

AUTOMATION IN MARINE INDUSTRY



CONTAINERSHIP 6000 TEU– US\$200 million

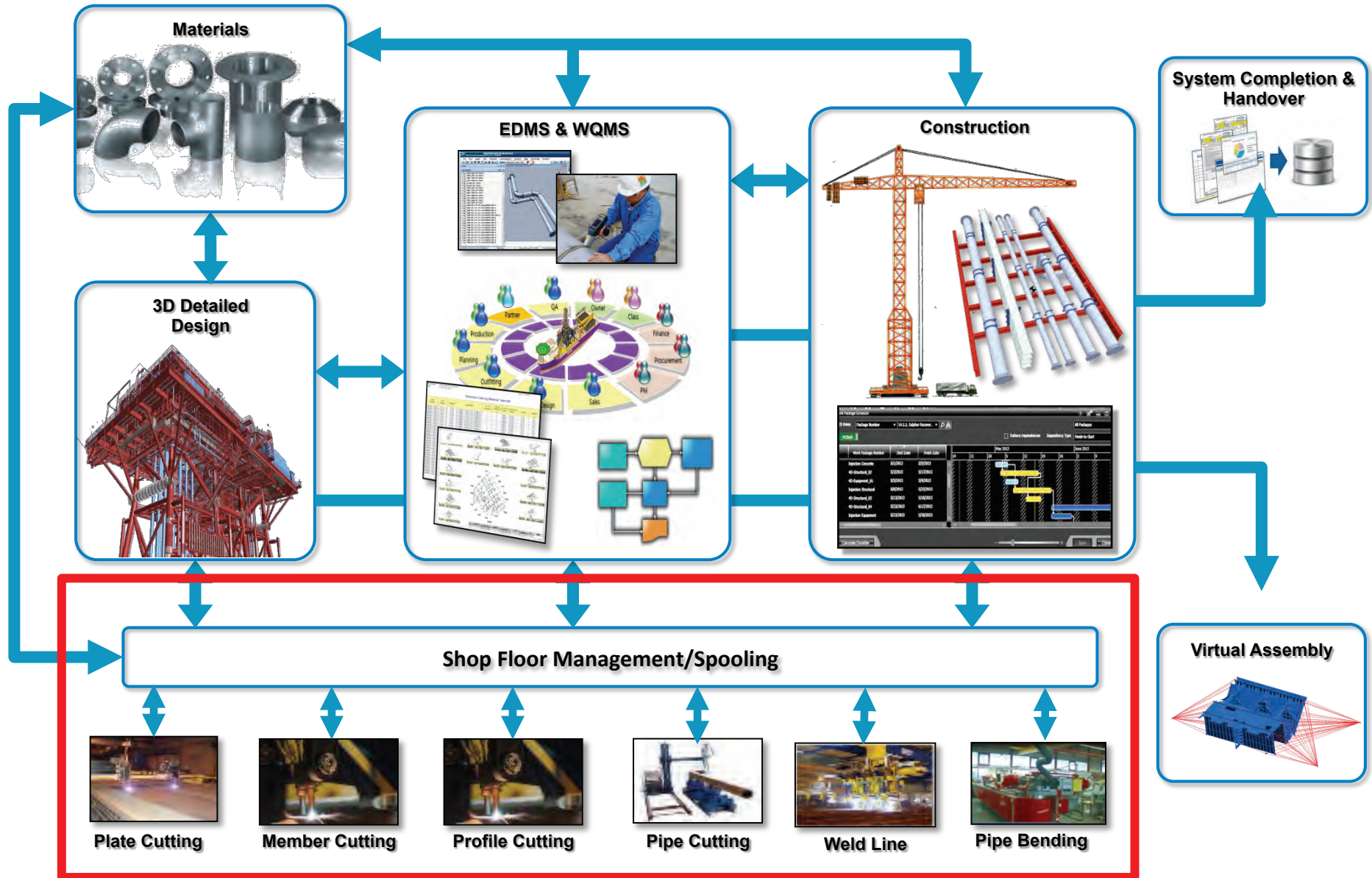


AIRCRAFT CARRIER – US\$1,800 million



JACK UP OIL RIG – US\$300 million

Smart Yard Integration



Smart Production Management

Nesting and NC programming of pipe, plate and profile parts is the heart of the production process. Modern Panel line Cutting/welding is supported as part of "LEAN" assembly production and produces needed parts

Pipe Cutting:

Optimization of pipe parts on reserved material

- **Robot cutting output (Ex. HGG)**

Plate Cutting:

Nesting plate parts on reserved material.

ESSI/EIA Supports all cutting technologies and created NC code for the cutting machines

- **CNC cutting output (KOIKE – KAP8030N)**

Profile cutting :

Optimization of profile parts on reserved material

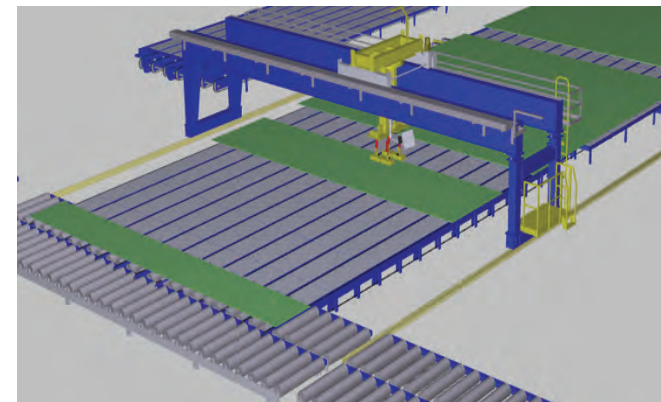
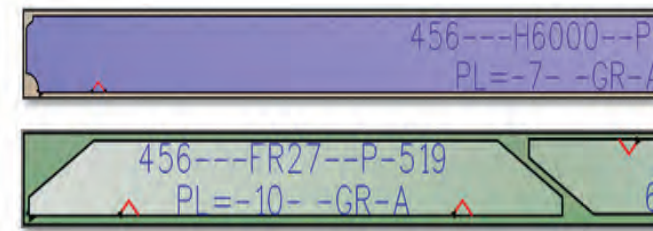
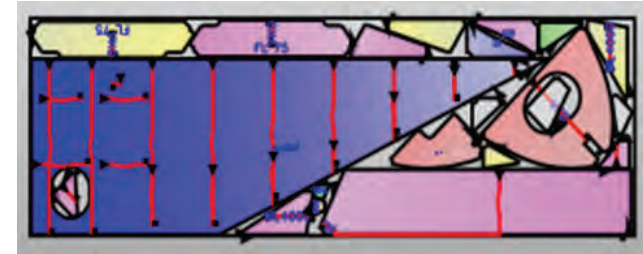
- **Macro program output (KOIKE -ABGRAPH)**

Panel line welding:

Optimization of Panel Robots

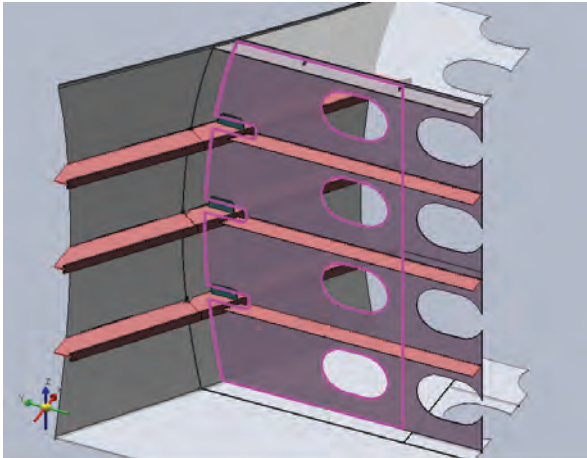
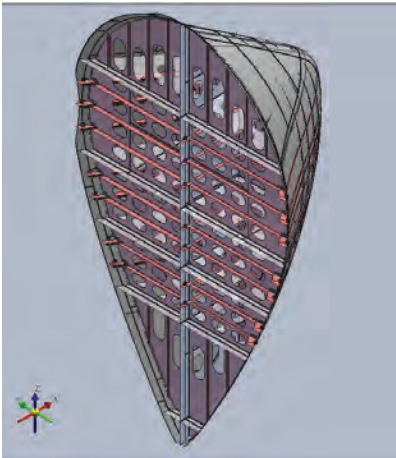
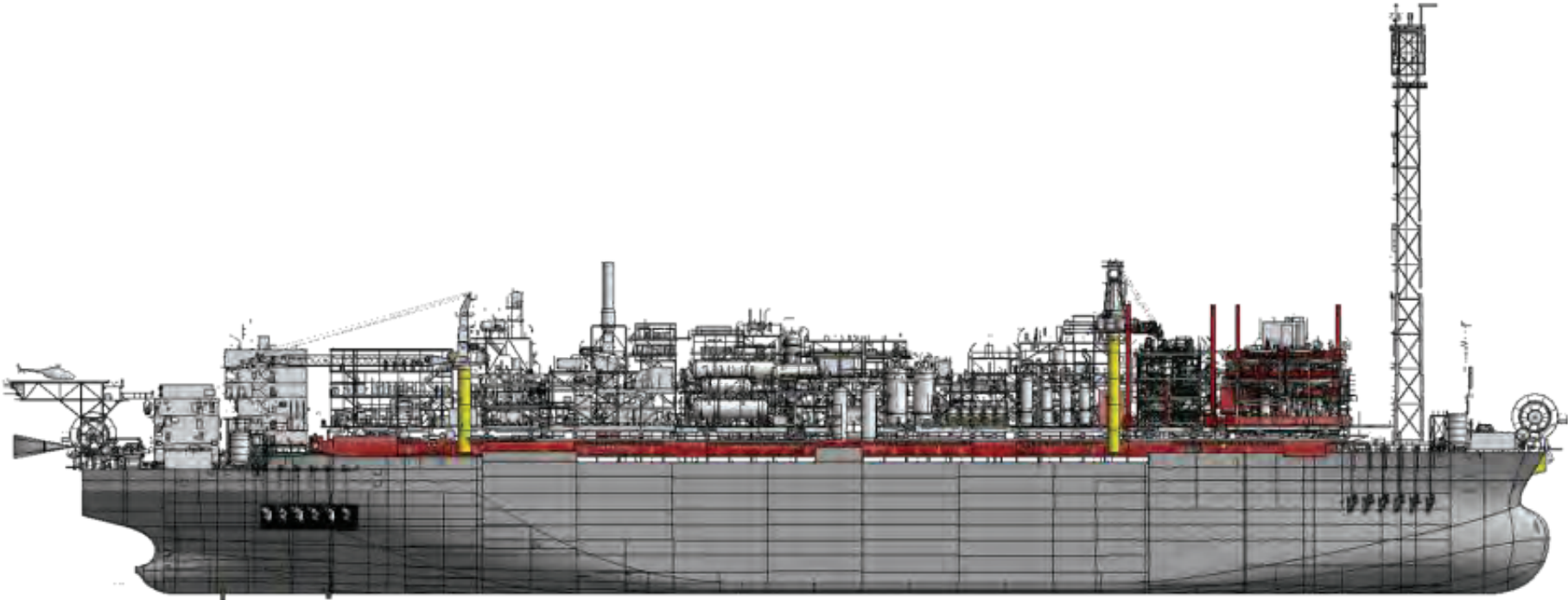
- **Macro program output (Ex. PEMA)**

Required Working time calculation is made for Parts and Assemblies



SHIP BUILDING BLOCKS

Nesting of cut parts for maximised plate utilisation.



Challenge 1

Invalid MTO?
Cannot locate correct materials?
Where in the purchasing system?

Challenge 4

Is the correct craft labor available?

Challenge 5

Am I working on the most recent drawings?
Do I have all of the information necessary to execute?

Challenge 2

What is the correct status of the project?

Challenge 3

Am I using the correct technical standards?



Shipyard – An Assembly Line



CUSTOMER BENEFITS DUE TO SMART PRODUCTION



Smart Production is a *production oriented* data system controlling all aspects of steel production in the ship/offshore/construction yards:

Benefits: Yards have typically a lot of software application, which don't speak with each other. Having one data system, which controls entire steel production in the yard changes the control of the production dramatically and reduces amount of data system in production up to 80%

Smart Production integrates with ship yard's design, material management and project scheduling:

Benefits: NESTIX makes automatic work preparation based on design information for the production, which has proven to reduce 70% of the work preparation time.
Changes in design, scheduling and material (typically 10 – 30% of the parts and assemblies) is one of the biggest problems in the yards. Managing changes reduces material usage and rework costs

In Smart Production "real time" production status always available:

Benefit: According to studies 40% of the production management's time is used to control status of the production. In the yards significant amount of people make work, which does not add value in production by collecting and processing information for the production management
In NESTIX up-to-date status of the production is available for all people without old reports.

Smart Production shortens production's through put time (more product at the same time):

Benefit: Integrated work preparation and production process with LEAN production flow has proven to increase production's throughput even in organized production systems 20-40 %.



Smart Production saves material

Benefits: Control of all production related information (e.g. geometries, assemblies, scheduling, material reservations, stocks and machinery) and efficient part nesting increases stock/remnant material utilization 2-5%

Smart Production reduces man hours in production and increases machine utilization

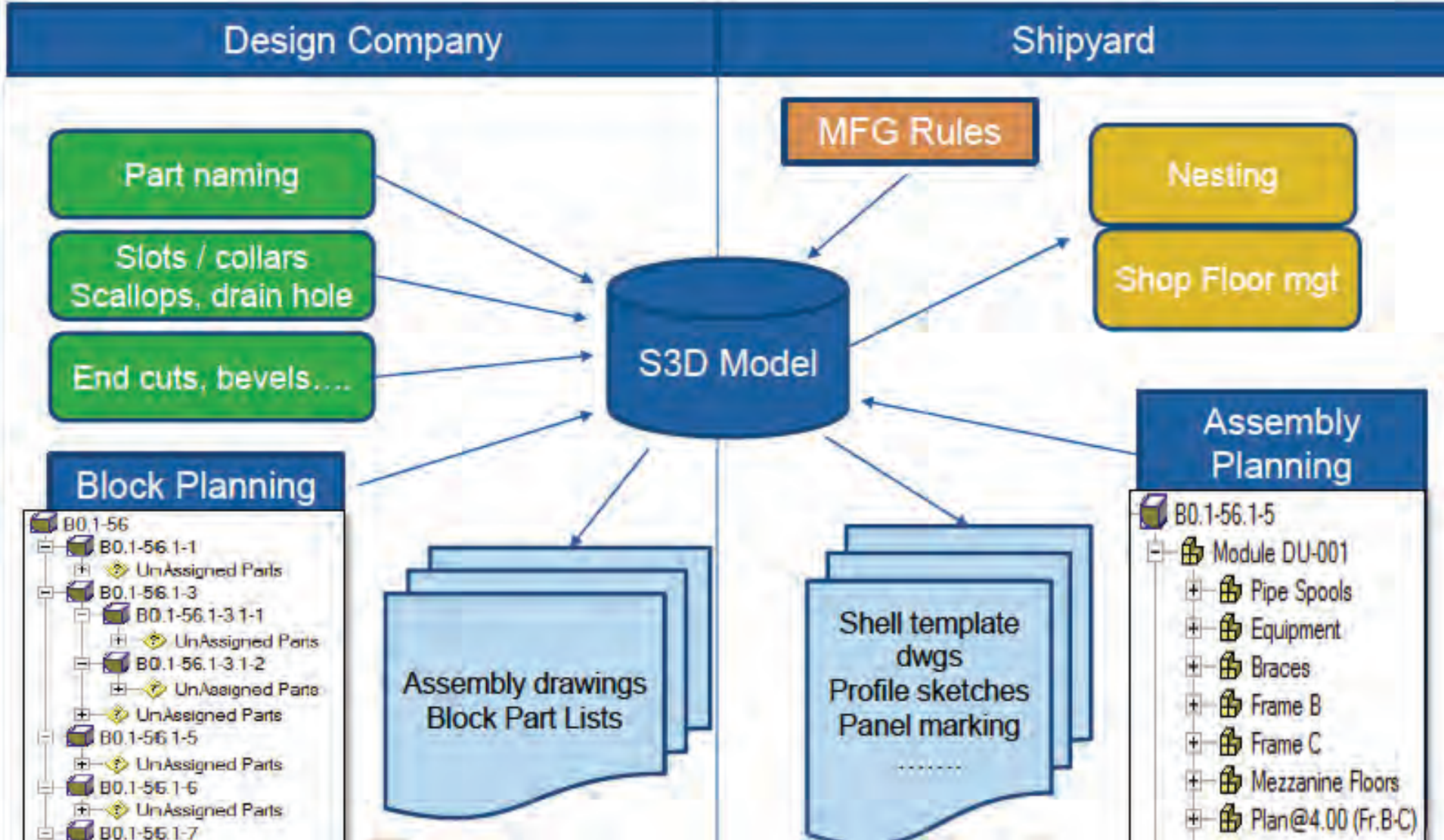
Benefits: Better planning and LEAN production process reduces material in process, which increases machine utilization in production bottle necks according to experience up to **40%**. This reduces at the same time need for man hours in production
Effective NC programs use machine resources better thus improving machine efficiency

Smart Production process improves quality and gives full traceability

Benefits: One process, which start from design results and ends up to production machinery
reduces mistakes in the production process and thus improves quality
NESTIX process follows up e.g. execution of the production work phases of parts and assemblies, production times, material heat numbers and welds thus giving required traceability according to classification requirements



Distributed Workflow – Collaboration Enabled



KOIKE add value to your production



Nesting of cut parts for maximised plate utilisation.

