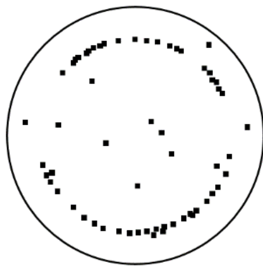
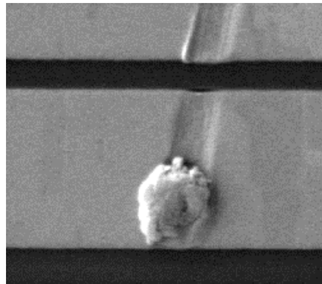
RIPPEY™
An ITW Company

# nanoShear R2 PVAc Brushes

## for critical BEoL post-CMP cleaning applications

**BEoL • Copper • Cobalt • Ruthenium**

*Wafer Circle scratch*

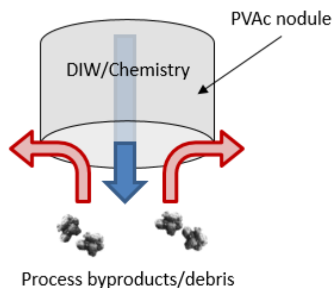
## Description

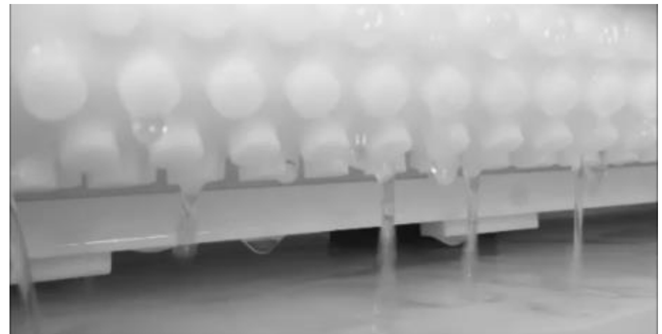
Rippey nanoShear R2 brushes were developed to address ≤22nm BEoL post-CMP physical defect challenges (eg. circle scratching). Tailored specifically for softer metal films, nanoShear R2 brushes protect the interconnect metal while maintaining particle removal efficiency. nanoShear R2 brushes reduce metal open defects and improve EM/SM performance.

## Features

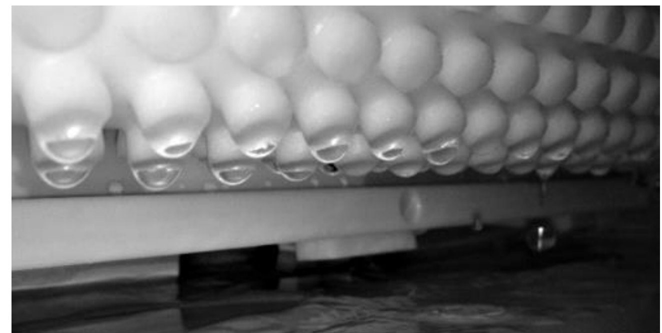
Rippey nanoShear R2 brushes include all of the features of standard nanoShear brushes (eg. superior dimensional uniformity, torque stability, and uniform flow distribution), but also include a proprietary PVAc treatment process that enables selective fluid flow through the brush nodule.

Treating the nodule and systematically controlling its morphology hydrodynamically prevents adhesion and agglomeration of unwanted process debris which reduces brush loading, wafer scratching excursions, and increases brush lifetime.



*Untreated brush*



*Nodule treated nanoShear R2 brush*

nS R2

Rippey (*a division of ITW Contamination Control*)
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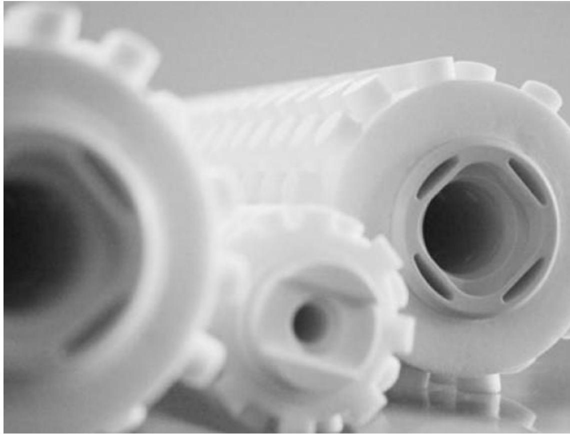
ISO 9001:2015 CERTIFICATION Intertek



## Applications

Rippey nanoShear R2 brushes are compatible with all major CMP OEMs. Mandrels and tool interfaces are designed for quick and simple exchange.

To prevent bacterial growth and ensure long shelf-life, brushes come preserved in $H_2O_2$ or $NH_4OH$, or can be e-beam sterilized.

Depending on the application and cleaning requirements, nanoShear R2 brushes can be customized with various nodule formats.

| OEM | Applied Materials | Ebara | |
|---|---|---|---|
| System | Reflexion® LK, LK Prime™ | FREX 300S(2) | FREX 300X(3SC) |
| PN | *2F*N-70-31NM-0317 | *2F*N-38-18NM-0310 | *2F*Y-60-32NM-0310 |

NOTE: nanoShear brushes are only available in 300mm

✶ 2 F ✶ N

Preservation: (H) 1.00%wt. $H_2O_2$ (M) 0.25%wt. $NH_4OH$ (E) e-beam

PVAc Formulation: (S) Symmetry (2) F2 (E) Eclipse (C) Eclipse HCS

## Quality

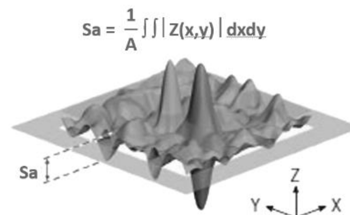
Every nanoShear R2 brush is measured and characterized to assure 100% conformance of all products shipped.

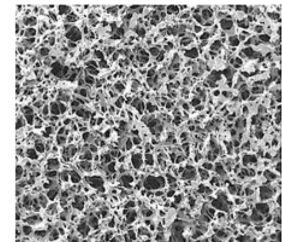
Every nanoShear R2 brush is individually processed on Rippey's proprietary flow-through cleaning systems. The cleanliness of each brush is quantified by effluent Liquid Particle Counts (LPCs).

The quality of nanoShear R2 brushes are additionally characterized by nodule morphology measurements. Maintaining a consistent nodule texture from brush-to-brush and lot-to-lot is critical to the performance of the product.

| Metric | unit | Specification | Method |
|---|---|---|---|
| Radius Range | mm | <0.7 | vCMM |
| Torque Variation | % | <10%,1σ | Rippey |
| Final LPC | - | <2000, Sum >0.1μm | Effluent |
| Nodule Morphology | Sa | >28μm | Rippey |

NOTE: Brush physical properties and ionic contamination are PVAc formulation dependent. Contact Rippey Sales or Applications for specific product inquiries.



*nanoShear R2 nodule morphology*

nanoShear™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