

INTRODUCTION OF **iSYS** & System

Vision 2015

To be the World wide PVD & Ion Beam Irradiator Manufacturing Company



“iSYS is committed to building the best”

January. 2007

[Introduction of Business]

iSYS, based on excellent technology and sufficient equipment manufacturing experience, is an energetic venture company where every employee is pursuing to be the best in their respective role while regarding confidence of customers as the ultimate value.

iSYS has supplied various **PVD systems** to specialized coating companies for various materials such as plastic, ABS, polymer film, cutting tools, molding, automobile parts and accessory hard-coating.

iSYS has also an technology transfer of **Ion beam irradiator** from KAERI, is a core device of nano-materials.

iSYS has developed various plasma sources and systems so as to improve product quality and cost effectiveness.

President	Sang - Youl, Bae
Foundation	2001. 10. 25
Main Product	PVD coating equipment, Ion Beam Irradiator & Vacuum Valves
Contact Us	Phone : 031 - 447 - 6627 Fax : 031 - 447 - 7386 Website http://www.isysinc.co.kr

Portfolio	SYSTEM	Components & Service
	<ul style="list-style-type: none"> ➤ Hybrid Arc System(iA) ➤ Ion Beam Irradiator(iB) ➤ HCD System(HIPS) ➤ In - line System(ILS) ➤ Sputtering System(MSS) 	<ul style="list-style-type: none"> ➤ Vacuum parts <ul style="list-style-type: none"> ✓7G Gate Door Valve ✓Circular Valve ✓Rectangular Gate Valve ➤ Service <ul style="list-style-type: none"> ✓ISYS Coating Service(iC)

[Company History]

2001. 10 : Foundation of the Intelligent System Inc.

business type: Manufacture and trading

Item : PVD coating equipment, Vacuum System, Coating Service,

2002. 03 : Developed rectangular gate valve

2002. 06 : Developed auto pressure gate valves

2002. 11 : Sales contract for the consumables of semiconductor equipment

2003. 05 : Exported Arc Ion plating system to China (model: AIPS - 800)

2004. 12 : Developed Circular gate valves

2004. 12 : Export Arc Ion Plating System to Japan (model : AIPS - 800)

2005. 03 : Developed 7 Generation Gate door valve

2005. 04 : Registered as a venture company

2005. 05 : **Made a know how license agreement with KERI
(The method and system of large - sized MgO coating)**

2005. 05 : Developed new Arc source for decreasing marco particles

2005. 06 : Designated as a clean business place(KOSHA)

2005. 07 : Selected as a company for the export support(Kyunggi - Do)

2005. 08 : Selected as a promising export company(Kyunggi - Do)

2005. 09 : Developed HCD ion plating system (model : HIPS - 820)

2005. 11 : Selected as a materials & components industry company
(Ministry of commerce, Industry & Energy)

2005. 12 : Foundation of the ISYS Research & Development Center

2006. 04 : Selected Kyunggi - province promising company and Innovational
Business Company (INNOBIZ)

2006. 08 : Administered SMBA Project

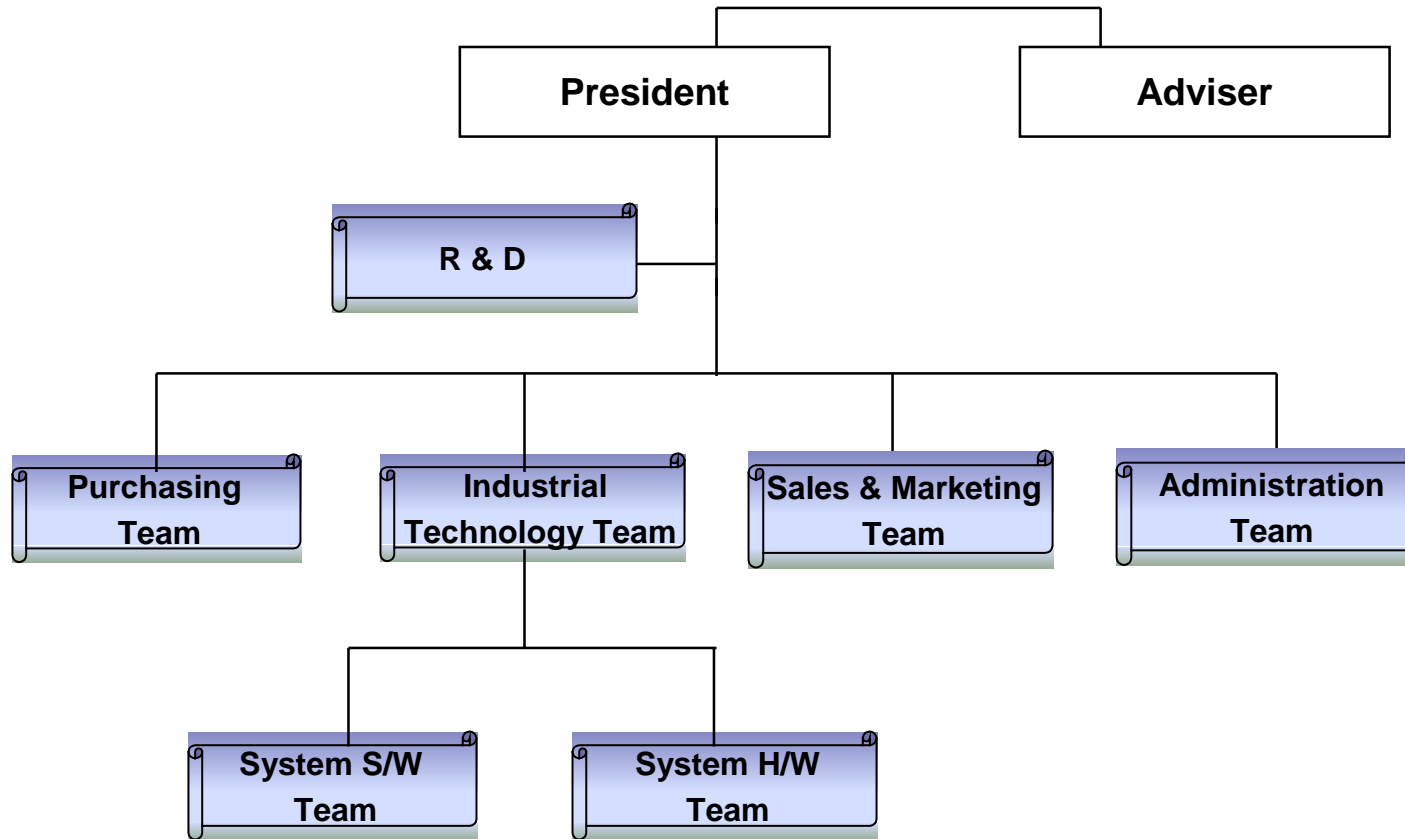
『Developed High speed coated Arc source without macroparticles』

