EHWA

EHWA DIAMOND INDUSTRIAL CO., LTD.

Oversea Marketing : Sundus Trading Company

U.S.A Distributor : Semiconductor Technology America., Inc

Vision 21

Ehwa's vision is to be the 21st century's customer satisfaction leader in

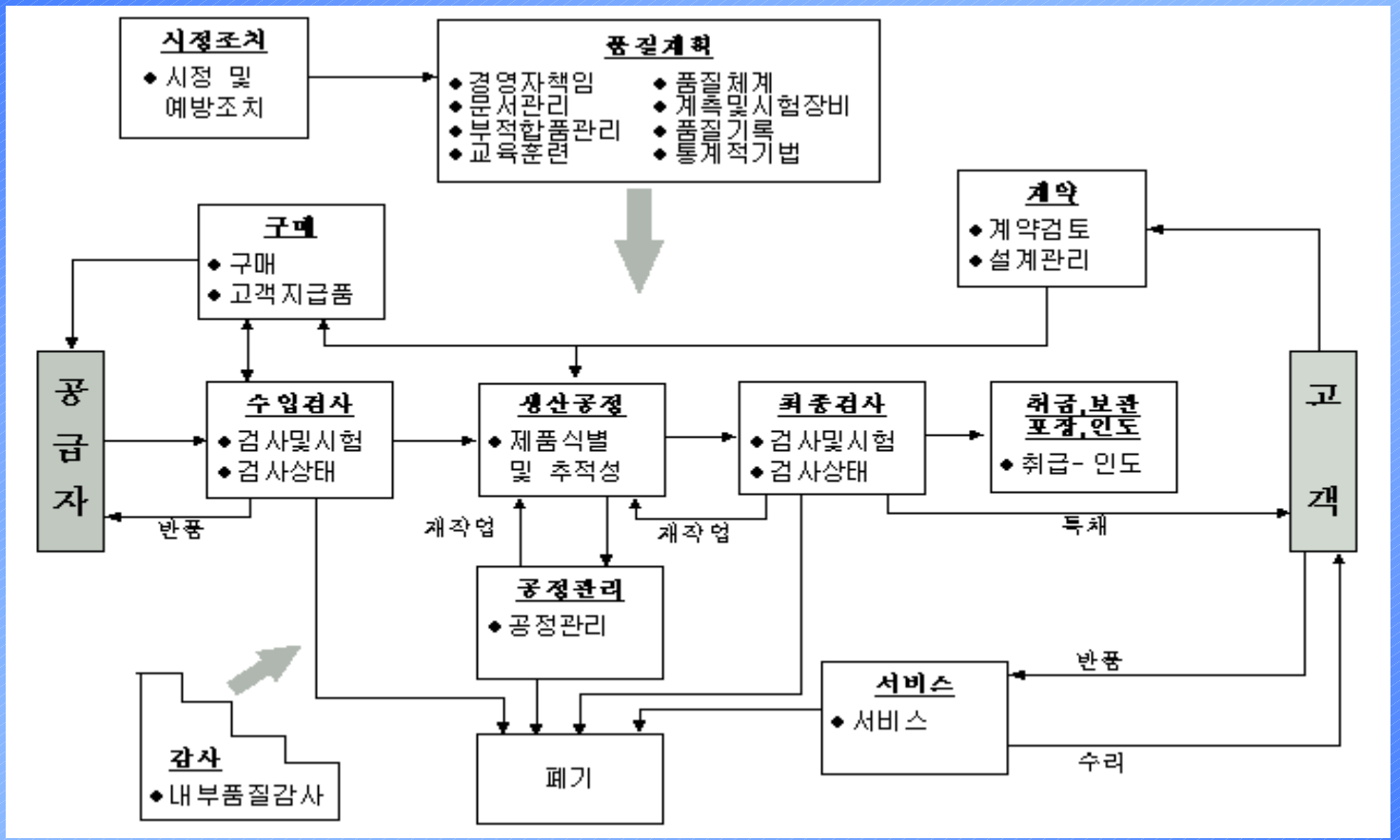
- Product Quality
- Service
- Innovation and Technology
- Trading and Education

Providing our customer with a competition advantage in the market

Company Profile

1975. 01	EHWA Diamond Ind. Co., LTD. was established in Youngdungpo, Seoul Started to manufacture and sell diamond tools for stone.
1976. 04	Started to manufacture and sell diamond Core Bits and Reaming Shells for drilling.
1977. 03	Started to manufacture and sell diamond grinding wheels.
1977. 03	Started to Manufacture and sell diamond grinding wheels.
1985. 04	Moved its plant form Seoul to Osan.
1988. 07	Set up a R&D laboratory.
1990. 10	Established technical ties with Osaka Diamond Co. of Japan for the production of Rotary Dresser and precision Electroplated tools.
1992. 04	Company products were designated as “world class” products by Ministry of Commerce and Industry.
1993. 01	Set up a China factory and a Suhchun factory.
11	Acquisited ISO9001 certification for export tools.
1994. 05	Awarded IR52 CHANG, YOUNG SIL prize for new developed product, Diamond Wire Saw.
1995. 11	Received U.S. $50 Million Export Tower an the Meritorious Exporter Tower at the Trade Day Celebration. (Presidential Citation)
1996. 07	Designated as Best Quality Management Enterprise in Kyungi-do Province.
1997. 01	Designated as Best Labor-Management Cooperation Enterprise.
1998. 11	Awarded the golden prize for the product quality at the 1st WBA competition(Korea Management Association Consultants)
1999. 07	Awarded the diamond prize for the production process at the 2nd WBA competition
2000. 05	Awarded the first prize in the 24th productivity competition (Presidential Citation)(Korea Productivity Center.)

