and is, therefore, a precondition.

Date:

- Friday, 13th of November 2009 (registration closing date: 27th of October 2009)

Attendance fee: € 260.00

Max. participants per workshop.

Detailed information and registration details can be gathered directly from Step-Four.

Tips and Tricks
from the pros

Trade Fair Schedule

We will exhibit at the following trade fairs in 2009. Come visit us!

22nd till the 25th of April 2009

BWS



International trade fair for wood-working and wood processing in Salzburg
Hall 12, stand 12409

22nd till the 26th of April 2009

INTERMODELLBAU



Dortmund
Hall 4, stand 4146

25th till the 27th of September 2009

SALZBURGER SPIELEMESSE & MODELLBAUWELT



Salzburg

1st till the 3rd of October 2009

VISCOM



Duesseldorf
Hall 8b, stand I 50

30th of October till the 1st of November 2009

FASZINATION MODELLBAU



Friedrichshafen

2nd till the 5th of December 2009

EUROMOLD



Frankfurt
Hall 9.0, stand F06

Register now at
www.step-four.at and
you will always receive
our latest up-to-date
information.

It works with WING designer ...

Herr Behrendt wrote to us from Munich: "The Blohm & Voss project 215 from March 1945 was never realised. I wanted to build my own model at a scale of 1:10 with an electro impeller. I said to myself, if Wing designer can be used to construct wings, it must be possible to slip frame "profiles" into the software.

No sooner said than done, and it worked wonderfully. The fuselage construction was quite easily performed. I used the "plug-in mount" feature for the air intake cavities, the undercarriage, the engine cavities and the position of the chord. This feature is really great, because you can do so many things with it.



■ Herr Behrendt and his masterpiece

Painstaking attention to detail

Due to the fact that I'm a pensioner and can't afford a hot wire cutting system, I printed out the frames at a scale of 1:1 (with crop marks) in DIN A4 size, cut everything appropriately and glued the individual sheets together. I stuck each frame print to a three millimetre thick piece of hardboard and sawed out each frame template with the aid

of band saw, jigsaw and mechanical fret saw. After sanding down, I oiled the cut edges, so that the cutting wire would run smoothly. The wire slides better when the cut edges are covered with self-adhesive aluminium foil and rubbed down smoothly.

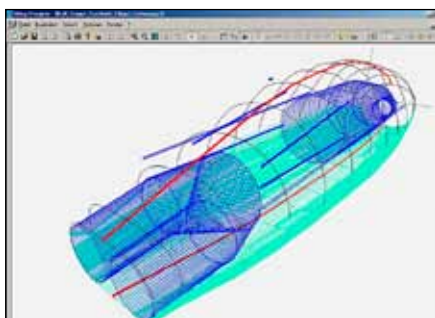
Templates help

I affixed my self-made templates to the 80 mm thick Styrodur boards with the aid of double-sided adhesive tape and cut out the individual segments with hot wire. Due to the large number of segments, I didn't have to do too much sanding down after gluing the individual segments together with white glue. The "spar" specifications of the frame prints helped me to correctly fit the individual segments together. The wings and the rudders were made in the same way.

Apart from a few thin spars made of strips of spruce and a little balsa wood for nose and end strips, I didn't need to use anything else. After fitting a propeller, the model flew really well. So well, in fact, that I decided to install a small turbine (65 N). After modifying the tail and the nose of the fuselage, the model received a very thin coating of glass mat with epoxy.

Turbine on board

After painting – now the model weighed 5.5 kg with a full tank – the model was sent on its "second maiden flight", this time with a turbine: It flies absolutely wonderfully! You can take a look at the model "in action" under the following link. <http://www.youtube.com/watch?v=0dzIRBYHB0U> Thank you very much to Step-Four for developing such amazing software."



■ The amazing things one can make with Wing designer ...

Big, bigger, Thunderbolt

Herr Pitzschel from Lehrte has begun a very special project with his Step-Four systems. He is working on an A 10 Thunderbolt at a scale of 1:4. This means that there will be an approximately 4 m of fuselage length and 4.2 m wingspan. Weight approximately 50 kg. Drive 2 x 18 kg turbines. Together with a friend, he wants to build two wooden models with the aid of Wing designer and his machines.

You will find more details about his project and the developments involved under www.A-Team-Thunderbolt.de The Styrofoam model is for checking the longitudinal dihedral and the centre of gravity. The actual models are then made of wood.



■ Herr Pitzschel and his high-flyer

In-house exhibition 2009!

The sixth upcoming Step-Four in-house exhibition is held on Friday the 9th and on Saturday the 10th of October 2009, from 10.00 a.m. till 17.00 each day. You will find more detailed information about the programme in the next edition of our newsletter.



Congratulations!

And here are the lucky winners of our in-house competition 2008.



Hans-Georg Stiefel from Schwieberdingen is up on cloud 9 with the 1st prize, a scenic flight in a glider over the city of Salzburg.



Hans Baumann from Pfarrkirchen is the lucky winner of the 2nd prize, a 150 Euro Step-Four product voucher.



