vargus
NEUMO Ehrenberg Group

VARDEX Industrial Solutions

METRIC

VARDEX
Advanced Threading Solutions

VARDEX

Vardex – Advanced Threading Solutions

VARGUS Ltd. is a world leading developer, manufacturer and supplier of high-quality, precision cutting tools. The company's VARDEX product line is the number one source for threading solutions worldwide and includes the largest range of thread turning and thread milling solutions implemented in almost every metal industrial segment.

Thread Milling

MiTM

TMSD

TM Solid

Standard TM

Thread Turning

V6

microscope

Multi plus

Standard TT

For over 50 years, VARDEX has been the #1 name of indexable threading in the metal industry. Since introducing the first triangular laydown thread turning and thread milling insert systems, the VARDEX product line offers thousands of solutions, for virtually every thread standard and application, most available for immediate supply. From the original VARDEX tool design to its threading tool systems of the 21st century, VARDEX threading continues to live up to its name as the industry standard of threading. **VARDEX - Making Threading EASY!**

VARDEX Thread Turning

A complete range of standard indexable thread turning cutting tools from fine to large and extra-large pitches, as well as an extensive range of insert types such as laydown, vertical, multitooth and more. The VARDEX thread turning line offers solutions for applications from minute to large bores.

VARDEX Thread Milling

VARDEX provides the most extensive and professional thread milling cutting tool solutions available in the market. Our offering includes a wide range of single and multi-tooth indexable inserts as well as solid carbide tools. The VARDEX thread milling line also offers a large variety of pitches for applications in shallow and deep holes suitable for miniature to large diameters.

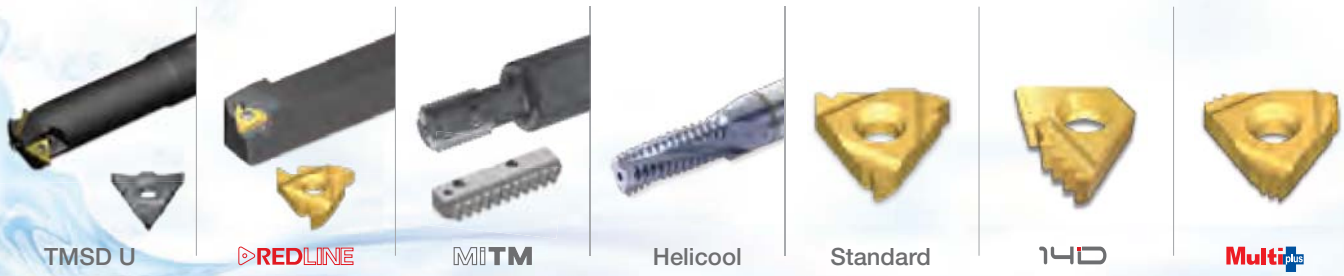
INDEX

OIL & GAS

Vardex has designed and developed a unique threading line for the Oil & Gas industry. The innovative and creative response VARDEX offers to it's customers has established VARDEX as a front line player in this growing market.

Thread Method	Applications	Threading Standard
Thread Turning	Casing, Tubing and Couplings	API-5CT: Buttress Casing, API Round, EL-Extreme Line, VAM, OTTM, OTTG
	Line Pipe	API-5L: LP, NPT
	Rotary Drilling Connections	API-7: NC, Regular, FH, IF, Hughes H-90
Thread Milling	Gate Valves, Wellhead	NPT, BSP, UN, ACME, ST. ACME, Modified ACME
	Subsea Gate Valves - "Christmas Tree"	NPT, BSP, UN, ACME, ST. ACME, Modified ACME

The VARDEX Oil & Gas line offers both a comprehensive variety of standard tools as well as an extensive range of tailor-made tools manufactured to customer specifcations and distinct applications.



TMSD U | REDLINE | MITM | Helicool | Standard | 14D | Multi plus

Case Study 1

14D - New API Insert

Background

The customer was using a competitor's tool to mass produce couplings. As this method offered only 35 pieces per cutting edge, the customer looked for an alternative to improve output.

