Prime Water

PRIME WATER PRODUCTS
5-ELECTRODES CELL FEATURES

New Larger

5

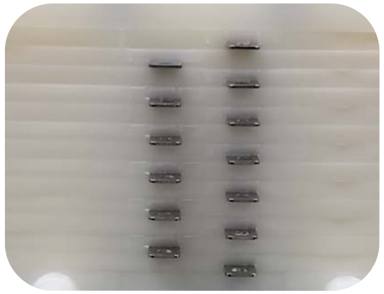
Platinum
Titanium Plates

New Larger Ultra Efficient
Multi-Level Electrolysis chambers

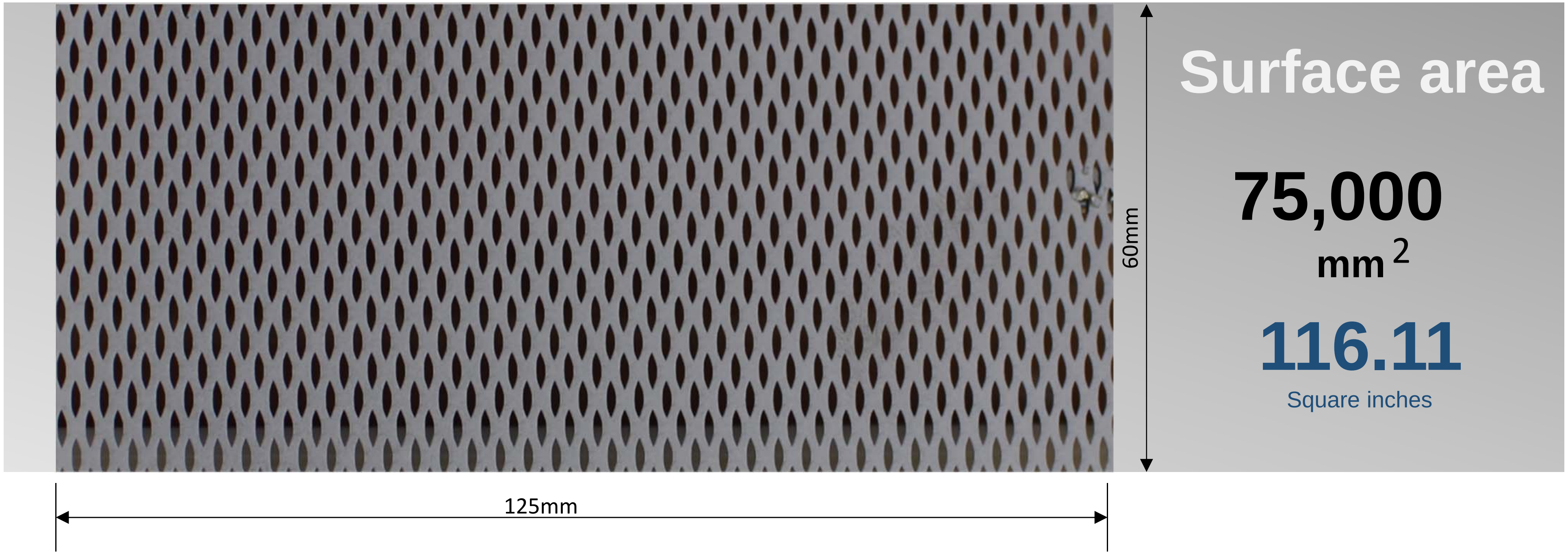
New Larger 5 Titanium/Platinum Plates

Prime Water Ionizers with Solid and Mesh plate delivers an electrical current to the water through an array of positively and negatively charged Platinum coated Titanium plates.
The more the water passes in and out of the Titanium Mesh system and the greater the electrical charge to the water (especially when powered by the newer SMPS power systems) - the higher the pH (potential of Hydrogen) and the ORP (Oxidation-Reduction Potential) of the drinking water.

A mesh plate uses the same principle as the slotted plate, but improves upon it by providing cross-channeling to more evenly direct electron flow. The applied current more evenly saturates the plate, increasing the effective delivery of electrical current to create better alteration in your water. Mesh plate technology is just like the best irrigation systems



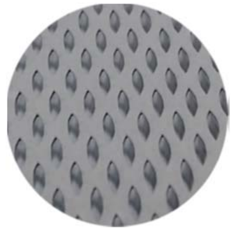
Multi-Level



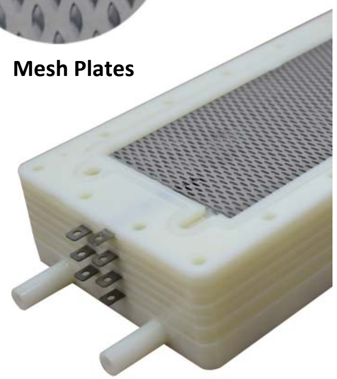
75,000mm & 116.11 square inches

High Performance
Smart & Larger Surface Area Electrode

Prime Water Ionizers have larger 5 platinum titanium electrodes.
With its 5 Mesh large platinum titanium plates, it is up for the job at task producing the highest -ORP for prolongs amounts of use making it the best residential water ionizer out there.