Quality Management



ISO 9001 •••••

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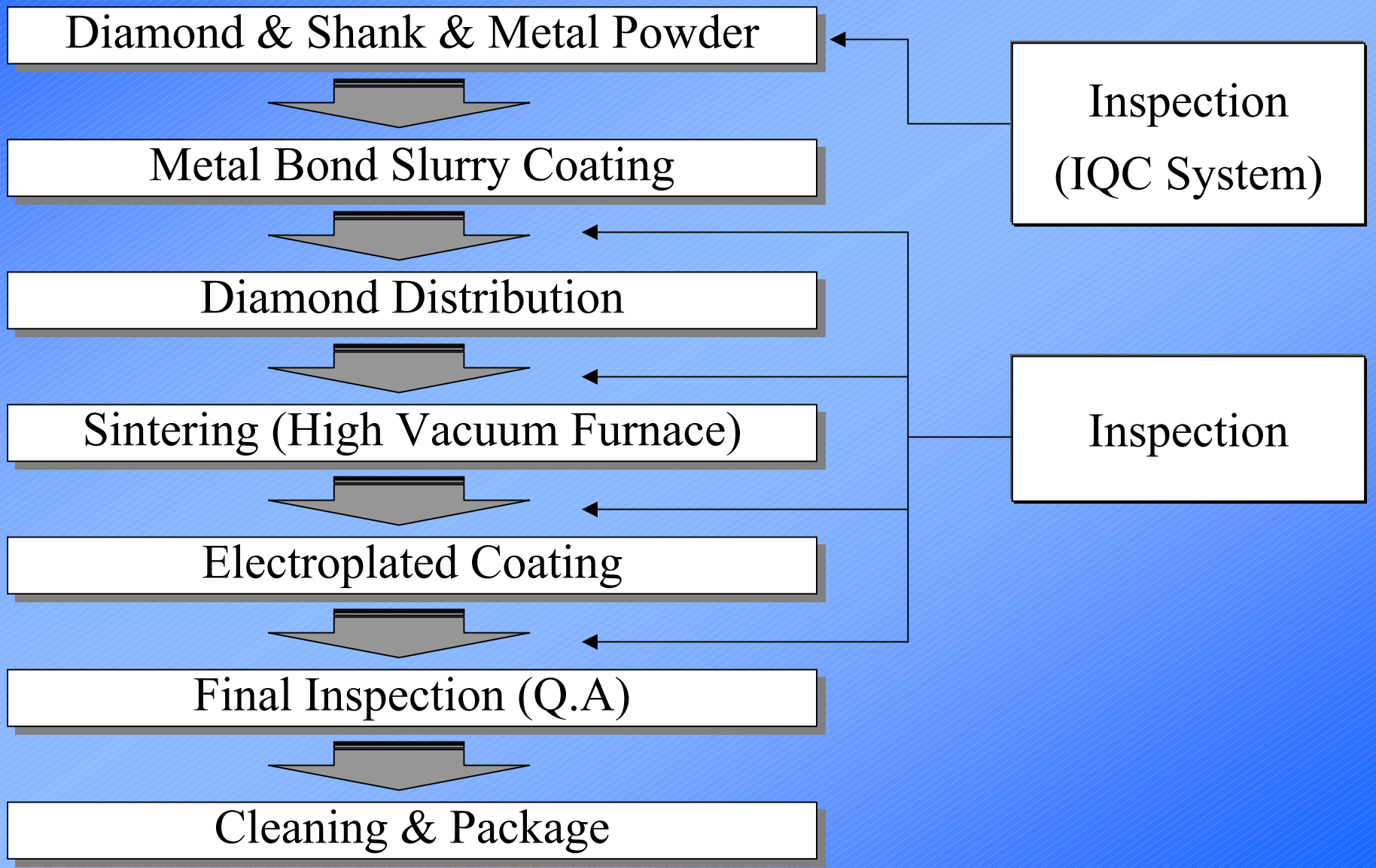
PROCESS FLOW CHART



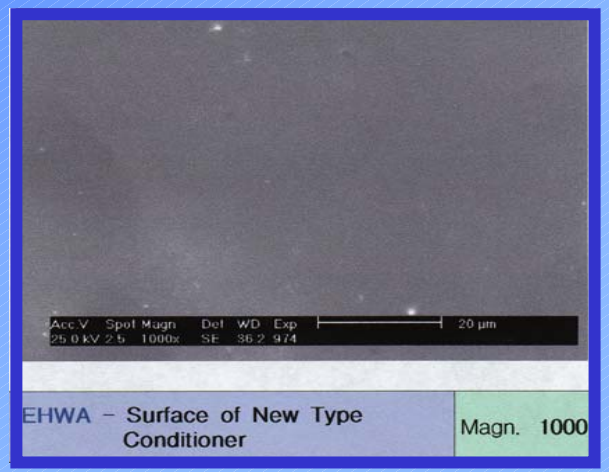
SPECIFICATION APPROVAL FLOW CHART

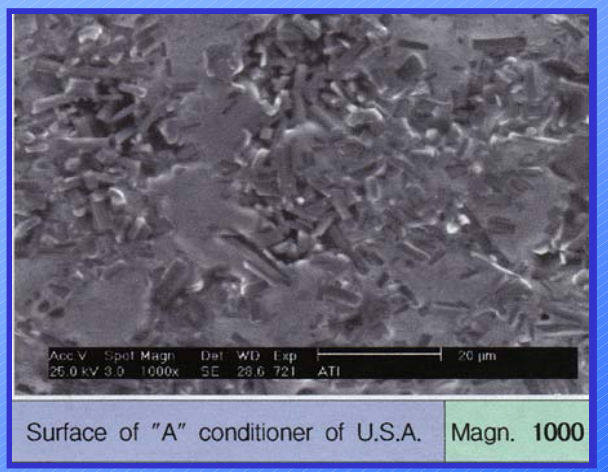
CHARACTERISTICS

- Removal of contamination due to the metal extraction

  : Double metal layer restrains the development of *micro scratch* preventing the metal particle from being extracted from surface