The VARGUS Solution

A tailor-made VDI holder with VARDEX **14D** style inserts was produced for the customer's unique clamping system. The result - an incredible 400% increase in tool life!

Test Details	
Application	4.5" X 5 BUT x 55
Component	Coupling
Material	N80
Holder	T03 HOLDER L1=121 168/256
Insert	14DIR5BUT752T+ (14D)
Cutting Speed V (m/min)	160
RPM	446
Number of Passes	5
Cutting Time	15 sec.

150 pieces per cutting edge - Improved tool life by 400%!

Case Study 2

Multi+ for Mass Production

Background

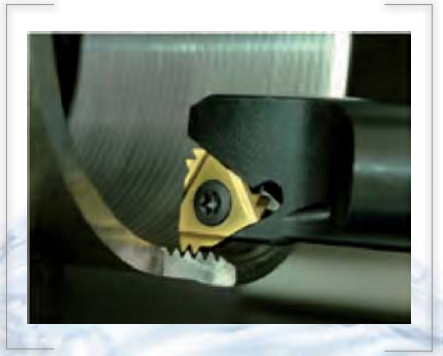
A coupling manufacturer had to produce a large quantity of products in a short delivery time. He applied a single tooth standard insert and completed the threading in 12 passes. The cycle took **41 seconds**.

The VARGUS Solution

Using **Multi+** indexable thread turning inserts, the threading cycle was complete in just 6 passes and **21 seconds**. The **Multi+** inserts reduced threading cycle time by 49% and increased tool life by 100%. The customer is now able to meet delivery deadlines.

Test Details	
Application	2 7/8" x 8 APIRD x 60
Component	Coupling
Material	NL 80
Holder	AVRC 40-4
Insert	4IR8APIRD2M+
Cutting Speed V (m/min)	160
RPM	660
Number of Passes	6
Cutting Times	21 Sec.

49% time savings and 100% increased tool life!



VALVES

To best serve the non-symmetrical shape of Valves, VARDEX offers its renowned thread milling system, thus eliminating the common problem of broken taps and the necessity to build special and complicated fixtures as required for thread turning.

Case Study

MiTM Replaces Taps for the Valve Industry

Background

While using a tap, the customer experienced repeated problems with tap breakage and unsatisfactory surface finish, which required additional manual finishing operations.

The VARGUS Solution

By using the **MiTM** Multi flute indexable thread milling inserts, the customer machined the job continuously without tool breakage and with excellent surface finish.

Test Details	
Application	1¼" x 8UN x 35.0
Component	Gate Valve
Material	Cast Steel
Holder	RTMC 2520-44S3 (MiTM)
Insert	R25I8UNTM VBX
Cutting Speed V (m/min)	70
RPM	1100
Feed f (mm/flute)	0.05
Cutting Time	2min 40 sec.

Uninterrupted production; superb surface finish!

Helicool

MiTM

TM Standard

TMSD Shell Mill

MiTM Shell Mill

FITTINGS

The worldwide Fittings industry encompasses a range of applications, from the production of simple cast iron fittings to the machining of highly sophisticated, high quality products. VARDEX has a wealth of experience in threading requirements for Fittings and provides an extensive scope of solutions for both turning and milling.

Case Study

Helicool for Fitting Production

Background

Previously machined by thread turning tools, the component thread was often scratched by the resulting chips. Due to the demand for a high quality surface finish, an additional operation was required and this increased machining time.

The VARGUS Solution

In order to overcome the problem caused by the chip flow, VARDEX offered the Helicool solid thread milling alternative and, while the surface finish met the highly demanded requirements (because the chips are promptly removed by the coolant), this new method took only 17 seconds compared to the previous operation that took twice that amount of time.

Test Details	
Application	½"x14NPTx13.55
Component	Fitting
Material	Stainless Steel 316
Tool	HC16142L19-EI14NPT TM VTH (Helicool)
Cutting Speed V (m/min)	100
RPM	2234
Feed f (mm/flute)	0.034
No. of Passes	1
Cutting Time	17 Sec.

