

Remarkable savings available for every wire mill and cable plant by using new state-of-the-art die repairing equipment :

使用最新技術的模具修理裝備，對每一個線材廠電纜廠商來說，都可有非常可觀的節省：

The wire drawing die – a „magic tool“!

線材伸線模-- 一個 “魔術工具”

When entering a wire drawing or cable plant, in the midst of all spectacular infrastructure and huge machinery therein, it is easy to lose sight of the die-tool. 當進入一個線材伸線或電纜廠，在所有雄偉的基礎設施和巨大的機械之中，伸線模是容易被忽視的。

We all know well that this eyecatching infrastructure and the attractive wire drawing machinery available is very important. However, it is this small, ultra-hard precision wire drawing die-tool with a tiny hole in it, which remarkably defines the success or failure of any wire drawing process and economy.

我們都知道引人注意的基礎設施和有吸引人的線材伸線機是非常重要的，然而，這些細小的、帶有微小內孔的超硬精密線材伸線模具，不可思議地決定了任何線材伸線製程和經濟效益的成功或失敗。

One of the major keys to boost any wire drawing/cable plant's economy and the net product value considerably, simply is not to allow costly precision wire drawing die tools to deteriorate, as prolonged die tool life will ensure that more and consistent wire can be drawn. How this is done best, I will show you a little bit later.

大大提高線材伸線/電纜廠商的經濟效益和淨產品價值的一個關鍵，只不過是不允許昂貴的精密線材伸線所用的模具品質變壞而已，也就是維持模具壽命以確保生產更多的、穩定的線材。如何最大程度地做到這一點，稍後我將會展示給您。

Let us first have a short view on the different die-tool materials available:

讓我們先簡短地看一下所用到的不同的模具材料：

a) Tungsten Carbide (TC) :

碳化鎢 (TC)

Today TC dies are mainly used when drawing ferrous wire materials but partly also for drawing of metals in bigger diametrical sizes, particularly when only smaller quantities are to be drawn and diameter sizes to be changed frequently. Other applications are for drawing of bars, tubes and profiled materials.

如今，TC 模具主要應用於生產鐵質線材和部份用於其它大線徑的材料，特別是在頻繁改變線徑規格和較少的伸線量時。其它的應用如：棒材、管材和型材的伸線。

Since the availability of synthetic polycrystalline Diamond (PCD) blanks in the early 70th of last century and in continuously larger blank-dimensions and in even thermally stable execution, the application of TC dies has been drastically reduced, particularly in the non-ferrous wire drawing industry. Their niche for survival mainly is in the ferrous wire drawing industry now.

自從人造多晶模(PCD)在上個世紀 70 年代得到應用以來，接著大尺寸胚料和均勻熱穩定的

製作技術發展, TC 模具的應用激劇減少, 特別是在有色線材伸線工業。如今它們僅僅存在於鐵質線材伸線工業。

b) Natural Diamond (ND) :

天然鑽石 (ND)

In former times and until the introduction of PCD, natural diamond has been “the die-material” with an unrivalled hardness and wear-resistance. ND has been mainly used for dies with rather small diametrical sizes and for producing finishing dies. Now available fine-grain PCD dies have largely replaced ND also for these applications.

在以前直到 PCD 模具的採用, 天然鑽石以它無與倫比的硬度和耐磨性成為了“模具材料”。ND 模具主要用於細小直徑的規格和成品模。現在, 細晶 PCD 模具大量地替代 ND 模具用於這些應用上。

c) Synthetic Polycrystalline Diamond (PCD):

人造多晶模 (PCD)

Already in the late 60th and under confidentiality, EDER-Austria have been able to test and use the first “man-made” PCD material, “**COMPAX**”, from General Electric, successfully for dies.

在上世紀 60 年代, 在保密情況下, 奧地利 EDER 公司已經開始測試和使用第一種“人造”PCD 材料“**COMPAX**”, 來自於通用電氣, 並成功地應用於模具上。

This then led to the development of a series of new, more powerful die working machines, which made this initially complex to work PCD material an absolute winner in the die-tool scenario from the early 70th onwards. Thanks to another patented EDER-technology, the initial problem of polishing the then orange-peel-alike polycrystalline die-surface, was solved soon too.