2006. 11 : Selected as a Frontier Kyunggi - Do Internet Trade

2006. 12 : Contracted with KAERI

『Manufacturing Technology of Industrial Ion Beam Irradiator』

[Organization Chart]

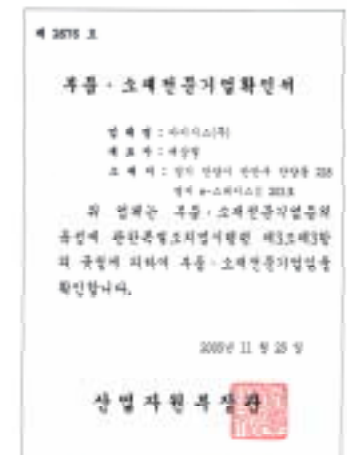
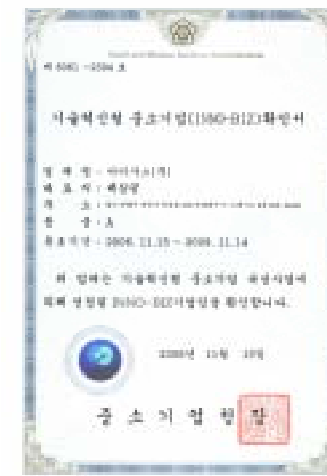
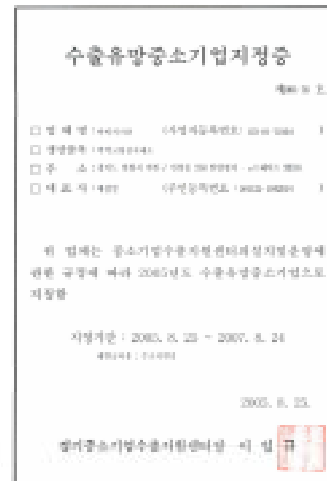
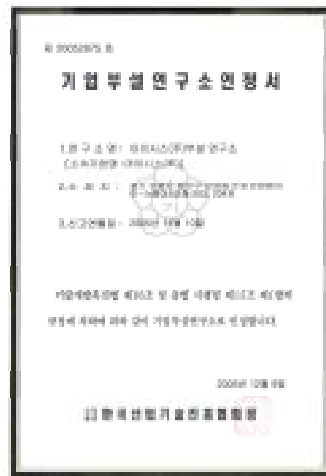
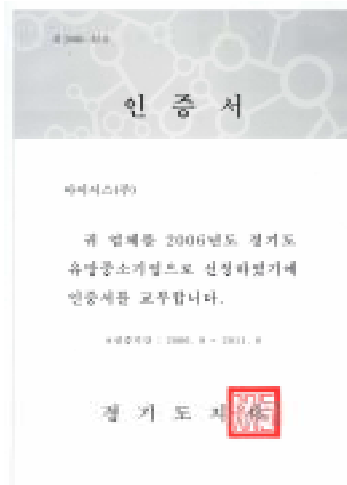


[Technical Patent]

Division	Title	Application Date	Registration date	Remarks
Patent	The system and method for surface treatment using plasma	02.01.08	05.01.24	No. 0469552
	The carrier box for display glass	03.10.17	05.12.08	No. 0536938
	The method and system of large -sized MgO coating	03,07.08	05.07.05	No. 0501044
	Plasma gun for thin film deposition and thin film deposition apparatus thereof	06.06.08	07.01.18	No. 0674031
	Arc discharge control device for ion plating and ion plating apparatus thereof	06.06.08	07.05.02	No. 0716264
Utility Model	Back pressure Gate valve	04,12.28	05.03.24	No. 0380587
Design	The carrier of display glass	03,10.17	04.11.17	No. 0367934

[Certification]

Division	Title	Institute	Certificate date	Remarks
Certificate	ISO14000 E.M system	DAS	2005. 07	
	Venture company	SMBA	2005. 04	
	ISYS R&D center	KOITA	2005. 12	
	Export promising company	SMBA	2005. 08	
	Internet trade frontier business	Kyunggi-Do	2006. 04	
	Promising company	Kyunggi-Do	2006. 11	
	INNOBIZ	SMBA	2006. 11	



PVD System – **iA** Series

Systems

i70A,i90A,i120A. i150A

Hybrid Arc system is a main ion plating for a hard film coatings

Features

- ❖ Above 90% ionization
- ❖ High energy ion plating(60 100eV)
- ❖ High adhesion(Arc > Sputter > E/B)
- ❖ **New Arc source for Decreasing of macro particle**
- ❖ **Hybrid method (HCD+Arc+Sputter)**
- ❖ Auto process & compiling database
- ❖ Self diagnosis system(Leak & Insulation)
- ❖ Movable cart with rotation unit
- ❖ Application :Cutting Tools, Automobile, Electronic part & molds



Ion Beam Irradiator - IB Series

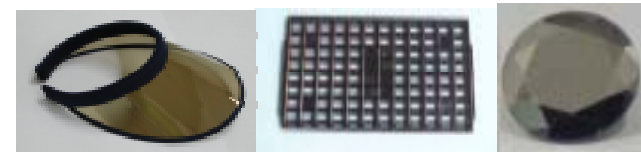
Systems

IB - 50,90,120, 150

Ion beam irradiator is an equipment of surface modification into inner surface with accelerated metal or gas ion. iB series are improving a performance of materials like a metal, ceramic, polymer and so on.

Features

- ❖ Ion beam energy : below 300KeV
- ❖ Ion beam current : 5-50 mA
- ❖ Mass analyzer, Acceleration tube, scanner, MQD
- ❖ Mechanical, electric, optical & chemical properties change
- ❖ **Hybrid method (IB+Arc+Sputter)**
- ❖ Application : Prevent static electricity, Electromagnetic shielding, doping, Hydrophilic/Hydrophobic treatment



PVD System – HIPS Series

Systems

HIPS - 520,820

HCD Ion plating system, as an equipment of using a hollow cathode discharge, which holds a high energy of low voltage and high current, coats a thin film on the substrate by vaporizing the material in a crucible

Features

- ❖ Ultra wide electronic beam (~300A)
- ❖ Reactive characteristics & excellent adhesion (Above 25% ionization)
- ❖ Insulated material plating possible
- ❖ Self diagnosis made before processing
- ❖ Auto process in every step
- ❖ Application : TiN(Cutting tools & decorate)
Hard Coating
Metal Coating



[Products of ISYS]

PVD System – ILS Series

Systems

ILS - 740,920,1460,1720

In-line system is an equipment of connecting all the process chambers of various batch process for the productivity improvement.