Mesh Plates



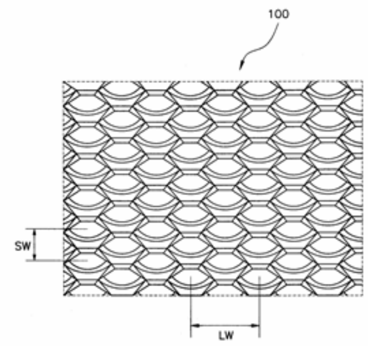
Max Large

MESH

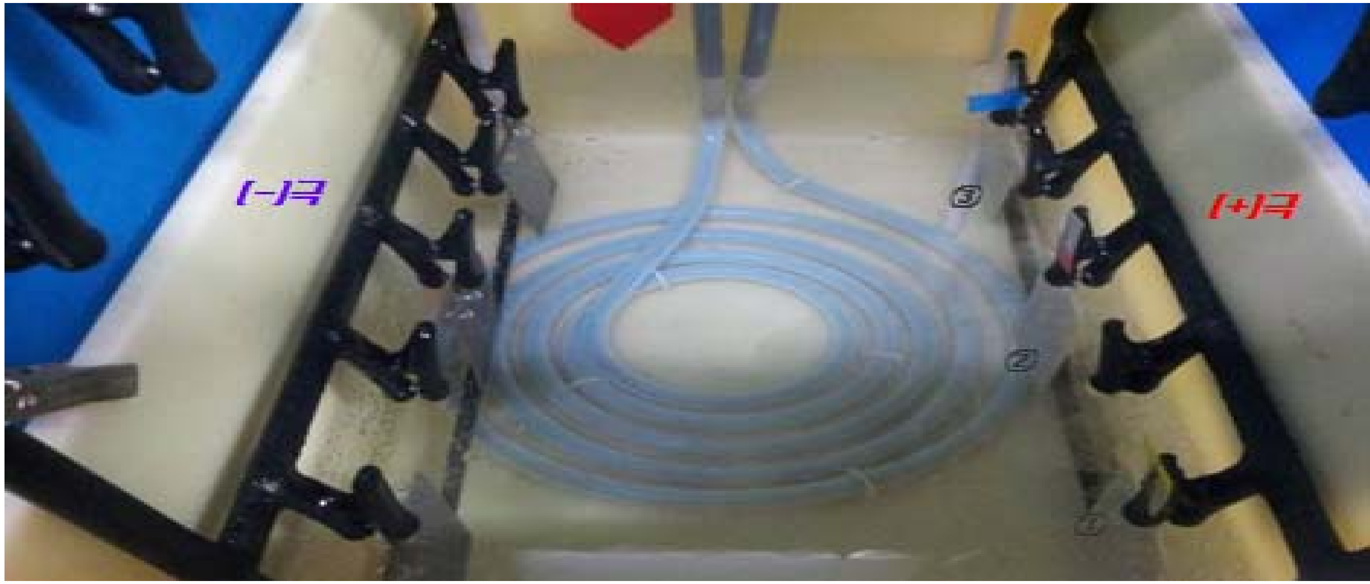
Platinum Titanium Plates

Comparison of Solid Plate Electrodes and Mesh Electrodes

According to a study (Patent Publication 2003-0093171) in order for mesh titanium electrode plates to obtain an increase of 30% in active electrode area, the mesh structure should be LW0.1-2mm SW1.0-4.5mm .



The principle of edge conductivity is well known as electrons travel better and faster along edges rather than flat surface.
Mesh plate increase edge surface area, and it conducts and distributes electrons more uniformly and more efficiently rather than flat surfaces. As the entire surface area of mesh plates act as energy distribution point, there is no concentration of energy to cause burning effect or oxidative corrosion as in solid plates. Hence it is more effective in maintaining pH, ORP and activated Hydrogen. Besides, it is evident that mesh technology creates better water flow.



Prime Water Electrodes

DURABILITY

PRIME WATER ELECTRODES
Internal Durability Test Conducted

According to the analysis of the test results:
The tests were performed according to standard test methodology.
After each test was taken according to the different flow rates and comparing the analysis to a range of standards, even when not using the standard amounts, water cell life was ten years

- TEST conditions: H_2SO_4 0.5mol / l on the electrolyte solution 40 ℃, 2A / d ㎠ is current, 240hr electrolysis
- TEST Quantity: 3 varieties [Heat 1, Heat 2 times, Brazing products]
- TEST Date: 1/10 08:00
- TEST End Date: 20.01 08:00
- TEST progress results: 240hr after all

n=	1 Pt 1 =	0.22
n=	2 Pt 1 =	0.18
n=	3 Pt 1 =	0.20
n=	4 Pt 1 =	0.19
n=	5 Pt 1 =	0.14
n=	6 Pt 1 =	0.18
n=	7 Pt 1 =	0.21
n=	8 Pt 1 =	0.20
n=	9 Pt 1 =	0.21

Mean	0.190
Standard deviation	0.024
C.O.V. (%)	12.85
Range	0.08
Number of readings	9.0
Min. reading	0.14
Max. reading	0.14
Measuring time	0.22
Operatior:	20

Electrolytic Performance
Water Cell Electrode Performance
Test Results

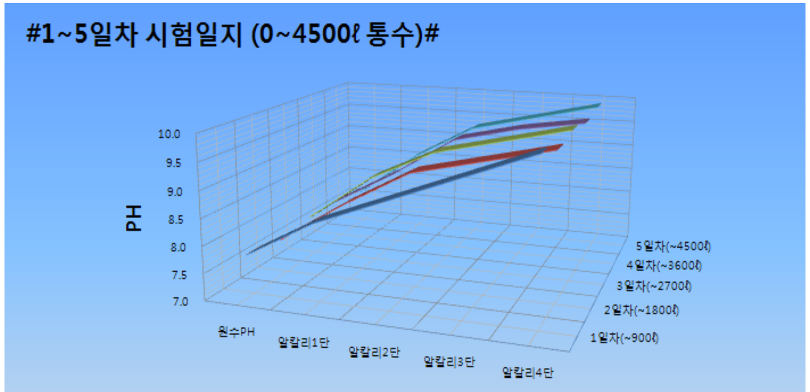
Prime Water Electrodes

Performance

NO	Data	Descriptions	Comments
1	Product	Electrolytic Alkaline Water Generator (Prime 1301 – 13Plates)	
2	Test Period	April 11, 2014 to March 27, 2011 (40 days)	Daily Journal kept
3	Total Discharge	36,000 liters (Four people using 10 L per day on average: about 10 years worth)	Standard - 360 day year
4	Basis of usage life	About 10 years	
5	Water pressure	2.5 Kg/㎠	Water pressure from unit
6	Water flow rate	2.5 l/min	Alkaline water:1.5l/min Acidic water:1.0l/min
7	This method	Every day five samples were taken to test pH and the average was taken down.	
8	This started cleaning method	The machine was used for 30 min. to produce alkaline water after which the machine went into cleaning cycle then tested.	
9	Testing machine	pH-meter Model:HM-20P Jejo Co.: TOA(Japan)	