- Morphology of lower surface





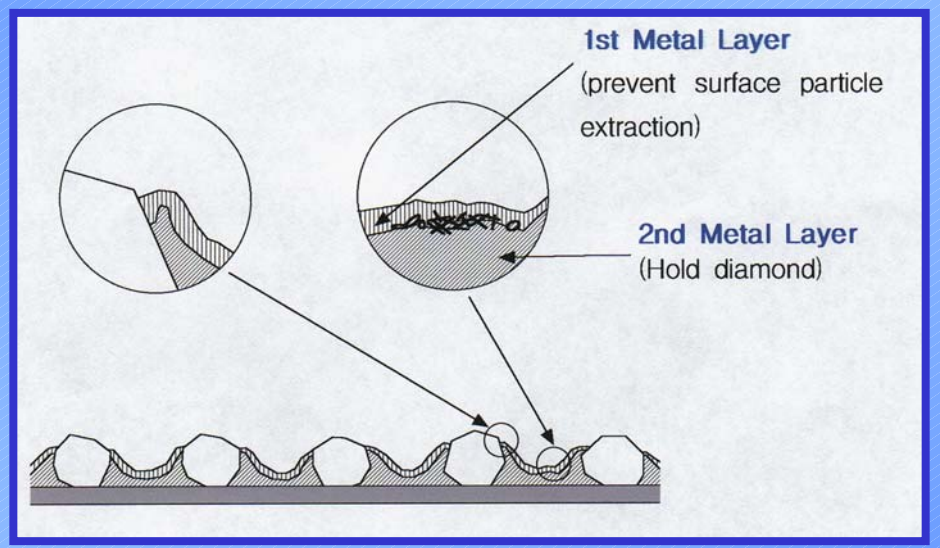
CHARACTERISTICS

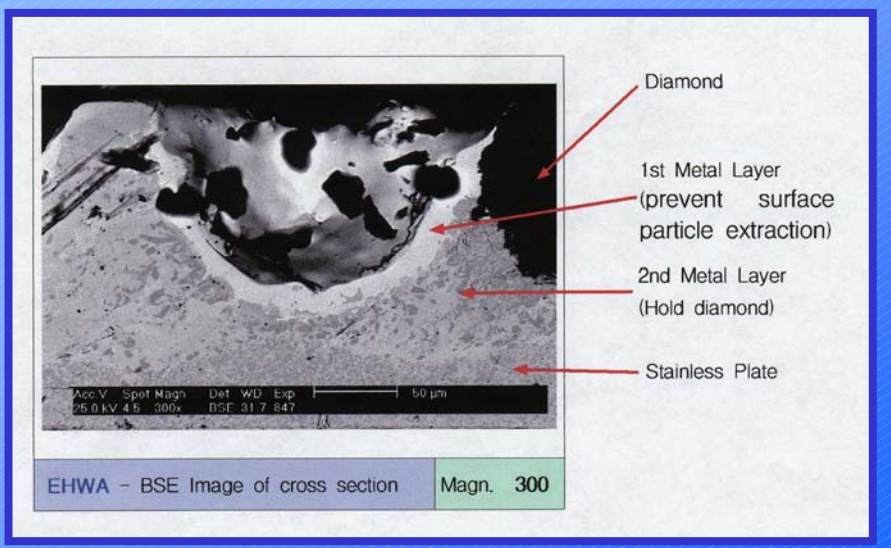
- Schematic diagram cross section of new conditioner

(EHWA Patent Peding)

- 1st Layer restrains the micro scratch by filling the chink of metal surface where the particles can easily come off.

- 2nd Layer made with conventional MSL process guarantees excellent holding force of diamond, longer life time and a chip pocket that allows the slurry to be easily discharged.





