

WINTECH

AUTOMATIC WELDING SYSTEM

for
PIPING SHOP FABRICATION

WINTECH's technology is your competitiveness

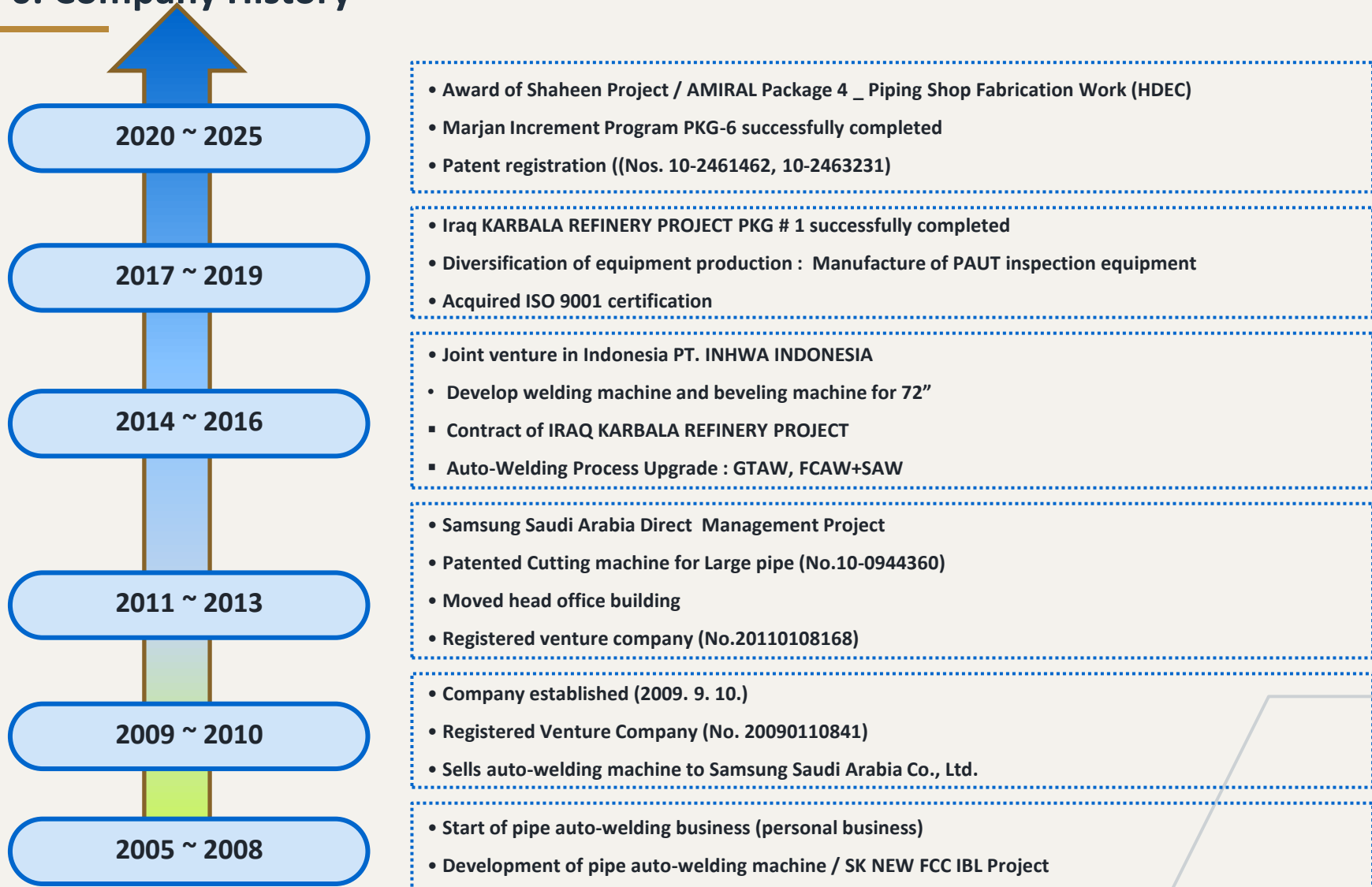


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WINTECH's technology is your competitiveness.