Features

- ❖ **Suitable to large size glass and sheet**
- ❖ **High productivity & reliability**
- ❖ **Full Auto process**
- ❖ **Compiling database for each chamber**
- ❖ **Large sized plasma cleaning system**
- ❖ **Application : ITO(Plat Panel Display), CrN(Automobile parts)
TiN(Decoration), Hard Coating(Cutting& mold)
Metal Coating(Electric part)**



[Products of ISYS]

PVD System – MSS Series

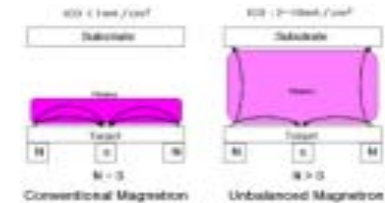
Systems

MSS - 500,700,800,1200

Magnetron sputtering system is an equipment used in coating of a thin film on the substrate by forcing the atoms to bounce out and accelerating it from the collisions of high-energy ions on the target surface

Features

- ❖ Long distance coating with UBM mode
- ❖ Very smooth surface
- ❖ Fine & High-density films
- ❖ High yield Target Erosion(40%)
- ❖ Hybrid system (UBM+Arc+HCD)
- ❖ Application :DLC,MoS₂,TiAl(metal),TiAlN
TiCN,TiN,CrN Hard coating



[Products of ISYS]

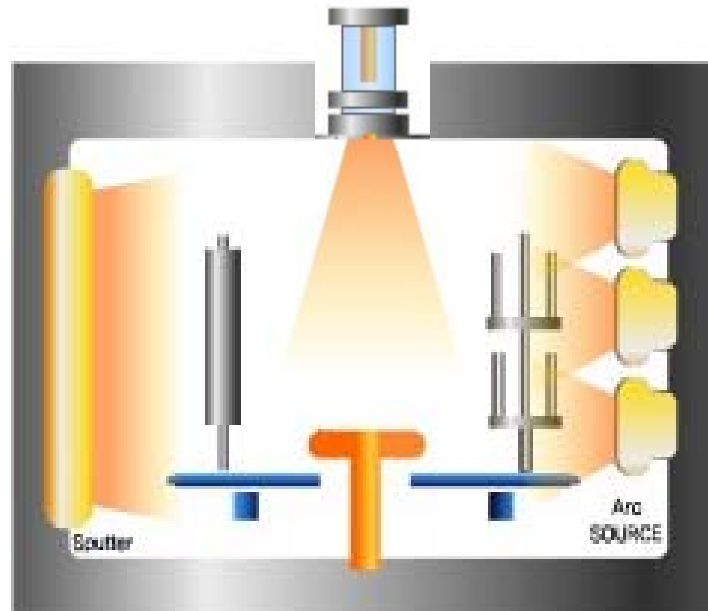
PVD System – Valves



- **Lighter than competitor's valve of same size**
- **Easy maintenance and small vibration**
- **Possible to make a non-standard size**
- **Leak rate is better than 2×10^{-9} sccm/sec**
- **>100,000 Life reliability test**



[Diagram of I90A]

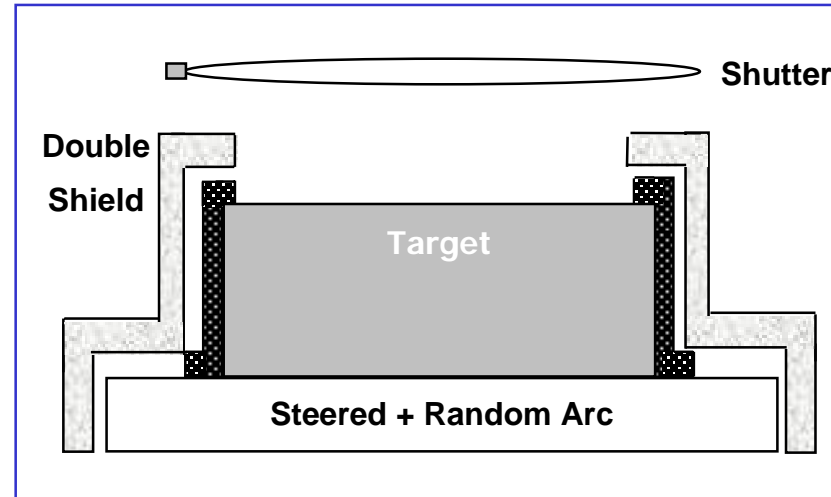
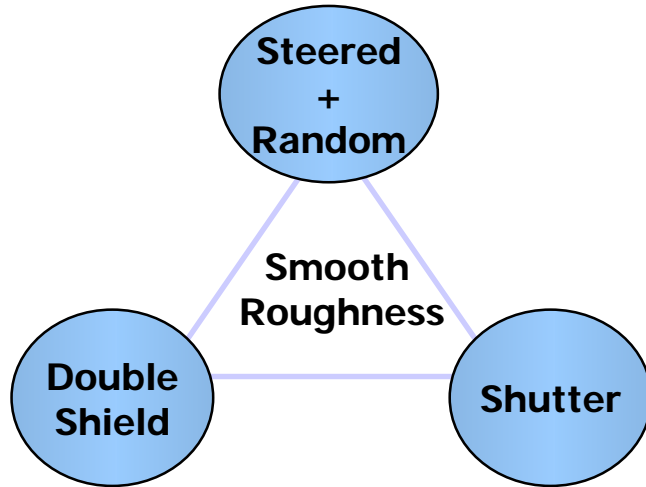


Arc+HCD+Sputter

- HCD: Cleaning Process
- Arc : Main coating
- Sputter: Functional coating(OPTION)
- Note: HCD Coating(OPTION)

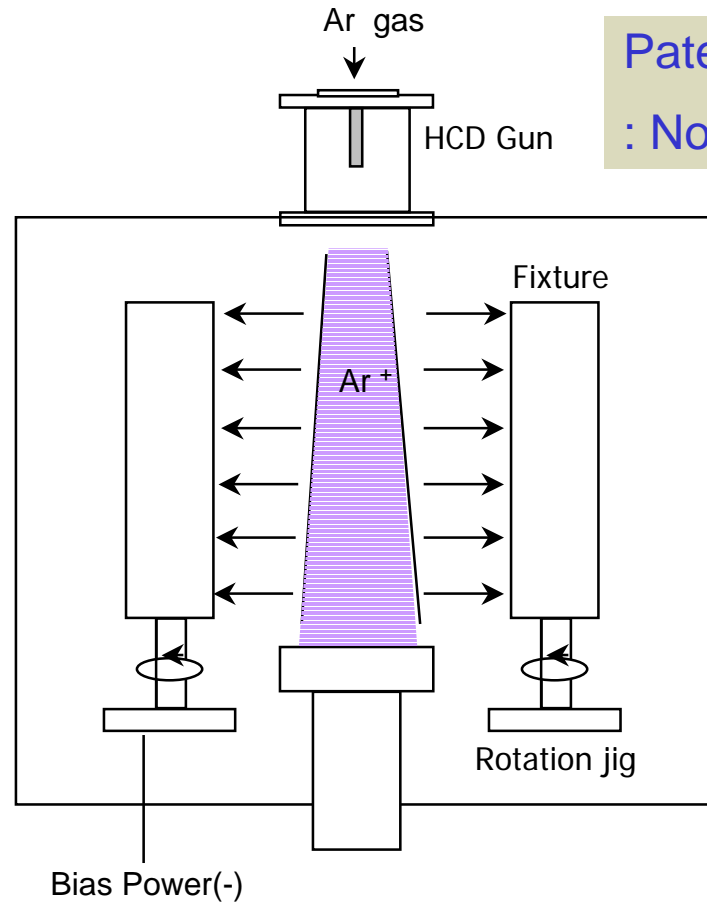
[Features of i90A]