Reduce machining time by 50% and get excellent surface finish!

GEAR

Advanced Technologies for Gear, Spline & Rack Manufacturing

VARDEX presents an original and innovative solution for the gear milling industry, offering a competitive alternative to the traditional Hob system. Gear manufacturers can now mill external splines, external cylindrical gears, sprockets and racks as well as many additional gear applications with VARDEX gear milling tools.

VARDEX GEAR MILLING Concept

- Milling tools with multi-flute indexable carbide inserts.
- Tailor-made inserts and holders designed per customer application. The inserts have the exact required profile shape (evolvent, involute or any other profile) which is transferred onto the component.

Vardex System Advantages:

- **Super Fast** - At least 50% less machining cycle compared to any other method:
  - Carbide inserts - High cutting speed
  - Full profile per pass - One pass per slot
- **Long Tool Life** - Tough sub-micron substrate insert coating
- **Machining** - Simple set- up and use on standard 3.5 axis CNC milling machine
- **Economical** - Absolute Price/Performance advantage over existing technology
- **High Precision** - Gears up to Class 7 according to DIN 3962 or Class 11 according to ANSI 390.03
  - Involute Splines according to DIN 5480 or ANSI B92.1
  - Straight sided Splines according to ISO 14-1982
- **Accuracy** - No need for additional machining
- **Cutting Edges** - Up to 3 cutting edges per insert for extended tool life
- **Quality** - High surface finish

GEAR

SPLINE

RACK

Shell Mill

End Mill

Disc Mill

U Style

UT Style

Case Study 1

Gear Production

Background

One of Europe's leading gear manufacturers traditionally produced splines using a HSS hob. The production cycle for each gear took 60 seconds. The customer wanted to reduce this cycle time.

The VARGUS Solution

After analyzing the project, the indexable carbide **Gear Milling** tool was applied and, after utilising the tool for a regular mass production run, machining time was reduced by 75%.

Test Details	
Application	Module 0.75
Component	Gear (Diameter 40.5, 52 teeth)
Material	42CrMoS4V
Toolholder	GMD10S D80-22-2U (10 Cutting edges)
Insert	2UEM0.75GM VBX (Gear Milling)
Cutting Speed V (m/min)	125
RPM	500
Number of Passes	1
Cutting Time	4.3 min.

Reduced machining time by 75%!

Case Study 2

Rack Production

Background

With an existing HSS cutter, one rack manufacturer produced 4 teeth in one pass in a total machining time of 10.74 minutes.

The VARGUS Solution

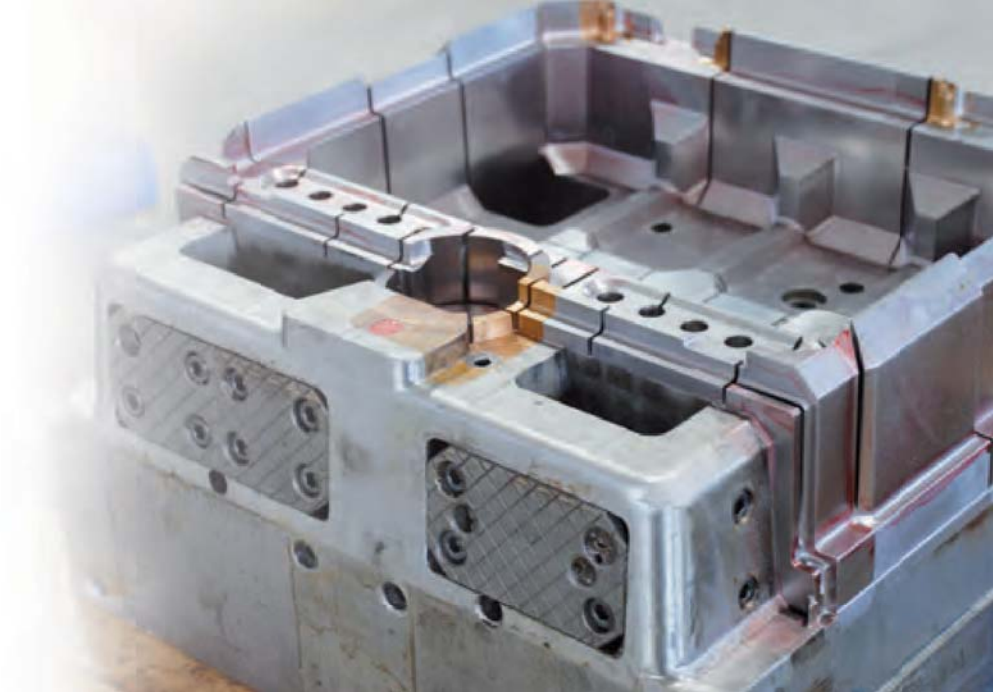
To reduce this long cycle time, VARDEX offered the **Gear Milling** solution with indexable carbide inserts. Allthough producing 2 teeth at a time, the total machining time, when using the new tool, is only 3.3 minutes!