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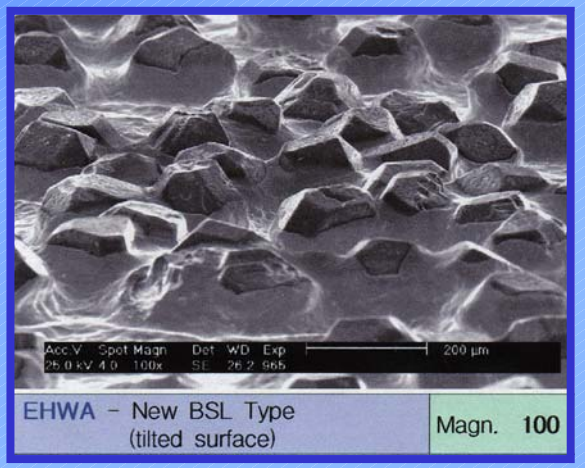
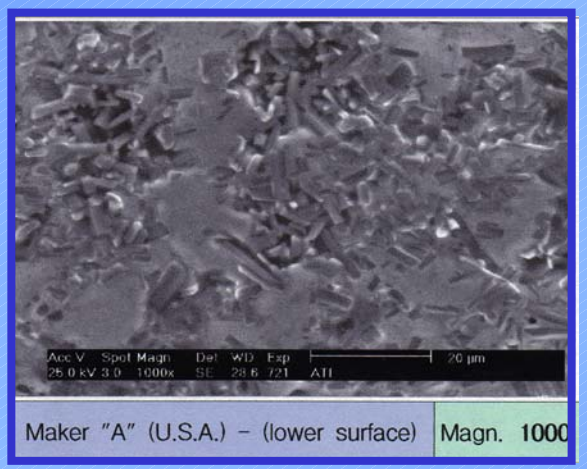
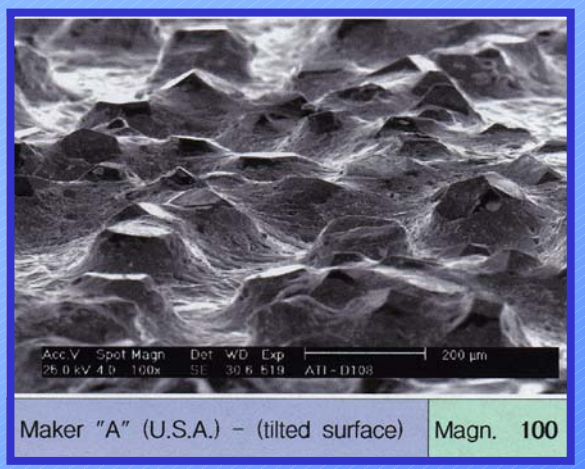
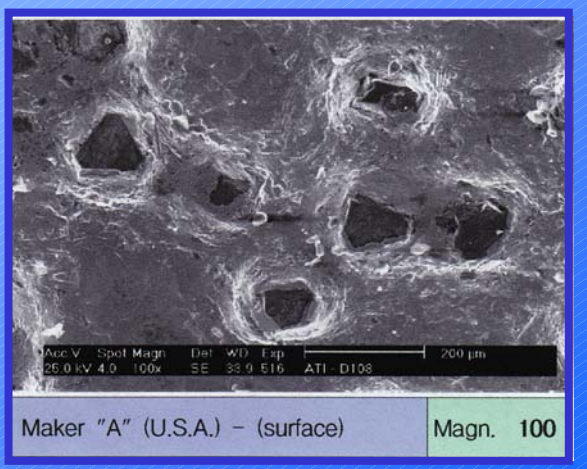
- Comparison of New type conditioner



