ARACA℠
6421 North Nirvana Place, Tucson, AZ 85750 USA
Email: araca@aracainc.com
www.aracainc.com

Pad Functional Testing

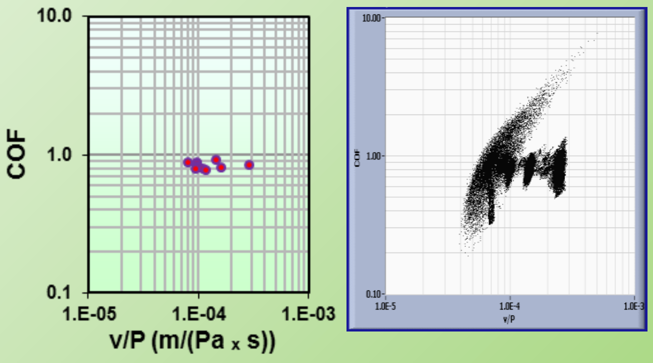
Functional pad tests on 200 and 300-mm wafers for all CMP and polishing applications using our APD-800® single-platen CMP polisher and tribometer in a class 100 environment.

Variety of polishing tests for pad characterization:

- **Effect of groove type(s)**
- **Effect of pad mechanical (bulk and surface) properties**
- **Effect of break-in recipes**
- **Pad compatibilities with variety of conditioners, slurries and polishing applications**
- **Slurry residence time and utilization efficiency as a function of groove type**
- **General process development**

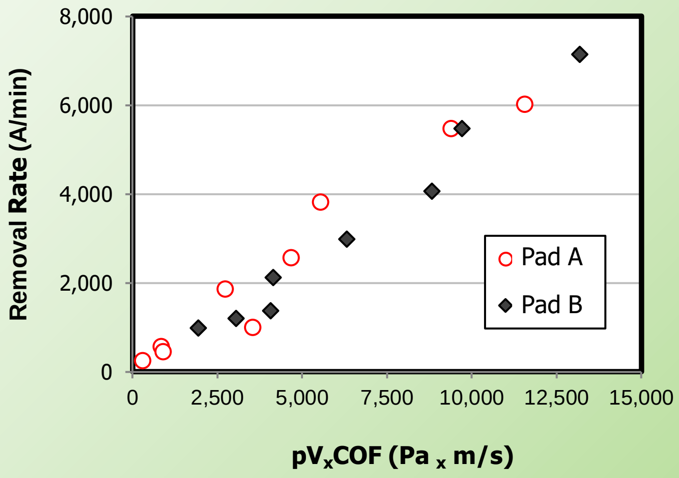
Typical information obtained via our pad testing services:

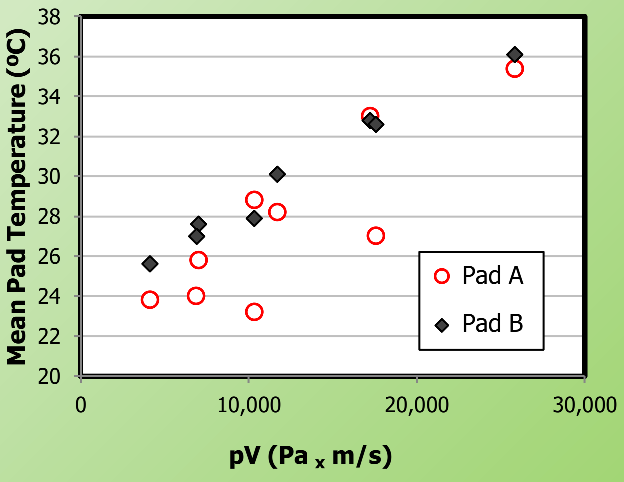
- **Shear and normal forces vs. polish time**
- **Coefficient of friction (COF) vs. polish time**
- **Pad surface temperature vs. polish time**
- **Removal rate**
- **Within-wafer removal rate non-uniformity**
- **Patterned wafer topography (dishing, erosion and oxide loss)**
- **Removal rate selectivity**
- **Pad wear rate**
- **The extent of pad vibration at certain processing conditions**
- **Directivity (Δ)**
- **Tribological mechanism(s) of polishing**
- **Stribeck, Stribeck+, and Delta curves**