Test Details	
Application	Module 5.0
Component	Gear Rack
Material	ST52-3
Toolholder	GMD16S D160-50-5U (8 cutting edges)
Insert	5UEM5.0GM VBX (Gear Milling)
Cutting Speed V (m/min)	150
RPM	300
Number of Passes	1
Cutting Time	3.3 min.

Reduced gear rack production time from 10.74 min to 3.3 min!

DIES & MOLDS

Dies and molds which are characterised by their non-symmetrical shapes and hard materials are ideal components for thread milling. Thread milling also avoids the expensive risk of broken taps in the workpiece, which are difficult to remove. VARDEX offers a wide range of thread milling solutions for the die and mold industries, including solid carbide as well as indexable insert cutting tools.



Case Study

TMSD Replacing Taps in the Mold Industry

Background

A mold production factory manufactures various types of threads for lifting rings such as M30x3.5/M36x4/M42x4.5/M45x4.5/M48x5/M56x5.5/M64x6. The customer generally used a variety of taps for this range of applications, but the taps tended to break. They are relatively costly in such large sizes and, in addition, the cost of mold making is very high and any damage caused by broken taps not only delays production and delivery, but is also expensive to repair.

The VARGUS Solution

As a solution, VARDEX offered the **TMSD** thread milling tool for deep holes, which it accomplishes with ease due to the low load applied to the inserts. In addition, because the **TMSD** inserts have partial profiles, the customer can also apply the same tool to the production of a variety of threads.

Test Details	
Application	M48x5x98
Component	Mold
Material	Cast Steel (28-32 HRc)
Holder	TM4CS40W42 120-3U (TMSD)
Insert	3UIDH60TM VBX
Cutting Speed V (m/min)	110
RPM	834
Feed f (mm/flute)	0.25
Cutting Time	3.85 min.

TMSD performs various applications with just one tool!

AEROSPACE

The Aerospace industry is known for the high level of accuracy required in its manufacturing processes. VARDEX precision tools meet the high level demanded by this market and are suitable for machining Aluminum, Titanium, Magnesium and high temperature alloys customarily used in this industry. The unique aerospace MJ and UNJ standards are available as popular stock items.

Dedicated Standards for the Aerospace Industry

Standard	Pitches
MJ	0.7 - 3mm
UNJ	48 - 4 tpi

Case Study

Helicool for the Aerospace Industry

Background

The component forms part of an hydraulic actuator for an aerospace instrumentation product and, as such, the demand for a very accurate thread finish is paramount.

The VARGUS Solution

The VARDEX tool out-performed all others by 20% and with a far superior thread finish.

Test Details	
Application	½" x 14NPTx13.5
Component	Hydraulic Actuator
Material	Stainless Steel PH1734R-009
Tool	HC16142L19-EI14NPT TM VTH (Helicool)
Cutting Speed V (m/min)	110
RPM	2500
Feed f (mm/flute)	0.04
Cutting Time	10 sec.

