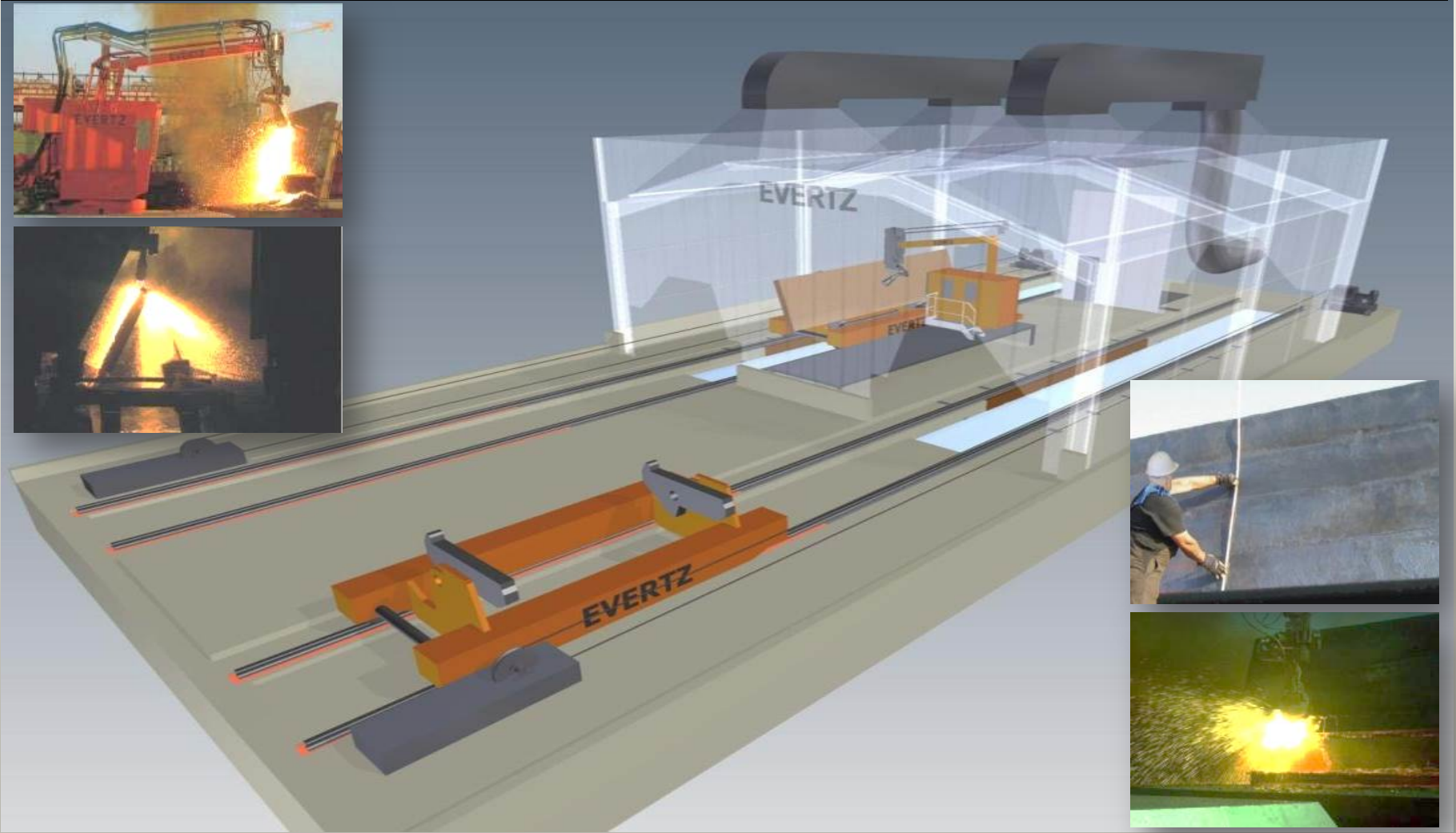


EVERTZ – Flame Scarfing

THE **EVERTZ**
GROUP





- Mit einer Belegschaft von über 600 Mitarbeitern arbeiten die Firmen der Evertz – Gruppe seit über 50 Jahren für die Stahlindustrie – in eigenen Betrieben, aber auch in den Stahlwerken vor Ort – und führen mit ständig optimierten Techniken und Verfahren Dienstleistungen für die Stahlproduktion durch.
- Engineering und Anlagenbau für Stahl- und Aluminiumwerke vervollständigen das Angebot. Aber auch andere Industriesparten werden bedient: so gehört seit Jahren auch der Klopp Maschinenbau mit der Produktion von Universalfräsmaschinen zur Evertz - Gruppe
- Sitz der Gesellschaft: Solingen, Deutschland
- Mitarbeiter: ~ 600 Mitarbeiter
- Über 300 angemeldete Patente
- Internet: www.evertz-group.com



Hauptsitz, Solingen

THE **EVERTZ**
GROUP



Hauptsitz in Solingen, Germany



Produkte & Dienstleistungen der Gruppe

(Auszugsweise)

THE **EVERTZ**
GROUP



Schleifen von
Stahlprodukten:
Halbzeug, Brammen,
Rund, Knüppel, ...