ITEM	Method	Contents
System	Auto & manual	Self diagnosis (vacuum,insulation) & Full auto system
HCD Source	Electron Acceleration type	Ion etching & excellent adhesion (80N)
Arc Source	New Arc source	Ra 0.06um (criterion,.TiAlN 3um, bare material Ra=0.03)
Pump	Rotary/booster pump	Second pump of Diffusion
	Diffusion pump	High Vacuum pump/Main process pump
Heater & TC	40KW	Maximum heater capacity (High temperature)
View port	Slim type	Wide view (option : CC camera)
Shutter	Arc & Sputter shutter	Prevent contamination & excellent performance
POWER	Arc, HCD, Bias power	Stable power supplies (made in Poland)
One body	Whole unit	Prevent dust contamination & Design
Vacuum Gauge	Full range, Pirani gauge	Long life time
S/W program	Ver.3.1	Real time graph & data base (include Analysis program)
Hot Cooling system	Max. 80	Blocking dew condensation & erasing out gas
Sputtering system (Option)	High yield target/Power	Target yield 40%
HCD Coating system(Option)	Hybrid Coating(HCD)	HCD coating with high power supply



Patent Number of Arc Source : No. 0716264

[HCD Ion Etching of i90A]

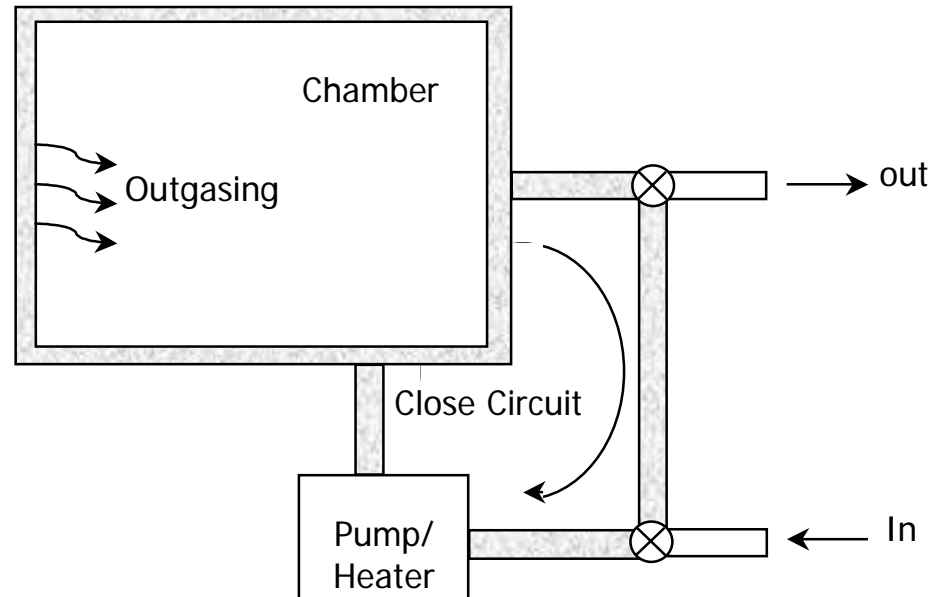


Patent Number of HCD
: No. 0674031

Feature : Flow lots of Ar ionization with HCD Gun

Effect : IEGD(Ion enhanced Glow Discharge) Ion etching

[Hot Cooling System of i90A]

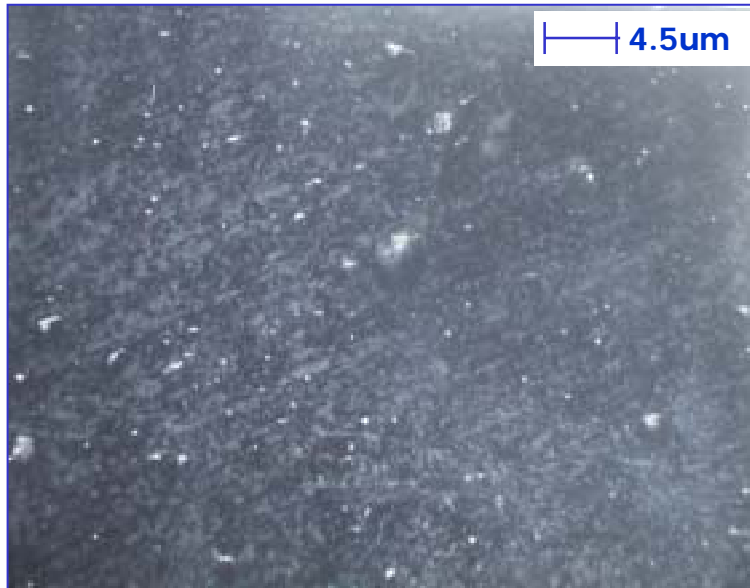


Feature : Close Circulation system with Water heater (about 30)

Effect : Blocking dew Condensation of chamber wall

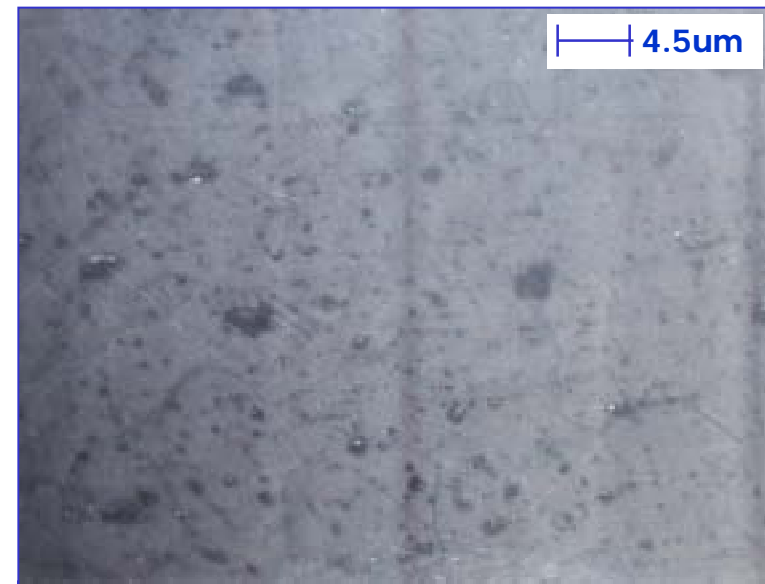
Removal outgassing of chamber using a warm water circulation

[Surface Morphology of i90A]