Mechanised MAG welding of parts.

Mechanised Plasma cutting.

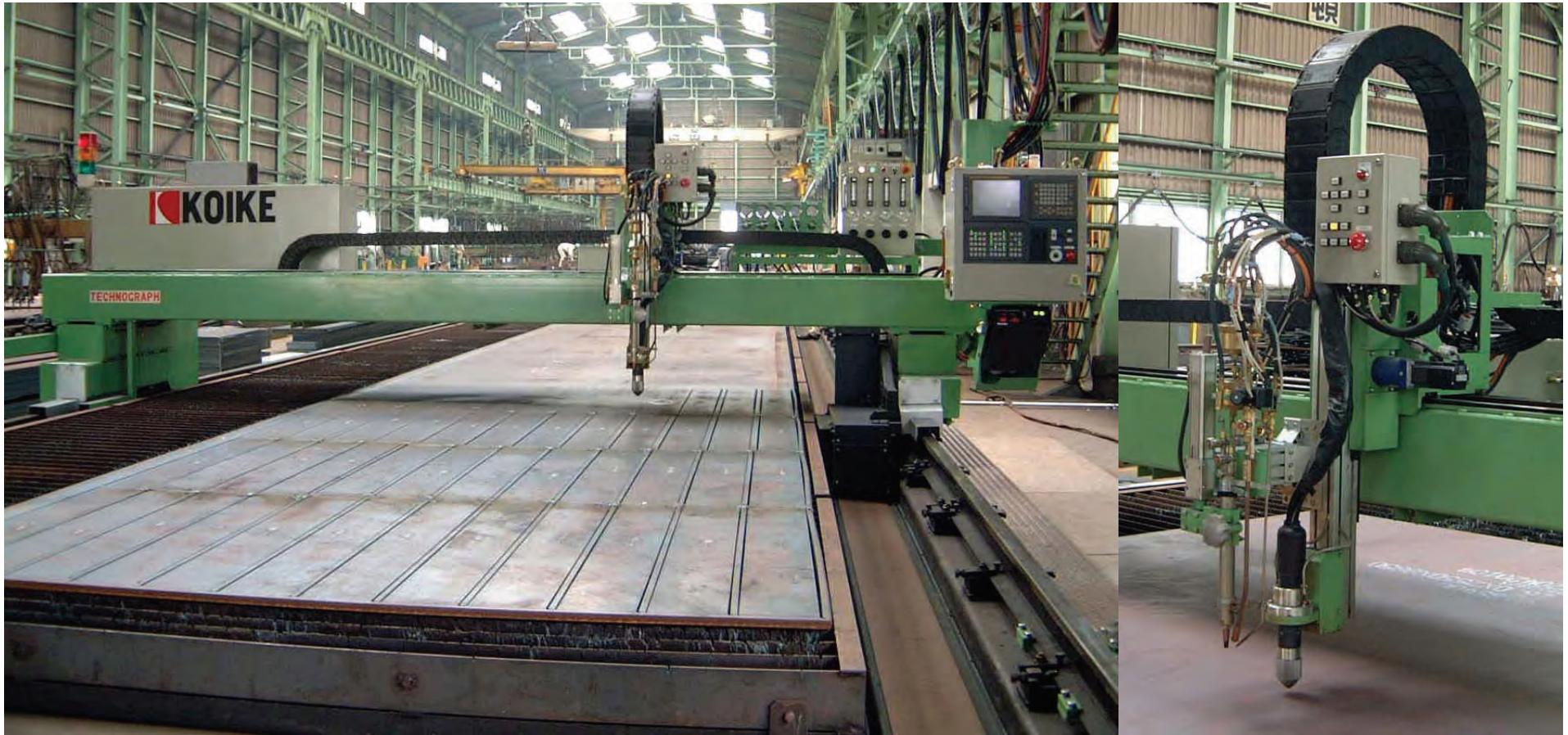
- Maximise plate utilisation.
- Minimise material handling.
- Eliminate rejects / rework.
- Line & Character marking.
- Improve work place safety.
- Excellent cut quality.
- Good weld fit up.
- Reduce weld volume.
- Reduce hand grinding.
- Increase productivity.
- Increase profits.

Mechanised MAG welding.

- Excellent weld quality.
- Good weld fit up.
- Reduce weld volume.
- Minimise heat distortion.
- Higher welding speeds.
- Reduce weld defects /repairs.
- Reduce hand grinding.
- Increase productivity.
- Increase profits.

CNC Plasma cutting system.

Nesting of cut parts for maximised plate utilisation.



KOIKE VERSAGRAPH 4500Z – SUPER 400PLUS PLASMA CUTTING SYSTEM.

Courtesy of Kanto Shearing Co. - Japan.

CNC Plasma cutting system.

Nesting of cut parts for maximised plate utilisation.



Courtesy of Jurong Shipyard – Singapore.

CNC Plasma cutting system.

Nesting of cut parts for maximised plate utilisation.



Plasma cutting process is very fast and minimum heat distortion of the cut parts.

Ship block production. CNC Plasma cutting with 3D bevel head



KOIKE VERSAGRAPH 4500 Z – FS30i – SUPER 400 Plasma.

Courtesy of Pipavav Offshore & Marine @ Gujarat - India

Ship block production.
CNC Plasma & Gas Cutting + Line marking.



KOIKE MAXIGRAPH 4500 DD – D500 – MAX 200 Plasma & Gas cutting system.
Courtesy of Ananda Shipyards – Bangladesh.

Ship block production. CNC Plasma cutting with 3D bevel head



KOIKE VERSAGRAPH 4500 DXI – FS30i – SUPER 400 Plasma.

Mechanised Plasma cutting.

- Maximise plate utilisation.
- Minimise material handling.
- Eliminate rejects / rework.
- Line & Character marking.
- Improve work place safety.
- Excellent cut quality.
- Good weld fit up.
- Reduce weld volume.
- Reduce hand grinding.
- Increase productivity.
- Increase profits.

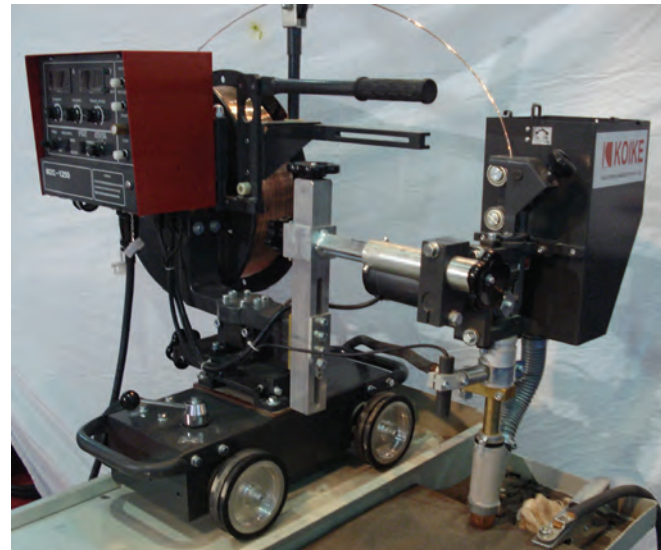


Courtesy of Sembcorp Marine – Singapore / Sembmarine Kakinada – A.P.- India.

Ship Panel production.



Sub-arc welding of large steel panel - Shipbuilding industry



Sub-arc welding of large steel panel @ Shipyard.





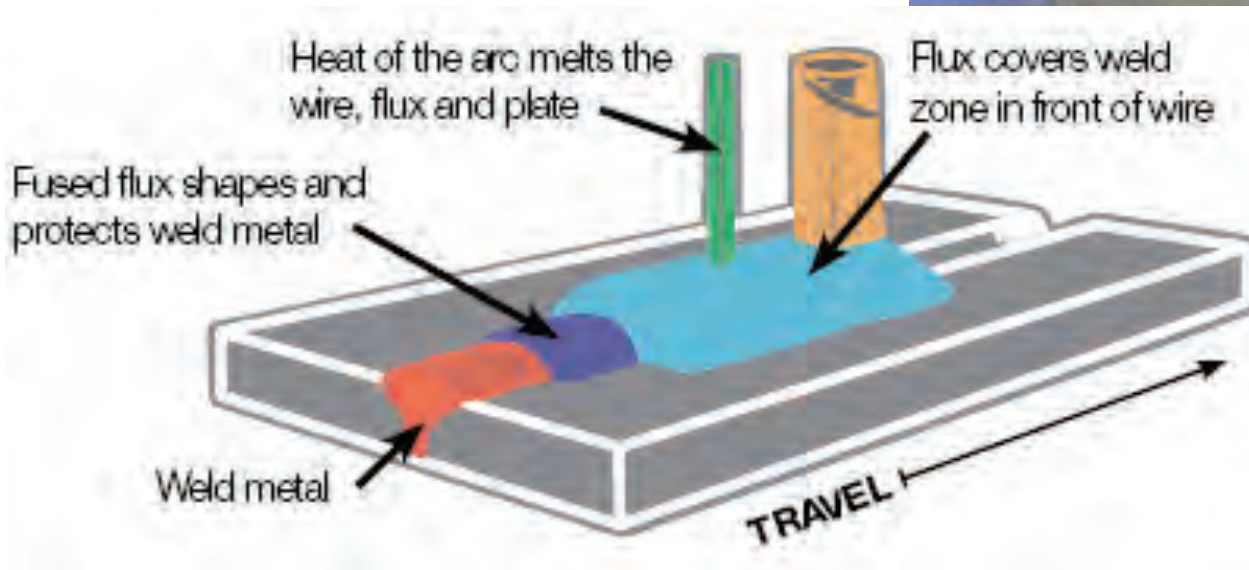
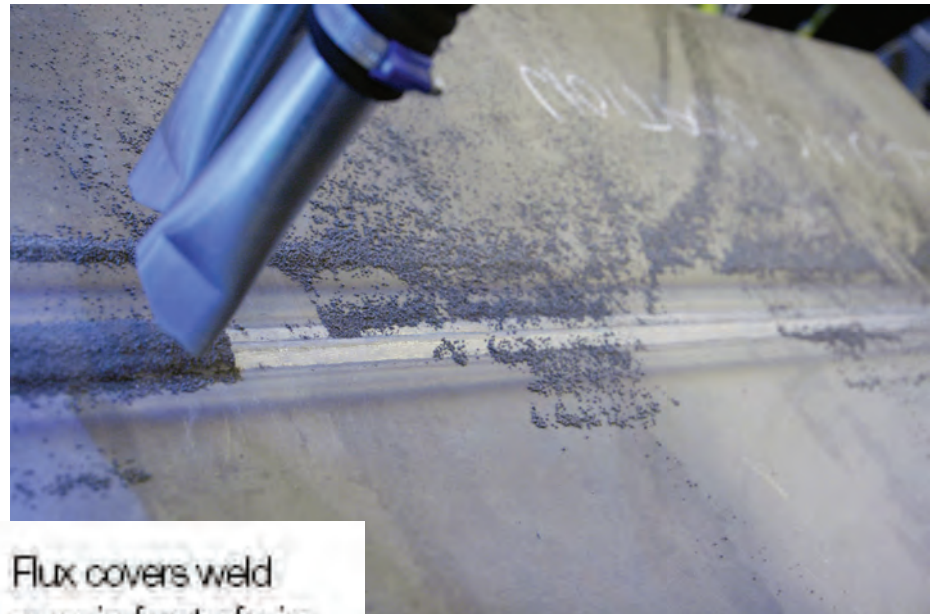
VIDEO OF VERSAGRAPH 4500 WITH SUPER 400PLUS

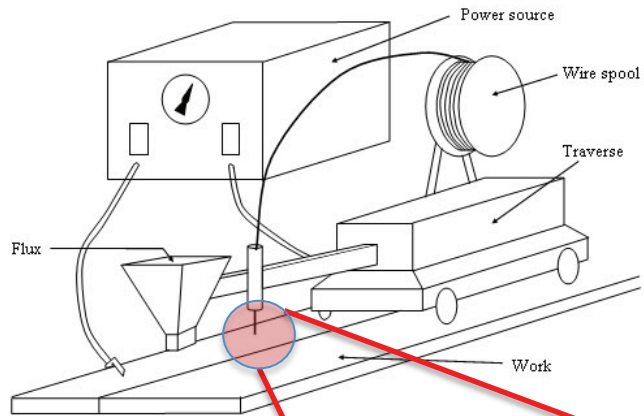


Ship Panel production.

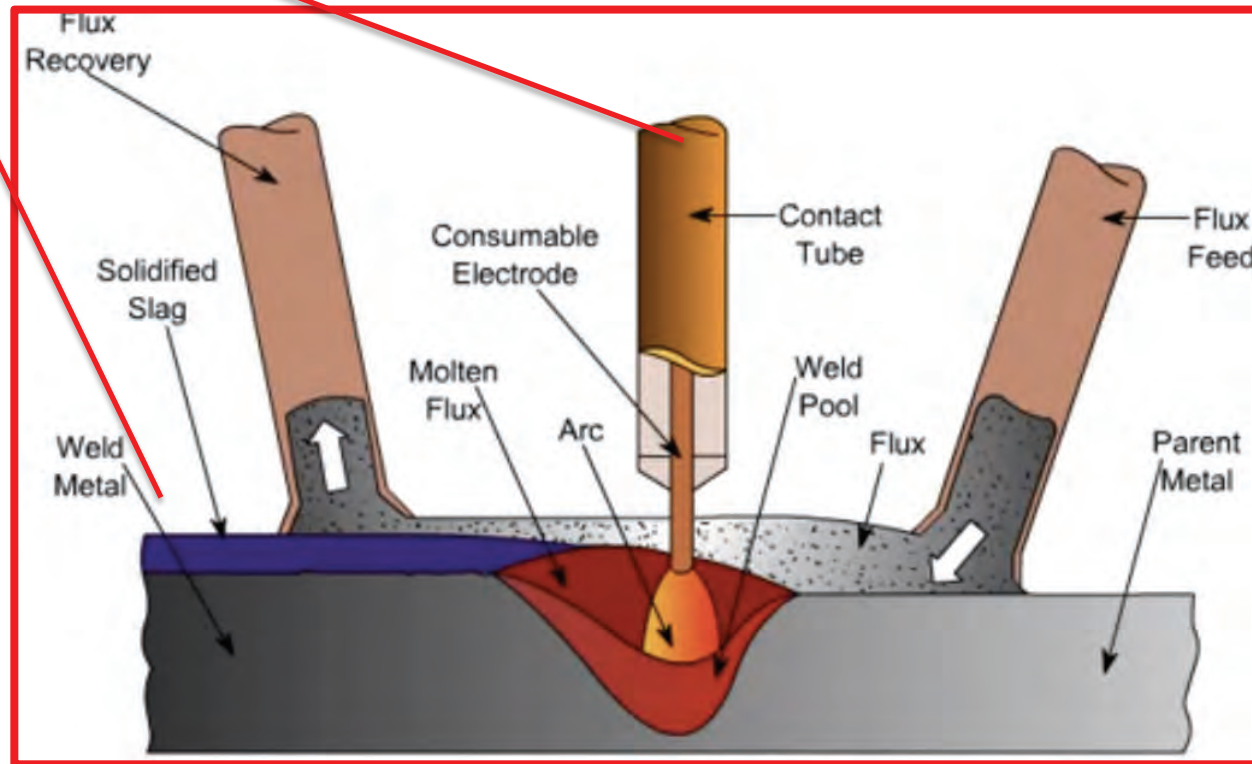


Submerged arc welding (SAW) is a common arc welding process with the highest weld deposition rate.





Submerged arc welding (SAW) is a common arc welding process with the highest weld deposition rate.