0. Company History



0. Headquarters and Factory Status

[Information – Head Office]

- ❖ Location : 29-4, Sumogwon-ro 49beon-gil, Osan-si, Gyeonggi-do, Korea
- ❖ Tel : 031-372-5800
- ❖ Email : autoweld@empas.com

[Information - Factory]

- ❖ Location : 48, Gongdanan-gil, Chilseo-myeon, Haman-gun, Gyeongsangnam-do, Korea
- ❖ Land area : 72,600m² (22,000py)
- ❖ Building area : 11,401m² (3,455py)

[Front View]



[Bird View]



1. Automatic Welding Background and Objectives

◆ Background

- Large plants and construction sites demand high welding quality
- Skilled welders are scarce and labor costs continue to rise
- Tighter schedules increase the need to shorten construction time

◆ Current Challenges

- Manual welding limits quality consistency and productivity

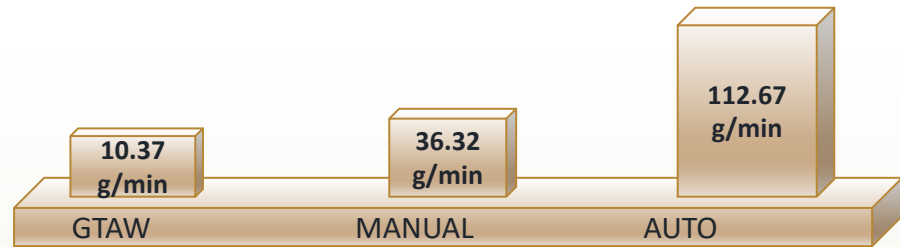
◆ Objectives

- Adopt automatic welding to improve quality, boost productivity, and reduce costs