這樣接著就引導了一系列新的發展, 更強勁的模具加工設備, 這使得最初複雜加工的 PCD 材料從 70 年代起至今成為模具的一個絕對的贏家, 也由於其它獲得專利的 EDER 技術, 如何將這如同剝橘皮般的多晶模表面拋光的最初問題得以快速的解決。

In the early 80th, after a joint proceeding with Siemens, EDER could successfully produce and introduce the first PCD stranding and compacting dies for Cu/Al-conductors and with very large bores to the global market too.

在上世紀 80 年代初, 在和 Siemens 聯合開展之後, EDER 成功地生產和推展了第一個大孔徑的 PCD 撚股和壓實模具, 用於銅/鋁導線, 並推向全球市場。

Today, hardly any wire drawing mill or cable plant could successfully perform without using PCD die-tools in many available variations and applications, starting from rod breakdown until fine wire drawing. PCD dies are preferably used for drawing of all kinds of non-ferrous wire materials but also for stainless steel and – in thermally stable execution – even for drawing of refractory materials etc. and have largely replaced the formerly used TC- and ND dies for most applications. Today, even profiled die-bore configurations are available in PCD.

如今, 幾乎沒有伸線廠或電纜廠在不使用 PCD 模具各種可能的應用情況下能成功運作的, 在從盤條到微細線材的伸線。PCD 模具更多地應用在各種有色材料和不銹鋼的伸線中, 甚至在熱穩定處理中可以伸線耐火材料等等, 並在各種應用場合中大量的替代以前所使用的 TC 和 ND 模具。如今, 甚至異型模孔構造也用到了 PCD 模具。

The reliability, extraordinary wear resistance, high performance and long service-life of PCD dies, also has been one of the key factors for success when introducing high speed/high economy offering multiline wire drawing lines.

PCD 模具的可靠性、非同尋常的耐磨性、高精確性和長使用壽命，同樣也是採用高速/高效益的多頭伸線生產線成功的一個重要因素。

A short survey on the production of such PCD dies : **關於 PCD 模具生產的簡短調查：**

At first the diamond or PCD die raw material is carefully selected to meet the subsequent wire drawing die application perfectly. After the **casing and mounting** process, the die-blank gets **drilled** and pre-shaped **on modern Laser equipment**, which must not thermally degrade the die material around the bore too much.

開始，鑽石模具或 PCD 模具的原料是精心挑選的，以完美地適應線材伸線模具的應用。在鑄造和裝配加工之後，模具坯採用現代化的鐳射裝備進行鑽孔和預成形，且需注意不能因為高溫在孔周圍造成材料熱的降解。

Thereafter all **conical die-portions** are processed by suitably powered **Ultrasonic equipment** and then the **cylindrical bearing portion** precisely calibrated and polished on high speed **wire-type sizing machines**.

此後，所有的模具圓錐部分採用適當動力的超聲波裝置來加工，然後模具圓柱定徑部分的校準和拋光採用高速線型定徑機完成。

Finally the dies get carefully **inspected** as to their surface-quality and perfect geometry achieved before being shipped to our customers worldwide.

最後，在送到全球的客戶之前，模具要進行仔細地檢查，如表面品質和精確的幾何形狀。

In our life, all things are subject to wear and dies are no exception to this rule !

在我們的一生中，所有的事情都會遭受到磨損和死亡不再適用於這個規則。

High quality die-materials chosen and in combination with a perfectly executed geometry and surface polish are the best guarantee for achieving a long die-service life and best results in drawing of wires and as such a major contribution for best possible economy in all plants.

選擇高品質的模具原料、幾何形狀的完美加工和表面拋光的結合，是在線材伸線中達到模具長壽命和最佳效果的最大保證，本身也是所有工廠的最大經濟效益的一個主要的貢獻。

However **former or later**, depending on the quantity of drawn wire and also on the care under which these die-tools are being used, **all dies are subject to wear too**.

無論過去或將來，取決於需要伸線線材的品質和採用何種模具，**所有的模具都要受磨損的制約。**

Their best economy and efficiency is achieved if the dies are taken out of the machine for a fast **re-polishing**, whenever an **onset of wear** is visible in the **drawing cone**, where the incoming wire establishes first contact with the die.

By doing so, the die-tools can get re-used repeatedly and successfully, often with their initial bore diameter for quite a long time.