VIDEO OF SUBMERGED AR WELDING PROCESS



Ship block production.



Ship block production. Use of MIG/MAG FCAW welding system



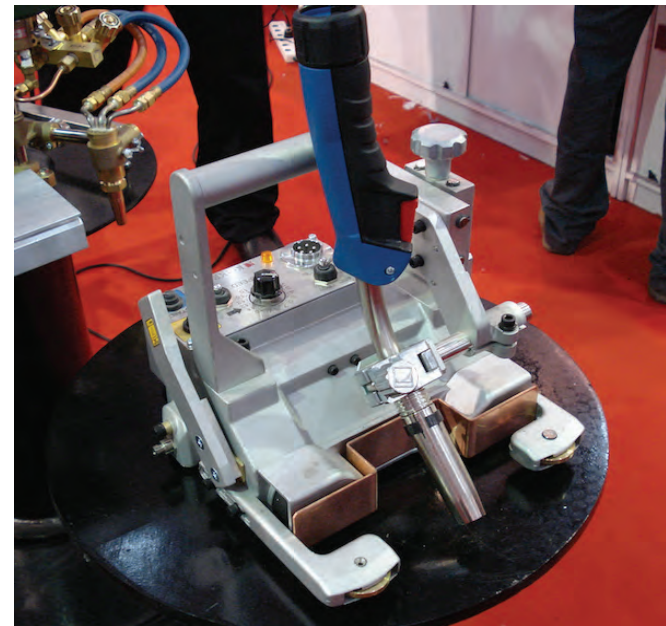
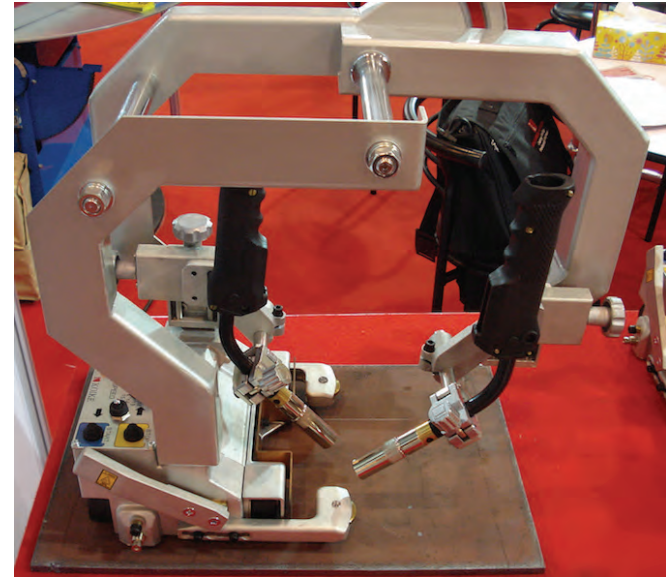
MIG/MAG FCAW welding.

- Good weld quality.
- Reduce heat distortion.
- Reduce weld volume.
- Reduce hand grinding.
- Increase productivity.
- Increase profits.



Ship block production.

Mechanised MIG/MAG welding of fillet and butt welds.
WEL HANDY MULTI STANDARD.



Ship block production.

Gantry welding station for panel stiffener welding.



Courtesy of Sembcorp Marine – Singapore.

Ship block production.

Gantry welding station for panel stiffener welding.



Steel panel is moved by chain conveyors supported by turning rolls.

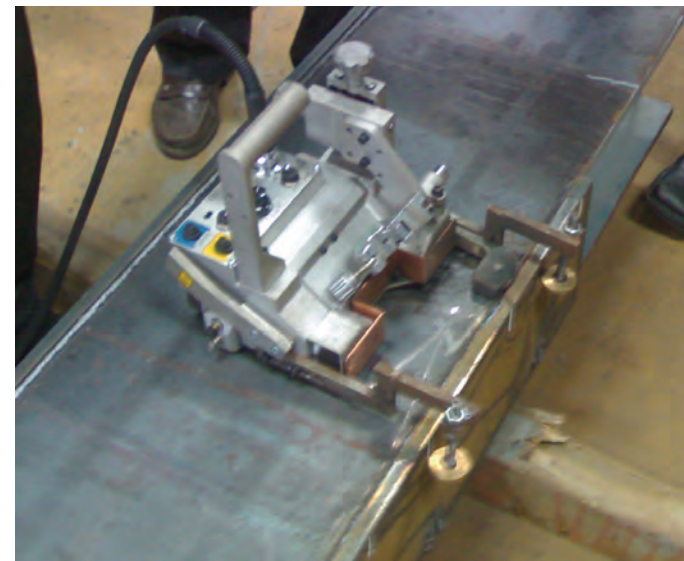


12 sets of MIG/MAG welding machines and Wire feeders and welding carriages.
Operated by only 2 workers.

Courtesy of KEPPEL FELS – Singapore.

Ship block production.

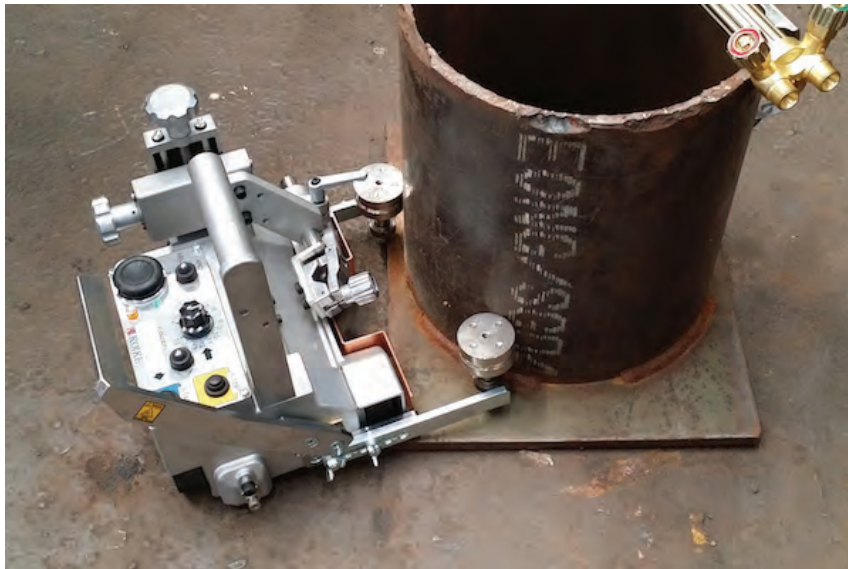
Mechanised MIG/MAG welding of fillet and butt welds.
WEL HANDY MULTI STANDARD.



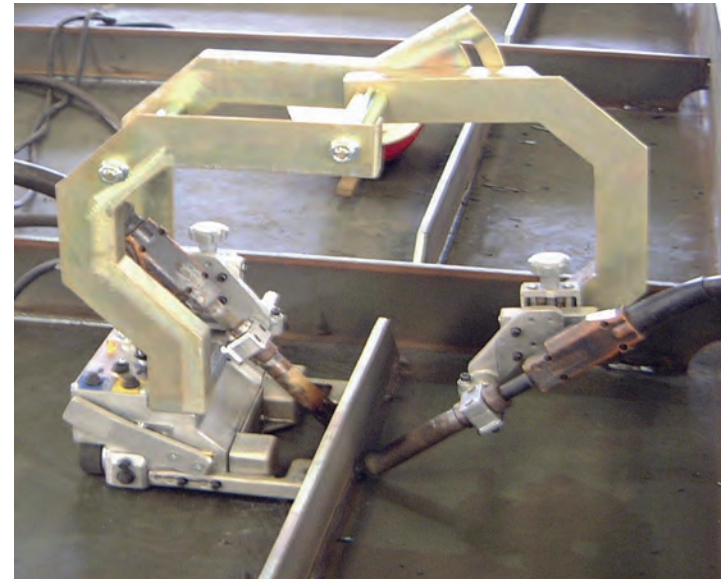
**IK-72 W 2 All position welding carriage
With magnetic rail and weaver device.**



Mechanised MIG/MAG welding of fillet and butt welds.



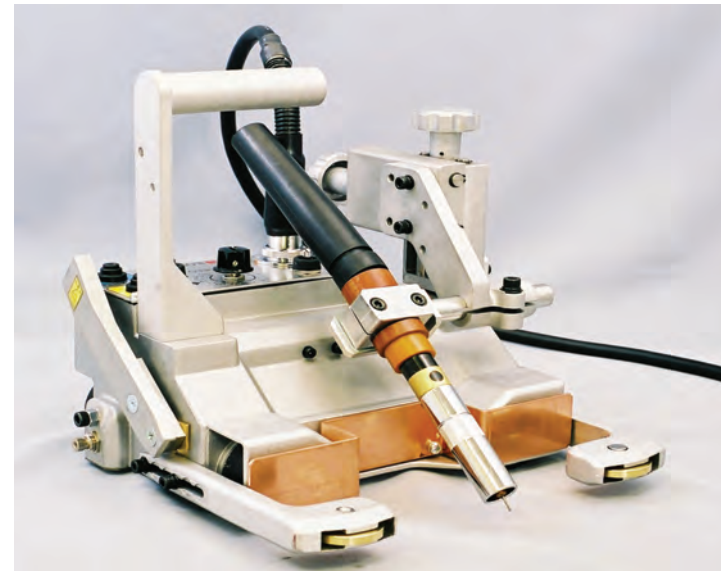
W.H.M. with magnetic guide wheels.



W.H.M. with twin torch attachment.



W.H.M. with standard guide wheels.



W.H.M. with straight welding torch.

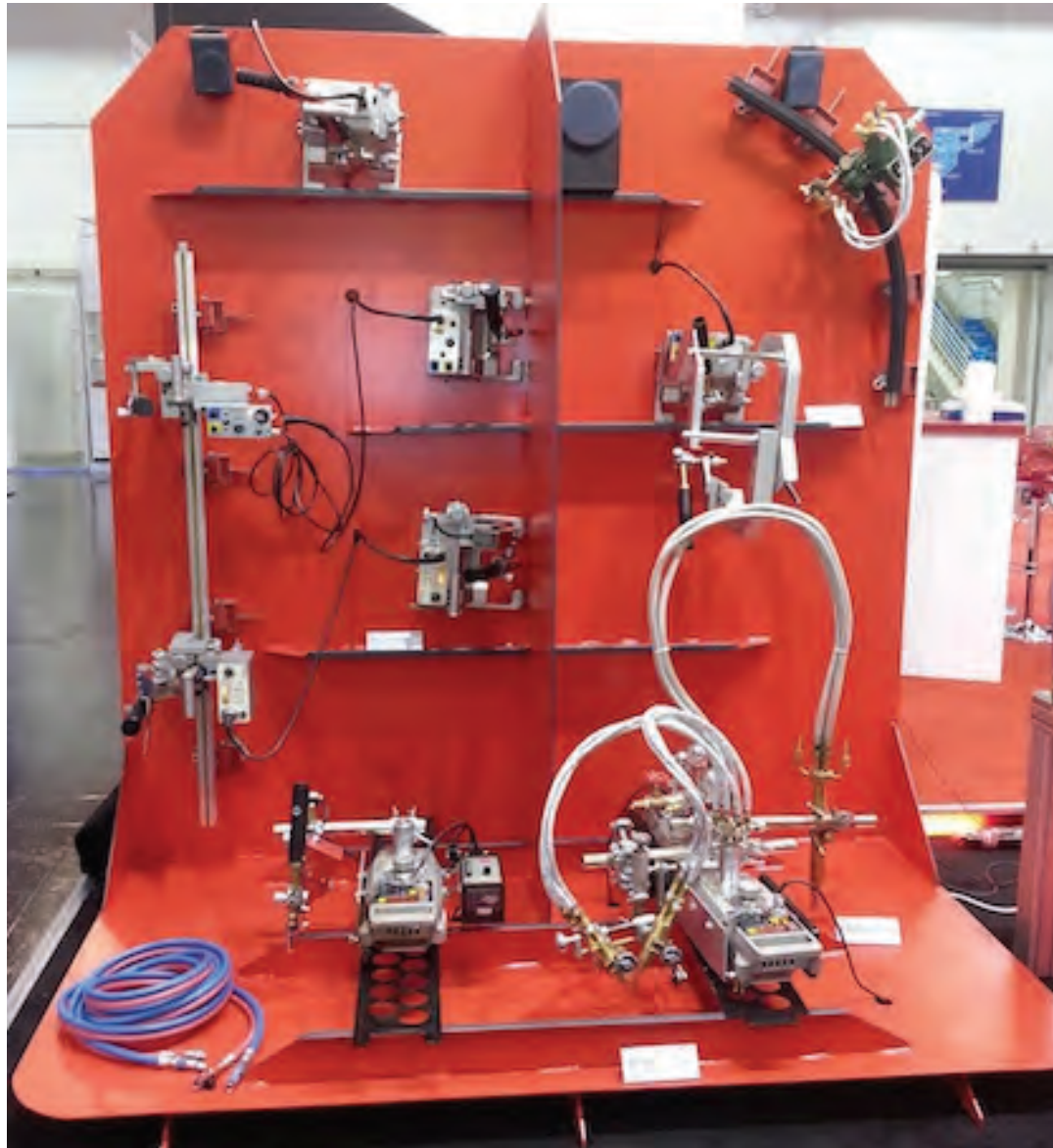
Wel handy Multi Std Strong magnet.
Welding of railway carriage wagons.



Courtesy of Texmaco India – Jamshedpur .

Ship block production.

Application for portable welding machines.



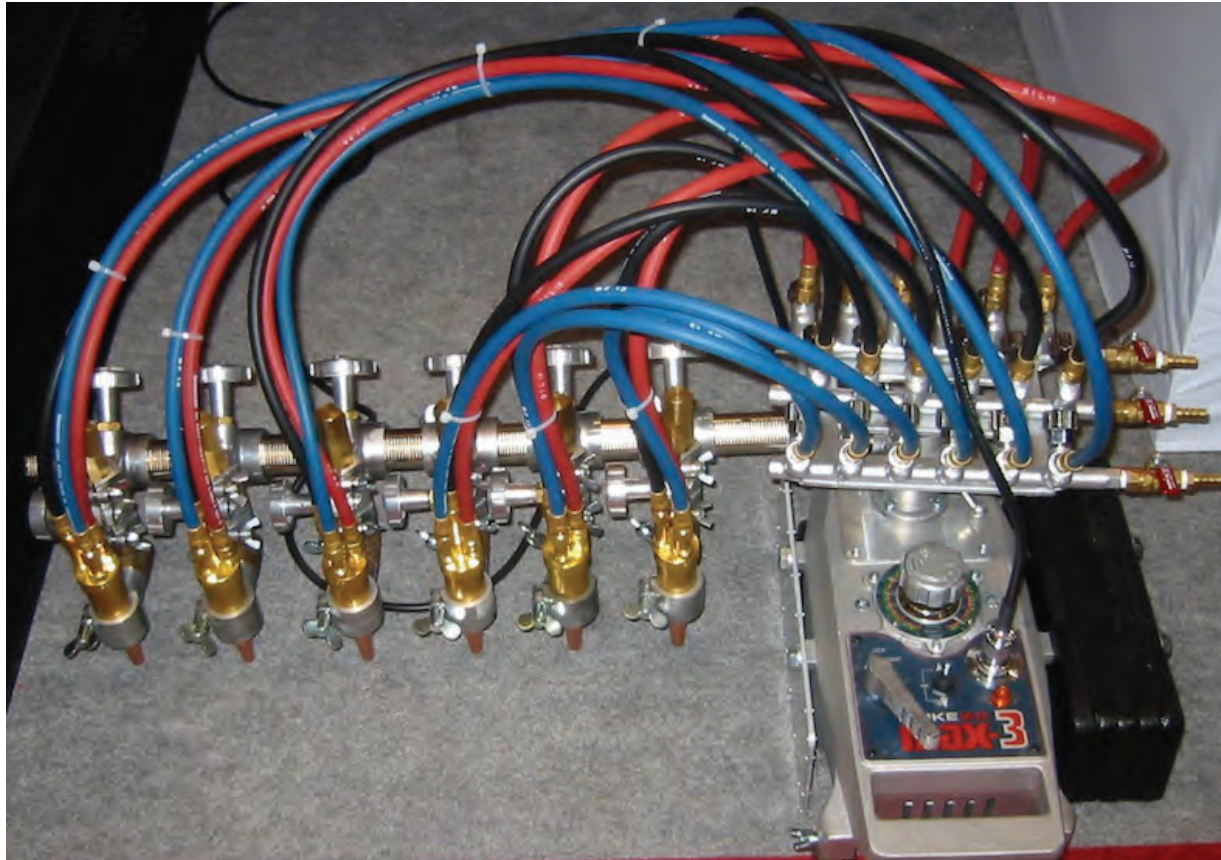
Wide range of models.