Flämmen:
Handflämmen/
Maschinenflämmen



Stranggusskokillen:
Herstellung, Reparatur,
Beschichtungen, Aufkupfern
(ewige Kokille)



Lasthebemagnetanlagen
bis Steuerungskategorie III
- vollständige Redundanz



Konstruktion und
Herstellung von CNC
Werkzeugmaschinen



Hydrotechnische
Installationen &
Komponenten



Dienstleistungen für die
Metall- und Stahlindustrie



Maßgeschneiderte,
schlüsselfertige
Lösungen für die
Stahlindustrie



- These steel grades often face problems when rolled in the form of defects such as rolled in scale, skin lamination, cracks and inclusions.
- The root cause of these defects comes from the continuous casting process where surface imperfections become trapped in, or are generated in, the slabs. In order to remove these defects before hot rolling the slabs need to be fully scarfed.
- For an industrial scarfing project of this scale it is vital to undertake an on-site visit to understand the client needs, discuss technical issues and see first-hand the proposed location for the scarfing facility.
- This project relates to a turnkey project which must include provision by the equipment supplier of all the buildings and concrete civils required.
- The key scarfing equipment would be designed, constructed, installed and commissioned turnkey by our company.
- Our scope of supply would normally include the training of your operations and maintenance personnel. Beyond the initial training and commissioning, we could equally accompany CUSTOMER's operators during 'XX' months to ensure that the project is industrially successful on a long term basis.

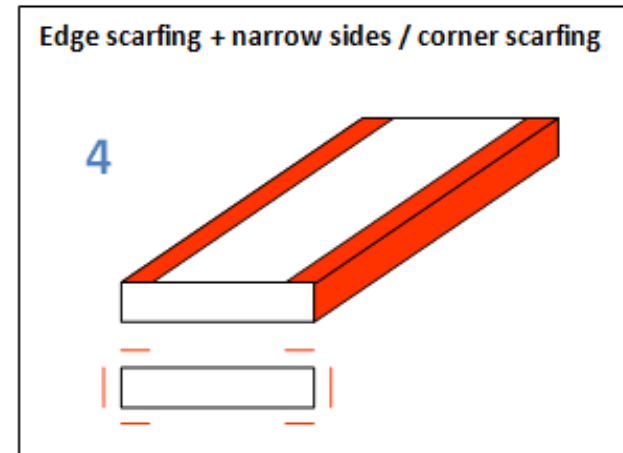
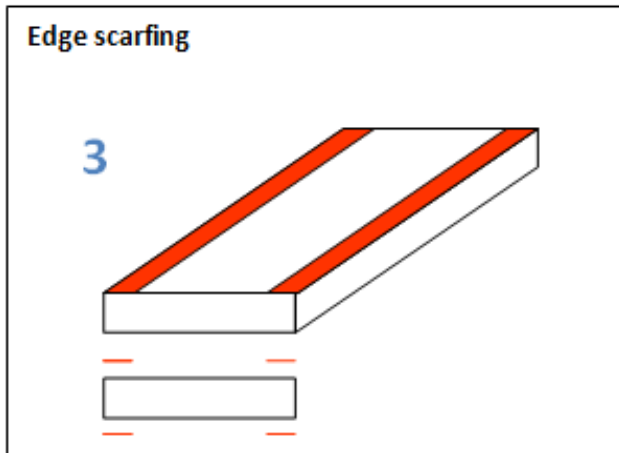
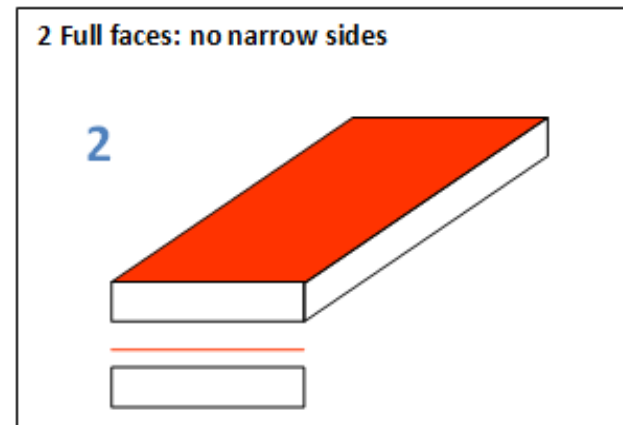
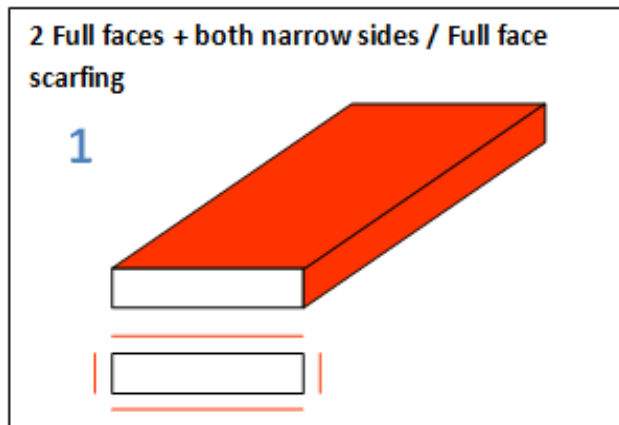