1. Comparison of Automatic and Manual Welding

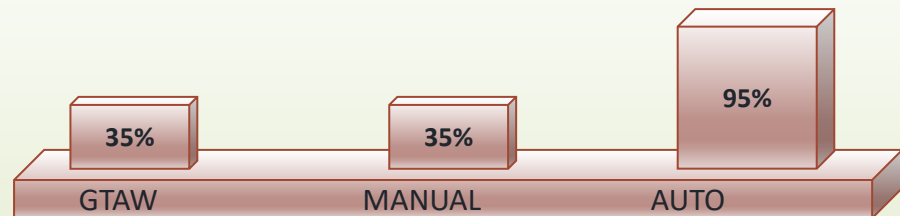
◆ DEPOSITION RATE

Weld metal deposition per hour



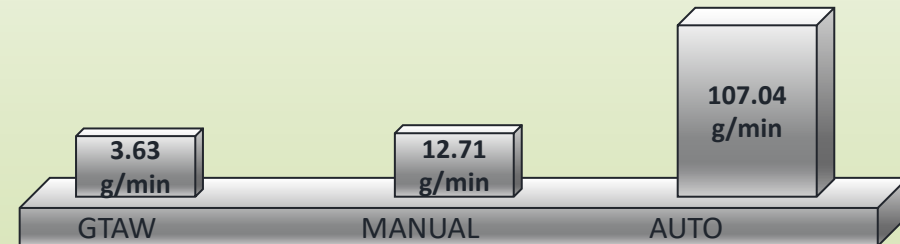
◆ DUTY CYCLE FACTOR

Ratio of arc time to working time



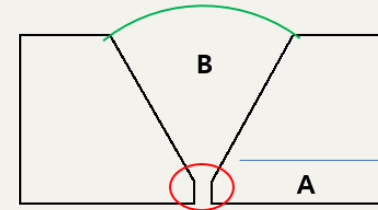
◆ DEPOSITION FACTOR

Weight of weld metal deposited considering the duty cycle factor



1. Comparison of Automatic and Manual Welding (cont.)

PIPE : 20" STD, SCH80, SCH160
MATERIAL : CARBON STEEL
WELD METAL : [A] ROOT & HOT, [B] FILL & CAP

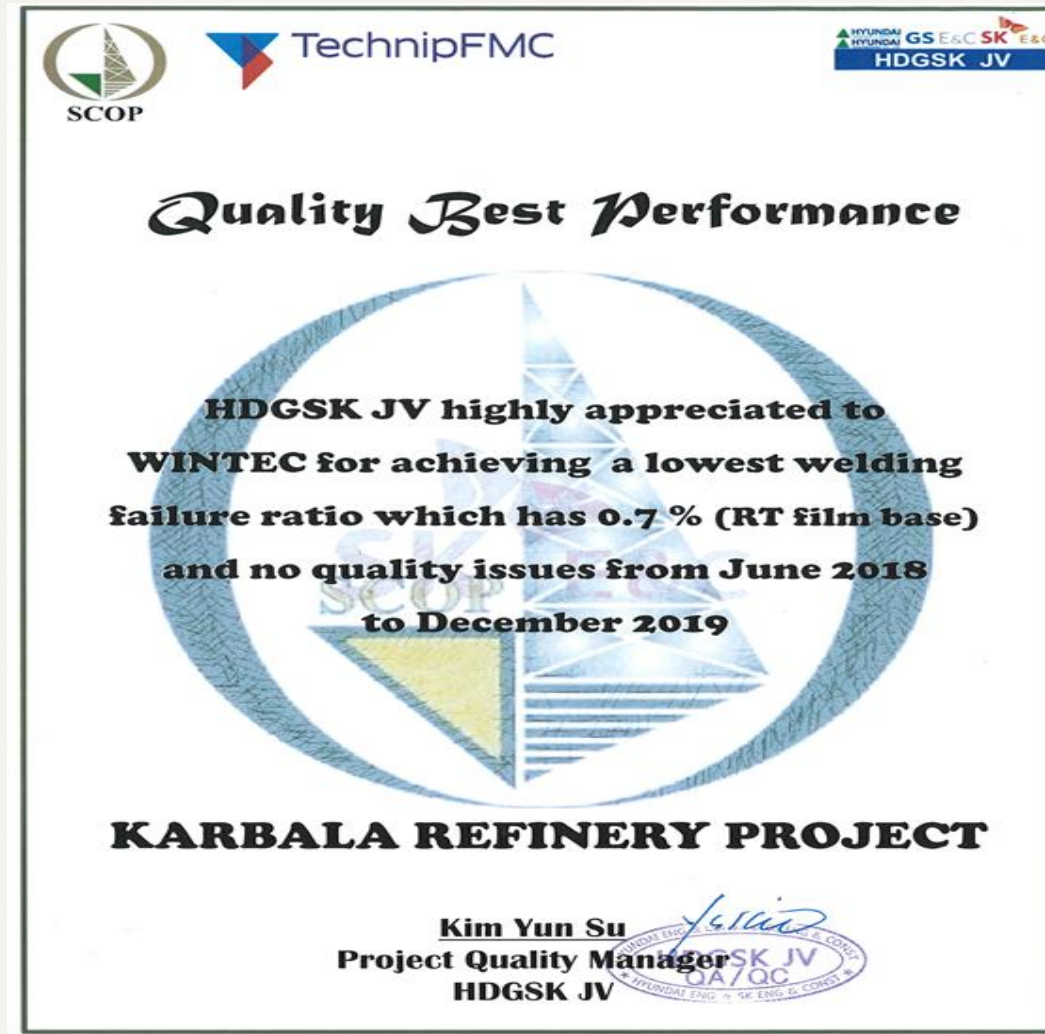


Pipe Size : 20 inch	Root & Hot	STD (9.53t)		S80 (26.19t)		S160 (50.01t)		Remark
	GTAW	Manual	Auto	Manual	Auto	Manual	Auto	
Weld Metal	400 [A]	874 [B]		6,938 [B]		18,330 [B]		g/joint
Deposition Rate	10.37	36.32	112.67	36.32	112.67	36.32	112.67	g/min
Welding Time (min)	38.56	24.06	7.76	191.02	61.58	504.68	162.69	Arc-time 100%
Ratio of arc time To working time	0.35	0.35	0.95	0.35	0.95	0.35	0.95	
Deposition Factor	3.63	12.71	107.04	12.71	107.04	12.71	107.04	g/min
Welding Time (min)	110.17	68.75	8.17	545.78	64.82	1,441.94	171.25	
Working Time		1hr 9min	8min	9hr 6min	1hr 5min	24hr 2min	2hr 51min	
Productivity		8.41		8.42		8.42		Productivity Comparison: Manual vs. Auto

2. WINTECH Automatic Welder Characteristics and Advantages

- Fully automatic welding driven by pre-loaded programs (non-experts can operate after short training)
- Welding process
 - ▶ GTAW + SAW : Manual + Automatic
 - ▶ GTAW : Automatic
- Applicable size and thickness
 - ▶ Size : up to 72 inches, expandable as needed
 - ▶ Thickness : no thickness limit
 - ▶ Material : C/S, Alloy Steel (P11, P22, P91), Stainless Steel (304, 316, 321), and all materials used in plant construction
- Applicable shapes
 - Straight pipe + elbow, heavily side-loaded spools supported
 - 3D-shaped spools supported
 - For straight extension pipes, dual-torch enables welding at two points simultaneously