- Wel Handy Multi Std.
- Wel Handy Multi Twin
- Wel Handy Multi Tack
- Wel Handy Multi Vert.
- IK-72W 1
- IK-72W 2 Weave
- IK-12 MAX W + Remote
- IK12 MAX 3 W.

Ship block production.

Application for portable cutting machines.

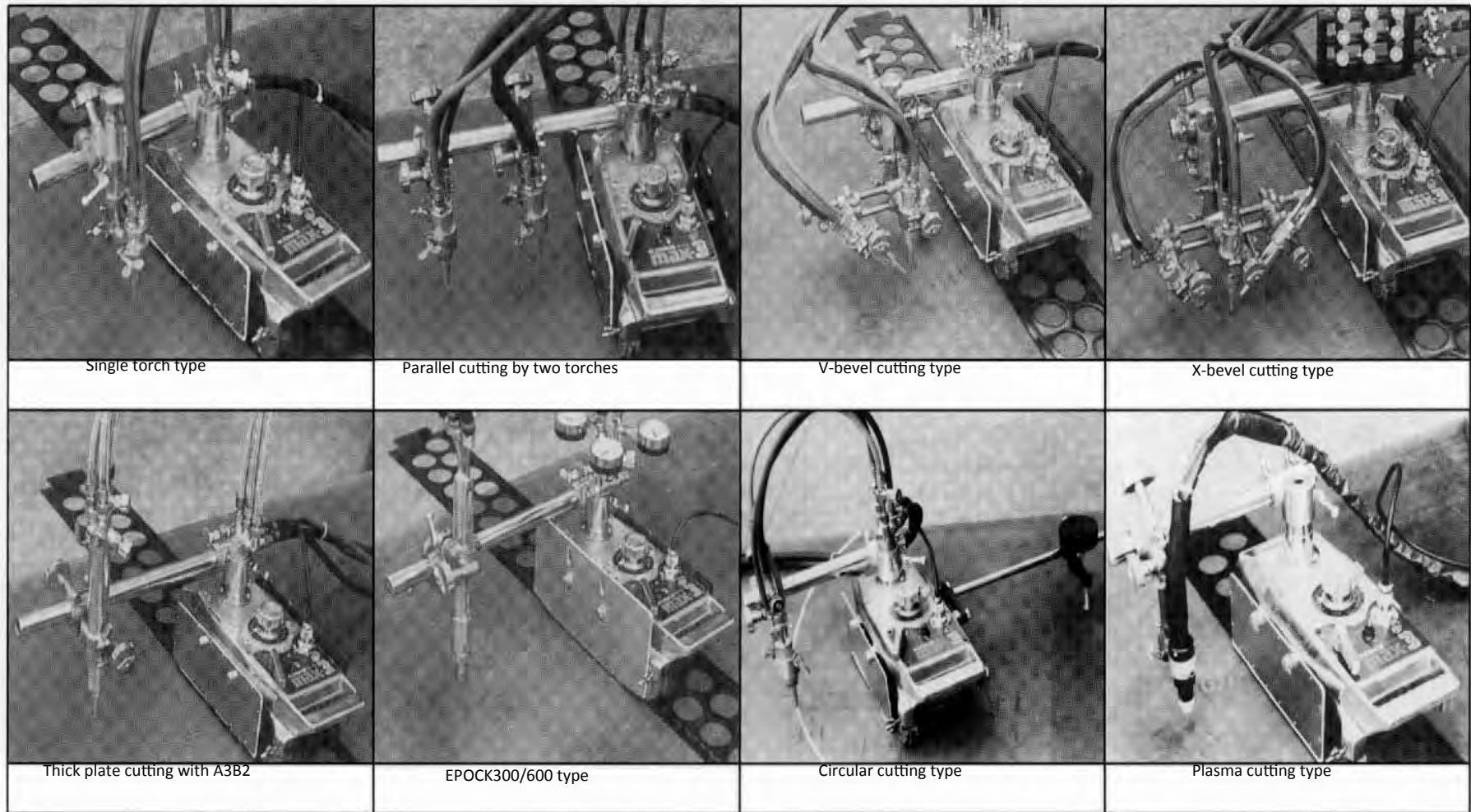
IK12 MAX 3 machine with 6 cutting torches for strip cutting.



Mechanised flame cutting.

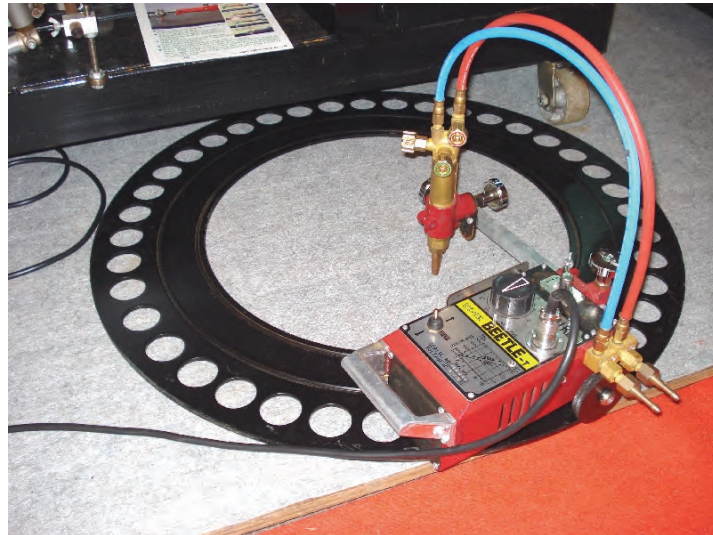
- Good cut quality.
- Good weld fit up.
- Reduce weld volume.
- Reduce hand grinding.
- Increase productivity.
- Increase profits.

IK 12 MAX 3 VARIANTS

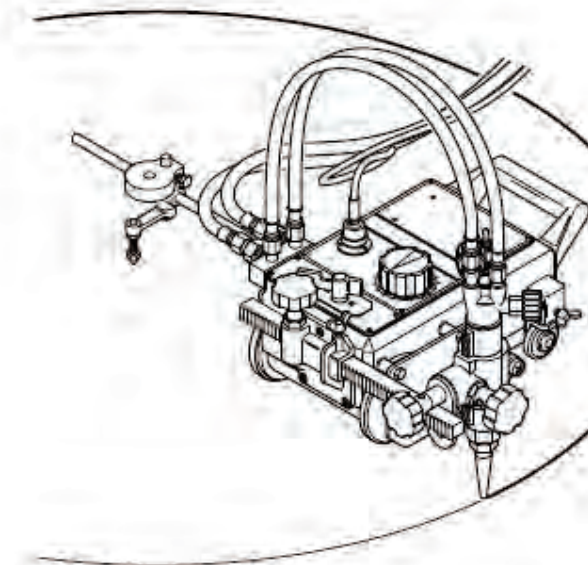


Portable , Versatile and Multi Function

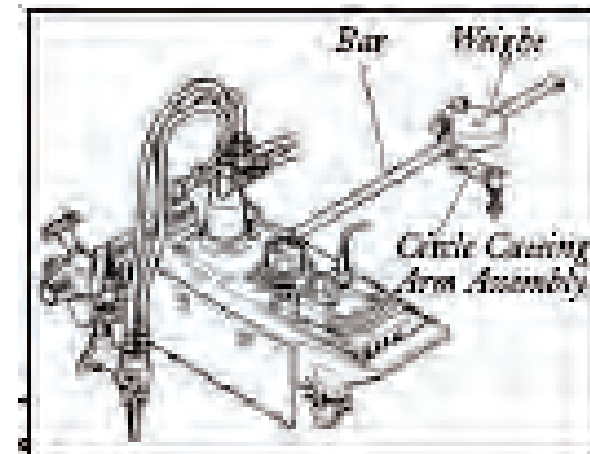
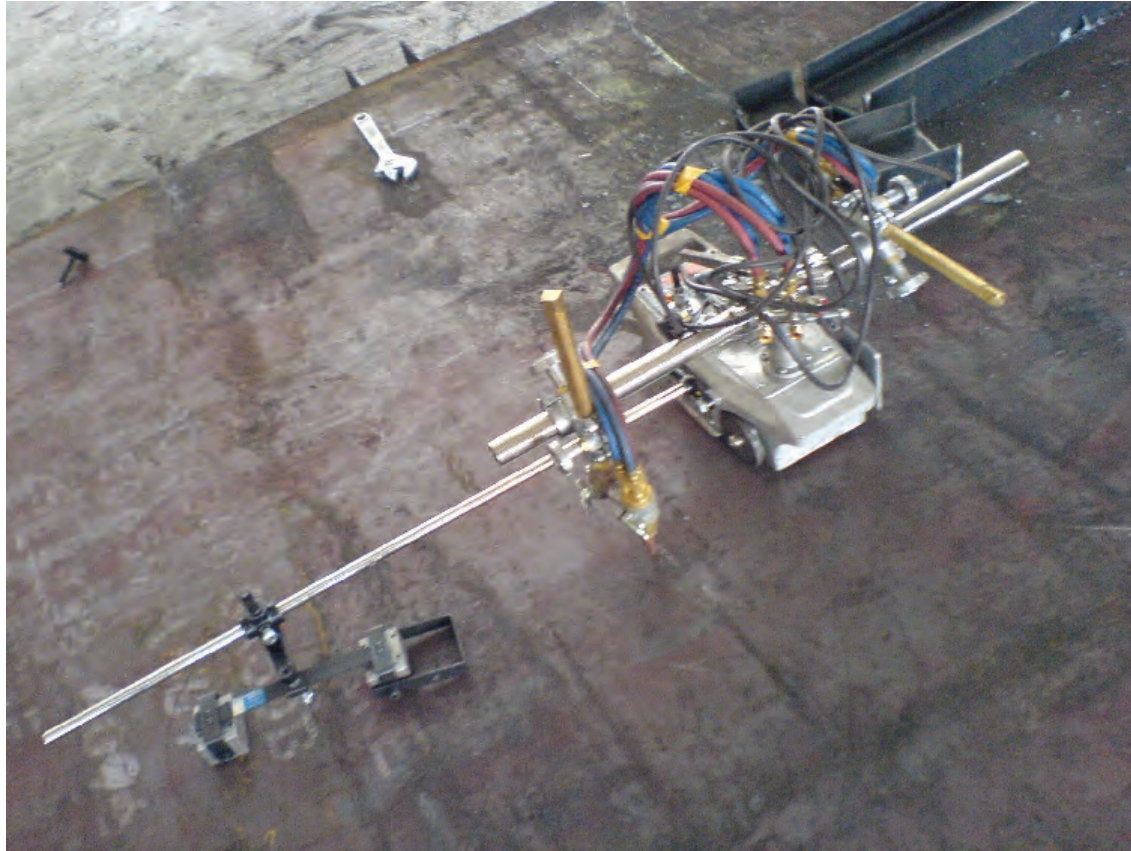
Circle cutting with IK12 Beetle & IK12 MAX 3



Using IK12 Beetle with circle track.
Inside cutting range : 40 - 360 mm
Outside cutting range : 770 -1150 mm

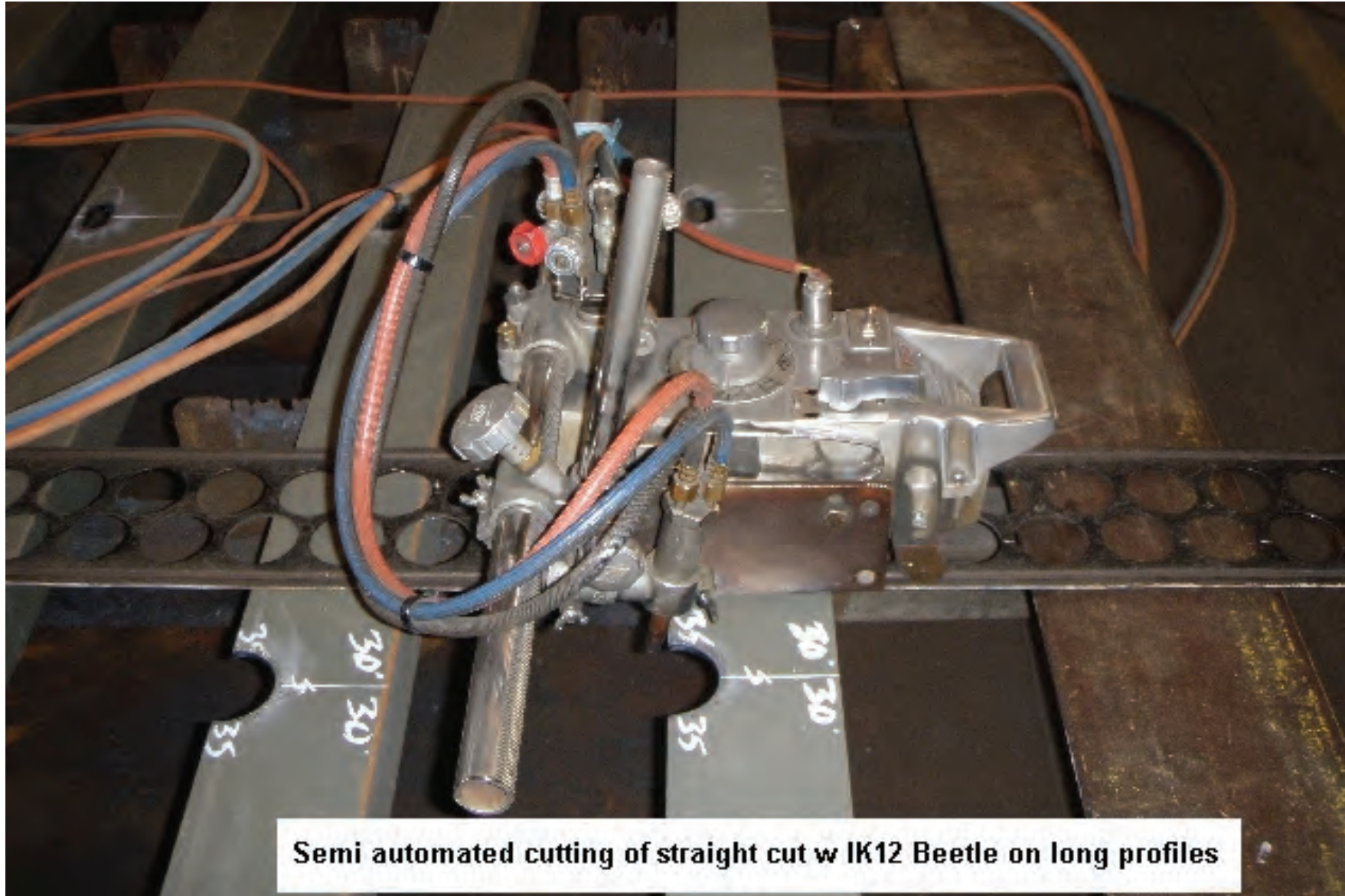


Circle cutting with IK12 MAX 3 & radius rod



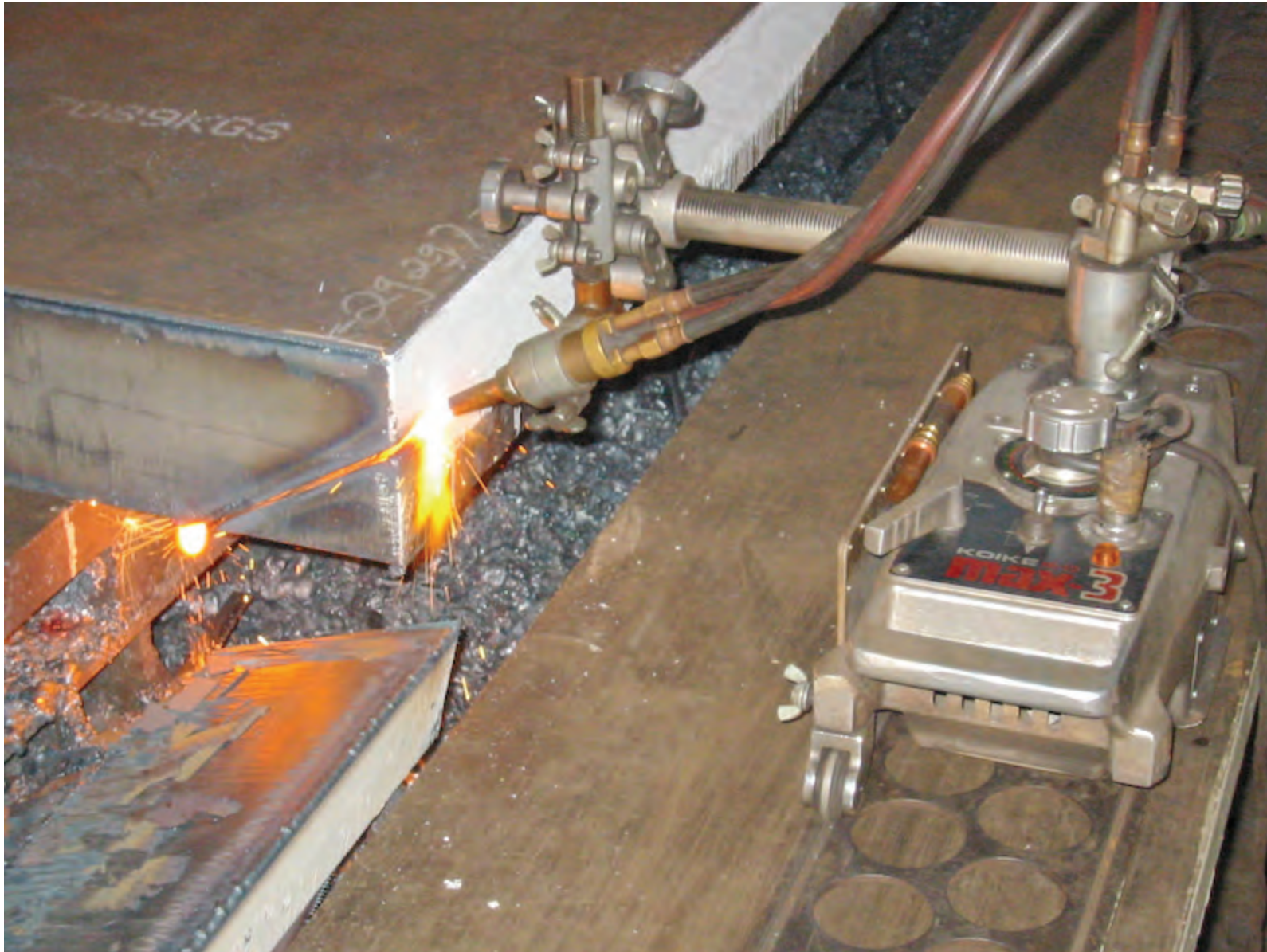
Using IK12 MAX 3 with radius bar & long arm.
Circle cutting range : 40 - 2650 mm.
Additional magnet to hold down centering pointer.