要達到最佳的經濟效益和效率，就是如果每當肉眼可以看見模具**減徑段**開始磨損，即進線確定和模具第一次接觸的地方，模具就需要從機器中取出進行快速重拋光。這樣，模具可以順利地重複使用，並長時間地保持最初的孔徑。

Latest, once a **drawing/wear ring** has developed in the reduction cone portion, this die must be taken out of the machine for refurbishment, as otherwise at first the wire surface quality will suffer or the wire will break, leading to considerable downtimes in the wire drawing process. In this case, a new die must get loaded into the wire drawing machine to continue the operation.

最後，一旦伸線/磨損帶發生在減徑部分，這個模具必須要從設備中取出，進行整修。否則，一開始是線材表面品質會變差或斷線，導致在線材伸線加工中產生相當多的停機時間。既然這樣，必須被更換一個新的模具到機器中，以繼續生產。

If one considers that in modern wire drawing/cable plants, usually one third of the available PCD dies is working in the wire drawing machines, another third is just being re-polished or re-sized in the die workshop and the other dies are remaining in stock as safeguard for any eventualities possibly occurring, it is obvious how important it is for the economy of any such plant to make an optimal use of their costly die-tools by repairing and re-using them as often as just possible.

可以認為，在現代的線材伸線/電纜工廠，通常是三分之一的 PCD 模具應用在線材伸線機械上，另外有三分之一的模具是在模具車間進行重拋光或重定徑，而剩下的三分之一模具儲存在倉庫內以防止任何不測事件的可能發生，由此顯而易見，如何盡可能最優化的利用修復和再使用這些昂貴的模具，對工廠的經濟是十分重要的

Considering the high number and the remarkable value of such PCD dies in use, it clearly is worthwhile to save and repair such worn-out dies, by providing them with a new proper geometry and to enlarge and re-polishing them to their next bigger usable size, on suitable die-reconditioning machines.

考慮到大量的、非常昂貴的 PCD 模具的應用，保留並修復這些磨損的模具是非常值得的，在適當的模具再加工機器上，將模具做成新的正確幾何形狀並擴孔與再拋光成為下一道較大可用尺寸。

To do this and to benefit from outstanding savings of such costly die-tools, it is indispensably necessary to have an efficient drawing die reconditioning workshop line at one's disposal !

要做到這些，並從這些昂貴的模具中獲得豐厚節約的利益，在工廠中具備有一個高效的伸線模具再加工車間是絕對有必要的。

Any die repairing equipment must get chosen according to the relevant specific die-material !

所有模具修理裝備的選擇必須要依照相關的特定模具材料！

Each kind of die-material demands a different type of technology/machinery and in principle the reasonable choice to be done when selecting suitable equipment, rather is for **semi-automatic conceptions**, as this offers most advantages, while fully **automatic**, rather expensive machines, are mainly used either in production steps or for reconditioning of largely – in size and/or wear condition - **identical** die-tools only.

在選擇合適的裝備時，原則是每一種模具材料需要一個不同類型的技術/機械，半自動機械的設計思想是提供相當的優勢，而全自動機械則是昂貴的機械，並主要應用在大量生產中或大量的同尺寸的再加工中-----直徑和/或磨損狀況為同一類型的模具。

1. For **reconditioning of Tc dies**, such an advanced semi-automatic machine, e.g. would be our model, „**ETC-1/HF**“, which can perform **all duties** such as **grinding plus polishing** and both the **reduction cone as well as the cylindrical die-bearing** in record time - between 3 to 10 minutes per die only - offering a uniquely extended workrange from approx. 0.70 up to 20 mm diameter. 關於 **TC 模具的再加工**，這樣的一台先進半自動機器，例如：我們的型號“**ETC-1/HF**”的機器，可以具有所有的功能如：壓縮段和定徑段的**研磨+拋光**可以同時進行---每只模具的加工時間在 3 到 10 分鐘之間---可以提供一個獨特的擴大加工範圍，從直徑 0.70mm 到 20mm.

For smaller or larger tc dies, other specialist machines are of course available too.
小規格或大規格的 TC 模具，我們同樣可以提供其它的專用機型。

2. However, the reconditioning of PCD dies is requesting a dual technology, using two different types of machines as follows :

然而，PCD 模具的再加工需要一個雙工藝，使用如下所示的兩個不同型式的機器：

For processing (= grinding + polishing) of the **tapered/conical parts** of the die-profile, suitably powered, easy to operate semi-automatic Ultrasonic machines, e.g. model **USP-115**, or – for larger quantities – model **USP-TWIN** are being used, while the subsequent calibration-polishing of the **cylindrical die-bearing**, thereafter is effected on special **high speed wire-type sizing/polishing machines**.