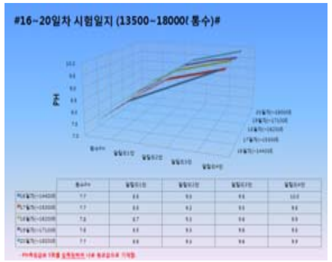
Prime Water Electrodes

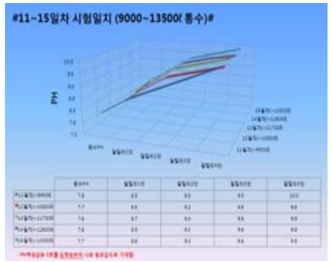
Performance

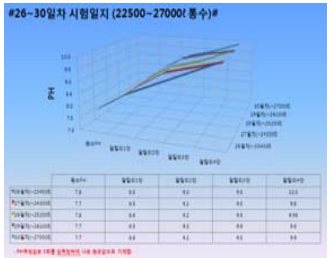


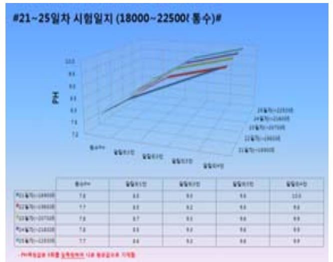
	원수PH	알칼리1단	알칼리2단	알칼리3단	알칼리4단
1일차(~900ℓ)	7.8	8.5	9.0	9.5	10.0
2일차(~1800ℓ)	7.7	8.5	9.2	9.5	9.8
3일차(~2700ℓ)	7.8	8.7	9.3	9.6	9.9
4일차(~3600ℓ)	7.8	8.5	9.3	9.6	9.8
5일차(~4500ℓ)	7.7	8.6	9.3	9.6	9.9

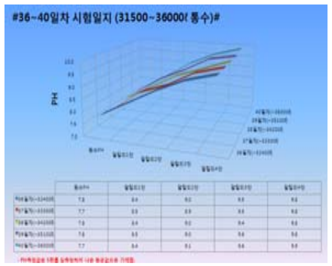
- PH측정값은 5회를 실측정하여 나온 평균값으로 기재함.

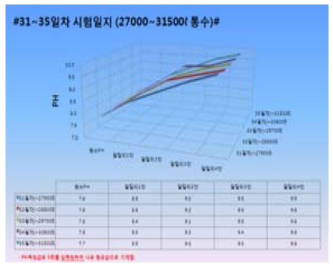












Electrolytic Performance
40 days test result

Prime Water Electrodes

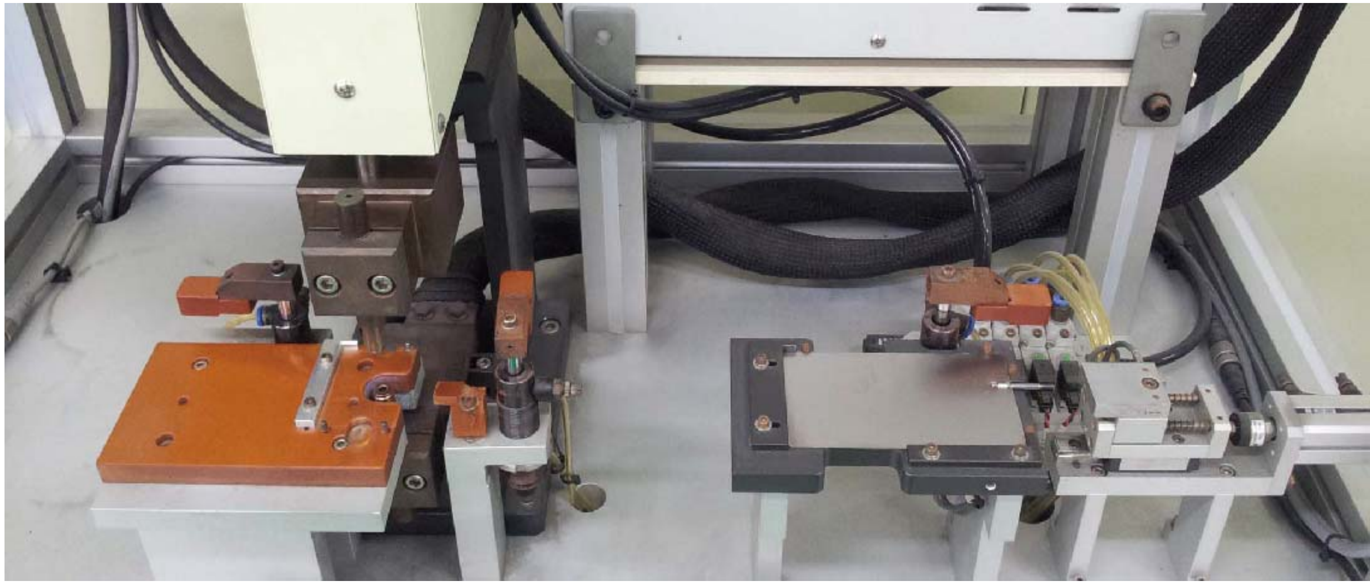
SAND BLASTING

Plates Sand Blasting Technology

Automatic Blast Guns & Traverse Moving System

In order to improve the performance of the Anode Oxide Coating between the metal and the substrate is closely a very important factor.
Therefore, the Anode Oxide Coating system, it must be strictly the substrate pretreatment, such as degreasing, sand blasting and etching, etc.