- Evertz is not only a renowned specialist equipment supplier to the steel industry. We also provide **outsourced services** operating under medium to long term contracts. Our activities include semi-finished product management, scarfing, oxycutting, grinding, bar peeling, CC mould services and various transport logistics and materials handling.
- Our company has been involved in scarfing machines for over 40 years. Evertz is one of the leaders in the domain of **Slab Conditioning** and will be able to meet all of CUSTOMER's technical, legal, environmental and contractual requirements.
- Within this document you will find information on how scarfing machine technology has developed over the years.
- Our latest patented torch system, called "**impulse scarfing**" is a revolution for mechanised scarfing and should be of key interest to CUSTOMER, offering :
 - ✓ Improved slab surface quality, less rolling mill rejects,
 - ✓ Less metal loss; better yield,
 - ✓ **Substantial oxygen consumption savings,**
 - ✓ And reduced noise emissions.
- This proposal is based on the supply of new equipment. The Evertz Group is however very flexible in serving its customers and in order to convince CUSTOMER of our capabilities we can offer as an alternative the purchase of a reconditioned scarfing machine offering a more economically competitive solution

Evertz Flame Scarfing



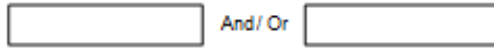
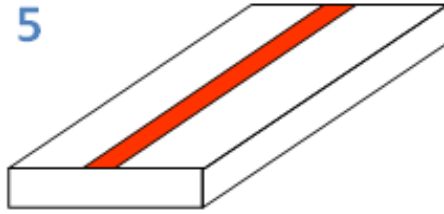
As a general rule our typical scarfing machines are capable of undertaking full face scarfing, spot scarfing, test scarfing and edge scarfing as shown below :





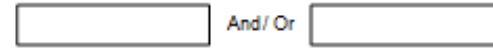
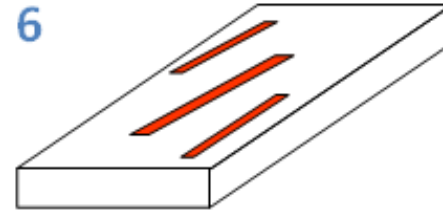
Selective scarfing over full slab length:
individual band passes

5



Selective scarfing over slab surface:
individual band passes

6



One example : for tube applications we tend to concentrate the scarfing on the slab edges rather than the full faces. This is an advantage of the Evertz scarfing machine. The machine is extremely versatile and can be used to do many different codes (as shown above).

- Scarfing torch pass width : client requirement unknown, but the Evertz torch can be effectively varied from 100 to 400 mm.
- Number of production shifts per month and per year = to be defined according to exact slab volume to scarf.
- Number of operating days = 335 days / year (according to page 4 of the TOR document). During this period the Evertz facility can (if required) operate 24 hours a day, 7 days a week. Effectively 160 hours per week, 20 shifts per week.



Evertz Flame Scarfing

THE **EVERTZ**
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The main reason for scarfing is not to remove metal from the slab surface, but to remove the surface defects from the slab. From our experience, most of the defects are located within the first 1 to 2 mm of the surface, but frequently other defects can be found deeper in the slab. For this reason, the Evertz scarfing manipulator is the best as it allows you to remove more or less metal in relation to the defects observed by the operator. This has the benefit of optimising the metal yield loss as you can undertake partial scarfing, spot scarfing, test scarfing or full face scarfing.



Our “off-line” scarfing manipulator is the preferred customer solution to eliminate surface defects on slabs and to optimize slab logistics. By using our “off-line” scarfing manipulator, our customers are able to substantially reduce their downstream rolling reject rate whilst at the same time optimising their metal yield loss.

Since 1966, Evertz has been constructing, developing and improving its scarfing technology. During these 40 years a lot of benchmarking and best practices have been established. Evertz is still today investing a lot of money and resources into continued research and development in this field.