- Flat position (1G) adopted to minimize defect rate (under 1%)
- Higher quality and higher efficiency than manual welding

2. WINTECH Automatic Welder (Weld Defect Rate Certificate)



2-1 Automatic-welding Machine 36" / 50" / 72"

◆ Auto Weld Master [AWM-36]

Complete View #1
[AWM-dual torch]



Complete View #2 [AWM-single]

2-1 Automatic-welding Machine – dual torch

◆ Auto Weld Master [Dual Torch]



❖ Key Features of the Automatic Welding System (Dual Torch / Single Torch)

- The automatic welding system improves spool productivity and quality
- Welds up to 2 joints simultaneously, boosting productivity (partial spool application)
- Productivity advantage over manual welding grows with pipe thickness
- Dual SAW / FCAW setup enables flexible process selection
- Heavily side-loaded spools are rotated at constant speed for stable welding

2-2 Patent Status

Patent

특허증
CERTIFICATE OF PATENT

특허 Patent Number	제 10-2461462 호
출원번호 Application Number	제 10-2022-0092896 호
출원일 Filing Date	2022년 07월 27일
등록일 Registration Date	2022년 10월 27일

발명의 명칭 Title of the Invention
파이프 자동 용접장치

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위의 발명은 「특허법」에 따라 특허원부에 등록되었음을 증명합니다.
This is to certify that, in accordance with the Patent Act, a patent for the invention has been registered at the Korean Intellectual Property Office.

특허청
Korean Intellectual Property Office

2022년 12월 27일

특허청장
COMMISSIONER,
KOREAN INTELLECTUAL PROPERTY OFFICE

이인실

QR코드로 원상복구
등록사항을 확인하세요

For Pipe Auto Weld M/C

Patent

특허증
CERTIFICATE OF PATENT

특허 Patent Number	제 10-2463231 호
출원번호 Application Number	제 10-2022-0092920 호
출원일 Filing Date	2022년 07월 27일
등록일 Registration Date	2022년 11월 01일

발명의 명칭 Title of the Invention
대구경 강관의 베벨 면위 가공장치

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Korean Intellectual Property Office

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특허청장
COMMISSIONER,
KOREAN INTELLECTUAL PROPERTY OFFICE