Outstanding surface finish!

TT Internal | TT External | Helicool | MilliPro | TM Standard

AUTOMOTIVE

The fast-moving, mass production manufacturing lines in the Automotive industry require quick delivery and on-the-spot responses and speedy supply of products. In order to reduce production costs, VARDEX offers flexibility and creative special-purpose tooling solutions demanded by this industry.

Case Study

V6 - for Greater Cost Savings

Background

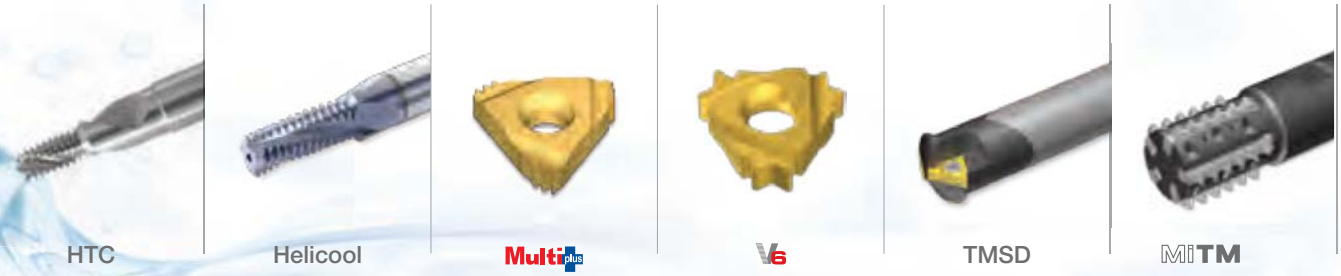
In order to find the most economical tool for the job, one customer tested 3 different suppliers of threading inserts.
Supplier 1 - Total threads per insert: 1,050
Supplier 2 - Total threads per insert: 1,162

The VARGUS Solution

VARDEX - Total threads per **V6** insert: **3,040**
VARDEX **V6** - the innovative laydown thread turning insert with 6 cutting corners proved that it is the ideal tool for the job, offering the longest tool life: tool life is increased by over 30 percent.

Test Details	
Application	M26x1.0x28.0
Component	Shock Absorber
Material	SAE 4340
Toolholder	AVR 20-3
Insert	3IR1.0ISO-6C VKX (V6)
Cutting Speed V (m/min)	90
RPM	1100
Number of Passes	4
Cutting Time	12 sec.

V6 insert: The most economical tool for the job with 6 cutting corners!



MACHINE BUILDERS

The wide range of applications in the Machine Building industry requires a multitude of threading tool profiles. VARDEX is proud to offer a variety of over 30,000 tools to provide comprehensive threading solutions.

Case Study

Saving Costs by Using Standard VARDEX Tools

Background

A thread of 1⅛" x 12 UN x 48 mm was required for a heat exchanger application. In the past, the customer used a competitor's special tool to produce the thread. As this was tailor-made, the cost was relatively high and the tool had a long delivery time.

The VARGUS Solution

VARDEX offered a standard **TM Solid** tool with helical flutes and, as a result, the customer considerably reduced both the delivery time and overall tooling costs.

Test Details	
Application	1⅛"x12UNx48
Component	Heat exchanger for a water desalination facility
Material	Alloy Steel
Tool	H20199L51-I12UNF TM VTH (Helical)
Cutting Speed V (m/min)	94
RPM	1500
Feed f (mm/flute)	0.07
Cutting Time	19 sec.

Reduced tooling costs with VARDEX standard TM Solid!

TT Standard

MilliPro

Helicool

TMSD Shell Mill

MiTM

WIND POWER

The growing popularity of 'green' energy supply has created increased demand for wind turbines. To satisfy this trend, VARDEX offers a comprehensive line of thread milling tools – the VARDEX TMSD line is the optimal solution – specially designed for deep hole applications.

Case Study

TMSD for the Wind Turbine Industry

Background

Using a tap to manufacture a wind turbine component, a stator ring support, required stopping the manufacturing process to add oil as coolant to aid cutting during machining. This procedure created a situation where the manufacturer was dependant on the experience and skill of the machine operator, who was required to continuously monitor the machine.