Cutting of long profiles with IK12 Beetle.

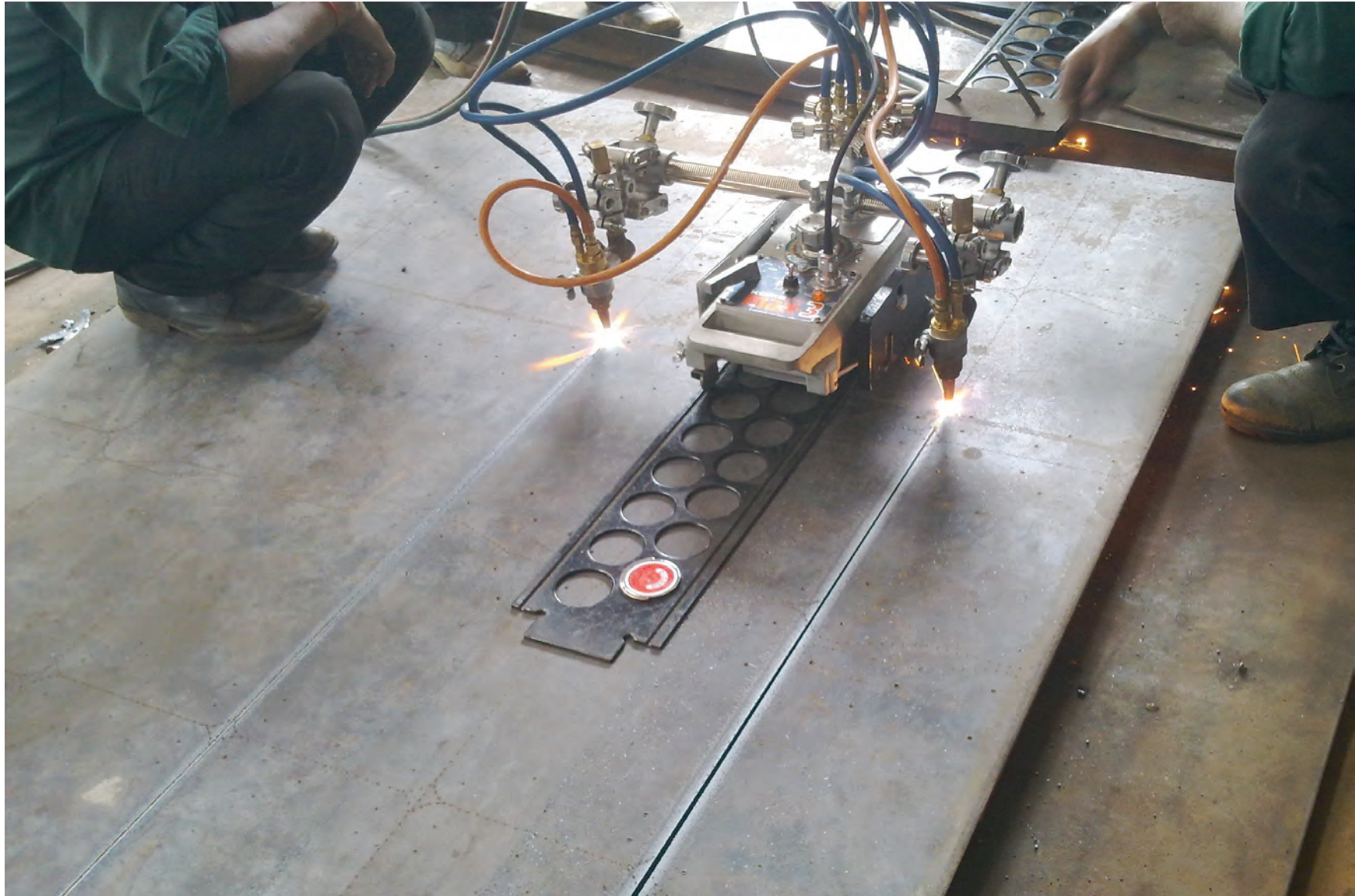


Semi automated cutting of straight cut w IK12 Beetle on long profiles

Thick plate beveling with IK12 MAX3



Straight line cutting with twin torches
IK12MAX 3 with 1.8m rail & Magnet clamp.



Plasma cutting with IK12MAX 3
Require high speed model.

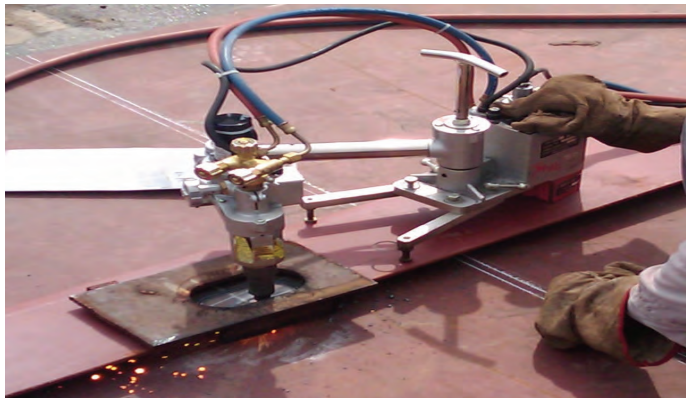


IK-82 M

SHAPE PROFILER FOR LONGITUDINAL PROFILES



Steel profiles and stiffeners requires lots of slot cutting and scallop / chamfering.
The IK-82M Shape cutting machine uses a magnetic template follower to trace any profile.

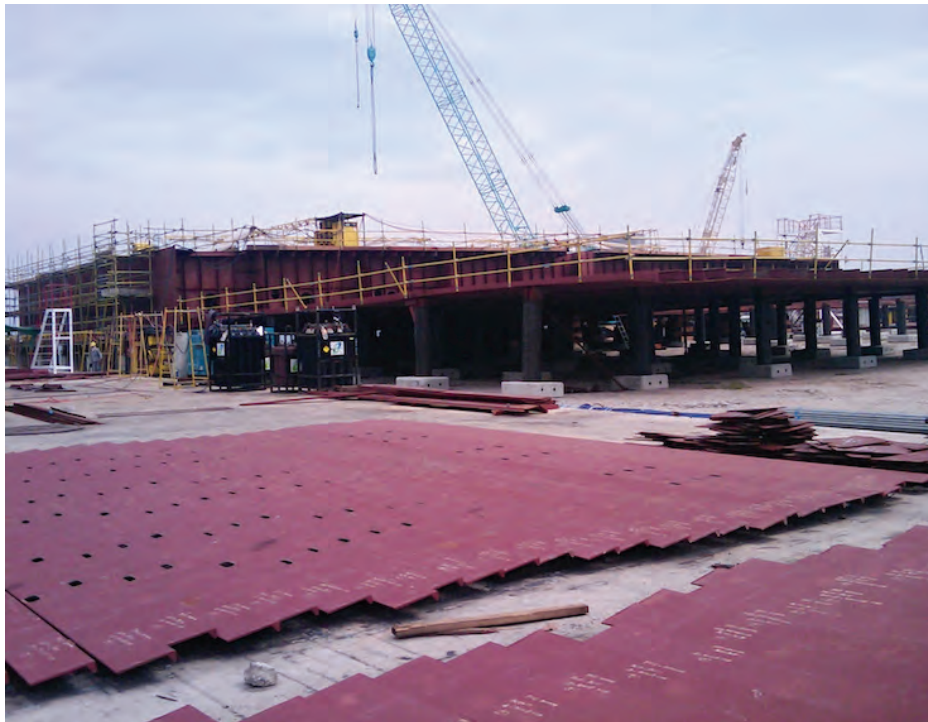


Courtesy of Pacific Richfield Shipyard – Singapore.

IK-82 M Shape cutting of long profiles.



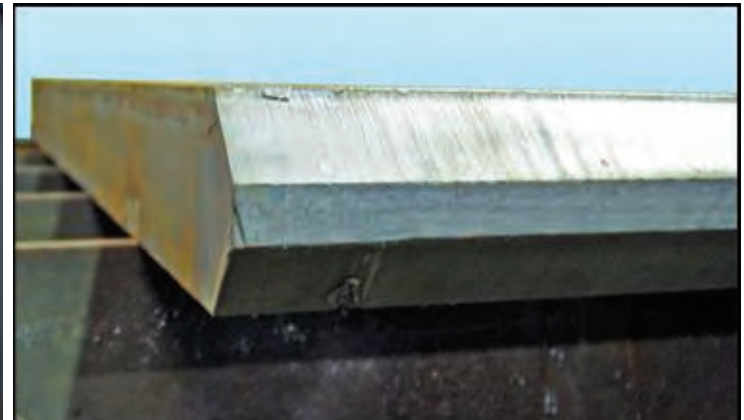
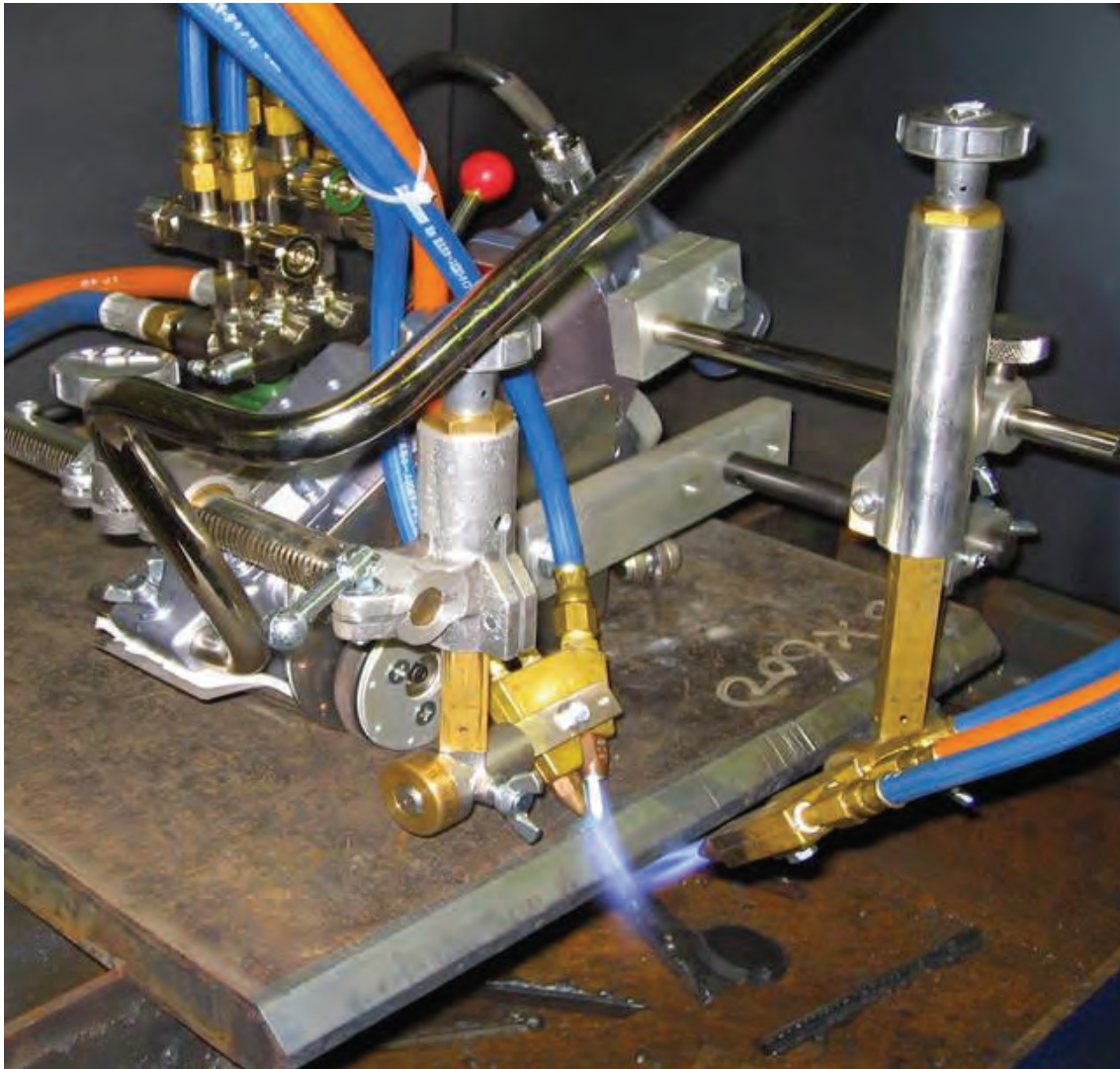
Thousands of profiles can be easily profiled with the IK-82M Shape profiler.
Just lay them out on a work jig and profile them with the IK-82M and IK-12 Beetle



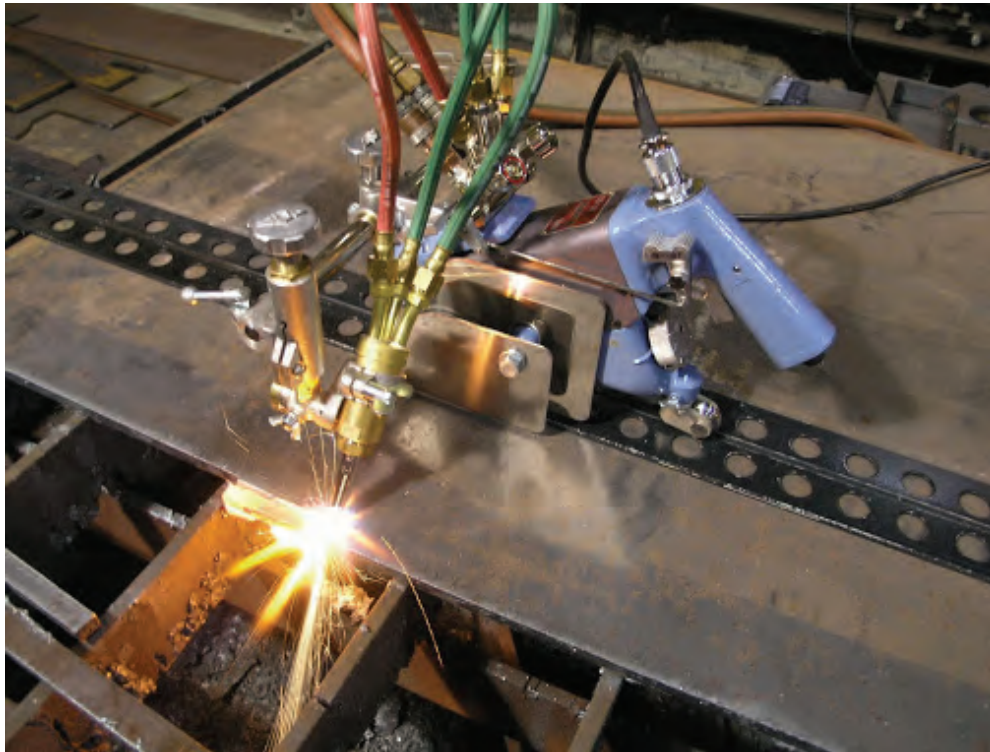
Courtesy of Pacific Richfield Shipyard / Keppel FELS – Singapore.