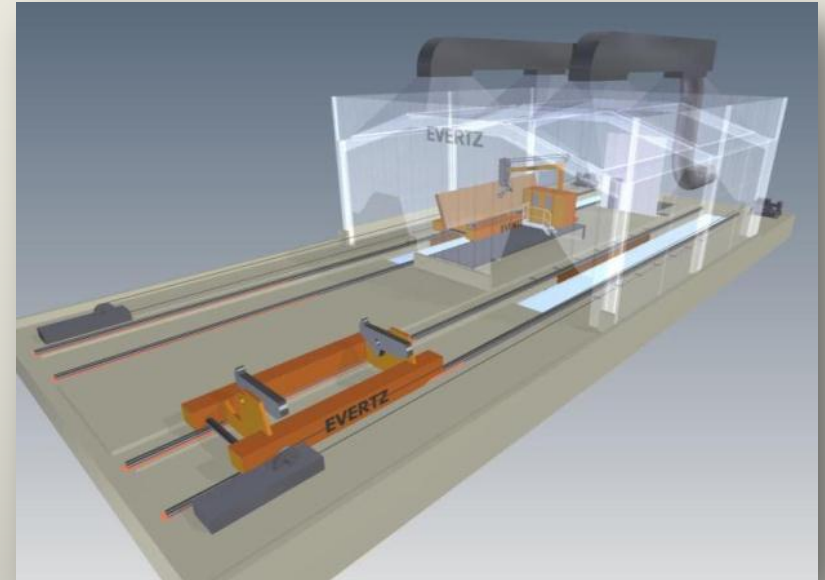
The latest “off-line” scarfing manipulator is the most advanced technological machine on the market. Not only has the scarfing manipulator technology been progressing during these years but also the very important “torch” technology. Numerous patents for the injection of CO₂ for the reduction of fume generation are but one example of Evertz’s improvements in the world of scarfing. Evertz has regularly filed patents during all of these years and today holds more than 240.





This chapter describes the equipment proposed by Evertz for the implementation of a new mechanised “off line” scarfing facility, called the MFA-HB 009h. The Evertz scarfing principle is to mechanise the slab surface conditioning process and offer CUSTOMER a fully integrated “off line” facility, including :

- efficient slab handling and turning,
- state-of-the-art scarfing machine driven by one operator,
- fume control system (with baghouse) as well as built-in scale granulation and extraction.



The proposed equipment has been developed from many years’ experience, but is in each case purpose designed for each specific client’s needs. Our proposals always integrate the best working practices from other operational Evertz scarfers.

This equipment and technology has been extensively tested and has successfully operated for decades. It has proven its reliability and day to day productivity.



Evertz Flame Scarfing

THE **EVERTZ**
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Customer currently envisages hot and cold slab scarfing.

Based on the customers requirements and the project knowledge we have to date, we are proposing for this project an **Evertz off-line machine with 2 scarfing lines**, (and 2 transfer cars).

The exact location of the facility will need further discussions with the customer to make sure that all of the following important points are taken into consideration:



- The slab handling onto and off of the scarfing installation is generally undertaken with overhead cranes.
- If the slabs are very hot (above 500°C), handling will need to be done with slab tongs.
- Cold slabs are more efficiently handled with our own electro-magnets.
- As hot scarfing will be required the facility will need to be located near the continuous caster roller run out table.
- Ideally the overhead cranes should be able to run over the top of the scarfing enclosure.
- The area around the scarfing facility will need to have slab storage zones for slabs waiting to be scarfed and for finished scarfed slabs.
- A zone for slab inspection and potential manual retouching will also be needed.



Evertz Flame Scarfing

THE **EVERTZ**
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Evertz has developed its scarfing system over a 40 year period to respond to increasingly stringent customer quality demands and environmental legislation. Experience gained has resulted in one of the most versatile scarfing systems available. Each component part of the installation represents years of development.

The Scarfing robot has been developed to mimic the movement of hand scarfing by allowing the operator five degrees of freedom on the torch movement.



The patented burner has been developed to allow the versatility of selective spot to full face scarfing from a single torch, with variable pass widths from 100 to 400 mm.

The machine operator can select individual scarfing programmes and vary the pass widths during the scarfing at the 'flick of a switch'. The most common 300 mm diameter torch was developed by Evertz to increase pass widths whilst at the same time decrease considerably oxygen consumption to only 2 400 Nm³/h. **Compare this value to our competitors !**

Iron powder injection into the scarfing flame allows virtually instant formation of a scarfing bath at any point on the slab surface. Experience with the system has shown improvements in quality by allowing gouge-free start-ups at any point on the slab's surface, and optimum production throughput. **Compare this solution to our competitors !**

The slabs to process are placed on dedicated transfer cars in the near vertical position to allow the operator the best view of the scarfing bath. Any defects in the bath can be clearly seen by the operator, who is required to report the quality of the slab after each surface is completed (to the dispatcher).



Evertz Flame Scarfing



For edge scarfing, the transfer car must be designed to tilt up to bring the slab to the horizontal position. The operator then selects a different scarfing program, with a smaller more appropriate path width, and can proceed to edge scarf the slab in one single pass.

High pressure descaling water sprays immediately follow the scarfing torch to prevent the re-oxidation of the slab's surface. The slab's surface is top quality which aids post visual inspection. A water filled trench below the transfer car granulates the oxides which are subsequently collected together (and pushed out the facility) via a plough fitted onto each transfer car. The granulated oxides are pushed outside the building into a pen where they can be collected into skips.

The water consumption of the process is minimal, only requiring small top-up to replace natural evaporation losses, (an environmentally friendly closed loop system).



Slab scarfing showing the near vertical slab on the transfer car



Evertz Flame Scarfing

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The standard Evertz scarfer is completely enclosed inside a fume collection enclosure connected to a baghouse filter. The dust emissions will be controlled to levels compliant with current local legislation.

An automations system allows all aspects of the scarfing operation to be logged and continuously monitored. A sophisticated PC (Process Control) package allows real time measurement and recording of the scarfing variables to ensure repeatable operational results. This PC package can be directly linked into the clients own production management system.