模具壓縮段的錐形部份的加工（研磨+拋光），配有適合動力裝置，容易操作的半自動超聲波機器，例如：型號 USP-115, 或---加工數量大時，採用型號 USP-TWN，後續接著在對模具的定徑段進行校準拋光時，採用專用的高速線型定徑/拋光機。

Ultrasonic machines (e.g. semi-automatic USP-115 or USP-TWIN) :
超聲波機器（例如：半自動 USP-115 或 USP-TWN）：

In general, are working the conical/tapered parts of the die-geometry and there are the following operations possible :

一般來說，模具幾何形狀的錐形/圓錐部分的加工有如下幾種操作：

a) de-ringing/re-polishing (= removal of a light/medium wear ring)

a) 重新找圓/重新拋光 (=移除輕的/中等的磨損環)

in this case a workneedle in appropriate shape and suiting the die-reduction angle is used and with rather fine-sized micron diamond powders only.

在這種情況下，一個工作針具有適當的形狀，並適合於模具減徑的角度使用，並只能使用細鑽石粉末。

By doing so, the wear ring is removed quickly and the reduction cone re-polished again, without interfering much with the cylindrical bearing itself.

這樣加工之後，磨損帶被快速移除並且壓縮段被重新拋光，不會過多影響定徑段本身。

Result: this die can get used again repeatedly at the same size, until about 60% of the initial die-bearing length will be available only. In this case, the die must then get reworked to a larger bore-size onwards.

結果：模具可以在同一規格下被重複利用，可以使用到直到大約 60% 的最初模具定徑長度。在這種情況下，模具必須要進行重加工，並擴徑到大規格的孔徑。

b) Reworking/enlarging the die to a now and defined size :

模具的重加工/擴徑及定徑：

is done based on the so called "**meeting-point method**", meaning that the point where a newly processed reduction cone and the exit cone of a die are meeting. This is effected by means of a specific, but easy to perform calculation available.

使用被稱做“會和點方法”的工藝，意思就是新加工的模具的壓縮圓錐和出口圓錐會和的點。採用一種特殊的，但是容易計算執行的工藝來實現。

Survey : ULTRASONIC DIE WORKING MACHINES :

概論：超聲波模具加工機器：

Without delving deeper into the technological details of Ultrasonic equipment in general (Generator + Transducer + Sonotrode/Workneedle), it should be mentioned that a lot of different machines, executions, varieties are available from various suppliers, which makes a proper direct comparison often quite difficult.

無需深入探究整體的超聲波裝置的技術細節（發生器+轉換器+三角形延長懸臂/加工針），這種機器應當被提及是因為具有許多不同的機器，不同配置，不同供應商有許多可用種類，而要得出一個正確的直接比較是非常困難的。

However, anybody interested in the acquisition of a modern Ultrasonic machine should carefully compare all available offers and check whether or not the relevant design has suitable power, a high degree of automation, is easy to operate and has a solid long-life construction.

然而，所有人都感興趣的是得到一款最新的超聲波機械，這就應當仔細地比較所有可用的方案並檢查相關的設計，無論相關的設計是否具有適當的功率，高度的自動化是易於操作和結實而長壽的結構。

“**Cheap Ultrasonics**” require careful study because they are often “sailing” under the designation “**semi-automatic**”, but really are simple standard machines, which require a lot of costly additional accessories, to reach the level they have initially pretended to belong to !

“廉價的超聲波”需要仔細研究，是因為他們經常在“半自動”的稱號下“運行”的，但是實際上是簡單的標準機器，需要大量昂貴的額外的附件，以達到他們最初所宣稱的功能！

With Ultrasonic die working equipment used in modern die reconditioning workshops “**SEMI-AUTOMATION**”, today really should be “**the Standard**”!

在現代的模具再加工車間內所使用的超聲波模具加工裝備，“半自動”實際上應當是“標準”

This semi-automatic standard. requires several important features:

這種半自動標準設備，要求下述的要素：

Checklist:

檢驗清單：

Automatic frequency / amplitude control !

Efficient working pressure adjustment system !

Built-in workneedle reshaping device !

Swivelling Turntable for mirrorpolishing of PCD dies !

