

EquipX WestBond 4KE SN: 22539

Overview

Machine is in EquipX's facility in San Jose, CA. The primary serial number of the 4KE is 22539. This is the same machine I previously viewed at EquipX. Machine has subcomponents with serial numbers captured in photos included in this report.

Equipment and Accessories

The machine is fully equipped with all the accessories, additional clamp set, and wire guide tubes that it was delivered from the factory with. This includes:

- Olympus SZ51 Microscope and E-Arm with 15X eyepieces. This is a standard binocular microscope and does not have any capacity for a camera.
- K-1200D temperature controller and -45G.533 work holder. Work holder is capable of mechanical clamping up to 2.75" x 3.00". There are multiple sets of mounting holes for moving the fixed clamp blade for different size parts.
- Microscope mounted LED illuminator
- Crosshair generator box and monitor for display of video image for targeting bond placement.
- NEFO box. Electronic Flame Off box using "Negative" EFO design for spark from wire to torch wand and improved control of Free Air Ball size.
- Wire clamps for deep access and ball bond operation. Springs for increasing clamping force for ribbon bonding.

Bonding Modes

The machine can bond in 45-degree feed wedge, 90-degree feed wedge, and ball bonding modes. The machine has all necessary accessory parts to bond in each of the modes listed.

I operated the machine in the 45 degree and ball bond modes. 90-degree wedge uses the same clamps as the ball bond. Testing in ball bond mode is sufficient to verify the machine performance for 90-degree wedge mode. 0.001" Au wire was used to make sample wedge and ball bonds to a substrate with an Au thin film for the bonding metal.

EquipX WestBond 4KE SN: 22539

Limitations

The machine is designed for “fine wire” bonding: 0.0007” to 0.002” wire diameters. Requires 0.750” bond tools and 16mm or 19mm length capillaries. The machine is equipped with a ½” diameter spool mount. There are no capabilities to handle wire on 2” diameter spool. Machine can bond Au ribbon up to 0.001” x 0.010”.

Condition and Status

Machine was verified for mechanical soundness. Photos of the internal components are included in this report. Video of live bonding is available through cloud portal. Ultrasonic system was verified for correct operation with oscilloscope and results are included in this report.

Based on serial number the machine is approximately 5 years old. No wear patterns visually present in locations where wear would normally be observed. Primary X and Y linear bearings are correctly loaded and do not show any signs of shipping damage. Secondary Y axis linear bearings, and Z axis linear bearings are correctly loaded. Stepper motors driving Y and Z axis do not show signs of wear or damage.

The machine has **not** been refurbished. Based on condition of machine, refurbishment is not necessary.

Power Compatibility

The machine, crosshair generator, EFO box, and LED illuminator are all equipped with switching power supplies and are capable of running on 240V. Temperature controller for heated work holder is dedicated 110V and **cannot** run on 240. Recommend powering machine with step down transformer.