Evertz scarfing installations have obtained numerous ISO 9001:2000 quality and ISO 14001 environmental certifications. The versatility of this scarfing system is its ability to mimic hand scarfing, coupled with the provision of iron powder injection, which allows the machine to deal with all types of scarfing codes on any area of the slab's surface. The operator has an ideal view of the scarfing bath and can undertake real time adjustments on defects observed.

The Evertz torch has the flexibility to provide the highest quality with minimal yield loss.

Standard scarfing programmes would be jointly determined with CUSTOMER via qualification trials. The Evertz machine and the steelmaker's trained operators will then scarf the slabs using these standard programmes, (which will of course evolve and be adjusted with time).



Typical slab surface and edge scarfed by Evertz – MFA-HB 009h



Evertz Flame Scarfing

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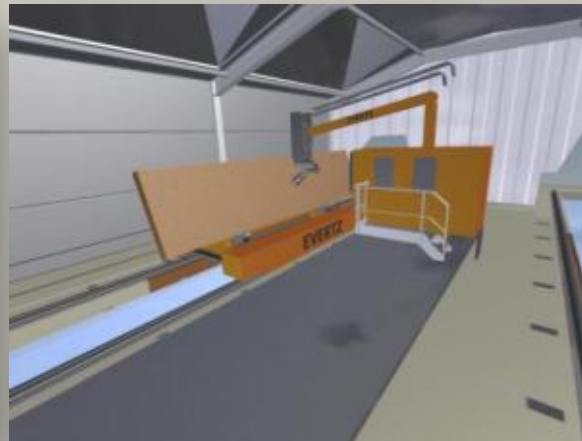
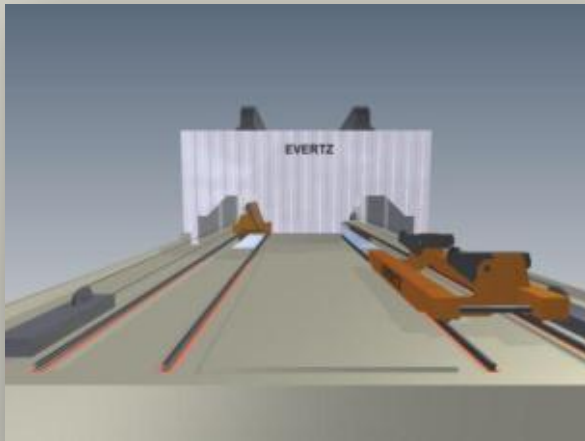
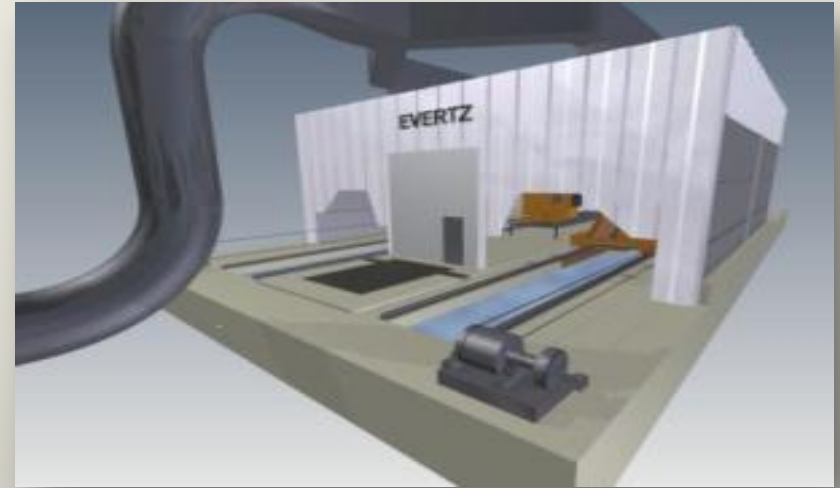
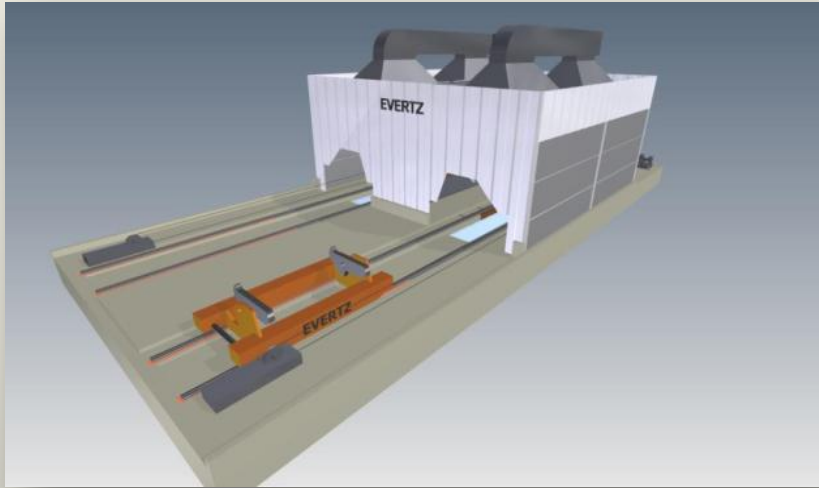
During normal operations, the single scarfing operator inspects the slab surface directly whilst scarfing. The number of defects on each slab scarfed is recorded and the operator can either:

- report the defects to the dispatcher and await a decision,
- divert the slab for inspection by another QA controller(s),
- re-scarf the surface locally until the number of defects reaches a pre-set acceptable limit.



