

brush megasonic
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Table 1. Source of particle and the effects on the device characteristics

Possible sources	Effects of contaminants
Equipment, ambient, gas, DI water, chemicals	Low oxide breakdown Defect(pinhole, microvoid)

1. Brush scrubbing

brush 가
brush 가
brush
1970 brush가
scratch 가 PVA(Polyvinyl Alcohol) bursh가
PVA
가 가 PVA brush scrubbing 1 μ m
0.12 μ m
PVA 2~12 pH 가 NH₄OH가 PVA brush
HF

Figure 1. Ipec DSS(Double Sided Scrubber)

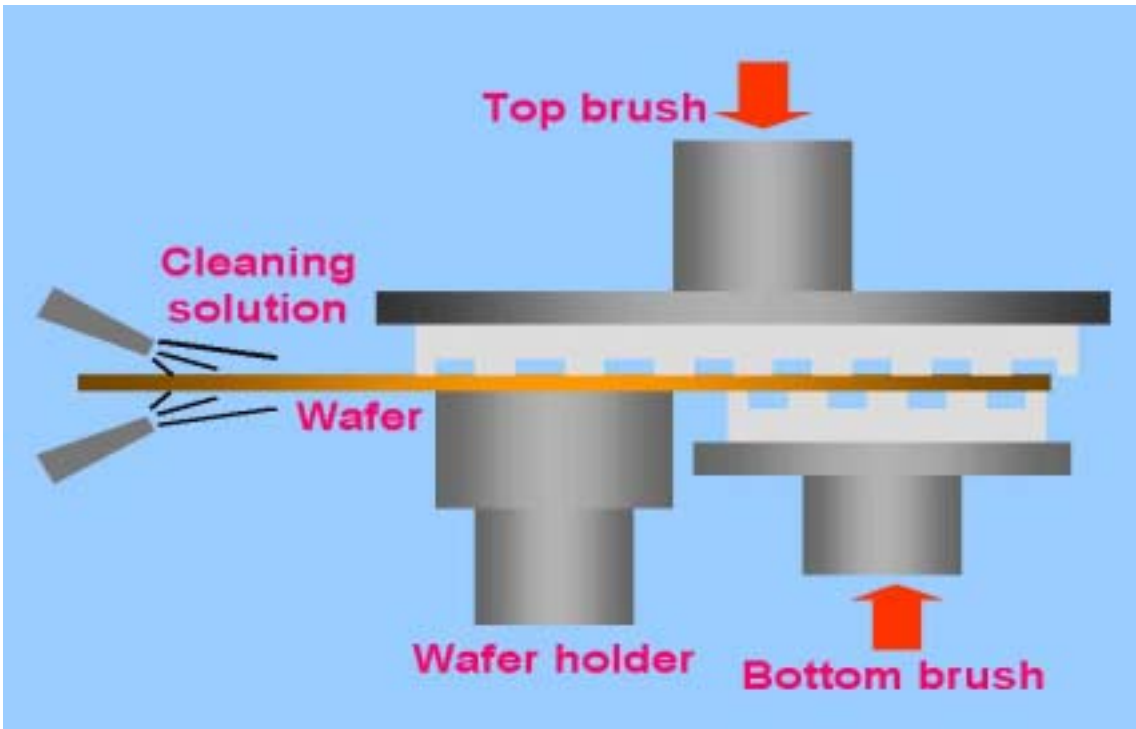


Fig. 1. Ipec DSS

2. Megasonics System

megasonic

. Megasonic