Roughened titanium substrate including blasting and etching in two steps, wherein spray Sand is caused by Macro rough.
Generally, considered: Blasting can remove the surface oxide film of titanium, exposing fresh Surfaces; Sand rough will make the surface of the compressive stress in the state is conducive surface coating and the substrate binding.



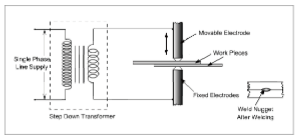
SPOT WELDING

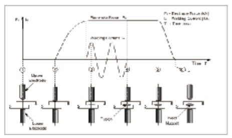
Spot Welding Technology

Spot Welding

In resistance spot welding, two or more sheets of metal are held between electrodes through which welding current is supplied for a defined time while force is exerted on the work pieces.
The principle is illustrated in the figure on the left below.

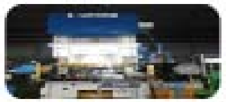
The welding cycle starts with the upper electrode moving and contacting the work pieces resting on lower electrode which is stationary. The work pieces are held under pressure and only then heavy current is passed between the electrodes for a preset time. The area of contact between metals is raised to welding temperature due to the flow of current through the contact surfaces of the work pieces.
Pressure between the two electrodes squeezes the hot metal together thus completing the weld.
The weld nugget formed is allowed to cool under pressure and then pressure is released.
This total cycle is known as resistance spot welding cycle and is illustrated in the figure on the right below.





PRODUCTION

Plate Production Process (1/2)



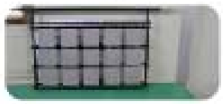
Press
Titanium shape processing in the press

Electrode machining
Electrode cutting and rolling process

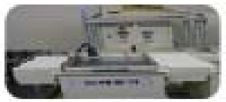
Washing
Removal of oil and grease from media and cut pieces

Spot Welding
Welding of the metal terminal to the electrode.

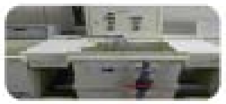
Sanding
Sand blasting process to improve plating adhesion



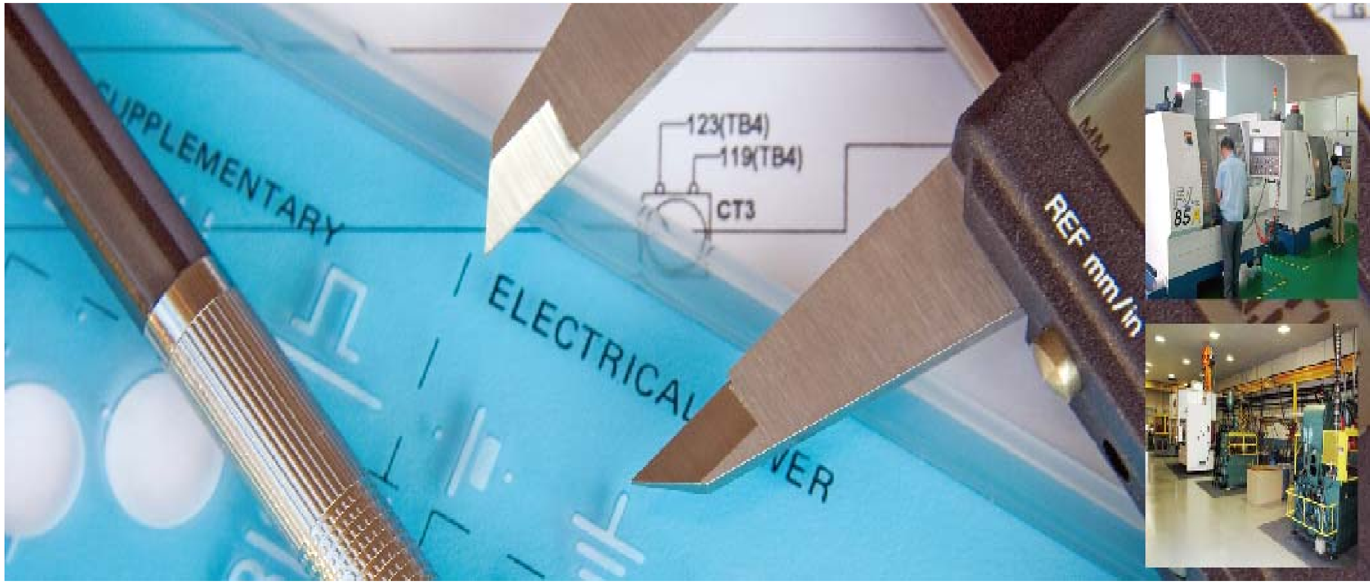
Racking
Titanium electrodes loaded onto plating jig



Skimmer
Removal of any surface grease or oil

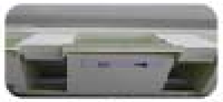


Etching
Removal of oxidation from titanium surface

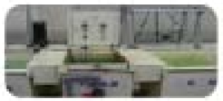


PRODUCTION

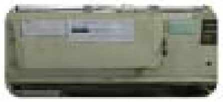
Plate Production Process (2/2)



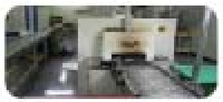
Etching
Removal of oxidation from titanium surface



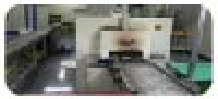
Activator
Surface of titanium activated to improve plating adhesion



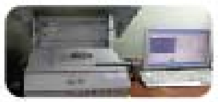
Platinum Plating
Titanium plated with platinum



Drying
Water is removed from the surface of the platinum



Heat Treatment
Heat treated in furnace to strengthen adhesion of Platinum to titanium.