Evertz Flame Scarfing

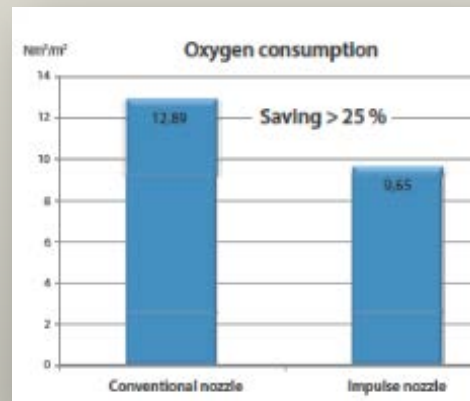
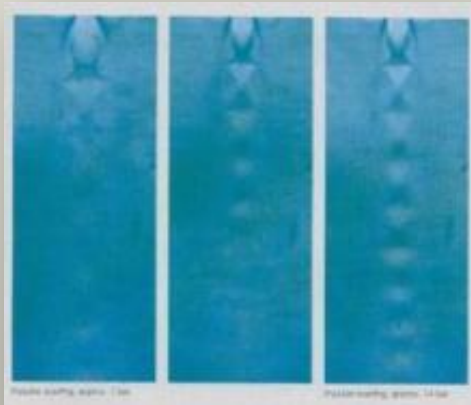
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Evertz has recently developed and patented a new surfacing technique called “impulse scarfing”. The main advantages with this new generation torch are :

- Reduced metal loss,
- even better slab surface quality,
- substantial gains in oxygen and gas consumption,
- Average oxygen consumption rate of only 2 400 Nm³/h.



This average oxygen scarfing consumption rate of 2 400 Nm³/h should be compared with that quoted by our competitors. Over the project life our customers will make an enormous cost saving on oxygen supply by opting for the more economical Evertz scarfing solution.



EVERTZ Scarfing Quality

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Slabs scarfed on the Evertz Scarfing Machine



Slabs scarfed on a typical “Letter Box” Scarfer



Note : the above are real photos ! The photos on the right have been provided to Evertz by steelmakers from previous projects where the steelmaker has not been satisfied with the surface quality of the “Letter Box” type scarfer.

These photos speak for themselves ! Compare the surface quality finishes on the big faces and the edges. In particular the start up zone of each slab from the “Letter Box” scarfer is very very bad!

The feedback we have had from various steelmakers is that “letter box” machines need an enormous amount of maintenance to keep the installation running. Downtime for these machines is very high, even up to 50% in some cases !

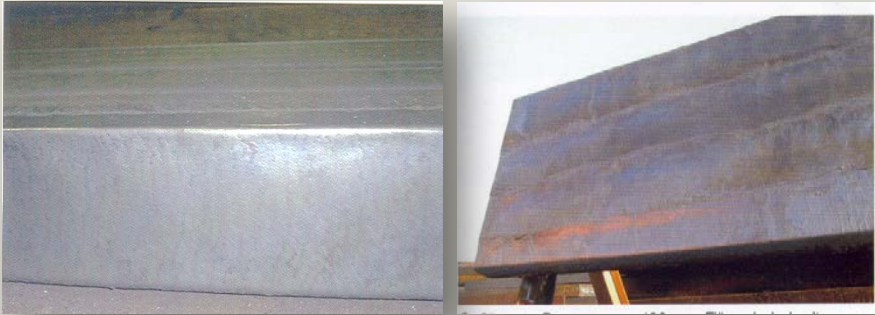


EVERTZ Scarfing Quality

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Slabs scarfed on the Evertz Scarfing Machine