Most working parameters being automatically established and maintained throughout all operations !

Automatic re-start whenever the work needle has reached the pre-set working pressure!

Fail safe operation protections incorporated !

(soft-start, overload cutout, short circuit protection, idle running protection, malfunction indication etc.)

Simple installation, taking into operation, easy to use.

自動頻率/振幅控制！

高效加工壓力調節系統！

嵌入式加工針再整形裝置！

PCD 模具鏡面拋光的旋轉擺動轉檯！

在所有操作中，多數工作參數已經自動地設定和保持！

每當加工針到達預設的加工壓力時，自動地重新開始！

包含安全運行防護裝置！（平緩啟動、超載斷路器、短路電路保護、空轉保護、故障指示等等）

安裝簡便，容易操作，易於使用。

It is important that the machines' Generator and Transducer components are perfectly chosen, adjusted and tuned to one another and to offer sufficient power transmission, to guarantee the necessary potential, reliability and economy.

對於設備的“超聲波發生器和轉換器”部件的精確選擇是非常重要的，調整過互相適合並提供足夠的功率傳送，以保證必要的可能性、可靠性和經濟性。

Such an ideal Ultrasonic machine is the EDER-model “**USP-115**”, – **Advanced Semi-automatic Ultrasonic Die Working Machine**, available in three different versions, to suit any specific operational demand.

關於這些超聲波機器的理論在 EDER-型號“**USP-115**” ----先進的半自動超聲波模具加工機器，具有三種不同的型號，以適用於所有的特定操作需求。

Version **USP-115 UF** is ideal to process dies from 0.05 up to 3.0 mm Ø, while the best sold **USP-115 F** model works all die-sizes between 0.10 to 8.0 mm Ø. For very large compacting-, bar- or tube drawing PCD die sizes, up to 20.0 mm Ø, the most powerful 1000 Watt model **USP-115P** also is available and all in a most advanced easy to operate, semi automatic execution.

USP-115UF 是用來加工從直徑 0.05mm 到 3.0mm 的模具，而熱銷的 **USP-115F** 則可以加工從直徑 0.10mm 到 8.0mm 之間的所有規格模具。對於大規格的緊壓模、棒材或管材伸線用的 PCD 模具，最大可達 20.0mm，最大功率為 1000W 的型號 **USP-115P**。所有的型號都是半自動工作，易於操作。

To assist companies who have to repair lots of PCD dies, or only do have very few experted die-workshop personnel, EDER-Austria have developped a new revolutionary Ultrasonic conception, the model **USP-TWIN** :

要幫助一些客戶需要修理大量的 PCD 模具，或只是模具加工車間有少量的熟練人員，EDER-奧地利公司開發了一種新的革命性的超聲波構想，設備型號是 **USP-TWIN**：

In general, the rate at which PCD dies need to be reconditioned is increasing as more wire and cable manufacturers are using higher speed multiline-wire drawing machines.

一般而言，PCD 模具需要修復的比率是漸增的，因為越來越多的線材和電纜製造廠商使用高速多頭伸線機械。

These machines use several expensive dies simultaneously, wearing them out relatively quickly, so that they often have to queue for reconditioning at die workshops where skilled operators or suitable die reconditioning equipment are often in short supply.

這些機械同時使用不同的昂貴的模具，相對而言磨損是非常快的，所以在這些工廠，需要修復的模具在模具加工車間內排隊等候，而熟練的操作人員和適當的模具修復裝置通常是短缺的。

Again as the first company in the world, EDER-Austria have therefore designed a revolutionary ultrasonic machine conception, the **USP-TWIN**, which features **two independent work-stations**. On this unique machine, **one single operator** can thus recondition two dies simultaneously, with e.g. one workstation handling the smaller die bore sizes, while the other one handles medium or larger sized die bores, thus allowing to nearly **double the output** of reconditioned dies.

此外，作為全球的第一家公司，EDER-奧地利公司為此設計了創新的超聲波機器理

念，**USP-TWIN**, 特徵是：**兩個獨立的工作臺**。在這台獨特的機器上，一名操作人員能夠同時修復兩個模具，例如：一個工作臺處理小孔徑規格模具，而另一個則處理中等或大規格孔徑的模具，這樣就允許修復模具幾乎是**雙倍的產出**。

However, for the calibration and polishing of the cylindrical die-bearing of PCD dies, high speed wire-type sizing machines are required.