The VARGUS Solution

VARDEX offered the **TMSD** thread milling line for the production of deep holes. The results: the machine did not require constant oiling of the thread area and the process was continuous and completely secure. An added benefit is that **TMSD** utilises indexable inserts, so tooling costs have been considerably reduced.

Test Details	
Application	M24x3x52
Component	Wind Turbine - Stator Ring Support
Material	ST37
Toolholder	CTM2SC16C21-80-2U
Insert	2UIDC60TM VTX (TMSD)
Cutting Speed V (m/min)	162
RPM	2500
Feed f (mm/flute)	0.23
Cutting Time	1.25 min.

Increased security and stability as well as reduced costs!

TMSD Shell Mill

TMSD (Mini L Style)

TMSD (Style U)

MiTM

POWER GENERATION

The power station is a multi-faceted system of production, development and maintenance that requires an unlimited range of both standard and special threading applications. With its extensive scope of threading tools, VARDEX provides complete and comprehensive threading solutions for the Power Generation industry.

Case Study

TMSD for the Power Generation Industry

Background

While threading a large and costly turbine, the manufacturer needed to reduce the long production cycle and decrease overall tooling costs. As the turbine is both sizable and valuable, any malfunction would cause damage and high loss to the customer. Therefore, the need for a safe and reliable process is essential.

The VARGUS Solution

VARDEX offered the thread milling **TMSD** Shell Mill System with 18 indexable inserts. The production cycle was reduced by 45% in one pass only (the previous method required 3 passes per thread) and tool life was increased by 62%.

Test Details	
Application	580x9 ARTILERIEx240
Component	Turbine Component for the Power Sector
Material	Alloy Steel Forged
Toolholder	TM18S-250-605V(18 Flutes)
Insert	5VIRD9ARTILVBX (TMSD)
Cutting Speed V (m/min)	119
RPM	152
Feed f (mm/flute)	0.12
No. of Passes	1 Radially / 27 cycles
Cutting Time	2.5 HRS

TMSD: Increased tool life by 62% and reduced production time by 45%!

TMSD Shell Mill

TMSD (Style U)

MiTM

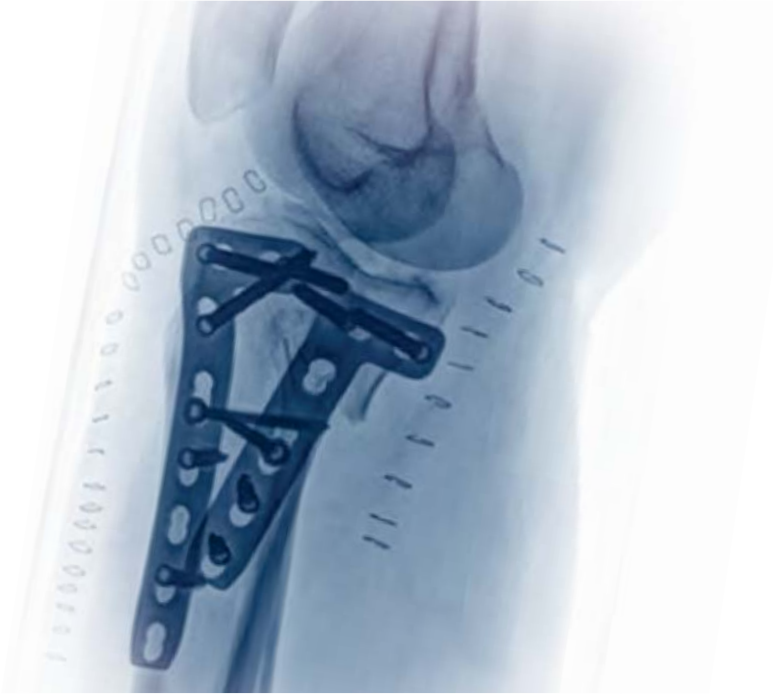
MiTM Shell Mill

TT External (V Style)

U Style for Coarse Pitch

MEDICAL

The surgical bone plate market is a rapidly developing area of the Medical industry.
The necessary components are largely manufactured from titanium and stainless steel, and they require non-standard profiles. VARDEX has developed a dedicated TM Solid Carbide tool for the bone plate industry. These high-quality tools provide an excellent solution for the multi-start conical threads required in these demanding applications. Along with the standard small application threading tools, VARDEX offers a complete solution for miniature threads.