Ship block production.

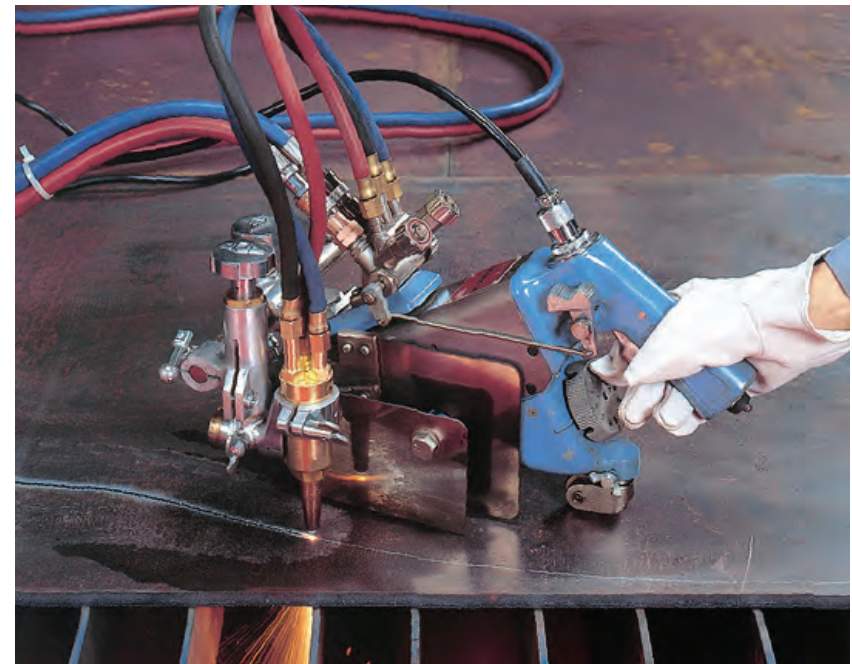
IK 93 EDGE CUT portable cutting & beveling machines.



IK-93 HAWK manual profiler.



straight line rail cuts or manual profiling



AUTO PICLE II and S Pipe cutting.

Electric driven with chain and guide rails D600 to D1500.



AUTO PICLE II and S Pipe cutting.

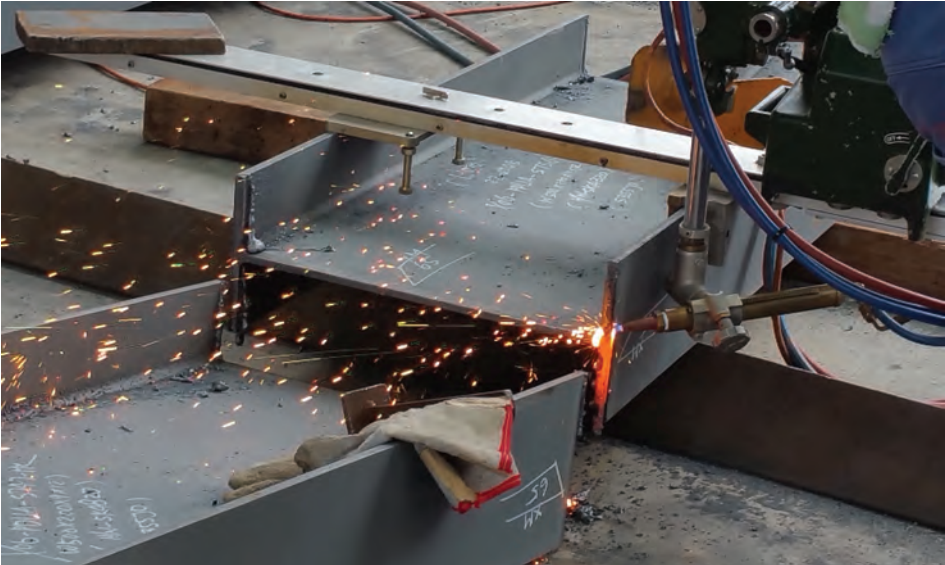
Electric driven with chain and guide rails D600 to D1500.



VIDEO OF PICLE PIPE CUTTING PROCESS



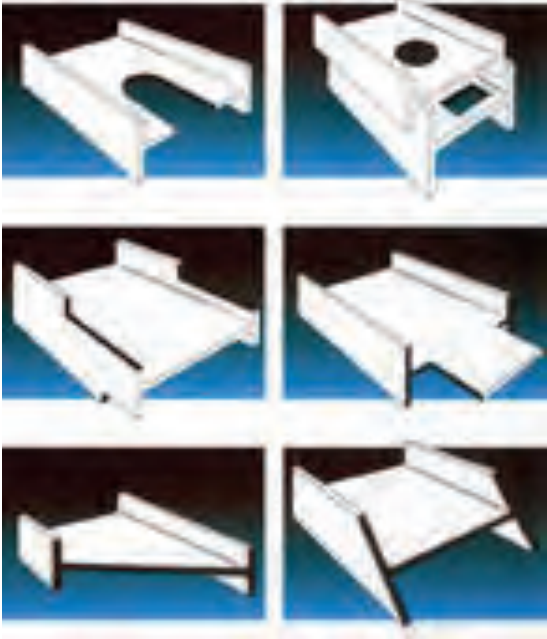
Mini Mantis II H Beam profiling machine for cutting Web and Flange.
Reduces post grinding process and provide good weld fitup.



Mini Mantis II H Beam profiling machine for cutting Web and Flange



Mini Mantis II H Beam profiling machine for cutting Web and Flange.
Mechanised cutting ensures quality cut and good weld fitup.



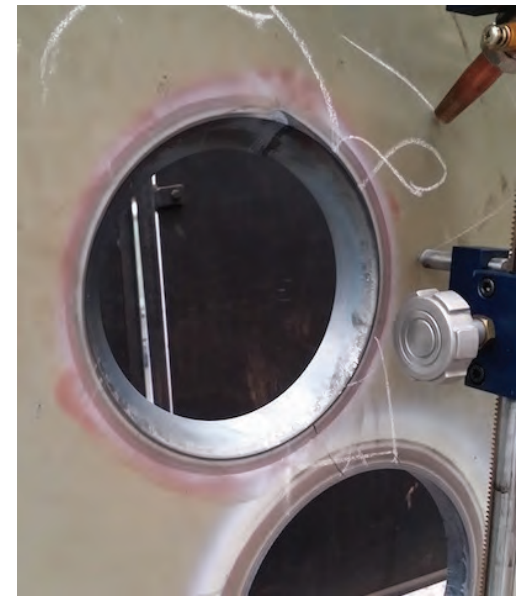
Cir-cut I & II machine for cutting small holes.
Mechanised cutting ensures quality cut and good weld fitup.



Simple to operate for cutting circles and bevelling, on flat or vertical surfaces, and any angle in between.

CIR-CUT
Portable automatic gas small circle cutting machine

CATALOGUE No. 80129



KOIKE KHC-600D Pipe hole cutter
Mechanised cutting ensures quality cut and good weld fitup.

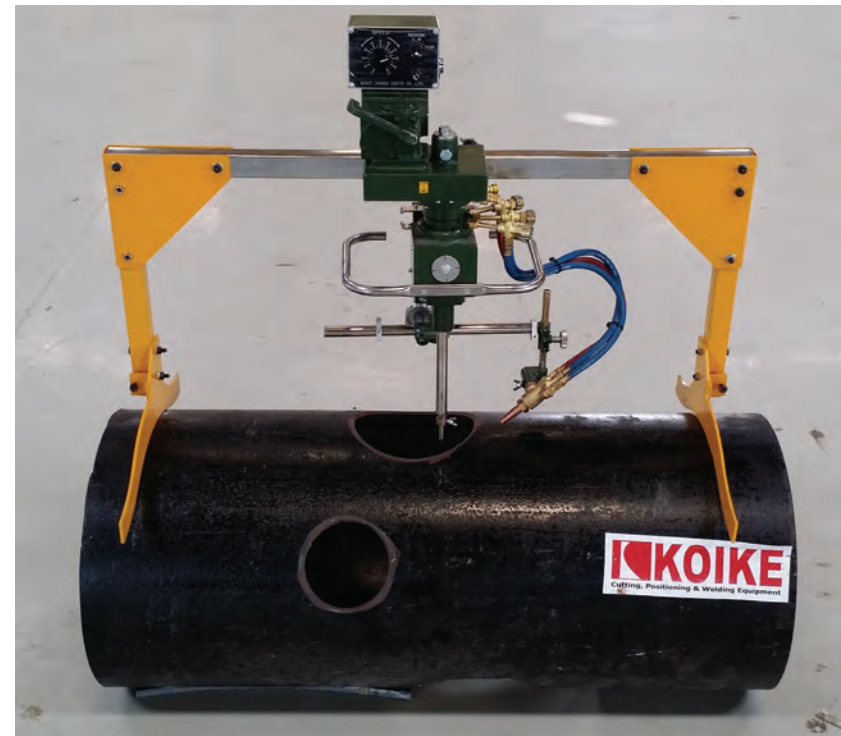


KHC 600D pipe hole cutter is excellent for nozzle hole cutting on large vessels.

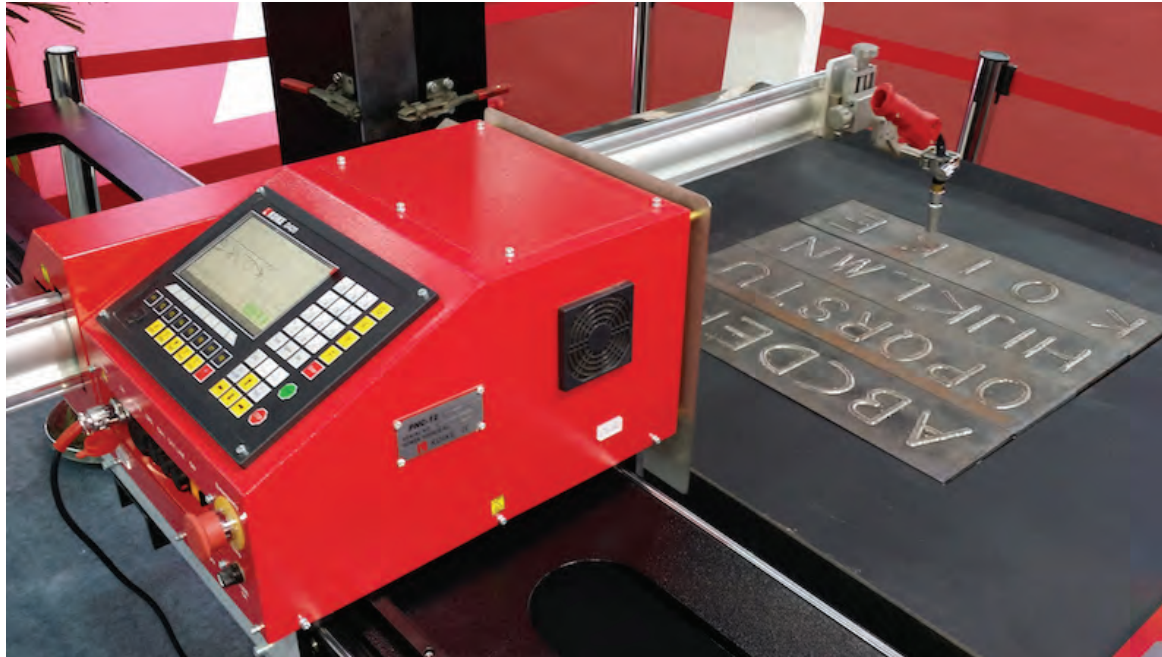
KOIKE KHC-600D Pipe hole cutter
Mechanised cutting ensures quality cut and good weld fitup.



KHC 600D pipe hole cutter is excellent for nozzle hole cutting on large vessels.



CNC Character welding machine



Applications such as I.D. marking on hatch covers, Man hole covers, equipment marking.

KOIKE PNC 12 EXTREME WELD.

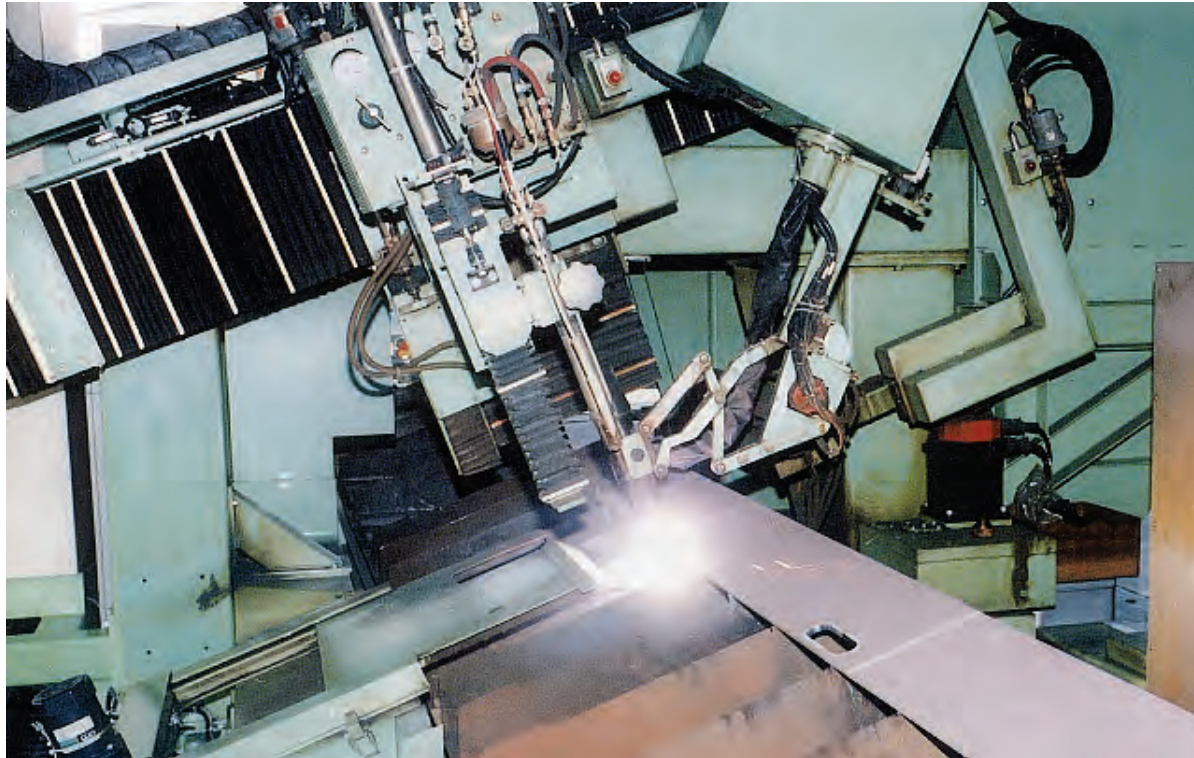


CNC Character marking & plasma cutting.