< EWHA Diamond New BSL Type >

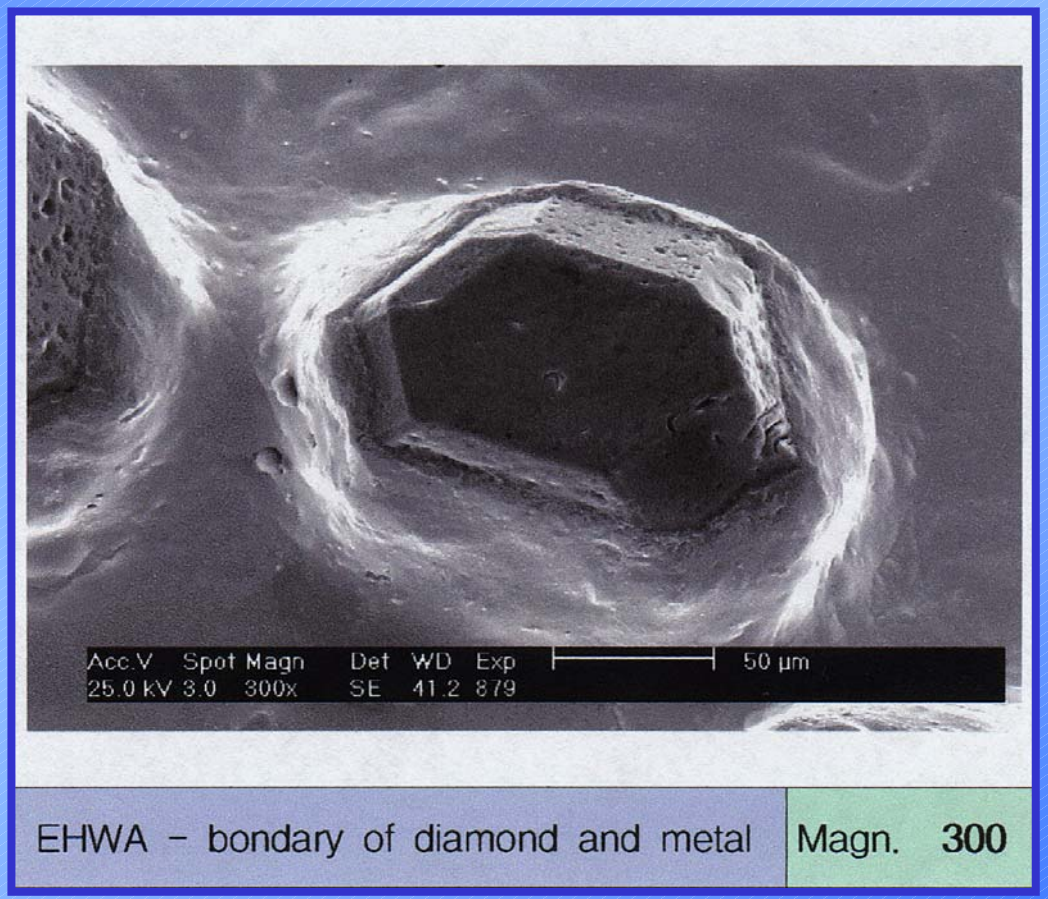






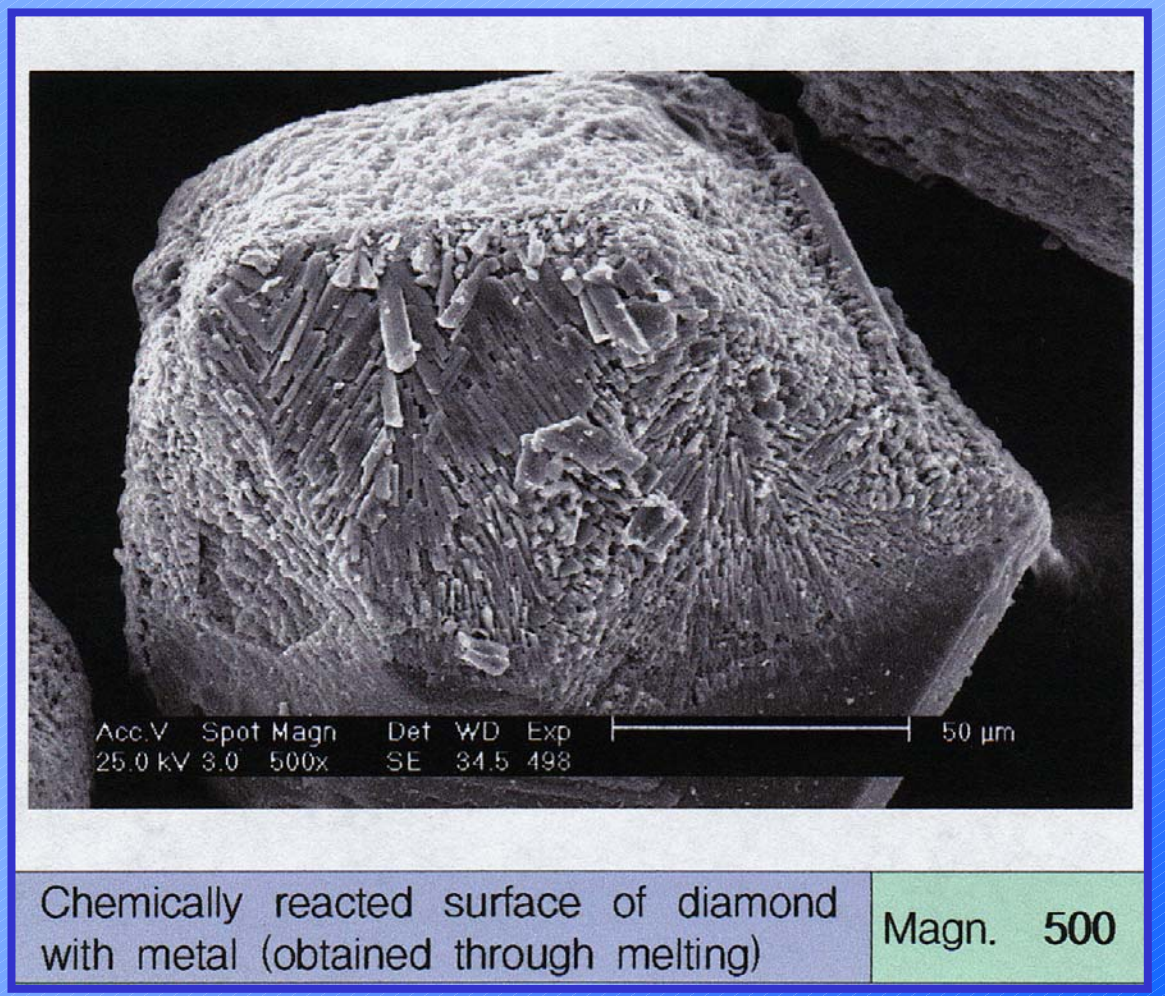
< Maker “A” (U.S.A) >

- **Nice finishing of boundary of diamond and metal bond**



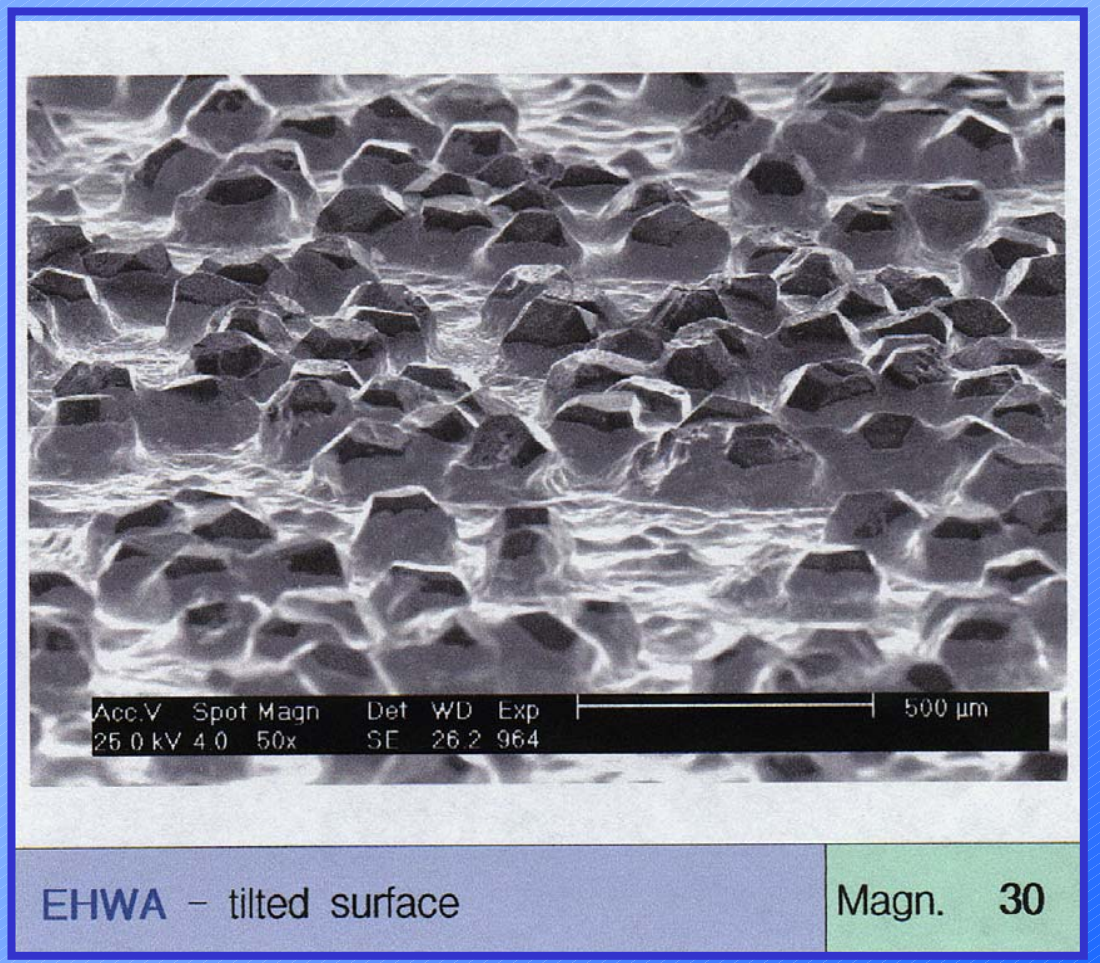
- **Excellent Holding Force**

  : As metal chemically reacts with the diamond and forms carbide at the interface the, holding force is very strong. As a result, the danger of diamond extraction is very small.