Shipping Inspection
Reliability and appearance Inspection / Certificate of Inspection issued

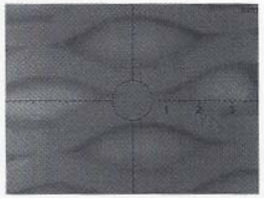
Packing/Shipping
Packing/Shipping

PLATING MEASURING

Platinum Plating Measuring Technology

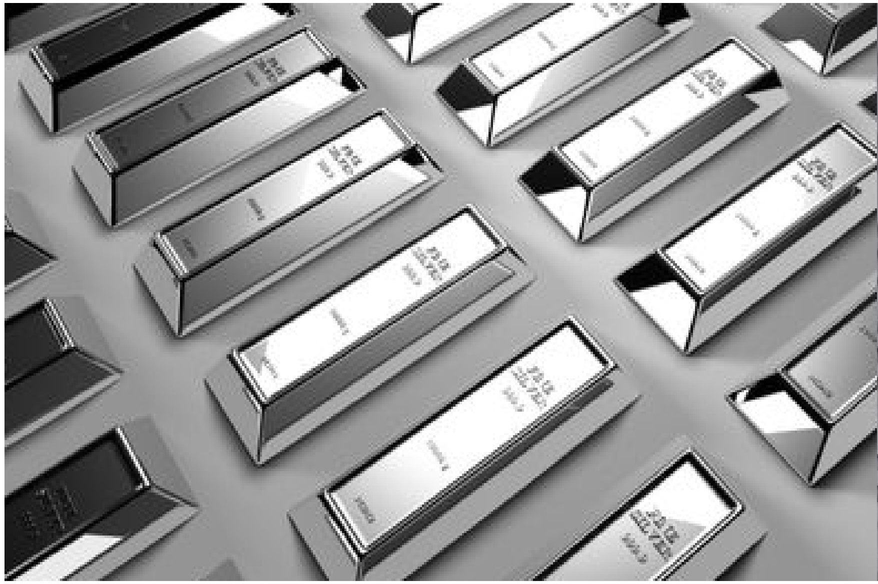
Energy dispersive x-ray fluorescence analysis is a method for measuring the thickness of coatings and for analyzing materials.
It can be used for the qualitative and quantitative determination of the elemental composition of a material sample as well as for measuring coatings and coating systems. The analysis uses methods that are well established in both laboratory and industrial environments and can be readily applied using modern equipment.

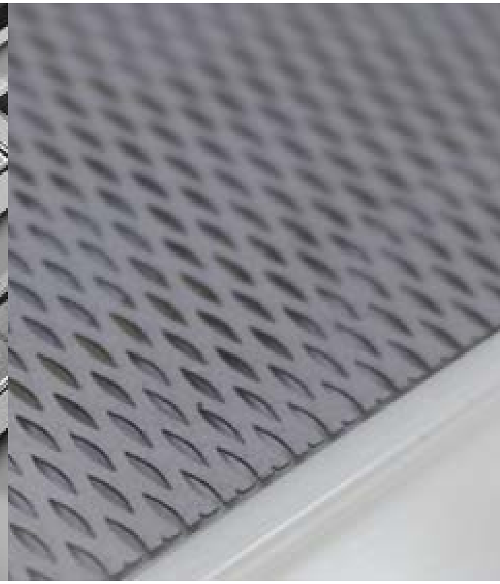
Platinum plating measuring equipment offers some outstanding advantages.
It covers virtually all technically relevant elements and works non-destructively and with no contact with the sample.
Measuring times range in the seconds and takes rarely longer than one minute to complete.
Measurements can be completed quickly and usually without extensive sample preparation. With our measuring equipment, it is possible to measure both thickness and chemical composition of homogeneous materials and coatings. Even traces of harmful substances can be detected in a very wide range of samples.



n=	1	Pt 1 =	0.158 um
n=	2	Pt 1 =	0.162 um
n=	3	Pt 1 =	0.163 um
n=	4	Pt 1 =	0.168 um
n=	5	Pt 1 =	0.169 um

Mean	0.164 um
Standard deviation	0.005 um
C.O.V. (%)	2.91
Range	0.012 um
Number of readings	5
Min. reading	0.158 um
Max. reading	0.169 um
Measuring time	5 sec





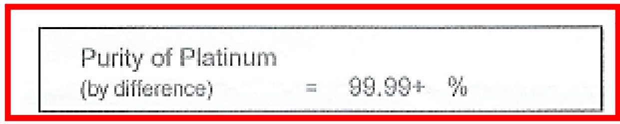
PURITY PLATINUM

99.99%

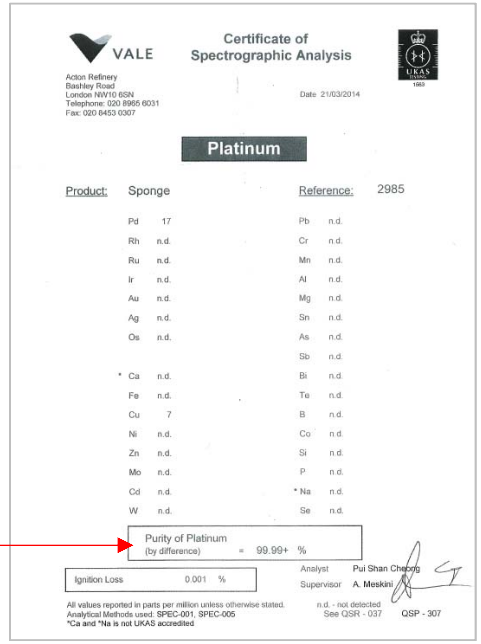
Purity of Platinum 99.99%

Platinum has great value.
Platinum is among the finest, purest and rarest precious metals on earth.