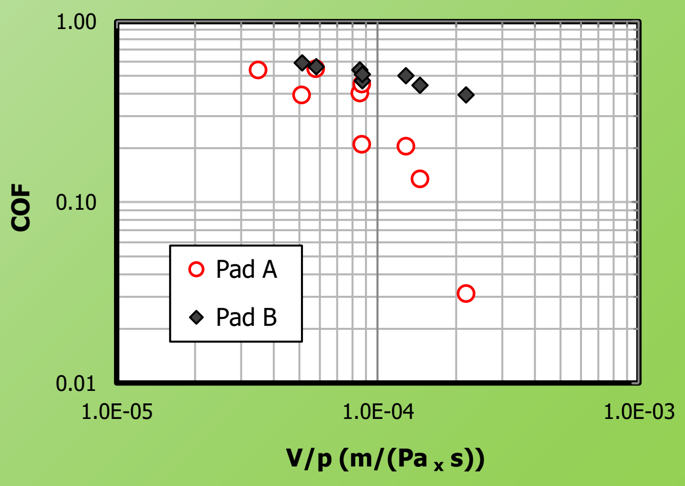


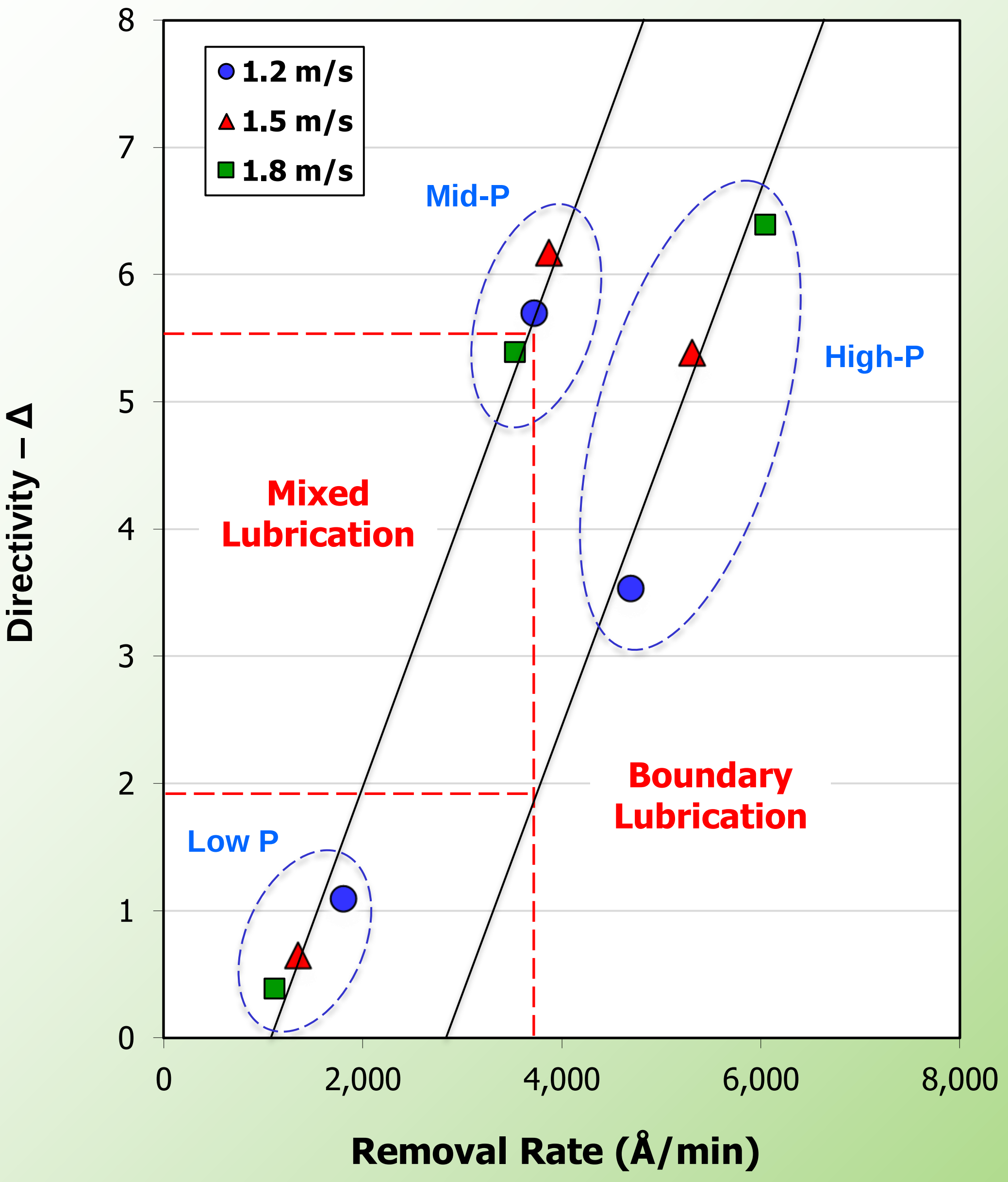
Step	v (m/s)	P (PSI)
1	1.0	1.8
2	1.4	2.1
3	2.0	1.0
4	2.0	1.8
5	1.8	2.4