- **Formation of Chip Pocket**

  : Because the chip pocket (drainage path of grinding residuum) between diamonds let the slurry move easily, a higher removal rate is obtained



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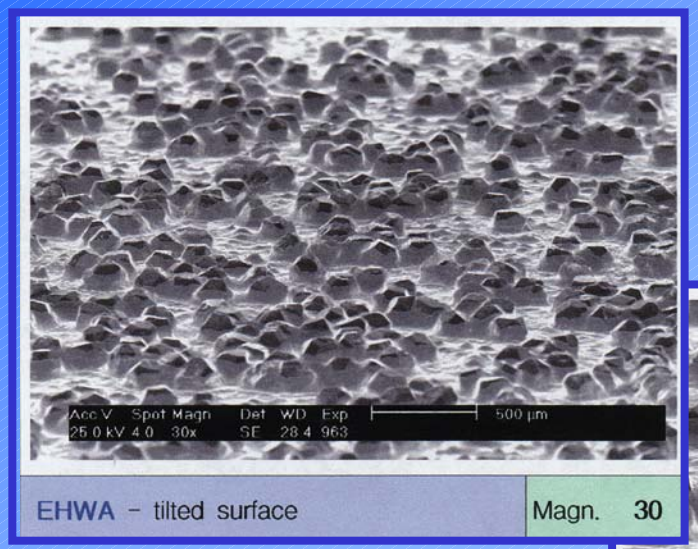
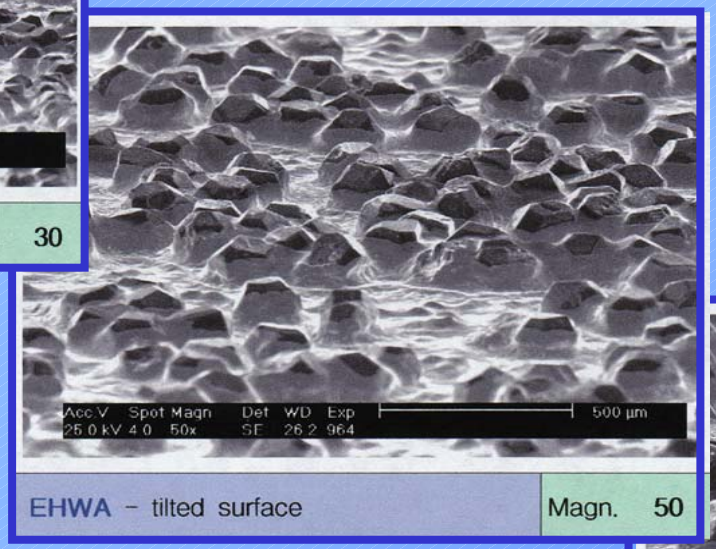
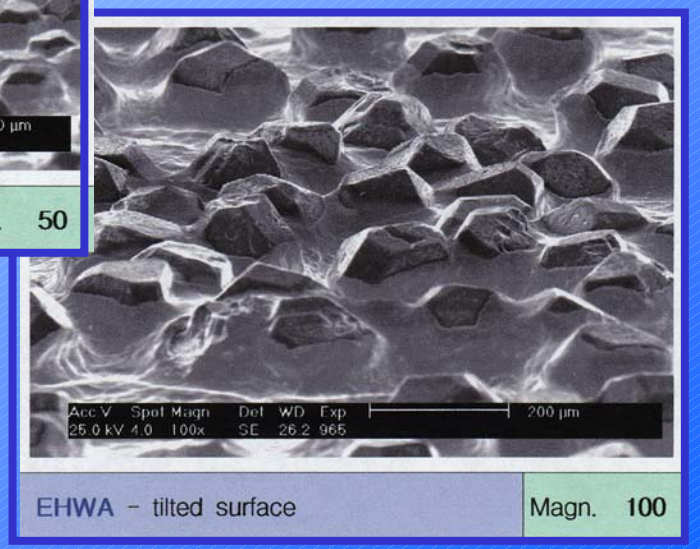
- **Related merits of each type**