This type of electrode is ideal for the production of chlorine because its long life, high efficiency and stability at low voltages allows it to reduce running costs.
Dimensionally stable Titanium anode are the state of art as anodes for a wide range of electrochemical applications.
The excellent stability of titanium against surface and pitting corrosion make it dimensionally stable permitting dramatic innovations in equipment design, operation conditions and energy consumptions of many electrolysis processes.
The application of coatings containing mixed metal oxides (MMO) such as RuO_2, IrO_2, TiO_2 and Ta_2O_5 allows it to reduce remarkably the over potential for anodic chlorine and anodic oxygen evolution.
Additionally the excellent stability of the MMO coated titanium anode consequently do not contaminate the electrolysis system, improving the products purity and maintenance costs.
DSE (anodes) are generally used to produce chlorine in saline solution.



Purity of Platinum
(by difference) = 99.99+ %



VALE

Certificate of Spectrographic Analysis

Acton Refinery
Bashley Road
London NW10 6SN
Telephone: 020 8965 6031
Fax: 020 8453 0307

UKAS TESTING 1563

Date 21/03/2014

Platinum

Product: Sponge

Reference: 2985

Pd	17	Pb	n.d.
Rh	n.d.	Cr	n.d.
Ru	n.d.	Mn	n.d.
Ir	n.d.	Al	n.d.
Au	n.d.	Mg	n.d.
Ag	n.d.	Sn	n.d.
Os	n.d.	As	n.d.
		Sb	n.d.
* Ca	n.d.	Bi	n.d.
Fe	n.d.	Te	n.d.
Cu	7	B	n.d.
Ni	n.d.	Co	n.d.
Zn	n.d.	Si	n.d.
Mo	n.d.	P	n.d.
Cd	n.d.	* Na	n.d.
W	n.d.	Se	n.d.

Purity of Platinum
(by difference) = 99.99+ %

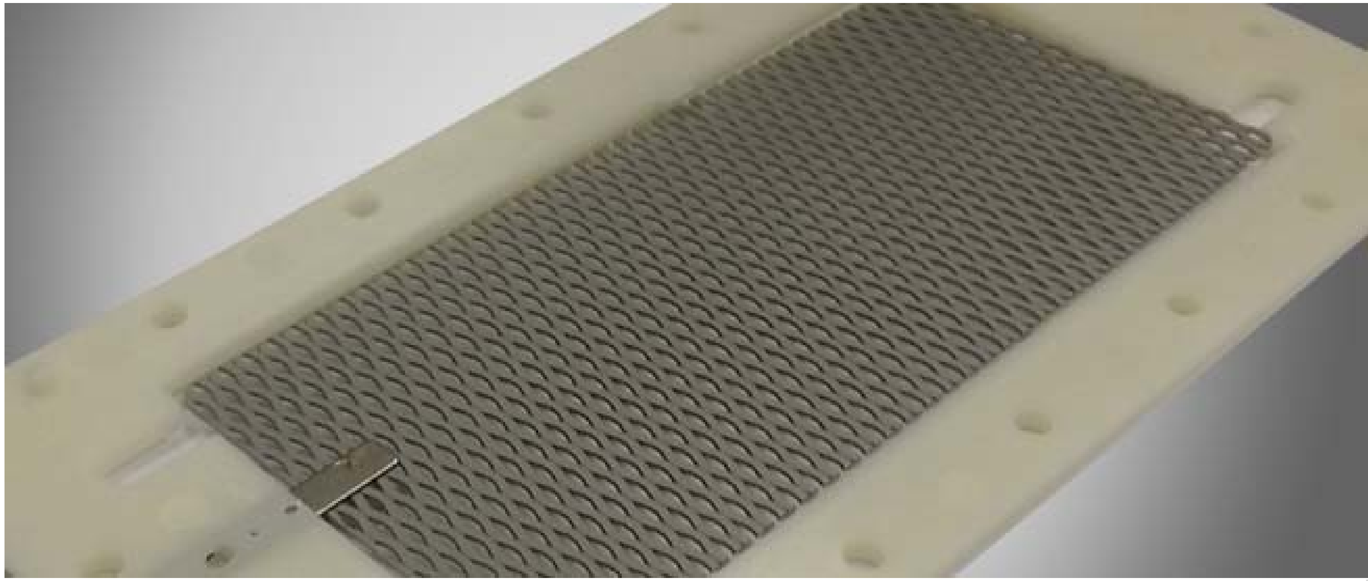
Ignition Loss 0.001 %

Analyst Pui Shan Cheong
Supervisor A. Meskini

All values reported in parts per million unless otherwise stated.
Analytical Methods used: SPEC-001, SPEC-005
*Ca and *Na is not UKAS accredited

n.d. - not detected
See QSR - 037

QSP - 307



CLEAN & SAFETY

Safety Platinum Titanium

Sample : Metal Specimen (Pt/Ti Plate)

TEST RESULTS

TEST ITEM	UNIT	SAMPLE	RESULT	TEST METHOD
H	%	-	0.003	KS D 2532 : 2007
O	%	-	0.06	KS D 2533 : 2009
N	%	-	0.002	KS D 2530 : 2007
C	%	-	0.02	KS D 6000 : 2004
Fe	%	-	0.04	KS D 6000 : 2004(ICP)
Ti	%	-	remainder	KS D 6000 : 2004
Pt	%	-	0.86	KS D 6000 : 2004(ICP)

USAGE : QUALITY CONTROL

NOTE : 1. The test results on this test report are only limited to the samples and sample names provided by the customer and KTR do not guarantee the quality of all products of the customer.
2. This test report shall not be used for public relation, advertisement, lawsuit and any other purposes outside the scope of its defined usage.

