

Semicon Synapsis

Carbon fiber end effectors for wafer handling

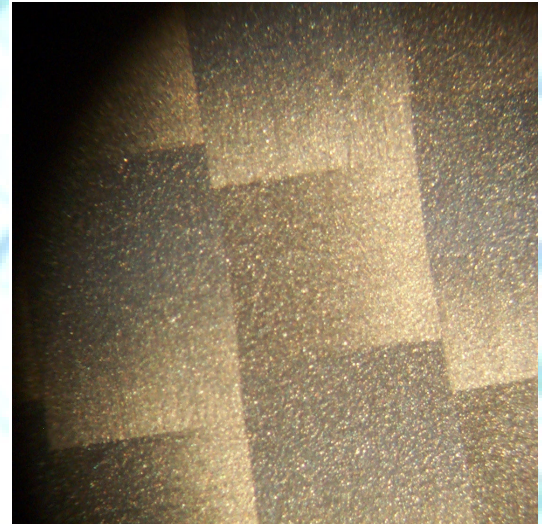
Technical features

Material: omnidirectional or unidirectional carbon fiber, depending on application

Matrix: epoxy or phenolic resin

Specific weight: 1.5

Elastic module [kg/mm²]: 28000
with matrix, module decreases: an average of 15000 can be considered (aluminum= 10000, for steel= 21000)



ESD protection: carbon is **conductive** and then **optimal for ESD protection**

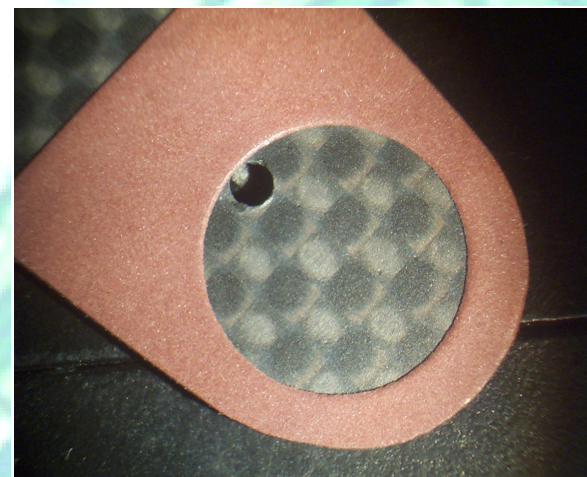
Temperature: maximum ambient temperature: **90 °C** for epoxy matrix material, **150 °C** for phenolic matrix material

Wafer temperature (handling time exposition):
with **PTFE** or **PTFE/ceramic** gasket: **150 °C**
(up to or more than **250 °C** with **Polyimide** gasket or metal protection)

UV protection: special metal protections are available for UV and high temperature protection

Vacuum gaskets: **PTFE**;
PTFE/ceramic for improved friction resistance
Polyimide for very high temperature contact

Different types, thicknesses and configurations available for any need



MECHANICAL FEATURES:

Tooling type: Computer controlled milling machine

Tooling tolerances: max. 0.2 mm

Thickness tolerance: max. 0.2 mm

Max. admitted bending on planarity test: 0.3 mm

QUALITY :

Testing sampling: 100%

Performed tests: material surface; tooling quality; planarity; final assembly; functional test (vacuum).

Traceability: each production part is marked with a serial number, a complete traceability is guaranteed from laminate production to final assembly.

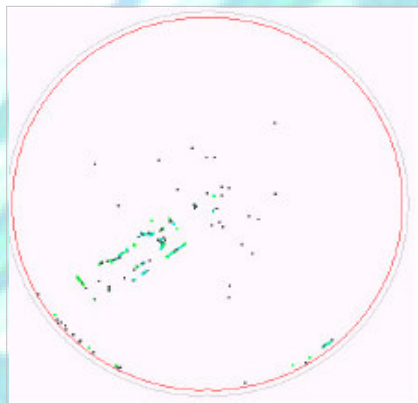
Packaging: each item is packed and thermally sealed into nylon bag.

CONTAMINATION FEATURES:

Particle: Particle test on a wafer handling, with contact surface of about 5. cm², gave 248 particles in total: no particles on the front side (conditions: 8" wafer, class 1 environment, KLA Surfscan 6200); weekly tests on production tools gave no particle increase on the front side.

SIZE	0.16-0.2	0.2-0.3	0.3-1.0	>1.0	TOTAL
	103	77	52	16	248

SYNOPSIS PART



SIZE	0.16-0.2	0.2-0.3	0.3-1.0	>1.0	TOTAL
	113	197	222	172	704

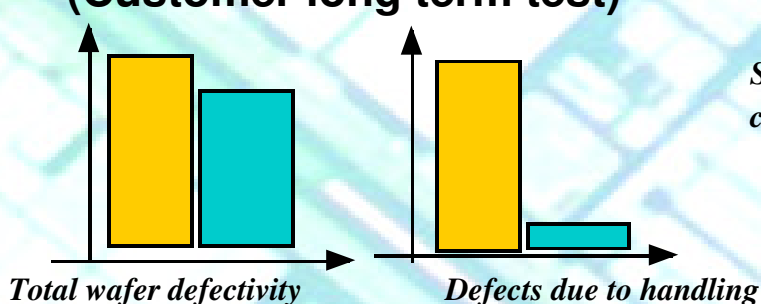
ORIGINAL PART



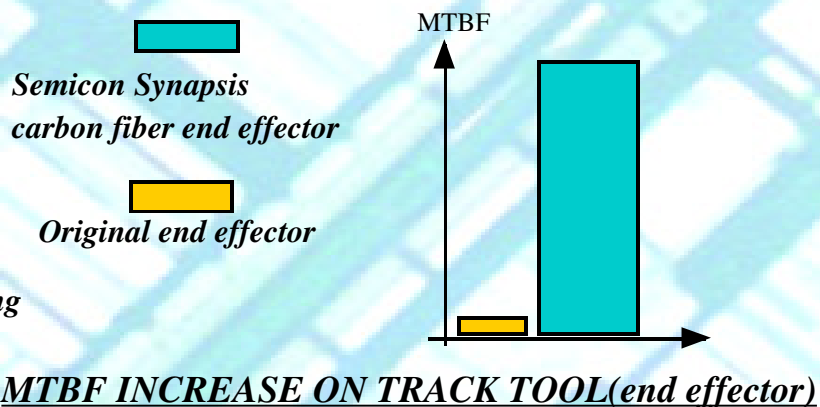
CONTAMINATION MAPS

Outgassing: Outgassing test for amines at ambient temperature, from room measurement (about 38ppb) no noticeable changes observed; at 110°C +18ppb, decreasing to +/- 0 after 3min.

DEFECT REDUCTION AND MTBF INCREASE (Customer long term test)



**DEFECT REDUCTION ON
MICROSCOPE LOADER**



MTBF INCREASE ON TRACK TOOL(end effector)