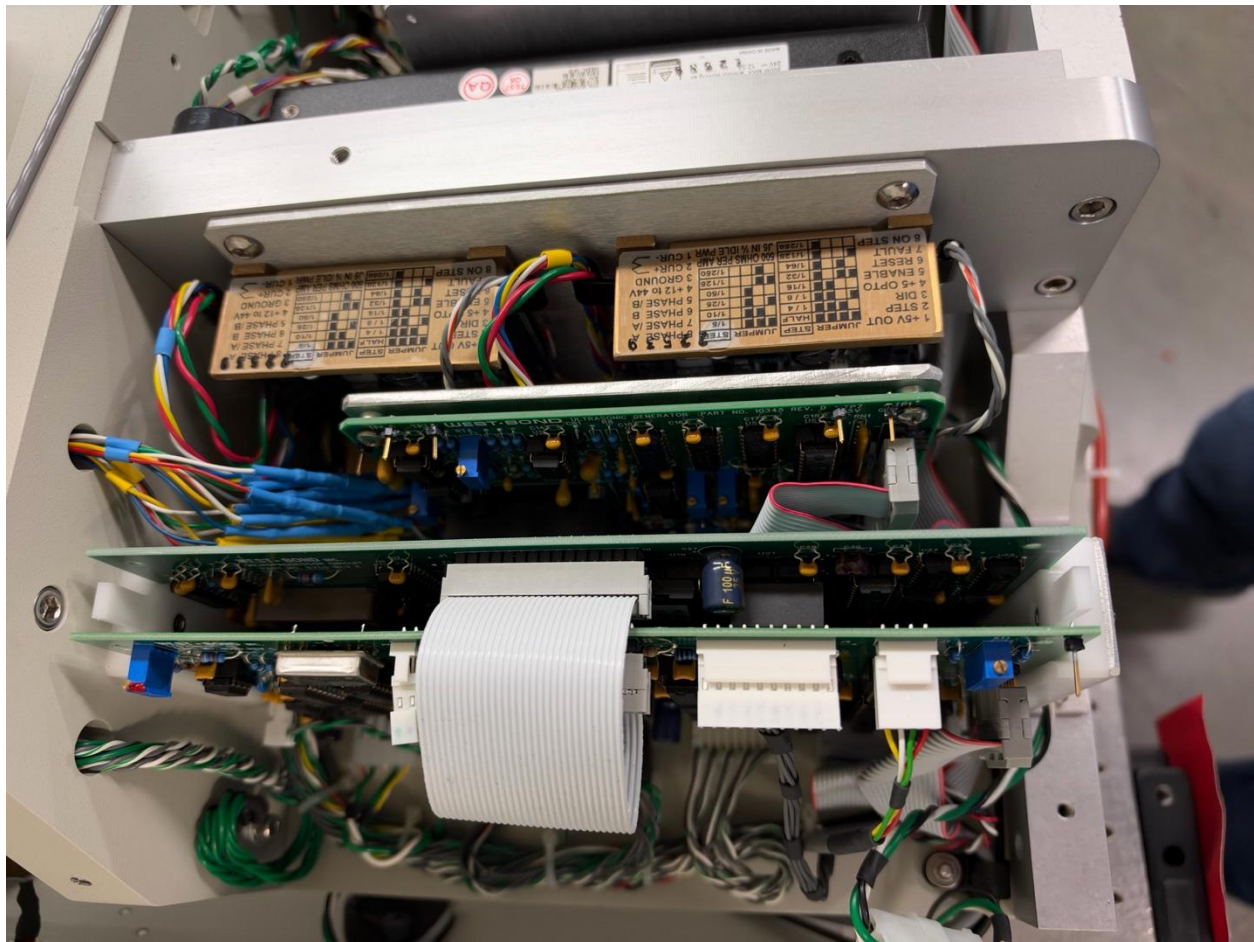
EquipX WestBond 4KE SN: 22539

Solenoid Valves for pneumatic braking, torch wand operation, wire clamp operations



EquipX WestBond 4KE SN: 22539

Stepper motor drivers, Ultrasonic generator board, IO board



EquipX WestBond 4KE SN: 22539

Main AC/DC power supply. Note input range states switching power supply but serial sticker on back of rates machine for 110V only.