Eduard Füllmeier, also from Pfarrkirchen, says cheers for his 3rd prize, a good drop of Augustiner Beer from Mülln.

A weekend for a picture

Competition: Send us a picture of your best, most innovative, exciting, complex or crazy work made with the aid of Step-Four systems. Simply send by e-mail to office@step-four.at. All participants take part in a draw and the winner goes on a Dream Weekend* to Hotel IRIS PORSCHE (www.iris-porsche.at) by the beautiful Mondsee Lake.

PS: If possible. Please send images in (300 dpi) printing quality and only per e-mail..

*2 nights in a double room with breakfast and a € 100.00 voucher for the restaurant. Bookable in accordance with enquiry and availability.

Iris Porsche Hotel & Restaurant

With a combination of exclusive service, exceptional design and the highest possible comfort, Iris Porsche greets her guests in a hotel with a class of its own: In the baroque centre of Mondsee, a picturesque town by the Mondsee lake, this treasure with 11 rooms and its own restaurant is an exquisite hideaway located only 20 minutes by car from the Festival City of Salzburg.

Guests seeking both tranquillity and vitality will find their own personal domain, within which they can retreat and relax, with the wonderful foothills of the Alps as a

■ The Mondsee hideaway meets the highest demands



scenic backdrop. The intimate hotel has eleven spacious, elegant and individual rooms and suites.

Culinary delicacies

The Iris Porsche Hotel & Restaurant in Mondsee provides gourmets with culinary delicacies of the highest standard. Georg Seidl runs the kitchen and ensures that organic produce and exclusive international top products are used to prepare wonderful dishes. The menu offers guests an amazing range of refined delicacies, which pamper the palates with rich, light, hearty and vegetarian dishes to suit every taste. Well treasured and inter-

national rarities and choice wines from the best Austrian winemakers wait in the cellar to be discovered and to complement a delicious meal. The wine cellar is opened up to guests in the restaurant to reveal its amazing range of choice wines. The wine bar and the restaurant are not only a trendy venue for connoisseurs, but also the perfect ambience to round off a wonderful day with a digestif or a cocktail.

Iris Porsche Hotel & Restaurant
Marktplatz 1
5310 Mondsee
Phone: +43(0)62 32/22 37
www.iris-porsche.at

Equipment and accessories for success

Work only makes fun when you have the right equipment and accessories. On our website www.step-four.at you will find a wide range of equipment and accessories that are especially made to suit our systems. You will find the right tool and the ideal material for your work piece. You can take a look at a selected assortment of STEP-FOUR accessories to compare and order.

Make the most of the advantages of this unique service: With only a few clicks you will be able to view the fascinating diversity of our assortment, whereby you can check out the products of your choice and order directly online.



■ On www.step-four.at you are provided with a great selection of appropriate tools, materials, lubricants and practical accessories.

Optimised milling tips

Choice of tool:

- Always choose a milling cutter that is well suited to your material. Resist the temptation to use "any old tool". Select the shortest milling tool you can, and insert and clamp the tool in as far as possible.
- Milling cutters with polished T-slots have proved successful for milling critical materials, such as polystyrene or Kömacel.
- A TiN coating is advantageous for milling aluminium.

Operating parameters:

- Are based on speed and forward feed in accordance with value tables. You can further optimise the milling process by changing the parameters during the milling process itself.

- Inner contours are advantageously milled in a clockwise direction, and outer contours anti-clockwise. Thus, the less attractive side of the material always lands in the waste.
- Do not mill deeper than approx. 2 to 3 cutting diameters; cut deeper grooves in several passes.
- As a rule, it is more efficient to mill in several passes with less depth and higher forward feed values than to mill a deep groove in one pass, which may respectively take longer.

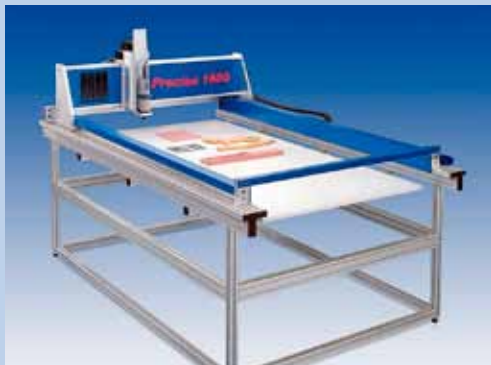
Cooling/lubricating:

- The main thing is that the tool is well cooled. This can be done best with the aid of a grease emulsion or, better than nothing – with compressed air.

- Lubrication additionally improves the surface quality and increases the service life of the tool. Aluminium and non-ferrous heavy metals can be lubricated with the aid of spirit or special emulsions, and lubrication with soap-suds considerably improves the surface of Plexiglas. Tip: EDM oil has proven ideal for stainless steel.
- If cooling is not possible, then the recommended minimum values for the speed and forward feed shouldn't be selected too low (heat flow due to swarf, danger of material scorching).

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