KTR(Korea Testing & Research Institute) Test Report

SGS

Test Report No. F690101/LF-CTSAYAA13-27633 Issued Date: 2013. 06. 12 Page 2 of 4

Sample No. : AYAA13-27633.001
Sample Description : Pt electrode
Item No./Part No. : N/A
Materials : Titanium

Heavy Metals

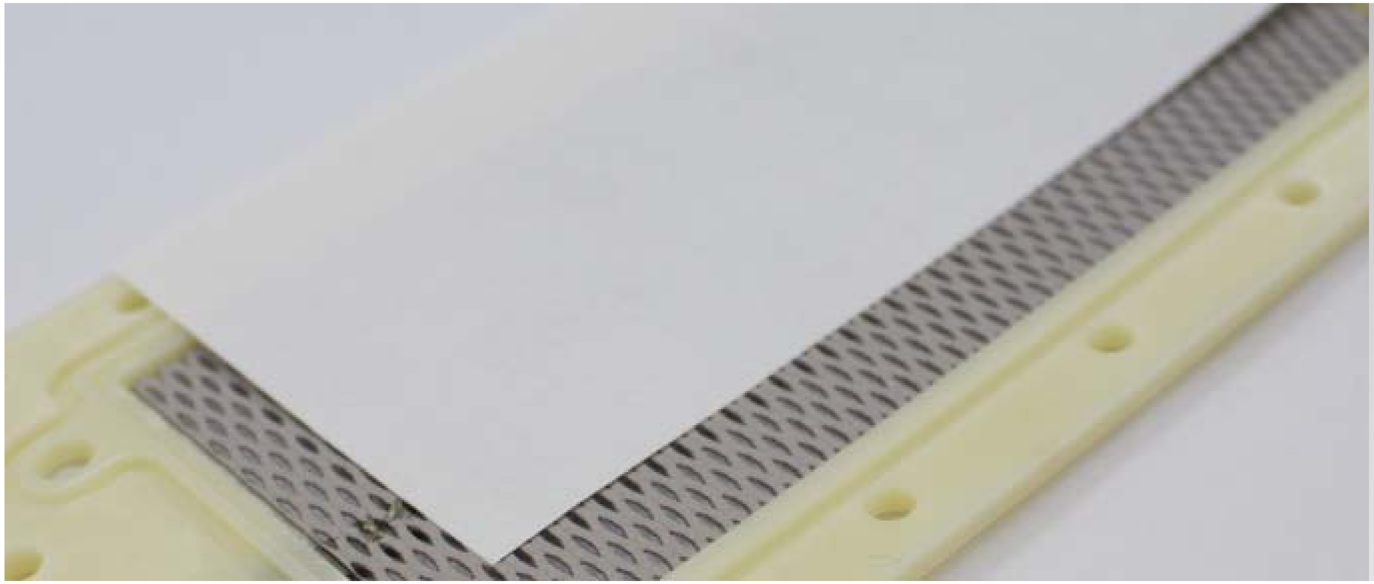
Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, ICP	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, ICP	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, ICP	2	N.D.
Hexavalent Chromium (Cr VI) By boiling water extraction*	**	With reference to IEC 62321:2008	-	Negative

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Decabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.

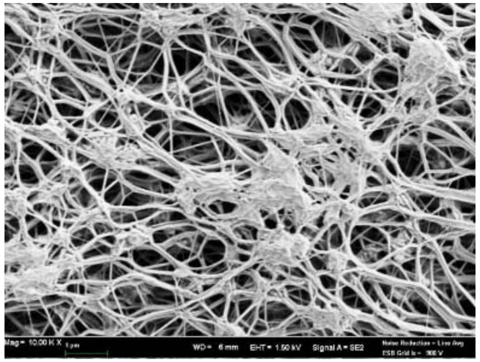
NOTE:
(1) N.D. = Not detected.(<MDL)
(2) mg/kg = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) Negative = Undetectable / Positive = Detectable
(6) ** = Qualitative analysis (No Unit)
(7) * = Boiling-water-extraction:
Negative = Absence of CrVI coating
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