Case Study

TM Solid for Medical: Metric 20° Taper

Background

A surgical bone plate manufacturer had to produce a special Metric 20° taper thread with 2 starts and was achieving just 50 threads per tool. Another solution was thread milling with a single tooth, but the machining time of 30 seconds was too long and thread quality was unacceptable.

The VARGUS Solution

We offered the customer the **TM Solid Carbide** thread milling tool. After producing the 20° taper, tool results were excellent. The customer manufactured 2,800 threads with one tool and the surface finish was outstanding. Both starts were made in one pass and the total machining time for each thread was only 3 seconds!

Test Details	
Application	6 x 0.5 x 5 (2 starts)
Component	Surgery Bone Plate
Material	Titanium
Tool	S060L0.90 I 0.5TAP60 TM VTH (Taper)
Cutting Speed V (m/min)	80
RPM	5660
Feed f (mm/flute)	0.03
No. of Passes	1
Cutting Time	3 Sec.

Excellent surface finish quality in only 3 seconds!

microscope

MilliPro

Taper

DENTAL

Dental implant technology is relatively new in dental treatments but, due to its increasing popularity, implants are being mass produced with a special demand for superior surface finish and thread quality. VARDEX has developed the MilliPro Dental as a unique solid carbide thread mill for such applications.

Commonly Used Standards

M Coarse	M Fine	UNF
M1.0x0.25	M1.4x0.25	
M1.2x0.25		
M1.4x0.30		
M1.6tx0.35		0-80
M1.8x0.35		1-72
M2.0x0.40	M2.0x0.35	
M2.5x0.45		

Case Study

MilliPro for the Dental Implant Industry

Background

Dental implants are mainly produced from titanium and stainless steel, and both are hard to machine with taps, especially when such small diameters are required. In addition, taps create a small burr at the bottom of the thread that is almost impossible to remove.

The VARGUS Solution

The **MilliPro Dental** tool provides a perfect solution for this application and has increased tool life by 25% with excellent surface finish.

Test Details	
Application	1-72UNx6.0
Component	Dental Implant
Material	Titanium
Tool	D3T03014L057-I72TM VTH (MilliPro Dental)
Cutting Speed V (m/min)	90
RPM	20,000
Feed f (mm/flute)	0.02
Cutting Time	6 Sec.

Increased tool life by 25%!

microscope

MilliPro Dental

MilliPro

VARDEX SPECIAL TOOLS

VARDEX engineers and toolmakers have the know-how and experience to design special cutting tools tailored specifically to customer requirements. Whether it's a special, complex shape or a non-standard size, our Special Tools service can quickly produce the tool you need using the latest techniques and technology.

- VARDEX expertise
- Quick quotation
- Prompt delivery time

Case Study

Special Tool for Extremely Large Pitch of 20mm

Background

The customer had to produce a TR180x18x310. He could not find a standard tool for such a unique application and therefore asked us for a solution.

The VARGUS Solution

We offered a special insert based on a 16mm carbide rod. A trapez profile was then ground on both sides of the rod, creating 2 cutting edges. This tool completed the thread in only 5.5 minutes and the surface finish was excellent.

Test Details	
Application	TR180x18x310
Component	Lifting device for heavy machines
Material	S355J2G32
Holder	NL40-16U Special
Insert	2M16THE18TR Special (Mega Line)
Cutting Speed V (m/min)	85
RPM	160
Number of Passes	50
Cutting Time	5.5 min.

The ideal solution for extra large pitches!

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