

VALQUA ARMOR®



ARMOR CRYSTAL®



SPOQ ARMOR®



HYREC ARMOR™



ULTIC ARMOR™



LABE ARMOR™



FLID ARMOR®

	ARMOR CRYSTAL®	SPOQ ARMOR®	HYREC ARMOR™	ULTIC ARMOR™	LABE ARMOR™	FLID ARMOR®
GRADE	Prevent Particle Contamination	Plasma Resistance	Heat & Plasma Resistance	Heat & Plasma Resistance	O ₂ Plasma Resistance	Special Low Surface Friction Performance
COLOR	Transparent/Clear	White	Deep Transparent Amber	Transparent Amber	Blue	Black
HARDNESS	60 or 70	71	58	70	75	73
FEATURES	<ul style="list-style-type: none"> - Lowest Outgassing - High Purity - Resistant to Plasma - Lowest Metallic Impurities 	<ul style="list-style-type: none"> - Excellent for Dynamic Applications - Low Adhesion - Resistant To Plasma - Low Metallic Impurities 	<ul style="list-style-type: none"> - Heat Resistant - Low Adhesion - Resistant to Plasma - Low Metallic Impurities 	<ul style="list-style-type: none"> - Excellent for Dynamic Applications - Heat Resistant - Low Adhesion - Resistant to Plasma - Low Metallic Impurities 	<ul style="list-style-type: none"> - Heat Resistant - Resistant to O₂ Plasma - Low Adhesion 	<ul style="list-style-type: none"> - Low Surface Friction - Abrasion Resistance - High Purity - Low Adhesion to Metal
MAIN APPLICATION	Dry Etcher Asher CVD Equipment	Dry Etcher/Asher Gate Valve CVD Equipment	Dry Etcher Asher CVD Equipment	Dry Etcher/Asher Gate Valve CVD Equipment	Asher	Carrier Belt Vacuum Equip. Gate Valve



Valqua America, Inc.

The remarkable advancement in the manufacturing technology of semiconductors in recent years has created a growing demand for high functionality in the peripheral materials. The performance of sealing materials varies depending on where they are applied. Demands are namely in their durability against plasma, heat and chemicals as well as in their low release of gas and contaminants.

Among the various semiconductor manufacturing equipment, the plasma etching, ashing and CVD systems used for dry processing are considered most damaging for sealing materials. Because this equipment is operated in the presence of oxidizing gas, such as fluorine and oxygen where plasma is generated, the sealing materials are degraded. The subsequent release of particles contaminates the system and shortens the life of the seals.

The contamination of the process stream decreases yields, resulting in a shortened seal life that increases the downtime of the equipment, which in turn affects the production cost. Furthermore, characterizing plasma density in the manufacturing process is creating demanding conditions for sealing materials, and is generating a stronger need to improve the durability of the sealing materials against plasma.

These demanding conditions have led Nippon Valqua Industries to create the **Armor Series** products. By means of a unique patented process, **Armor Series** products have enhanced physical properties which increase resistance to plasma and chemical attack without the introduction of contaminating metal fillers often used to modify the physical properties of elastomer materials.

			Armor Series					Competitive Materials			
			ARMOR CRYSTAL®	SPOQ ARMOR®	HYREC ARMOR™	ULTIC ARMOR™	LABE ARMOR™	FLID ARMOR®	General FFKM	General FKM	General Silicon-elastomer
Purity	Gas Emission		A	B	A	A	B	B	B	C	D
	Metal Impurities Contained		A	B	A	A	B	B	C	D	D
Resistance to Plasma	O2	Etch Rate	B	B	B	B	A	C	A	D	D*
		Number of Particles	A	A	A	A	B	C	B	D	B
	CF4	Etch Rate	B	B	B	B	C	C	B	C	D
		Number of Particles	A	A	A	A	C	C	B	D	D
Less Adhesion	To Metal		B	A	A	A	A	A	C	C	C
	To Quartz		C	A	A	A	B	C	C	C	D
Anticipated Resistance to Abrasion			B	B	C	B	B	A	B	B	D
Max Operating Temperature			~150°C	~200°C	~200°C	~200°C	~200°C	~200°C	~220°C	~200°C	~170°C

Legend: A = Excellent B = Good C = Fair D = Not recommended

* Extensive material degradation by plasma attack

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