SGS Test Report



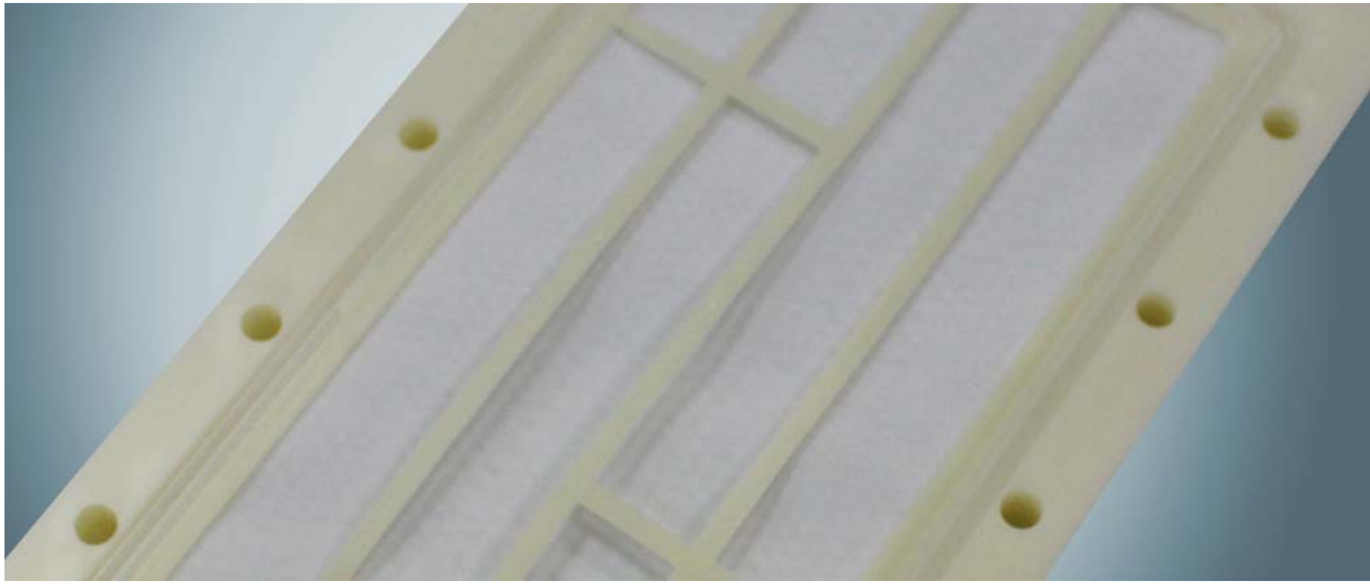
ION EXCHANGE MEMBRANE

Ion Exchange Membrane



First, PTFE offers excellent chemical resistance.
POREFLON is chemically stable and does not degrade when exposed to virtually all chemicals.
Second, POREFLON is extremely tough and thus has a long service life.
Third, POREFLON is highly permeable to water thanks to its high porosity.

The Illustration of POREFLON shows the microscopic structure of our POREFLON products.
The white area is made of PTFE fibers. The black parts represent voids, or pores.
The ratio of pore spaces to the total volume is referred to as the porosity.
Without strength limitations and other restrictions, the porosity of POREFLON can be increased up to around 90%.
A higher porosity implies less resistance to the passage of water and translates into higher water permeability.



PTEF

Safety Ion Exchange Membrane

Test Result(s)

PART NAME No.1 : WHITE SHEET

Test Item(s)	Unit	Method	MDL	Result No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4: 2013 and performed by ICP-AES.	2	n.d.
Hexavalent Chromium Cr(VI)	mg/kg	With reference to IEC 62321: 2008 and performed by UV-VIS.	2	n.d.

SGS

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SUMITOMO ELECTRIC FINE POLYMER, INC.
1-950 ASASHIRONISHI KUMATORI-CHO SENNAN-GUN, OSAKA, JAPAN

Test Result(s)

PART NAME No.1 : WHITE SHEET

Test Item(s)	Unit	Method	MDL	Result No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321-5: 2013 and performed by ICP-AES.	2	n.d.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4: 2013 and performed by ICP-AES.	2	n.d.
Hexavalent Chromium Cr(VI)	mg/kg	With reference to IEC 62321: 2008 and performed by UV-VIS.	2	n.d.
Sum of PBBs	mg/kg	With reference to IEC 62321-6: 2015 and performed by GC/MS.	-	n.d.
Monobromobiphenyl	mg/kg		5	n.d.
Dibromobiphenyl	mg/kg		5	n.d.
Tribromobiphenyl	mg/kg		5	n.d.
Tetrabromobiphenyl	mg/kg		5	n.d.
Pentabromobiphenyl	mg/kg		5	n.d.
Hexabromobiphenyl	mg/kg		5	n.d.
Heptabromobiphenyl	mg/kg		5	n.d.
Octabromobiphenyl	mg/kg		5	n.d.
Nonabromobiphenyl	mg/kg		5	n.d.
Decabromobiphenyl	mg/kg		5	n.d.
Sum of PBDEs	mg/kg		-	n.d.
Monobromodiphenyl ether	mg/kg		5	n.d.
Dibromodiphenyl ether	mg/kg		5	n.d.
Tribromodiphenyl ether	mg/kg		5	n.d.
Tetrabromodiphenyl ether	mg/kg		5	n.d.
Pentabromodiphenyl ether	mg/kg		5	n.d.
Hexabromodiphenyl ether	mg/kg		5	n.d.
Heptabromodiphenyl ether	mg/kg		5	n.d.
Octabromodiphenyl ether	mg/kg		5	n.d.
Nonabromodiphenyl ether	mg/kg		5	n.d.
Decabromodiphenyl ether	mg/kg		5	n.d.

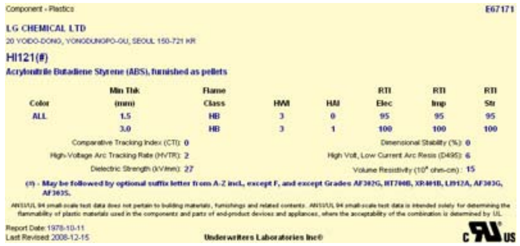
SAFETY PLASTIC

Safety Plastic Materials

Heavy Metals

Unit : mg/kg

Test Items	Results	MDL	Test Method
Pb	ND	5	ICP/OES, IEC 62321-5:2013
Cd	ND	2	
Cr	ND	2	
Hg	ND	1	Direct Mercury Analyzer, IEC 62321-4:2013



Component - Plastics E67171

LG CHEMICAL LTD
20 YOIDO-DONG, YONGDUNGPO-GU, SEOUL 150-721 KR

HI121(#)
Acrylonitrile Butadiene Styrene (ABS), furnished as pellets

Color	Min Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
ALL	1.5	HB	3	0	95	95	95
	3.0	HB	3	1	100	100	100

Comparative Tracking Index (CTI): 0
High-Voltage Arc Tracking Rate (HVTR): 2
Dielectric Strength (kV/mm): 27
Dimensional Stability (%): 0
High Volt, Low Current Arc Resis (D495): 6
Volume Resistivity (10^x ohm-cm): 15

(#) - May be followed by optional suffix letter from A-Z incl., except F, and except Grades AF302G, HT700B, XR401B, LI912A, AF303G, AF303S.

ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 1978-10-11
Last Revised: 2008-12-15
Underwriters Laboratories Inc®