Industrial Microwave + Plasma Systems

MUEGGE

MUEGGE STP Compact

Compact Microwave Plasma System for SU-8 Etching & Photoresist Ashing

System Description:

The MUEGGE STP Compact microwave plasma system is the latest and most advanced generation of MW batch ashers offered today and is a complement to the very popular STP 2020 series.

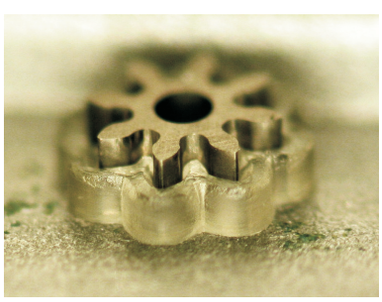
The MUEGGE STP Compact is ideal for photoresist ashing (perfect for SU-8), descum, wafer cleaning, surface activation and silicon and silicon nitride etching.

The MUEGGE STP Compact has successfully integrated a plasma process and system technology to remove SU-8 with dry plasma etching. Also for removing sacrificial layers, the isotropic etch property of microwave plasma is of advantage to undercut the top layer.

State-of-the-art process control in combination with microwave plasma generation are the key elements of the MUEGGE STP Compact.

Starting at very economic prices, the systems range from R&D tools to automatic systems for production medium quantities up to 200 mm wafer size. The MUEGGE STP Compact Batch Plasma systems can process all wafer sizes from 4" up to 8" with easy loading and unloading.

Stripping examples:



MUEGGE GMBH
Hochstrasse 4-6 · 64385 Reichelsheim
Fon +49 (0) 6164 - 93 07 11 · Fax +49 (0) 6164 - 93 07 93
info@muegge.de · www.muegge.de

MUEGGE STP Compact

Industrial Microwave + Plasma Systems

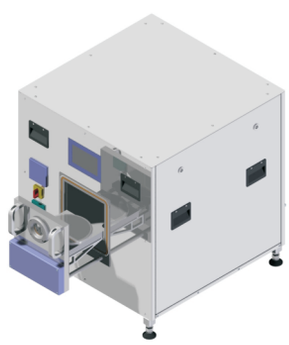
MUEGGE

Technology for SU-8 stripping:

The **R**apid **R**eactive **R**adical **T**echnology (R3T®), introduced by the **R**emote **P**lasma **S**ource, provides the capability to remove very thick layers of organic materials like SU-8 resist and other epoxy based materials with excellent throughput, high selectivity and no attack on metals. The radicals generated by the Remote Plasma Source are creating only a chemical reaction at the surface of the substrates, which leads to a pure chemical etch with an extremely low thermal load and damage free etching at high rates.

SU-8 Stripping Tool MUEGGE STP Compact:

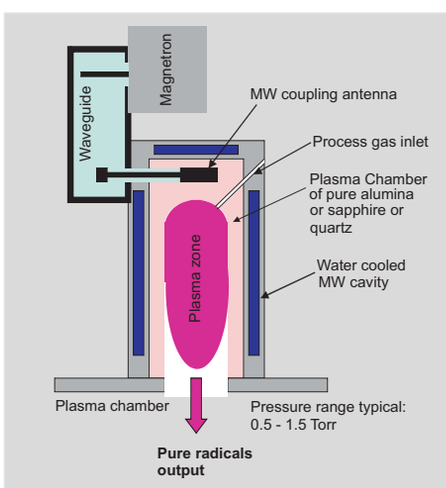
The new MUEGGE STP Compact Tool is designed as a compact table top tool, built for use in development laboratories or small fabs.



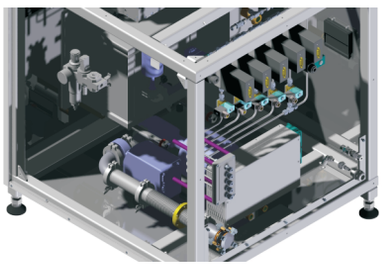
Dimensions: W = 800 mm, L = 800 mm, H = 800 mm
Working plate: for 1 x 8” or 1 x 6” or 2 x 4” wafers
Peripheral: Vacuum pump (e. g. dry pump 250 m³/h)
Gas cleaning system (e. g. dry absorber)

Key Elements:

- MUEGGE’s compact remote microwave plasma source with unique water-cooled plasma zone composed of alumina / sapphire / quartz guarantees **outstanding lifetime** of the plasma chamber
- **High performance at low cost of ownership**
- **High environmental compliance** due to very high dissociation of global warming gases such as CF_4 and NF_3.
- Pure chemical etching with no attack on the etching sample by ions; therefore **high selectivity** is achievable.
- Dense plasma excitation leads to **high amount of radical generation** which is necessary to start the stripping process.
- Remote plasma for much **less thermal load** in the chamber than conventional plasma
- Ideal for small fabs, R&D labs or Institutes



MUEGGE STP Compact



Industrial Microwave + Plasma Systems

MUEGGE

Features:

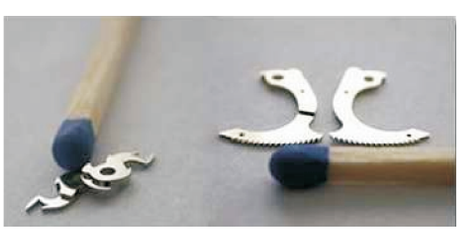
- Compact design
- Optimized for the removal of thick photo resist layers (e.g. SU-8, KMPR, etc.)
- Can also be used for isotropic etching of materials like Si, SiO_2, SiN, SiO_xN_y, W, Mo, etc.
- Pure chemical etching with no attack on the etching sample by ions
- Integrated compact RPS (Remote Plasma Source)
- Water-cooled plasma zone
- Very low thermal load for substrates
- Substrate size up to 240 mm x 240 mm
- No attack to metals (Ni, Ni/Fe, Au, Cu, etc.)
- Only very slight attack to Si and Si compounds such as SiO_2 or Si_3N_4
- High environmental compliance
- For 1 x 8” or 1 x 6” or 2 x 4” wafers

MUEGGE STP Compact etch process - special features:

- Etch rates nearly independent of pretreatment like hard bake (HB) conditions: differences in etch rate smaller than 10% between no HB and 200 °C HB.
- Stripping of very thick (SU-8) resist layers for MEMS possible (>1 mm).
- Remote high oxygen radical output plasma source, no damage by ions, heat impact only by reaction energy.
- Simultaneous etching of substrates with different resist thicknesses possible

MUEGGE STP Compact etch process - options:

- End point detection
- Additional mass flow controllers (MFC)



MUEGGE STP Compact

Industrial Microwave + Plasma Systems

MUEGGE

Specifications:

INPUT VOLTAGE :	400 V AC, 3 ph, 50 Hz, <3 x 16 A	**EXTERNAL DIMENSIONS:**	W = 800 mm, L = 800 mm, H = 800 mm
HF-POWER:	Max. 1 kW cw, 2450 MHz	**DIMENSIONS PROCESS CHAMBER:**	W = 500 mm, L = 500 mm, H = 400 mm (e. g. 9 x 6” wafers)
COMPRESSED AIR:	Quality: Oil-free, dry, 5 µm filtered Pressure: 6 bar - 9 bar	**CONDITIONS:**	Ambient Temp.: 5 °C – 45 °C non-condensing, T max. = 45 °C < 3 h/d, Humidity: 80% @ 30 °C, subsequently linearly reduced to 50% @ 45 °C
INPUT GASES; PROCESS PRESSURE:	Oxygen (O_2), Nitrogen (N_2), Tetrafluoromethane (CF_4); 0.4 mbar - 2.4 mbar	**COOLING:**	Internally air-cooled and water-cooled 4.5 bar - 6 bar, water inlet temperature 20 °C - 25 °C
WORKING PLATE:	Temperature: 20 °C - 70 °C Heating/Cooling Fluid: Water	**CONNECTIONS:**	Terminals 16 A (MAINS), USB / COM / Ethernet (INTERFACE), ½“ lock coupling Rectus Series 87 (COOLING WATER), ¼“ torque clutch (COMPRESSED AIR), 6 mm Swagelok (INPUT GASES), KF 40 (OUTPUT TO VACUUM PUMP), Stud M6 (PE)
ASSEMBLY :	Fully enclosed aluminum housing, Solid encapsulated assembly		

Recommended system components:

- Vacuum pump (dry pump min. 250 m³/h)
- Gas cleaning system (dry absorber)

MUEGGE GMBH info@muegge.de · www.muegge.de

MUEGGE STP Compact00003100100