cavitation acoustic streaming radiation force

. Figure 2. megasonic mechanism

acoustic streaming

가 가 가 가

. Megasonic cleaning 가 acoustic boundary

layer가 hydrodynamic boundary layer

. megasonic cleaning boundary

가 . Figure 3. Verteq megasonic cleaner

cleaning mechanism

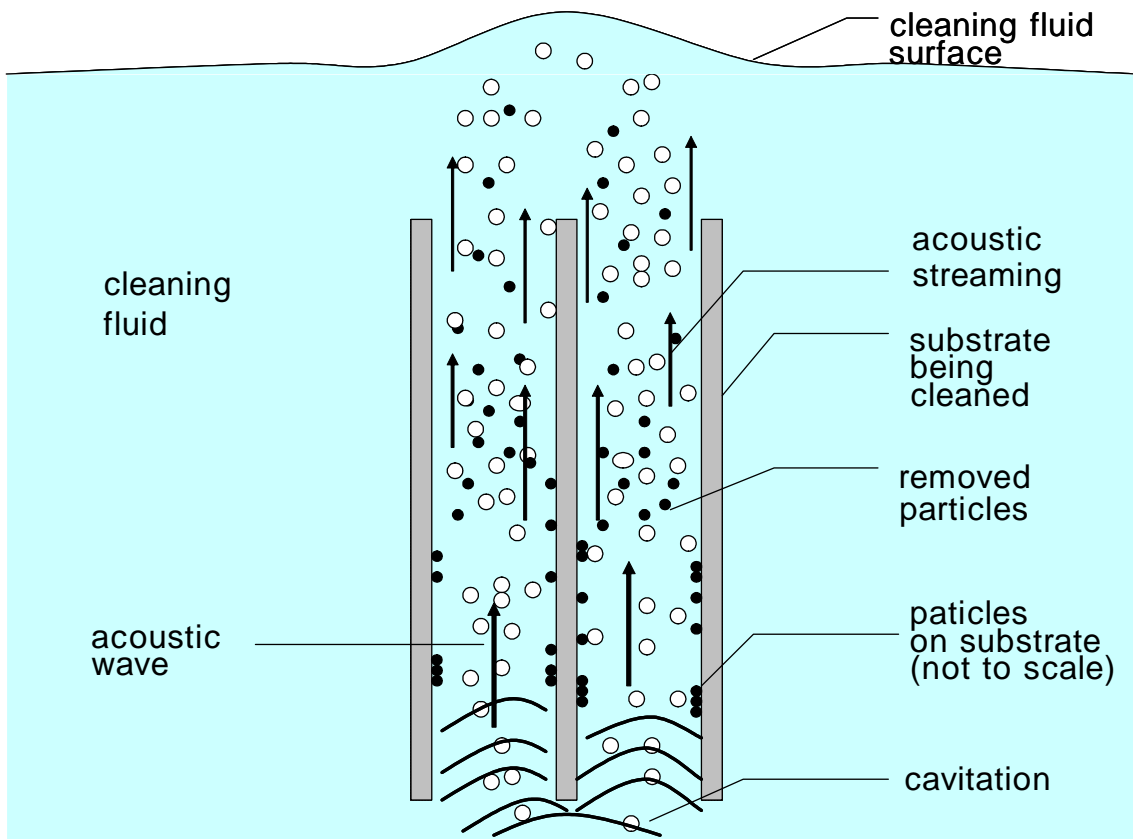


Fig. 2. Megasonic mechanism

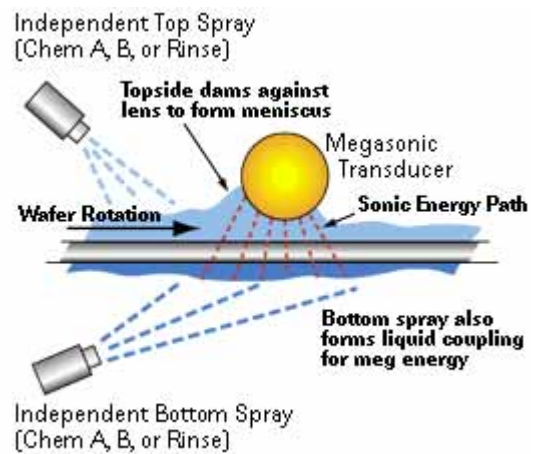


Fig. 3. Verteq Megasonic cleaner & cleaning mechanism

3. Rinse and Drying

4

H₂SO₄, NH₄OH, H₂O₂, HCl,

DIW



Fig. 4. Typical RCA cleaning process flow, with overflow rinse(OR) or overflow dump rinse(ODR) steps between each chemical treatment.