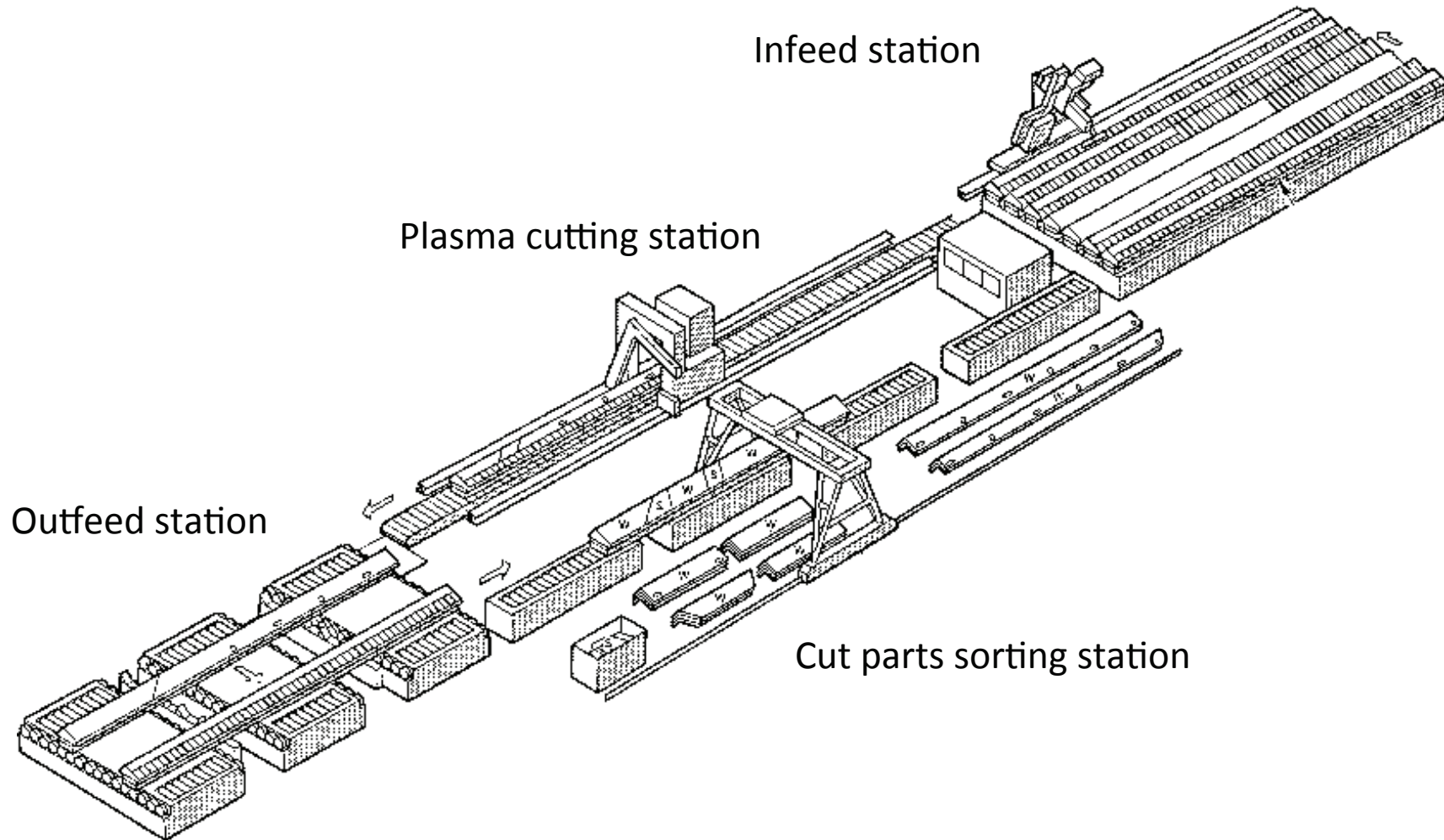
KOIKE PNC 12 WELD & CUT – Rail track can be extended for longitudinal profile cutting.

CNC PROFILE CUTTING MACHINE. ABGRAPH 1500.

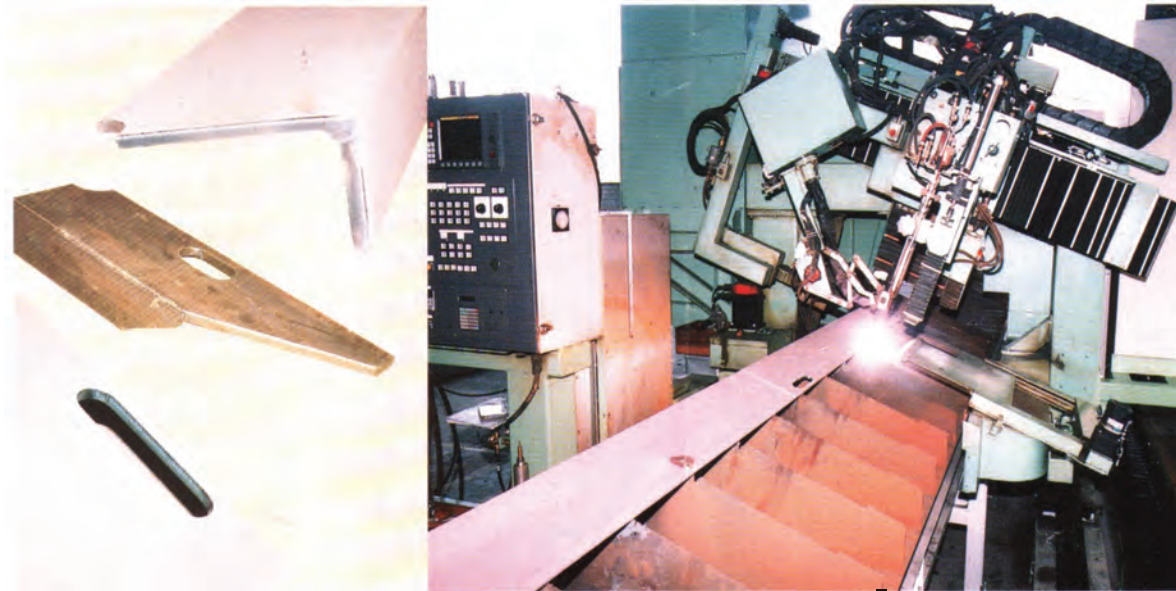


Line and character marking .
Plasma cutting of slots, scallops,
Chamfers, and many profiles.

CNC PROFILE CUTTING MACHINE. ABGRAPH 1500 general layout plan.



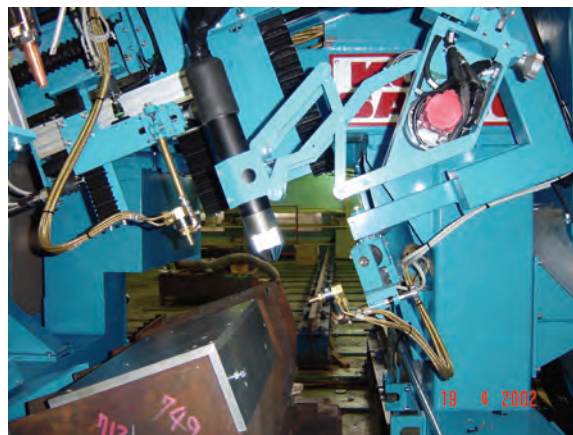
ABGRAPH can be integrated with an Infeed and Outfeed conveyor for max. efficiency.



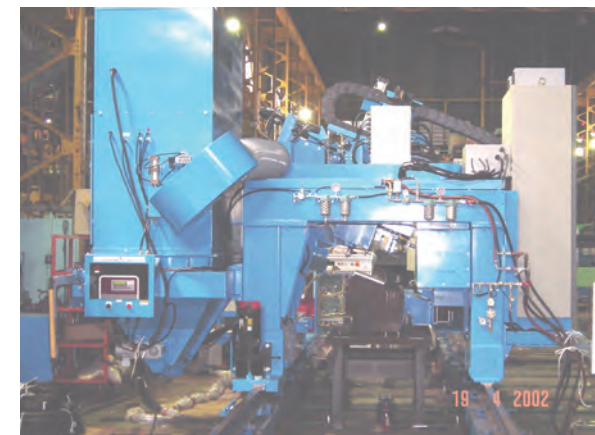
ABGRAPH Angle Bar Cutting System
 Rail Span : 1,700 mm
 Machine Length : 5,600 mm
 Machine Width : 3,800 mm
 Cutting Speed : 6,000 mm/min
 Marking Speed : 12,000 mm/min
 Rapid Travel : 36,000 mm/min
 Precision Oxygen Plasma Cutting system
 Powder Marking for Line.
 Dot Marking for Labeling.
 Integrated Fume Collection.
 ABPRO system accepts TRIBON files.
 FANUC Industrial CNC Control System



FANUC FS30i- 5 Axis CNC Control
 AB-PRO Programming System
 Integrated Fume Collection

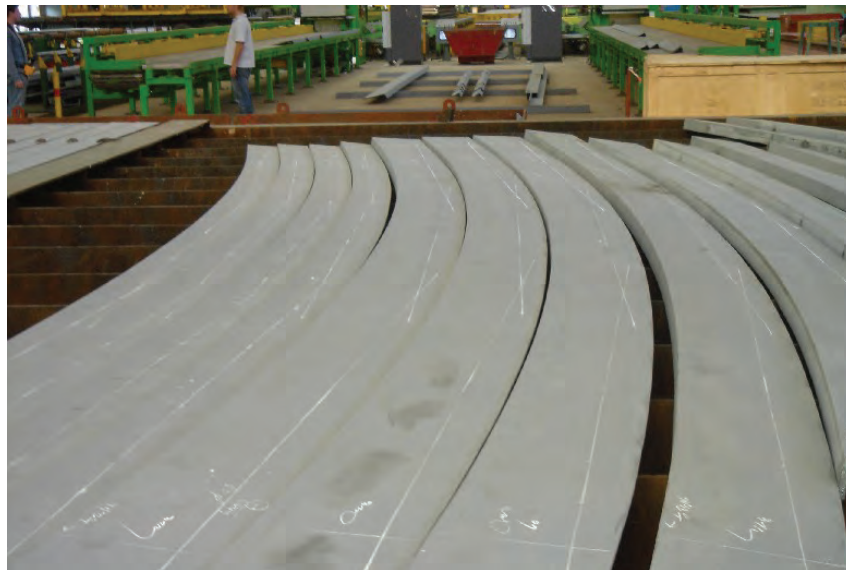


2-D Link SUPER 400 Plasma Cutting
 Air Sensor for work piece detection.
 Powder Marking and Labeling



Precision Longitudinal Rails
 Operates like a Plate Cutting Machine
 Easy to operate and maintain.

ABGRAPH 1500 Profile cutting system.



Bend lines powder marking.

Courtesy of Hanjin Shipyards Philippines, Subic Bay.

ABGRAPH 1500 Profile cutting system.



Effective cutting width 1.5m , Track length 43m, 2D Link + Super 400 Plus

ABGRAPH 1500 Profile cutting system.



Effective cutting width 1.5m , Track length 43m, 2D Link + Super 400 Plus

ABGRAPH 1500 Profile cutting system.



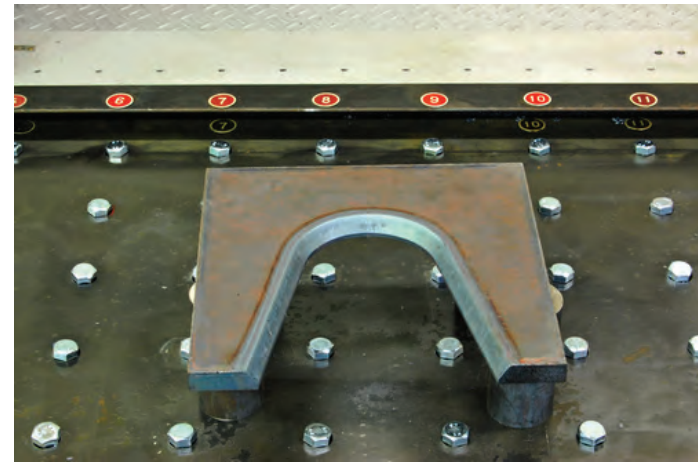
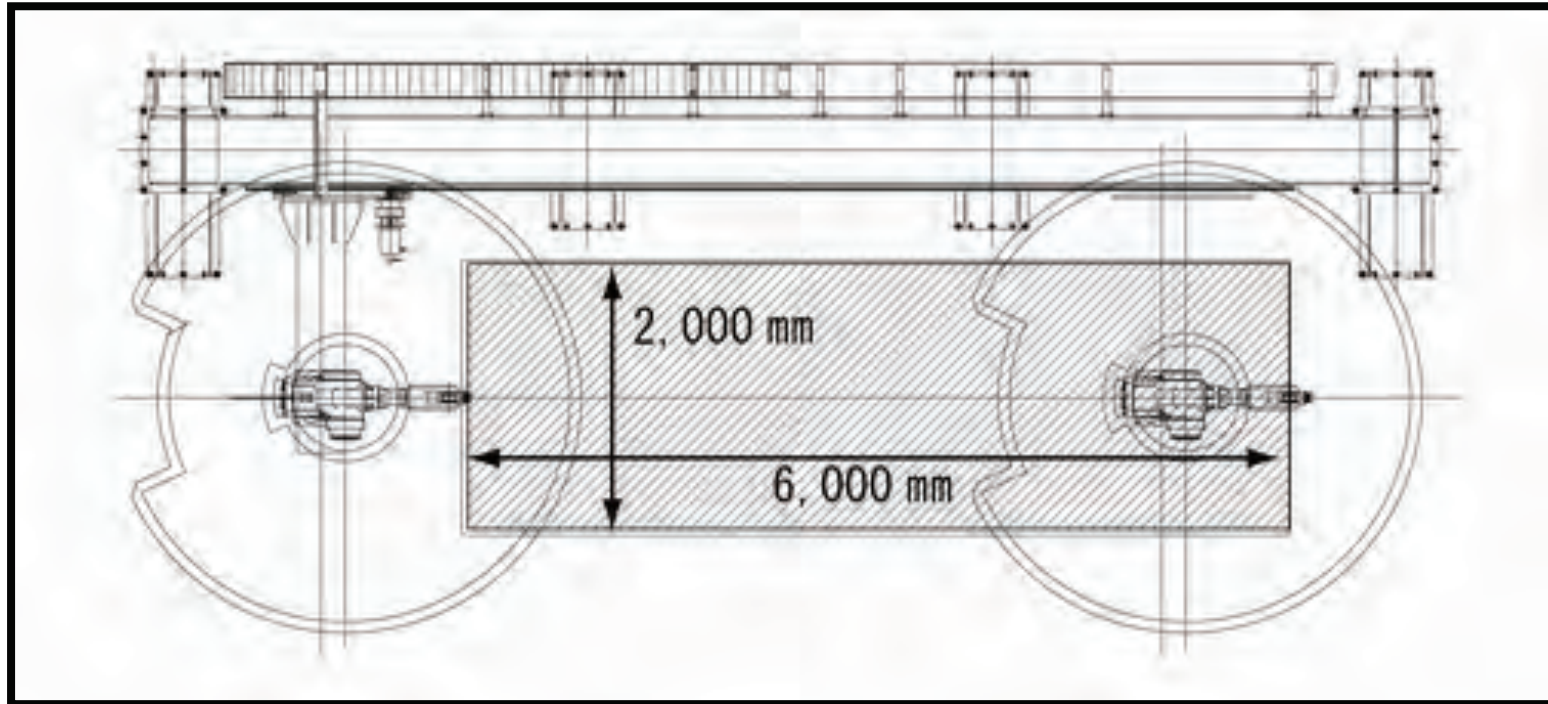
Dust collector for environmental pollution control

BEVEL MASTER – Robotic beveling system



BEVEL MASTER – Robotic beveling system

The effective work envelope is 6m length x 2m depth.