이인실

QR코드로 원상복구
등록사항을 확인하세요

For Pipe Bevel M/C

For Pipe Auto Weld M/C

For Pipe Cutting M/C

For Pipe Welding Jig & Fixture

3. Shaheen Project Performance

◆ Implementation of Automated Welding in Plant Projects

- S_Oil SHAHEEN PROJECT / HDEC / KOREA

- PERIOD : 2024 - 2025 - VOLUME : 241,157 ID



3. Shaheen Project Performance (cont.)

◆ **Work Period**

- **2024.09 ~ 2025.11 (14 months)**

◆ **Representative Volume**

- **Pipes : Total 241,157 D/I**

C/S : 109,677

Low Alloy(1.25Cr) : 26,201

Low Alloy(9Cr-P91) : 4,239

S/S(304, 316, 321) : 101,025

- **Heat treatment : 156,650 D/I**

◆ **RT defect rate**

- **84,737 Shoot, 475 Reject, Final defect rate 0.56%(Film Base)**

◆ **Automatic Welders Deployed**

- **SAW Automatic Welders : 8 units**

4. Piping Shop Experience (summary)

◆ OVERSEA PROJECT

No	Location	Name of Project	Material	Name of Owner	Contractor	D.I.	Contract Period	REMARK
1	ALGERIA	ALGERIA OMAN FERTILIZER PROJECT	CS / STS / 1CM / 2CM	SONATRACH	DAEWOO E&C	200,000	2010-2011	
2	SAUDI ARABIA	GAS JUBAIL PHASE-VIII PROJECT & OTHERS (about 20 project)	CS / 1CM / 2CM / STS / P92	ARAMCO	SAMSUNG SAUDI ARABIA Ltd.	2,250,000	2011-2016	
3	INDONESIA	BANYU URIP EPC1 PROJECT	CS / STS	EXXON MOBIL	PT. INWHA INDONESIA	20,000	2013-2014	
4	IRAQ	KARBALA REFINERY PROJECT - AG SHOP FABRICATION WORK	CS / STS / AS	SCOP	HDGSK JV	401,868	2018-2019	
5	SAUDI ARABIA	MARJAN INCREMENT PROGRAM – ONSHORE OIL FACILITIES PKG6	CS / STS / SUPER DUPLEX	ARAMCO	HYUNDAI E&C	933,325	2021-2024	
6	SAUDI ARABIA	AMIRAL Package 4 - Utilities, Flares and Interconnecting System K.S.A	CS / STS / AS SUPER DUPLEX	SATORP	HYUNDAI E&C	457,125	2024-2026	ON GOING

◆ DOMESTIC PROJECT

No	Location	Name of Project	Material	Name of Owner	Contractor	D.I.	Contract Period	REMARK
1	KOREA	SK NEW FCC IBL PROJECT	CS / STS / AS	SK ENERGY	SK E&C JEONGPOONG	100,000	2007	
2	KOREA	SUPPLY AGREEMENT FOR SHIN-PYEONGTAEK COMBINED CYCLE POWER PLANT PROJECT SHOP FABRICATED SPOOL	CS / STS / P92	SPPC	DAEWOO E&C	25,000	2018	
3	KOREA	SHAHEEN ETHYLENE FACILITY CONSTRUCTION PKG1	CS / STS / 1.25Cr / 9Cr	S-OIL	HYUNDAI E&C	241,000	2024-2025	ON GOING