1) Rinse

Rinse RCA

가

5 RCA

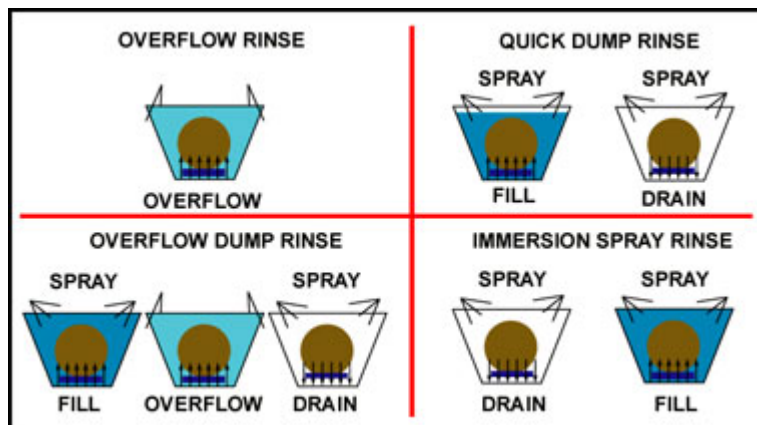


Fig. 5. Four possible rinse scenarios for the RCA standard clean.

2) Drying

가 .
가 .
 , IPA IPA
IPA
(marangoni)
IPA
(Marangoni Effect)
가 .
,
가 IPA 가
가
IPA
IPA 6 7

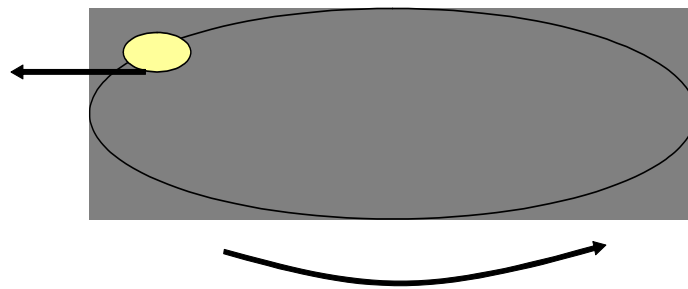


Fig. 6.

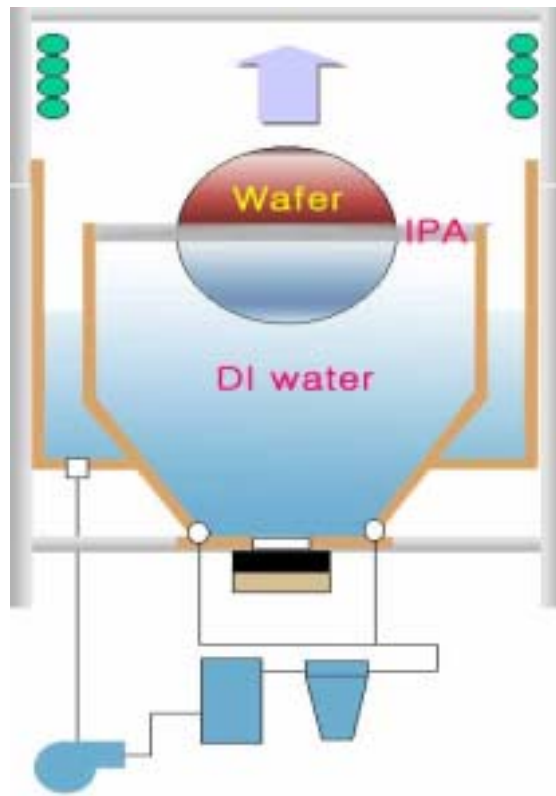


Fig. 7. Marangoni