Slabs scarfed on a typical "Letter Box" Scarfer



EVERTZ Scarfing Machine Advantages

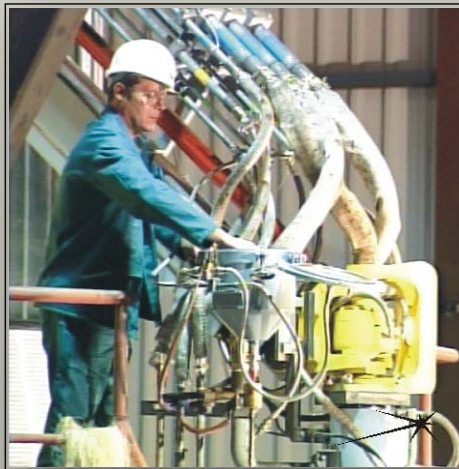
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- Best view of the torch and the slab to be processed ; immediate defect recognition, adjustment and removal of the defects during the scarfing process.
- The trained operator can immediately adjust and react to what he sees.
- Slabs of up to 50 T can be readily handled and scarfed. For slabs above 42 T it is just important that some special considerations and adaptations are made regarding the slab handling and the transfer cars.
- Minimal ridges between the scarfing passes. Scale free surfaces thanks to a universal patented descaling system.
- Latest development : Impulse scarfing with increased performance and quality.
- Several selectable scarfing programs with the same torch ; enabling the required scarfing width and depth.
- Possibility of either full face, narrow face, edge and selective scarfing at different speeds.
- Quick and safe torch ignition technology.
- Cost effective solution in terms of initial capital outlay and low operating and maintenance costs due to the use of benchmarked best practices and excellent equipment reliability.
- Low O&M (operating and maintenance) costs compared to “letter box” machines.
- No need to manually retouch the slab after machine scarfing, (compared to a letter box machine where the head and tail are not scarfed over approx. 100 mm).
- Easy access to all machine components for maintenance and cleaning interventions.

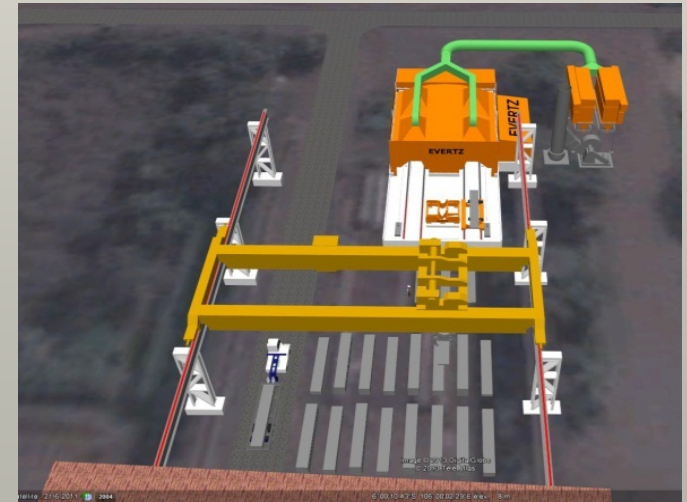
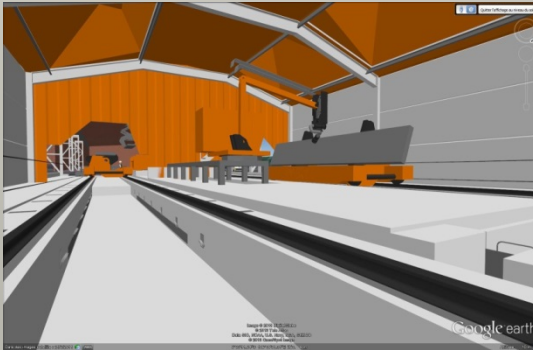
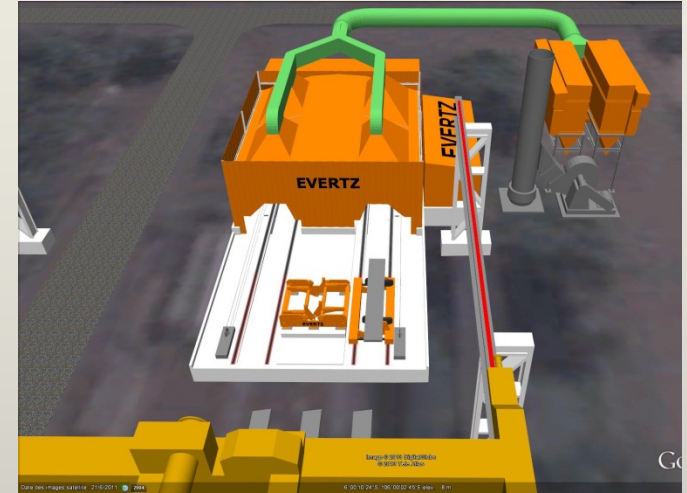


- The Evertz off line scarfing solution is based on 2 moving slab transfer cars and a fixed rotating scarfing machine in between ; all contained inside a de-dusting and fume collection building.
- This solution provides the necessary safety for the operator who is protected inside his cabin. In addition, special water-glycol hydraulic oil is used in order to eliminate any risk of fire compared to normal mineral based hydraulic oils.
- In accordance with environmental legislation the scarfing facility should be equipped with a fume de-dusting baghouse.
- Flexibility : Evertz has in the past produced and supplied scarfing facilities which work in the opposite way. The scarfing manipulator moves and the slabs are fixed. We are open to discuss any technical and optional issues or modifications and can adapt our technology, if possible, to meet CUSTOMER's specific requests.



Maschinenflämmen

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Brammenwendemagnet zum sanften Wenden und Transport von Brammen:

- Durch den speziellen Evertz Brammenwende- und Transportmagneten werden die Schläge in die Krananlage absolut minimiert. Dies bedeutet eine gewaltige Reduzierung der Kranstandhaltungskosten.
- Das Wenden der Brammen ist überall im Arbeitsbereich des Krans möglich. Mechanische Wendetische müssen nicht zeitaufwendig angefahren werden.
- Das Wenden ist ein sanfter und schonender Prozess, ein Abfallen der Bramme kann ausgeschlossen werden.
- Brammen können in vertikaler und horizontaler Lage gehandelt werden.