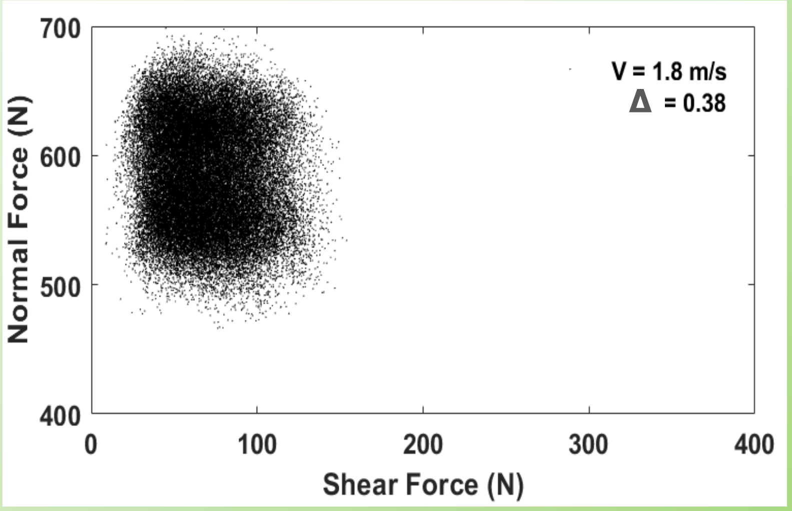
Stribeck and Stribeck+ Curves

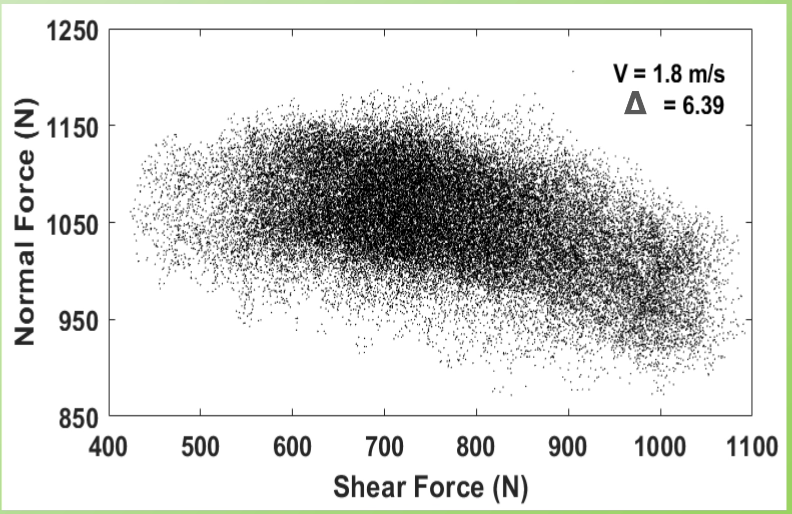







Directivity – Δ
Removal Rate (Å/min)
0
1
2
3
4
5
6
7
8
0
2,000
4,000
6,000
8,000
● 1.2 m/s
▲ 1.5 m/s
■ 1.8 m/s
Mid-P
High-P
Low P
Mixed Lubrication
Boundary Lubrication


Normal Force (N)
Shear Force (N)
700
600
500
400
0
100
200
300
400
V = 1.8 m/s
Δ = 0.38


Normal Force (N)
Shear Force (N)
1250
1150
1050
950
850
400
500
600
700
800
900
1000
1100
V = 1.8 m/s
Δ = 6.39