Conventional Arc Source

Ra > 1um



New Arc source

Ra = 0.06um

Rz = 0.47um

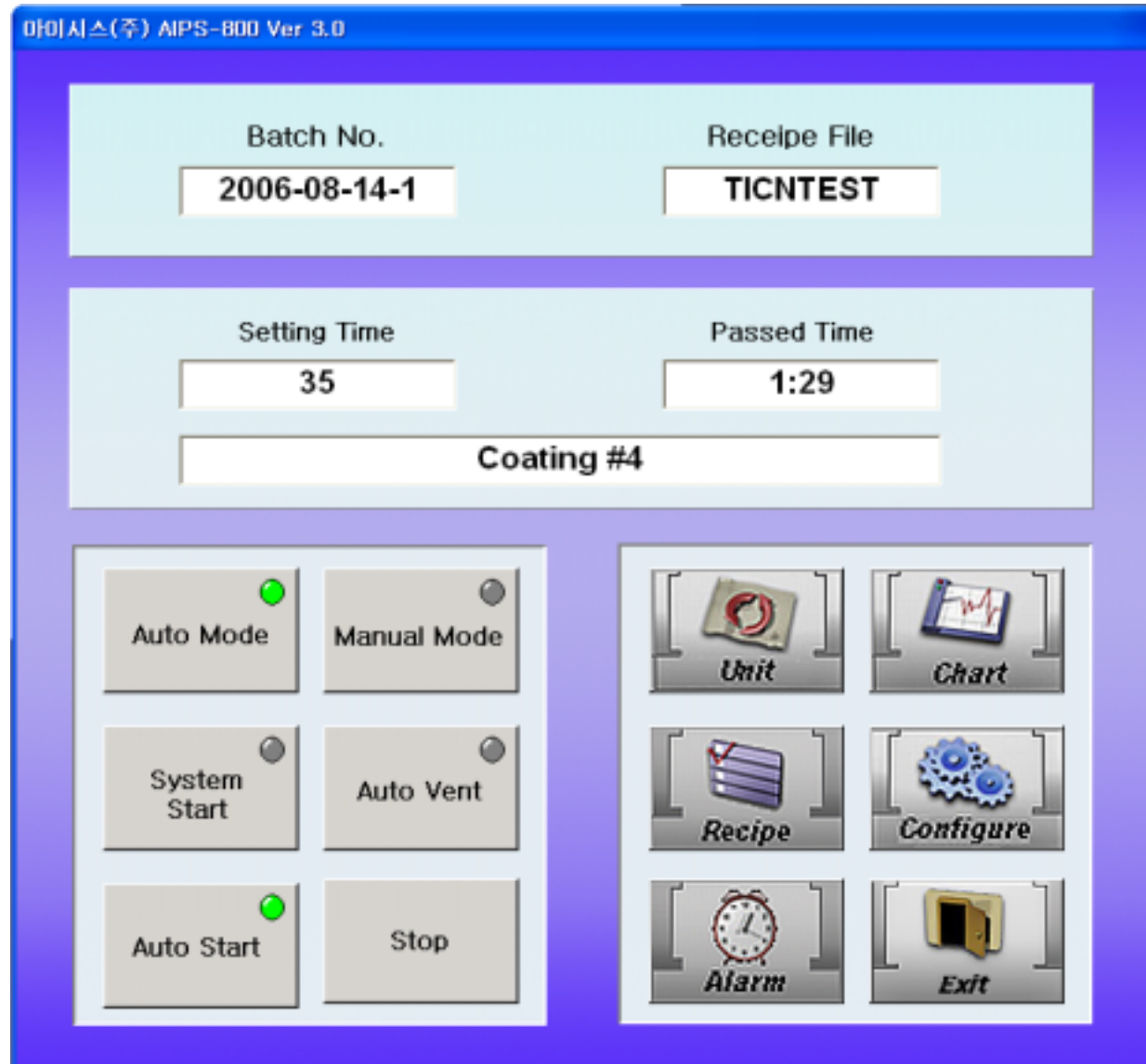
Rmax=1.50um

<Note> Sample : HSS Ra =0.03 um

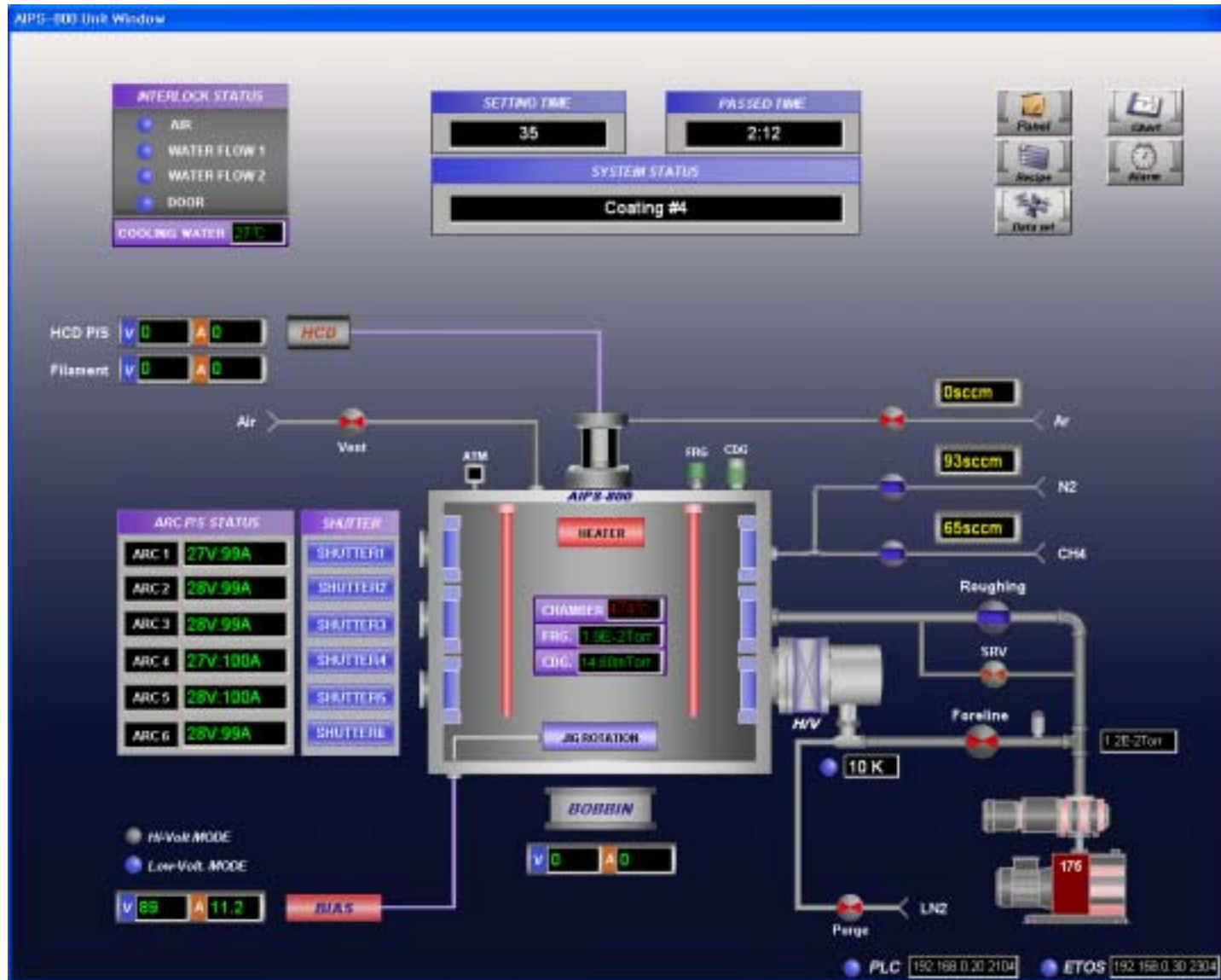
Film : TiAlN 3.0um

Optical microscope x400

[Main Window of i90A]