4. Piping Shop Experience #1

◆ Implementation of Automated Welding in Plant Projects

1) SK NEW FCC IBL PROJECT / SKEC / KOREA

- PERIOD : 2007 - VOLUME : 100,000 ID



4. Piping Shop Experience #2

◆ Implementation of Automated Welding in Plant Projects

2) ALGERIA OMAN FERTILIZER PROJECT / DAEWOO E&C / ALGERIA

- PERIOD : 2010 - VOLUME : 200,000 ID



4. Piping Shop Experience #3

◆ Implementation of Automated Welding in Plant Projects

3) SAMSUNG SAUDI ARABIA VARIABLE PROJECT / SSA / SAUDI ARABIA

- PERIOD : 2011-2016 - VOLUME : 2,250,000 ID

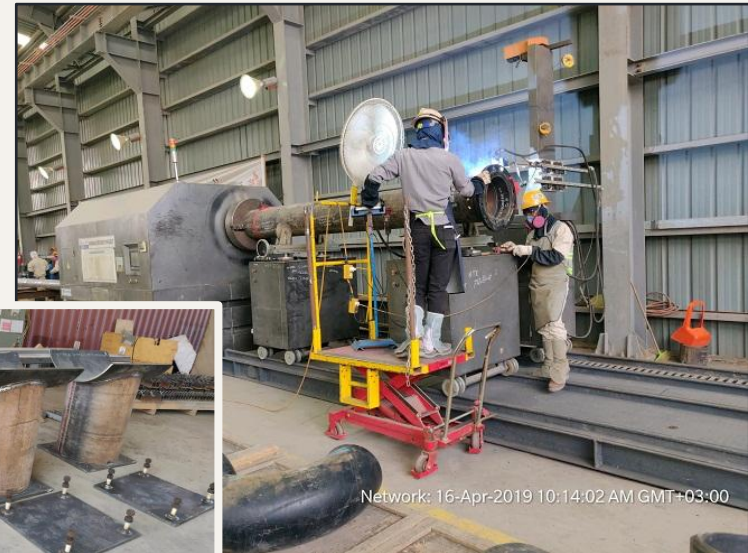


4. Piping Shop Experience #4

◆ Implementation of Automated Welding in Plant Projects

4) KARBALA REFINERY PROJECT / HDGSK JV / IRAQ

- PERIOD : 2018-2019 - VOLUME : 401,868 ID - SUPPORT : 691 TON

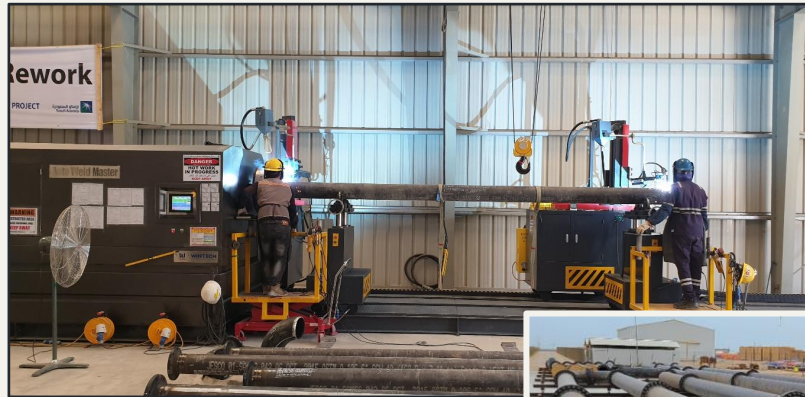


4. Piping Shop Experience #5

◆ Implementation of Automated Welding in Plant Projects

5) MARJAN INCREMENT PROGRAM PKG#6 / HDEC / SAUDI ARABIA

- PERIOD : 2021-2024 - VOLUME : 933,325 ID



4. Piping Shop Experience #6 (cont.)

◆ Implementation of Automated Welding in Plant Projects

6) AMIRAL PKG4 Utilities, Flares and Interconnecting System / HDEC / K.S.A

- PERIOD : 2024-2026 - VOLUME : 457,125 ID - SUPPORT : 1,504 TON



References : Video Clips (Auto Weld of SAW, 1x speed)

Click on this image to start video clip

Auto Welding M/C – DUAL SAW [SAUDI ARAMCO – Marjan Project]



References : Video Clips (Auto Weld of SAW, 8x Speed)