然而，PCD 模具的圓柱形定徑段的校準和拋光，則需要高速線型定徑機。

Survey : Wire type sizing/polishing machine procedure :

概論：線型定徑/拋光機的加工程式：

Based on the aforementioned "meeting point", a defined size and length of the cylindrical bearing can then get achieved at suitable wire-type sizing/polishing units, such as our high speed dual workstation **HGM-21 machine, offering a uniquely extended die-workrange between 0.05 up to even 10 mm diameter.**

基於前面提到的“會和點”，圓柱形定徑段的尺寸和長度已經設定，而利用適當的線型定徑/拋光裝置就可以完成，例如：**HGM-21** 高速雙工作臺機器，提供有一個獨特的擴展，模具加工範圍可達直徑 0.05mm 到 10mm.

The semi-automatic **EDER HGM-21** is very simple to operate with hands-free PLC control throughout operation once the machine has been initialised. Each of the two die working stations can be used individually and features an automatic work cycle stop giving an audio and visual indication whenever the relevant operation is completed.

EDER 的半自動型機器 **HGM-21**, 具有免提的 PLC 控制，當機器啟動之後，在整個操作過程中非常易於操作。兩個模具加工台的每一個都可以單獨使用，在工作周期結束之後自動停止，並在相關的操作結束之後給出聲、光指示。

The workspindles can get exchanged within a minute and the **HGM-21** machine will then offer the **following unique workrange potential** :

加工針可以在一分鐘之內進行更換，HGM-21 型號的機器可以提供下述的可能需要的獨特的加工範圍：

On Standard spindles : **0.05 to 2,0 mm Ø**

使用標準軸： 直徑 0.05mm—2.0mm

On LWS (large wire spanner) : up to 4.50 mm Ø

使用 LWS(大線徑扳緊器)： 最大直徑可達 4.50mm

On Maxispindle-set: **up to 10.0 mm Ø (larger possible)**

使用最大軸組： 達 10.0mm(有加大可能)

For working of ultrafine die-sizes, between 0.010 to 0.30 mm Ø, a specialist machine, model **UFW-1 is available in Standard and Advanced execution too.**

對於超細規格模具的加工，介於直徑 0.010mm 到 0.30mm 之間，一特別的型號 **UFW-1** 則可以做為標準選擇，也有更先進的配置的。

To **complete the infrastructure** of a modern die-tool reconditioning workshop, some other special **ancillary devices and instruments**, such as one of our various **“SONOMATIC”** Ultrasonic die cleaning tank units, an efficient **“DIM ZOOM 160”**, die inspecting microscope, **DEZ** – measuring wire pulling devices, **ZTE** – elongation measuring units and other suitable **precise measuring and profile monitoring devices** are inevitably required also, allowing a proper checking of die-tools during all reconditioning stages and for their final inspection prior to re-using them.

要完善一個現代化的模具再加工車間的基礎設施，一些其它的特殊**附屬設備和儀器**，例如：一種我們的一些 **“SONOMATIC”** 超聲波沖洗槽裝置，一個高效的 **“DIM ZOOM 160”** 模具檢測顯微鏡，**DEZ**—測量線材牽引裝置，**ZTE**—延長率測量裝置和其它適當的精密測量和輪廓控制裝置是不可避免地同樣需要，在所有的再加工階段進行模具的正確檢測並在重新使用之前進行最終檢測。

Technical Services :

技術服務：

Advanced and largely automatic die processing machinery, such as those available from **EDER-Austria**, can also compensate a lot for the increasing lack of skills in die tool technology, but cannot perform miracles if only a basic die processing know how exists???

EDER-奧地利不只是提供先進的、大量自動化的模具加工機械，利用這些是可以彌補在模具技術方面的越來越多的技能缺乏，但如果僅有些基本的模具製程知識是無法產生奇跡的。

For an efficient repairing of die-tools, **a certain experience and die working know how must exist.** Buying a machine (car/hardware) is easy, but running it to perfection (= availability of a driving license/software), is another, totally different matter.

做為一個高效的模具修理，**一定的經驗和模具加工的專業知識是需要的。**購買設備（汽車/硬體）容易，但是熟練地運用它（=駕駛執照/軟體）則是個困難。

If such an experience it is not sufficiently available or no longer current/up-to-date, in your plant, this necessary **Technical Assistance** can easily get supplied from EDER-Austria specialists too and at any time required.