[Diagram Window of i90A]



[Recipe Graph of i90A]

APIS-003 Recipe Window

Batch No. **2006-08-14-1** Recipe File **TICNTEST**

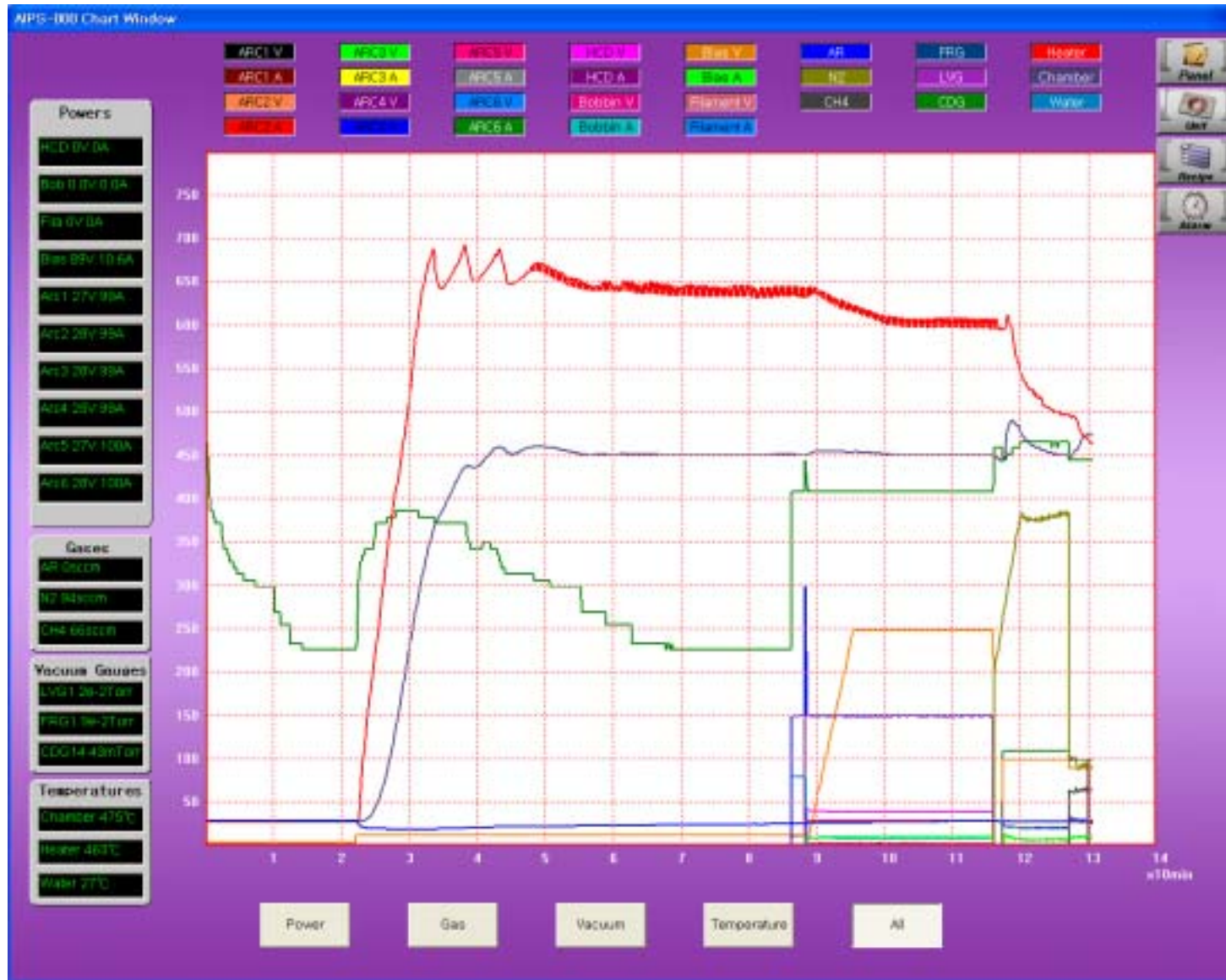
Panel Chart Alarm

Process	P-V	Heating	HCD Stamb	Metal Stamb	Coating #1	Coating #2	Coating #3	Coating #4
Time, Min:Sec	0:51	45	30	0	1	10	1	35
ARC1, V:A	29:99			0	0	110	100	100
ARC2, V:A	30:99			0	0	110	100	100
ARC3, V:A	28:99			0	0	110	100	100
ARC4, V:A	27:100			0	0	110	100	100
ARC5, V:A	29:99			0	0	110	100	100
ARC6, V:A	28:99			0	0	110	100	100
HCD, V:A	0:0		150					
Filament, V:A	0:0							
Stambin, V:A	0:0							
Blas, V:A	89:84		250	0	0	100	90	90
AR, sccm	0		150	0	0	0	0	0
N2, sccm	91				200	200	100	100
CH4, sccm	64				0	0	1	1
CH4 Ratio, %					0	0	60	70
Pressure, atFem	14.85				40.00	40.00	0.00	15.00
Temp, °C	465	450	450	0	450	450	450	450

Prev Next

Open SAVE Read from PLC APPLY CANCEL

[Real Time Graph of i90A]



[Photos of iA Series]

<http://www.isysinc.co.kr>



[Specifications]

Chamber size : 900L x 900W x 900H

Coating zone : 540H x 600

Axis : 30Kg / 150 x 8 axes

Source : 5 inch circular x 6EA



[Specification]

Chamber size : 1500L x 1500W x 1000H

Coating zone : 540H x 1100

Axis : 30Kg / 150 x 16 axes

Source : 5 inch circular x 12EA

[Large Area Ion Beam Irradiator]

<http://www.isysinc.co.kr>



[Specifications]