Click on this image to start video clip

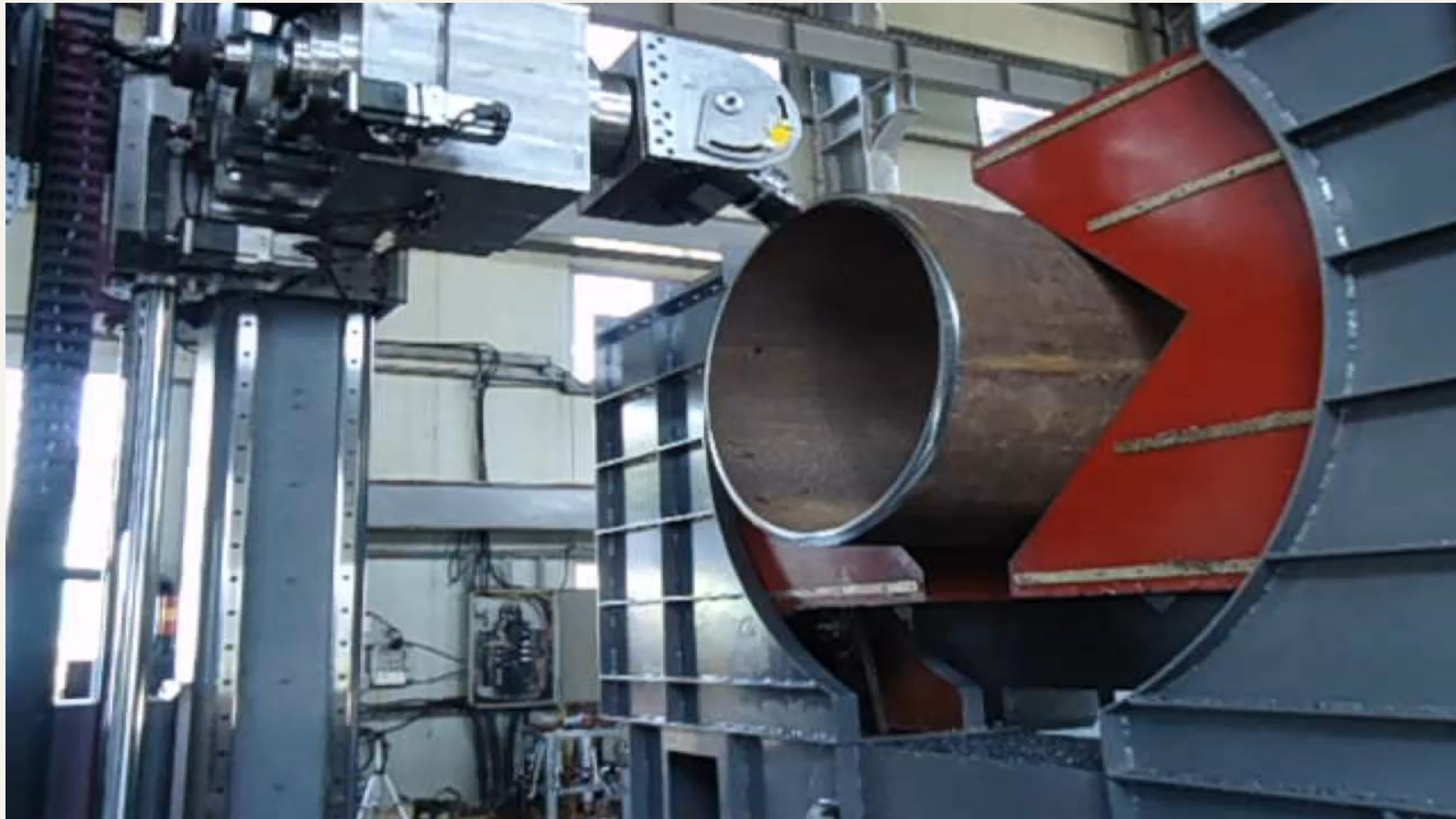
Auto Welding M/C – DUAL SAW [SAUDI ARAMCO – Marjan Project]



References : Video Clips (Beveling Mach. up to 10''~72'')

Click on this image to start video clip

Auto Welding M/C – DUAL SAW [SAUDI ARAMCO – Marjan Project]



5. Conclusion and Future Plans

◆ Conclusion (Conclusion)

- Haman Shaheen and overseas PJTcase studies validate that, in plant piping construction, automatic welding 's technical maturity and productivity gains have been proven
- WINTECH's automatic welding adoption is a necessity, not a choice

◆ Future Plans (Next Step)

- Laser automatic welding will be adopted to achieve high quality and efficiency

6. Q & A

Q & A

WINTECH

Thank You

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