如果您的工廠經驗不足或者和現行的技術不相符，則**技術援助是必需的**，可以容易地、在任何需要的時候得到 EDER-奧地利的專家提供的幫助。

Summary :

總結：

Quality does have a certain price always. This is not without truth for the wire and cable industry and particularly in times of globalization???

品質總是需要一些成本的。線材和電纜工業何嘗不也是，特別在全球化的今日？

It is a proven fact that only wire drawing dies, new or reconditioned, which are in perfect geometrical- and surface polish condition are producing good, high quality wires and can meet the increasingly crucial factors -high drawing speed, multi-line drawing applications, increasingly more critical diametrical tolerances, smaller wire sizes , ISO requirements etc.- any wire drawing and cable plant has to continuously comply with, these days.

經過驗證的事實是，只有線材伸線模具，新的或修復過的，具有完美的幾何形狀和表面拋光狀況，可以生產好的，高品質的線材並可以滿足越來越多的決定性的因素---高伸線速度、多頭伸線應用、越來越高嚴格的直徑公差、小規格線徑、ISO 規定等等。這些都是所有線材伸線和電纜工廠現今需不斷地符合的。

In times of nowadays hardest economical competition at all levels of the industry worldwide??, we must be clearly aware that worn-out drawing dies are „**unused treasures**“, which should be reconditioned regularly.

今日今時，全世界所有等級的工業都面臨嚴厲的經濟競爭?? 我們必須清醒地認識到磨損的拉絲模具是“無用的珍寶”，應當定期進行修復。

Correct refurbishment of dies, regularly undertaken in time, can prolong the service life of these costly tools considerably and as such will contribute a lot to a flourishing economy and a distinctly higher net product value in any wire and cable plant.

所有的線材和電纜工廠，模具的定期、正確整修，在任何線材或電纜廠都可以顯著地延長這些昂貴模具的使用壽命並有助於獲得可觀的經濟效益和較多淨產品價值。

EDER- Austria for over 60 years, are the leaders in supplying easy to understand and operate machines for reconditioning, grinding, and

profiling of dies.

EDER--奧地利具有超過 60 年的歷史，在模具的再加工、研磨和成型機械設備的供應上是領導者，設備易於操作和理解。

Investing in EDER machines benefits the customer by:

客戶投資在 EDER 設備上所獲得的利益：

(1) longer life for the Die itself.

模具自身的長壽命。

(considerably less new dies must get purchased).

(大量減少新的模具的採購)

(2) accurate reconditioning of the die, thus giving a first class product

模具的精確再加工，因此獲得了高等級的產品

(3) reduction of manpower

減少了勞動力

(high degree of automation built-in)

(高度的嵌入式自動化)

(4) lower operational costs

低操作成本

(less consumption of power and consumables due to high efficiency)

(減少了電量消耗和由於降低消耗而帶來的高效率)

(5) Durability with minimal maintenance costs

最小的維護成本帶來的耐久性

(6) easy operation and

易於操作

(7) the experience and after sales support of EDER.

EDER 的經驗和售後支持

This simply is the prime key for achieving optimal economy in any wire drawing- and cable plant.

在所有的線材伸線和電纜廠，這種簡單就是獲得最佳經濟效益的關鍵。

The returns from this additional productivity of properly refurbished die-tools, easily justify the premium you pay for quality and proper die maintenance, as the lack of quality and the need to continuously replace worn-out dies by purchasing new tools, exacts an even greater price. A relatively small investment is needed only to stage an efficient **EDER die workshop equipment line**, what means a very quick and substantial return.

從適當整修模具返回的額外生產率，容易地使您為了品質和適當模具的維護所支付的費用得到回報，由於缺乏品質和需要購買新的模具來連續更換磨損的模具，是一筆巨大代價。相對來說，建立一個高效的 EDER 模具加工車間只是小投資，卻獲得快速和可觀的回報。

EDER-Austria are standing by for any of your demands and to assist you too in achieving an optimal economy by keeping your wire drawing dies in perfect condition. EDER-奧地利公司一直守候著您的任何需求並幫助您的線材伸線模具處於理想狀態，以使得您獲得最佳的經濟效益。

Thank you very much for your kind attention and I remain at your entire disposal for any further questions required.

非常感謝您的關注，關於您所需要的任何疑問，我們隨時聽候您的差遣

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Drafted in 2011

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