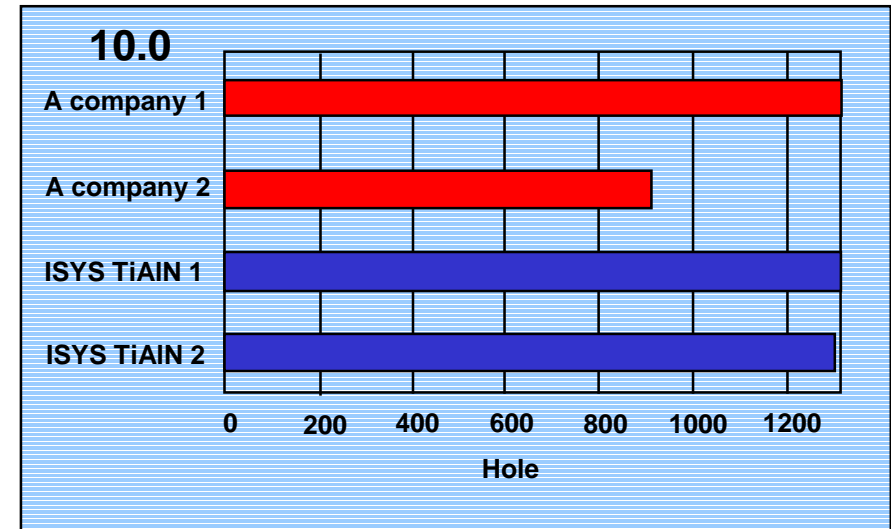
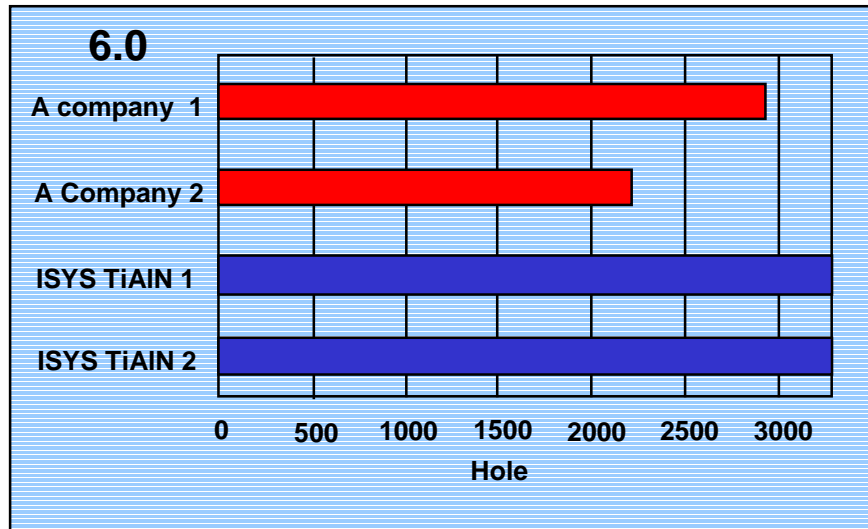
Energy : 5 50KeV

Ampere : 5 50mA, 10 100mA

Area of Irradiation : 30cm x 15cm

[i90A Cutting Test in Drills]

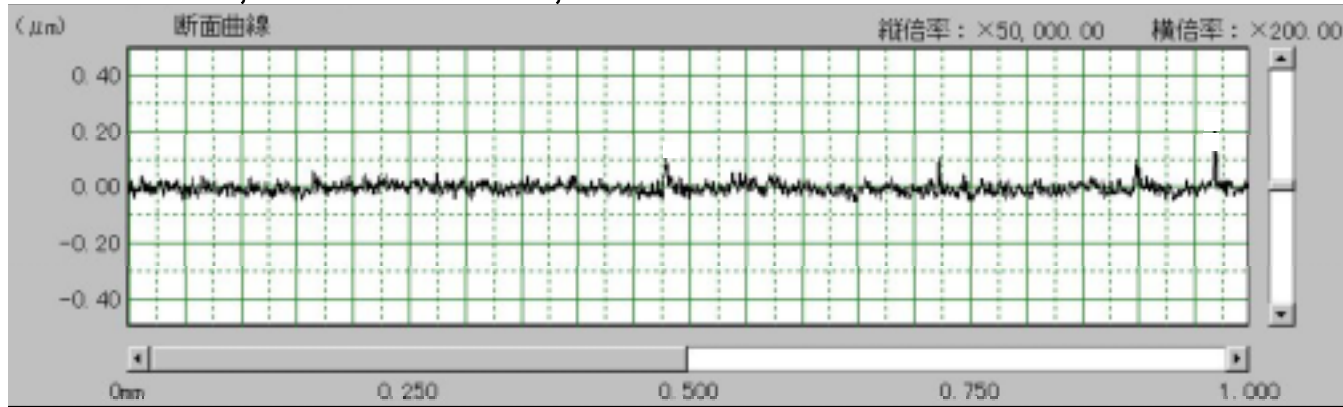
	6.0	10.0
Work piece	S50C	S55C
rpm min^{-1}	1,600	855
feed mm/rev	30	30
depth mm	0.17	0.23
Cutting holes (cutting length m)	3,300hole (53m)	1,280hole (38m)
Cutting Oil	Emulsion	
Machine	URAWA UB75	



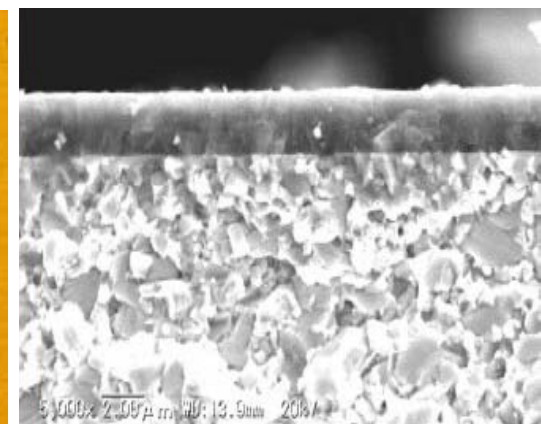
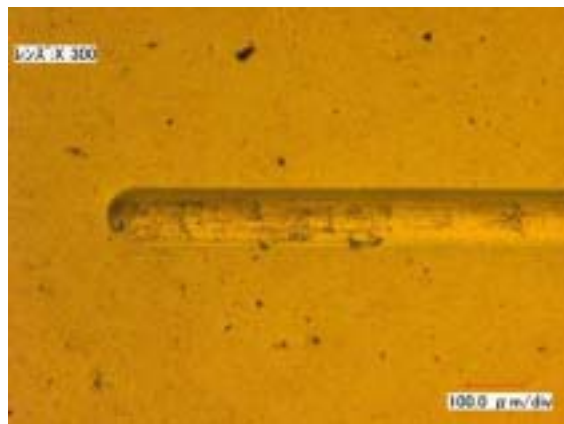
[HIPS-820 Coating Test Results]