Contents	Electroplated Type	Conventional MSL Type (ex, Maker "a")	EHA New BSL TYPE Conditioner
Stability (Dia. Holding force)	Bad	Good	Good
Life Time	Bad	Good	Good
Chip Pocket (drainage path)	Bad	Good	Good
Grinding efficiency	Medium	Good	Good
Restriction of micro scratch	Good	Bad	Good

- **Morphology of tilted surface**







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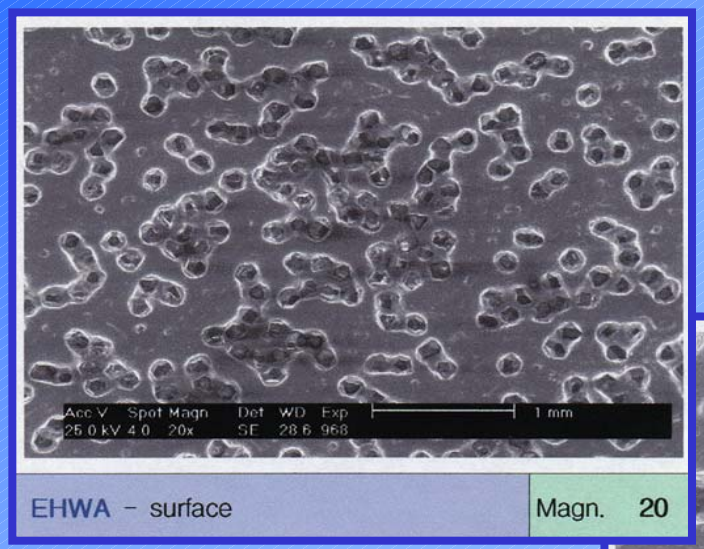
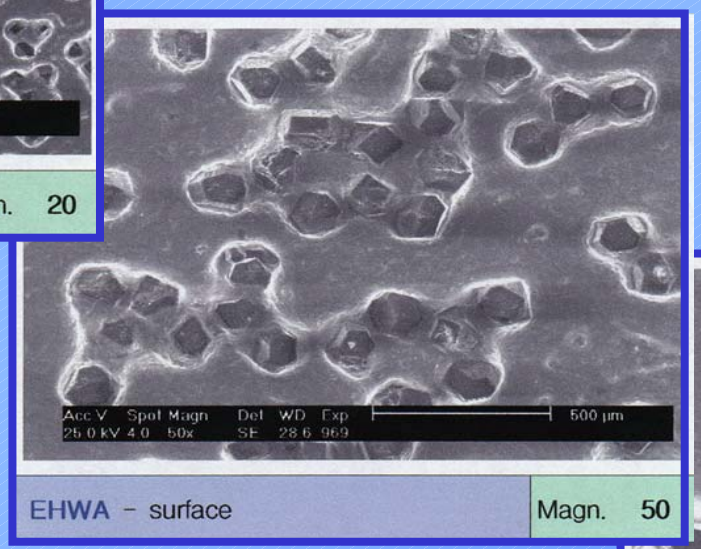
- **Morphology of surface**