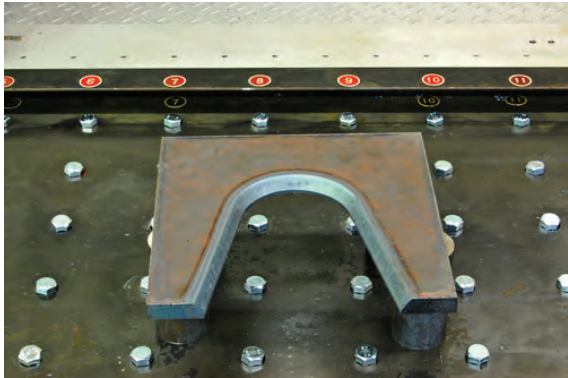
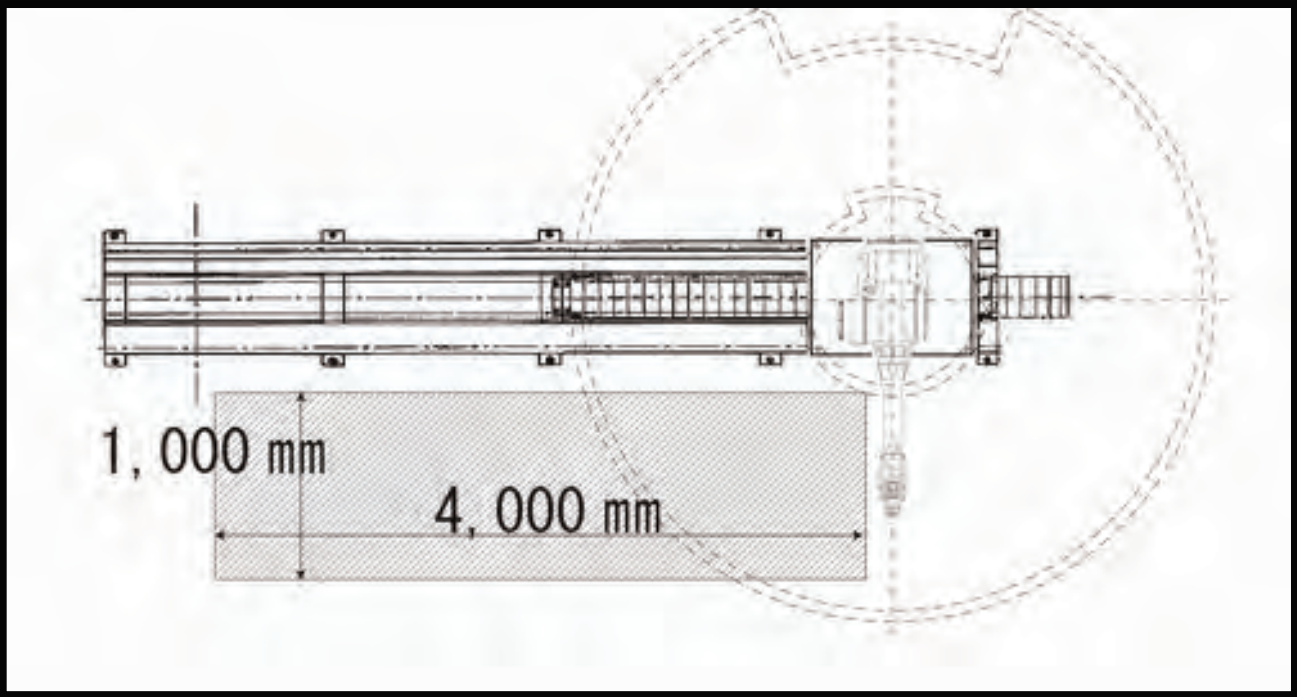
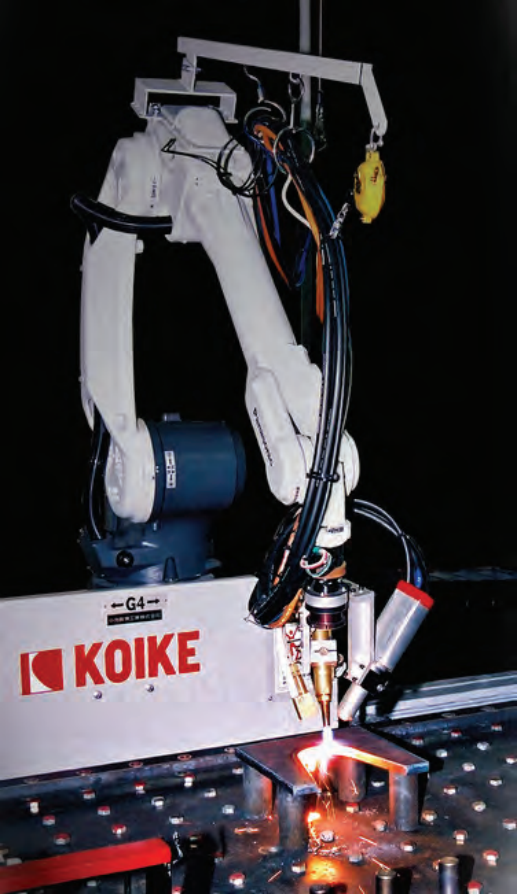
BEVEL MASTER – Robotic beveling system

The effective work envelope is 4m length x 1m depth.



BEVEL MASTER – Robotic beveling system

The effective work envelope is 4m length x 1m depth.



BEVEL MASTER – Robotic beveling system



Courtesy of INDIA METAL ONE PROCESSING COMPANY – SRI CITY –A.P. - INDIA

KOIKE NAVIGATION SYSTEM

Remnant steel plate processing system.
Turn your scraps into profits.



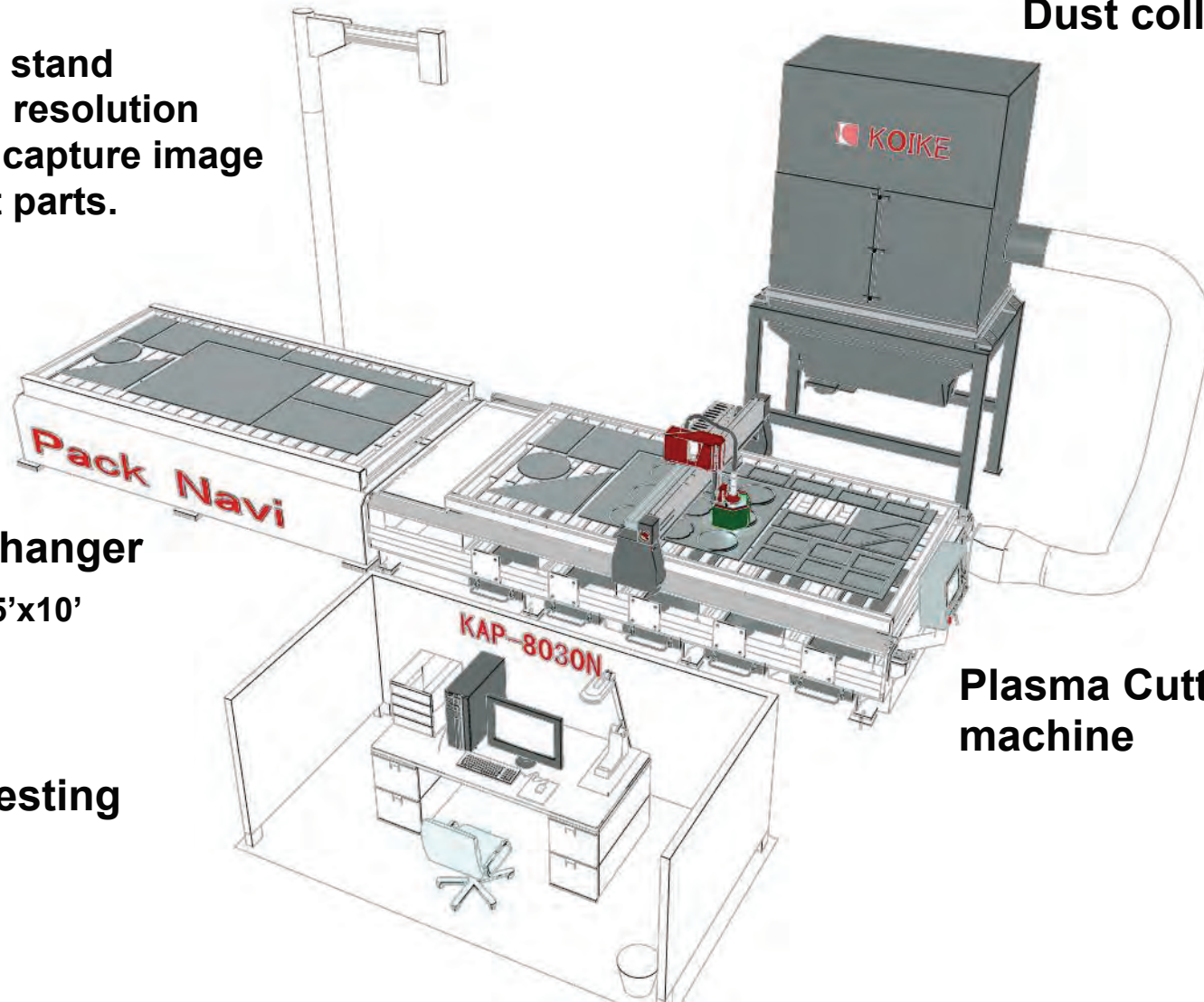
Navigation stand
Using high resolution
Camera to capture image
of remnant parts.

Dust collector

Pallet changer
5'x10'

Parts nesting
station.

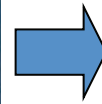
Plasma Cutting
machine



Flowing navigation system



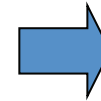
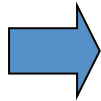
Remnants layout & image capture.



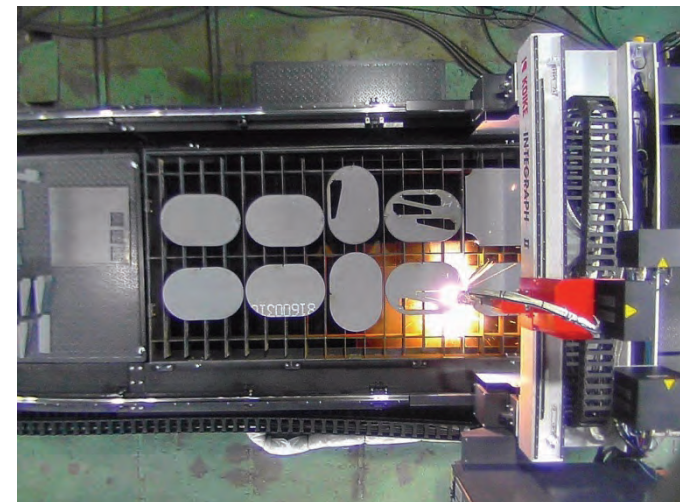
Remnants' shape extraction



Nesting & NC data creation



NC data transfer & Cutting



Benefits of Navigation system



An image of processed parts by Navigation system.

By cutting remnants repeatedly, the scrap ratio will be reduced significantly.

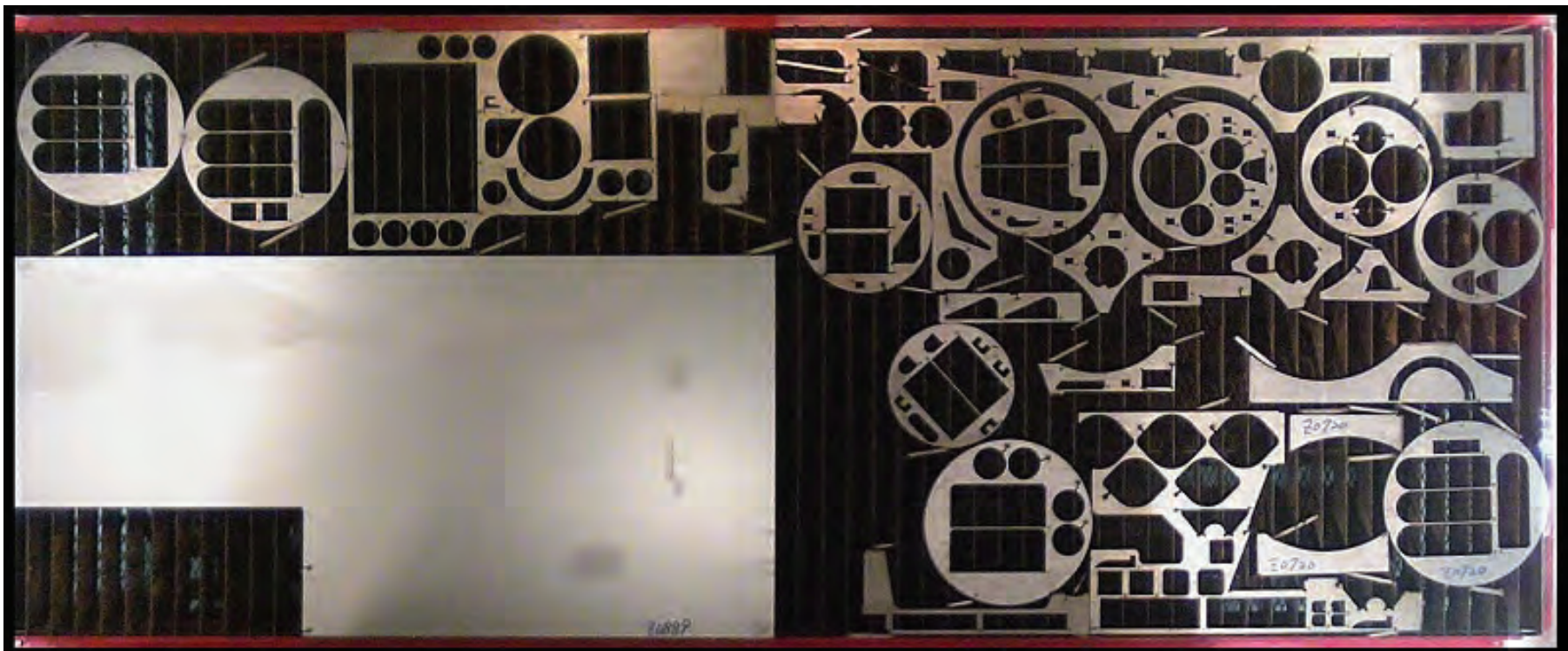


Image courtesy : Kisomekku Corp

Shipbuilding – Remnants processing.

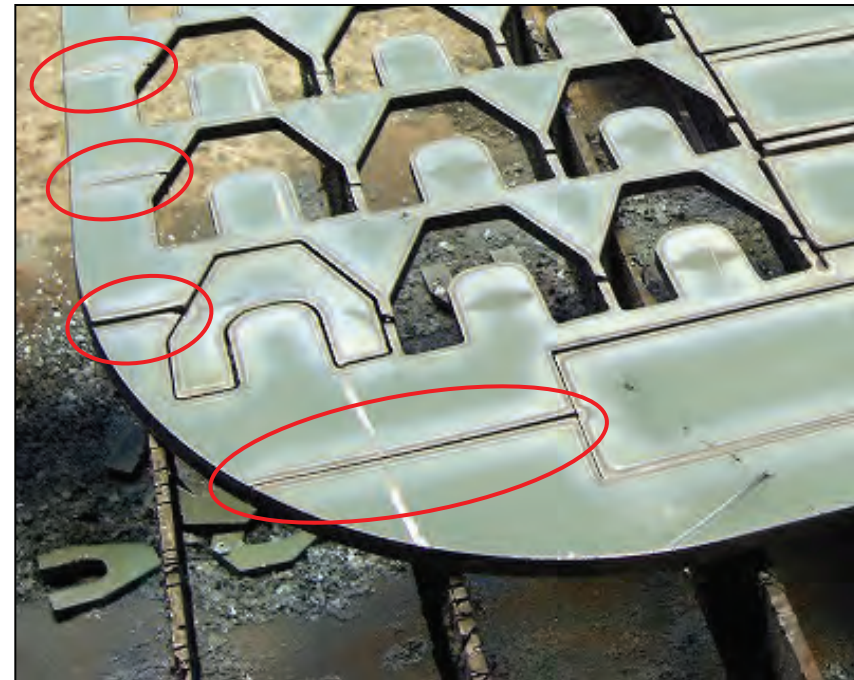


Image courtesy : Japan Marine United Co., Ltd.

Image courtesy : TSUNEISHI HEAVY INDUSTRIES

- Specialized for remnant processing of shipbuilding.
- Separation of remnant's processing improves working ratio after cutting.
- Thick plate cutting is available by using gas cutting machine

LOSSNAI factory system (LFS)

Japanese shearing company remnant plate processing plant.



Image courtesy : Tamatsukuri Co., Ltd.



Image courtesy : Jimi Sangyo

- Efficient material handing / loading by rotary turn table & conveyor.
- Central control room optimise cutting machine allocation based on nesting plan.
- Improved work safety with no vertical lifting operations.

TURN YOUR PILE OF SCRAPS INTO PROFITS.



CUTTING OF PARTS FROM SCRAP.



REMNANT SCRAP IS 20% OF PROCESSED PLATE.

Investment & Profit gained from Navigator system.



The increase in profit in major shearing company [purchase & processing 1500Ton]

Increase in sales amount.

Analysis of the annual sales of major shearing company.

(1) Before using (Material utilization is 80%)

Products $1500\text{Ton}/\text{Month} \times 0.8 \times (\text{¥}90,000 - \text{¥}55,000) / \text{Ton} \times 12 / \text{Month} = \text{¥} 504,000,000$

Total ¥ 504,000,000

(2) After using (Material utilization increased by 3%)

$1500\text{Ton} / \text{Month} \times 0.83 \times (\text{¥}90,000 - \text{¥}55,000) / \text{Ton} \times 12 / \text{Month} = \text{¥}522,900,000$

Total ¥522,900,000

Increase in annual profits after using = (2)-(1) = ¥18,900,000

TOTAL Savings = ¥21,600,000 + ¥18,900,000 = ¥40,500,000



THANK YOU FOR YOUR ATTENTION.
For more information contact us.

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