HCD coating film = TiCN/TiN 3.05um, Hardness[Hv]=2563

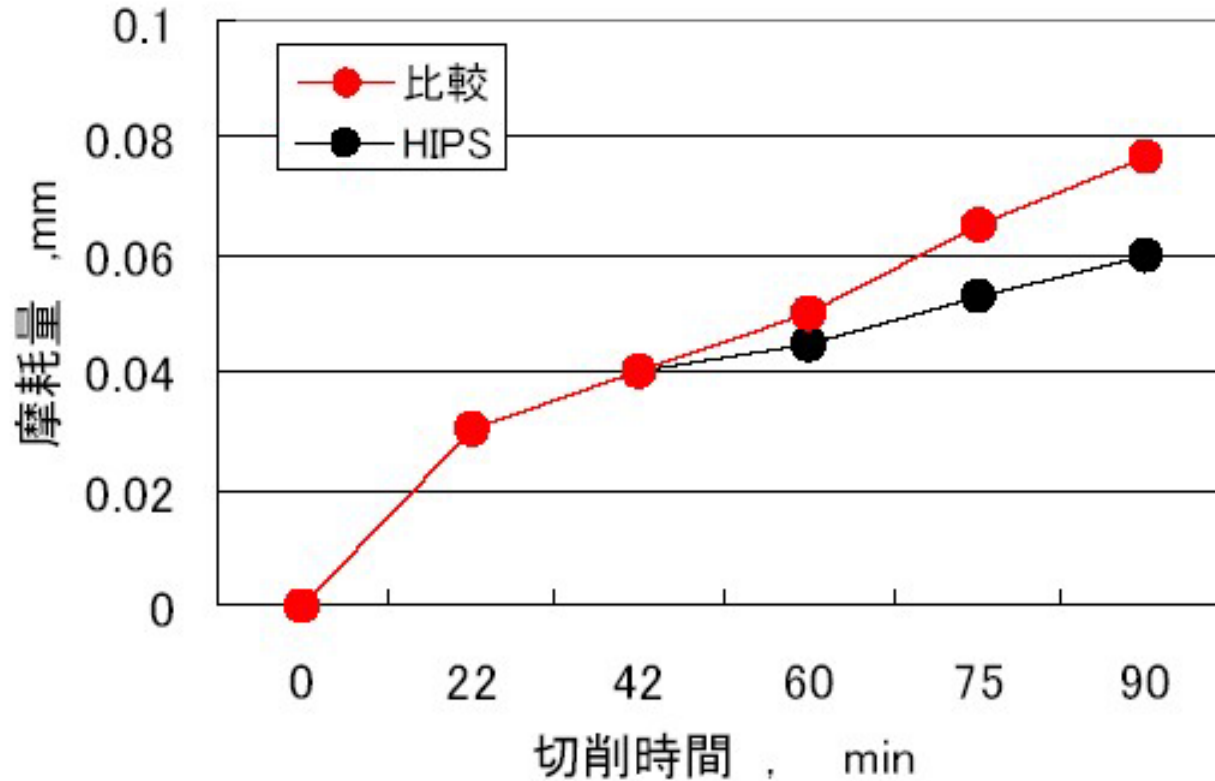
Ra = 0.0148um, Rmax = 0.3090um, Rz=0.1798um



Adhesion & Surface morphology

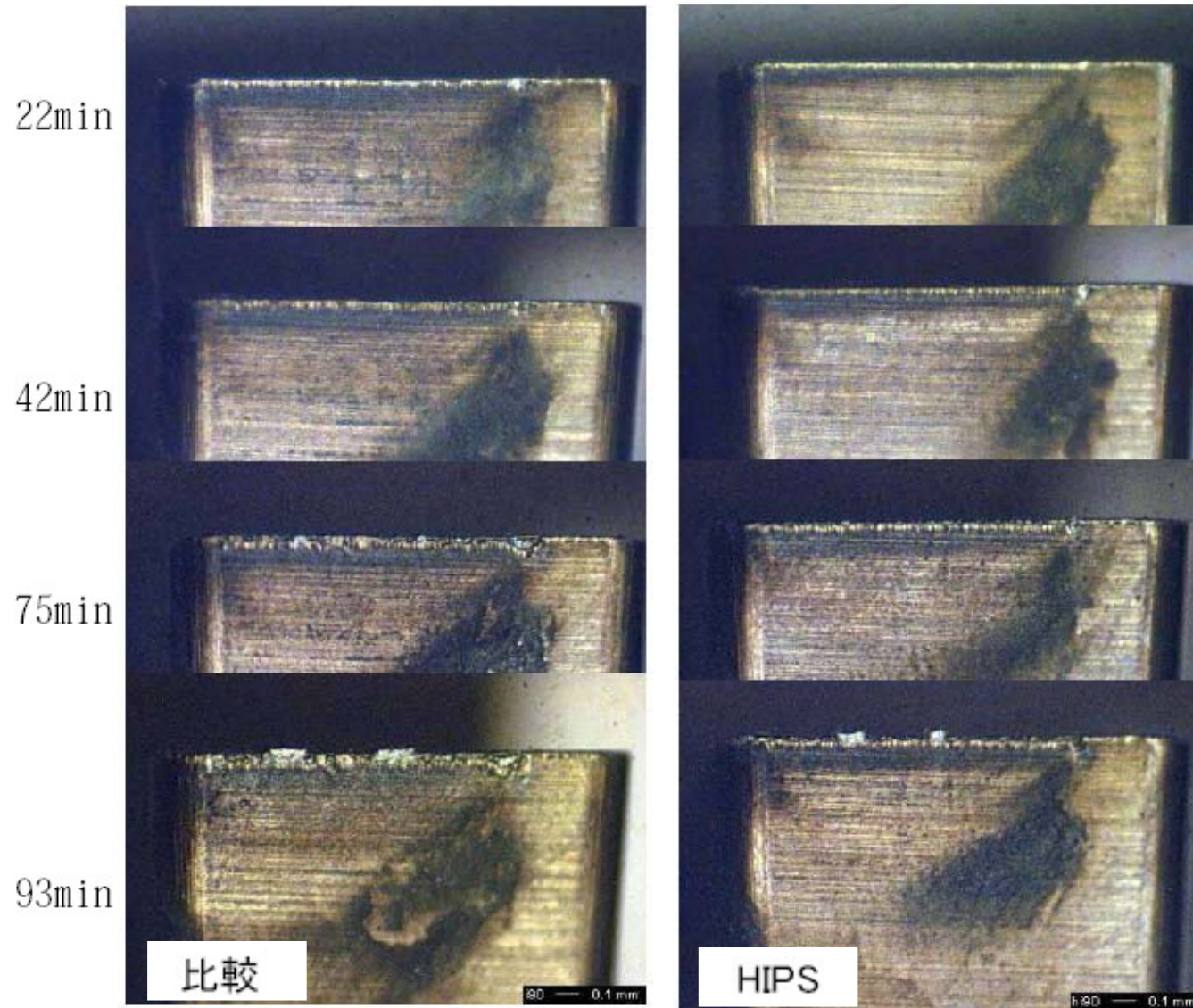


[HIPS - 820 Cutting Test in milling]



**Cutting Conditions : V=150m/min, f=0.1mm/rev, d=3.0mm, wet,
W.P=SCM435, GBA43L200**

[HIPS-820 Cutting Test Result]



[HIPS-820 Cutting Test Result]