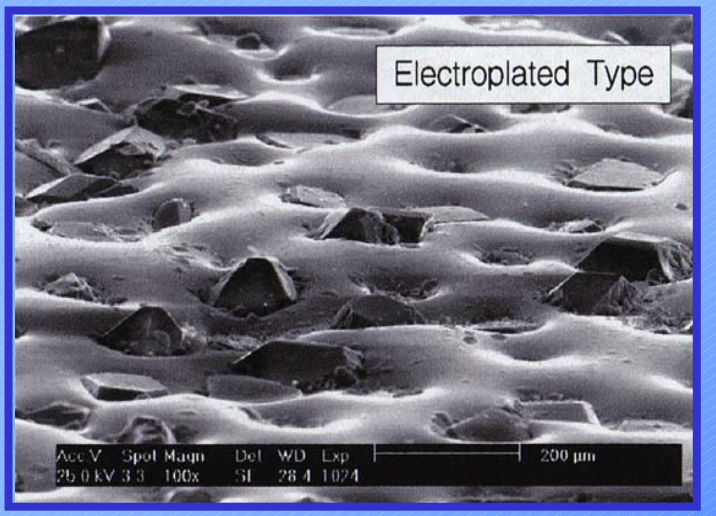


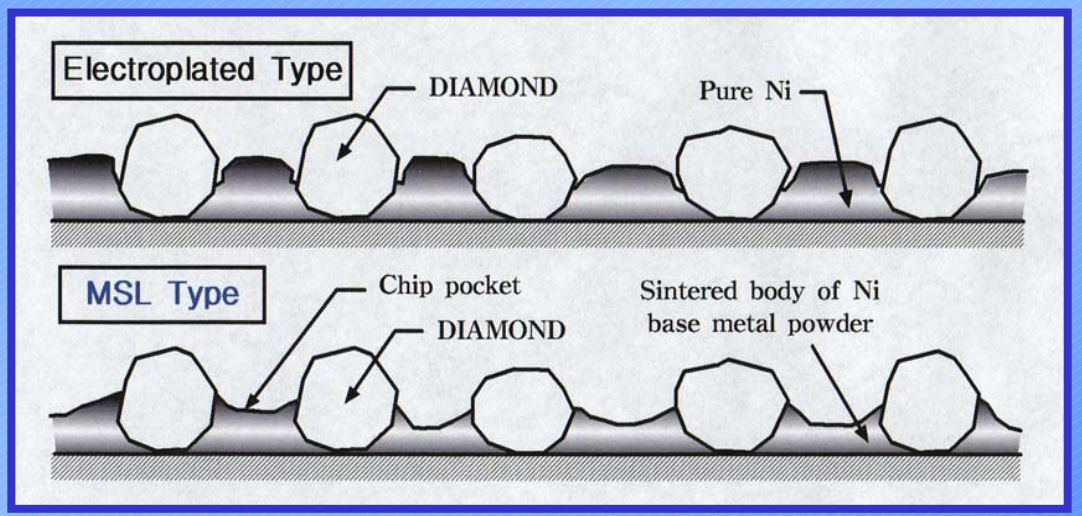
Relate merits of each type

Contents	Bad ← → Good					Remarks
Diamond Holding Force	Electroplated Type (ex, TBW, Marshall)	<	Conventional MSL Type (ex, TI(ABT)	< =	EHWA New BSL Type Conditioner	Holding force between Diamond and Metal Bond
Stability (Dia.Extraction)						
Life Time						
Chip pocket formation (drainage of residuum)	Electroplated Type	<	Conventional MSL Type	=	EHWA New BSL Type Conditioner	Existence of Chip Pocket
Grinding efficiency (removal rate)	Electroplated Type	<	Conventional MSL Type	=	EHWA New BSL Type Conditioner	
Restriction of micro scratch	Conventional MSL Type	<	Electroplated Type	=	EHWA New BSL Type Conditioner	
Roughness of surface	Conventional MSL Type	<	Electroplated Type	=	EHWA New BSL Type Conditioner	

Difference of manufacturing process between Electroplated type and MSL type

contents	Electroplated Type	MSL Type
Diamond fixing type	Mechanical contact	Chemical reaction
Shape of diamond	Irregular	Regular
Grade of diamond	Low	High
Chip Pocket	Do not exist	Exist
Controllability of diamond exposure	restricted	Easy





CERTICICATE

TÜV CERT

CERTIFICATE

The TÜV CERT Certification Body of TÜV Anlagentechnik GmbH

TÜV Rheinland/Berlin-Brandenburg Group of Companies

certifies in accordance with TÜV CERT procedures that

Ehwa Diamond Industrial Co., Ltd.
520-2, Won Dong, Osan-Shi, Kyunggi-Do,
Republic of Korea

has established and applies a quality system for
Design, Development and Manufacture of Diamond Cutting and Grinding Tools

An audit was performed, Report No. **3285**

Proof has been furnished that the requirements according to

DIN EN ISO 9001:1994

are fulfilled.

The certificate is valid until **2002 November**

Certificate Registration No. **09 100 3285**

TÜV Rheinland/ Berlin-Brandenburg

TÜV

TÜV CERT Certification Body of TÜV Anlagentechnik GmbH

Cologne, 1999-12-16

First certification 1993

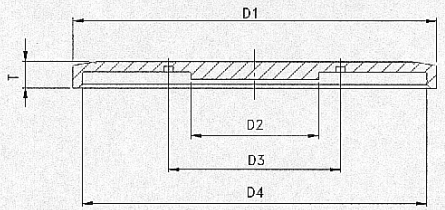
Conditioner Certification

CONDITIONER CERTIFICATION

※ This is the Confidential Document of EHWA Diamond Ind. Co., Ltd.

Unit : mm

MODEL No.		Production No.	
CHARACTERISTIC	Flatness	Abrasive Count / ㎠	Abrasive Exposure	Appearance
SPEC.	30 ㎛	60~250 ea	30~80 ㎛	Pass
PASS / FAIL	Pass	Pass	Pass	
CHARACTERISTIC	D1	D2	D3	D4
SPEC.	108	$37.9^{\pm 0.2}$	$51^{\pm 0.2}$	$102^{\pm 0.2}$
VALUE				



Specification			
DATE		INSPECTOR	

EHWA DIAMOND INDUSTRIAL CO. LTD.

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Inspection System of CMP Pad Conditioner

	Characteristic		Spec. (Analyser)	Remark
IQC	Metal Powder	Impurity	SEM & EDS	Ni Base
	Diamond	Diamond Grade, Size Distribution	Diamond tester, SEM, Size Analyser	G.E. MBG Grade (620,640,660,680)
	Shank	Dimension, Flatness	Vernier Calipers, Micrometer, Profile Measuring Machine	(Stainless Body)
Procedure	Flatness		0.030 mm	
	Diamond Count/Area		60 ~ 250 ea/cm²	Pattern or Non-Pattern Array (For #80 mesh)
	Surface Bond Strength		Hv 500 ± 50	
	Diamond Exposure		0.030 ~ 0.080 mm	For #80 mesh
	Appearance		Optics, Visual	