Ausrüstung für die Brammenhandhabung

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GROUP



Brammenwendemagnet zum sanften Wenden und Transport von Brammen:



Hier: Bramme 40t und 550°C





Die erforderliche Ausrüstung wird speziell von EVERTZ konstruiert und gefertigt und ist optimal an die Anforderungen für das Schleifen angepasst.

- Brammen - Wendetisch



- Kipptisch
zum Schleifen der
Schmalseiten



Brammenhandling vor Ort – mit einem Reachstacker

Kapazität mit Elektromagneten: Brammen bis zu 50t und einer Temperatur von 550°C

Evertz ist 100% verantwortlich für den Betrieb und die Instandhaltung der EVERTZ Anlagen und Ausrüstung



Brammenhandling vor Ort – mit einem Gabelstapler

Kapazität mit einem Elektromagneten: Brammen bis zu 40t und einer Temperatur von 550°C

Evertz ist 100% verantwortlich für den Betrieb und die Instandhaltung der EVERTZ Anlagen und Ausrüstung





Sicherheit für die EVERTZ – Gruppe hat absolute **Priorität!**

Wir sind verpflichtet und geschult:

- sicherzustellen, dass alle Sicherheitsvorschriften vollständig angewendet werden und in allen Arbeitsstätten von der Planungsphase bis zur endgültigen Lieferung an den Kunden, bzw. während des Betriebes, beim Kunden respektiert werden,
- allen Mitarbeitern die notwendige Ausbildung + Arbeitsmittel bereitzustellen, um sicherzustellen, dass sie ihre Arbeit sicher ausführen können.
- Sicherheitsrelevante Probleme an Maschinen, Ausrüstung oder Menschen so schnell wie möglich zu lösen.





Die Evertz Gruppe ist weltweit « Lloyd's Quality Registriert ».

Wir haben die **Gold**-Auszeichnung für 10 Jahre « erfolgreiche und kontinuierliche » Zertifizierung erhalten.

Alle unsere Maschinen und Anlagen sind zu 100 % in Europa hergestellt, « CE » zertifiziert, und in unseren eigenen Betrieben in Deutschland nach den nationalen « TÜV » Standards produziert, eine weltweit anerkannte Marke von Qualität.

Zur Sicherung einer maximalen Qualität besitzen wir den Großen Schweißbeignachweis der höchsten Anforderungsklasse E nach DIN 18.800-7 sowie 15.018 für Baustähle und Edelstähle.

Alle Schweißarbeiten an relevanten, tragenden Bauteilen werden unter Aufsicht eines Schweißfachingenieurs von geprüften Schweißern durchgeführt.



GSI SLV Duisburg	
Schweißtechnische Lehr- und Versuchsanstalt SLV Duisburg - Niederlassung der GSI mbH Bescheinigung Klasse E	
über die Herstellerqualitäten von Schweißern und Schweißarbeiten nach DIN 18800-7, 2008-11	
Dem Unternehmen wird für den Schweißbetrieb in	Eves Anlagenbau für Hiltenschnik GmbH 42651 Solingen, Birkenweher 66-80
Bescheinigt, dass er über die erforderlichen Fachkräfte und Vorrichtungen verfügt, Schweißarbeiten zur Herstellung tragender Stahlbauteile im folgenden Anwendungsbereich durchzuführen:	
Normen/Regelwerke	DIN 18800-7 DIN 15018
Schweißprozesse (Schweißverfahren nach DIN EN ISO 4063)	111 Lichtbogenhandschweißen 135 Metall-Arbeitschweißen teilmechanisiert
Grundwerkstoffe	S235, S275, S355 nach DIN EN 10025
Erweiterungen/Einschränkungen	Diese Bescheinigung ist eingeschränkt auf die Fertigung von Bauteilen des Maschinenbaus und der Hiltenschnik.
Verantwortliche Schweißfachingenieur (Name, Vorname, Geburtsdatum, Qualifikation)	Dipl.-Wirt.-Ing (FH) Lowag, Hans-Peter, geb. am 13.07.1952, IWE (IIV)
Vertreter (Name, Vorname, Geburtsdatum, Qualifikation)	erfüllt
Bemerkungen	Nach der jeweils gültigen Baupflichte gilt: Für Bauprodukte hat die Übereinstimmung im Verfahren UH zu erfolgen. Weitere Bemerkungen s. Rückseite
Gültigkeitszeitraum	vom 08.12.2010 bis 08.12.2013
Bescheinigungs-Nr.	2010.0151
ausgestellt am	08. März 2011 Mönich/Wa
Leiter der Prüfstelle (Name, Unterschrift, Stempel)	
Allgemeine Bestimmungen	siehe Rückseite

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Fax: 0203 120114 · Fax: 0203 120 1210 e-mail: www.gsi-slvs.de
Abteilung: Qualitätsmanagement · Fax: 0203 1201 120

DVS