EquipX WestBond 4KE SN: 22539

Serial tag



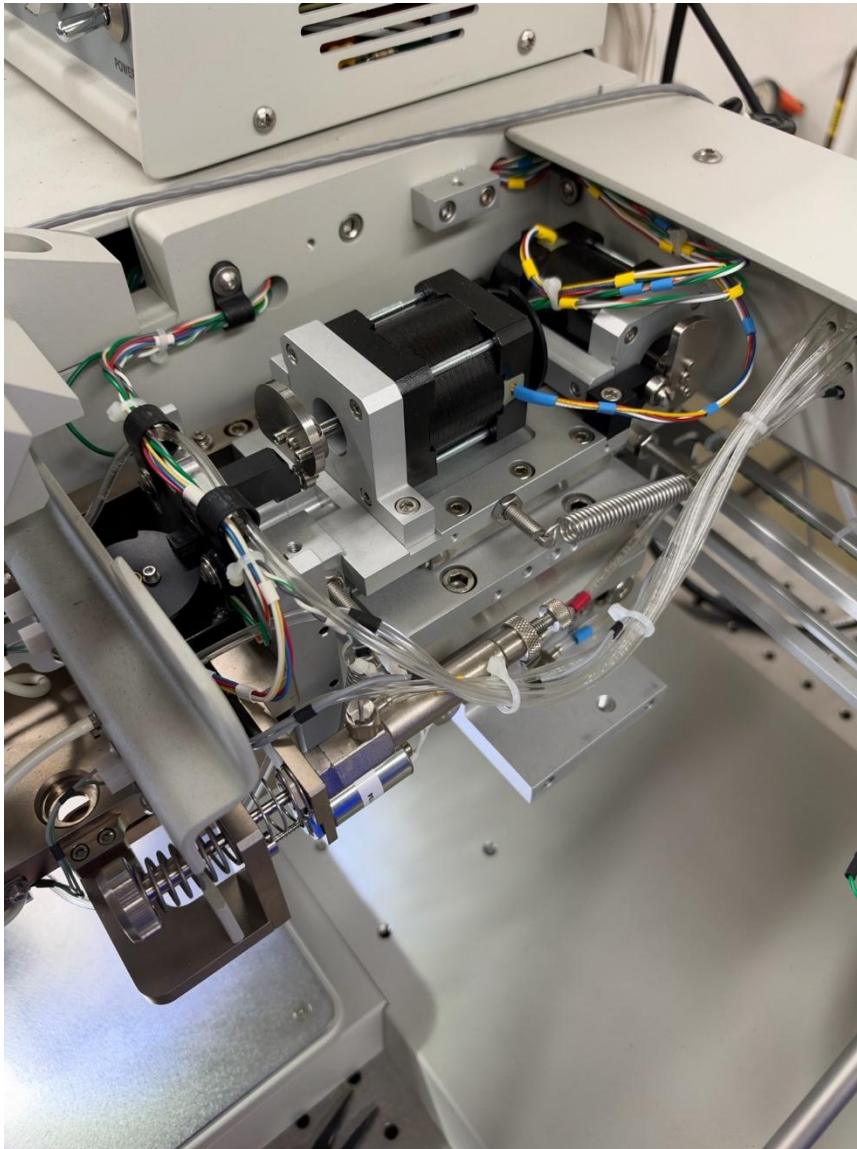
EquipX WestBond 4KE SN: 22539

Accessories: Temp Controller, Crosshair, NEFO box.

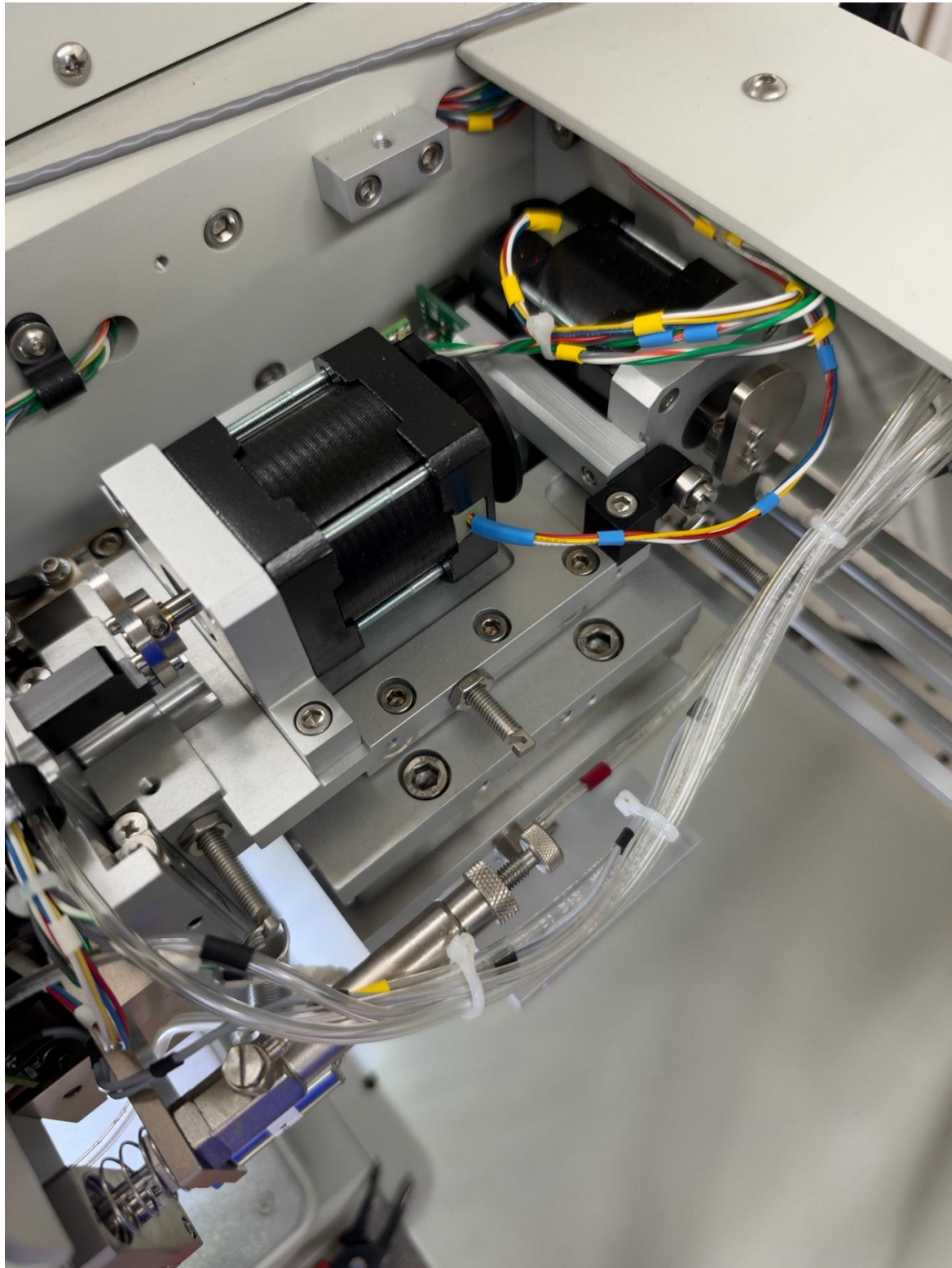


EquipX WestBond 4KE SN: 22539

XY Bearings and Y and Z slide assemblies

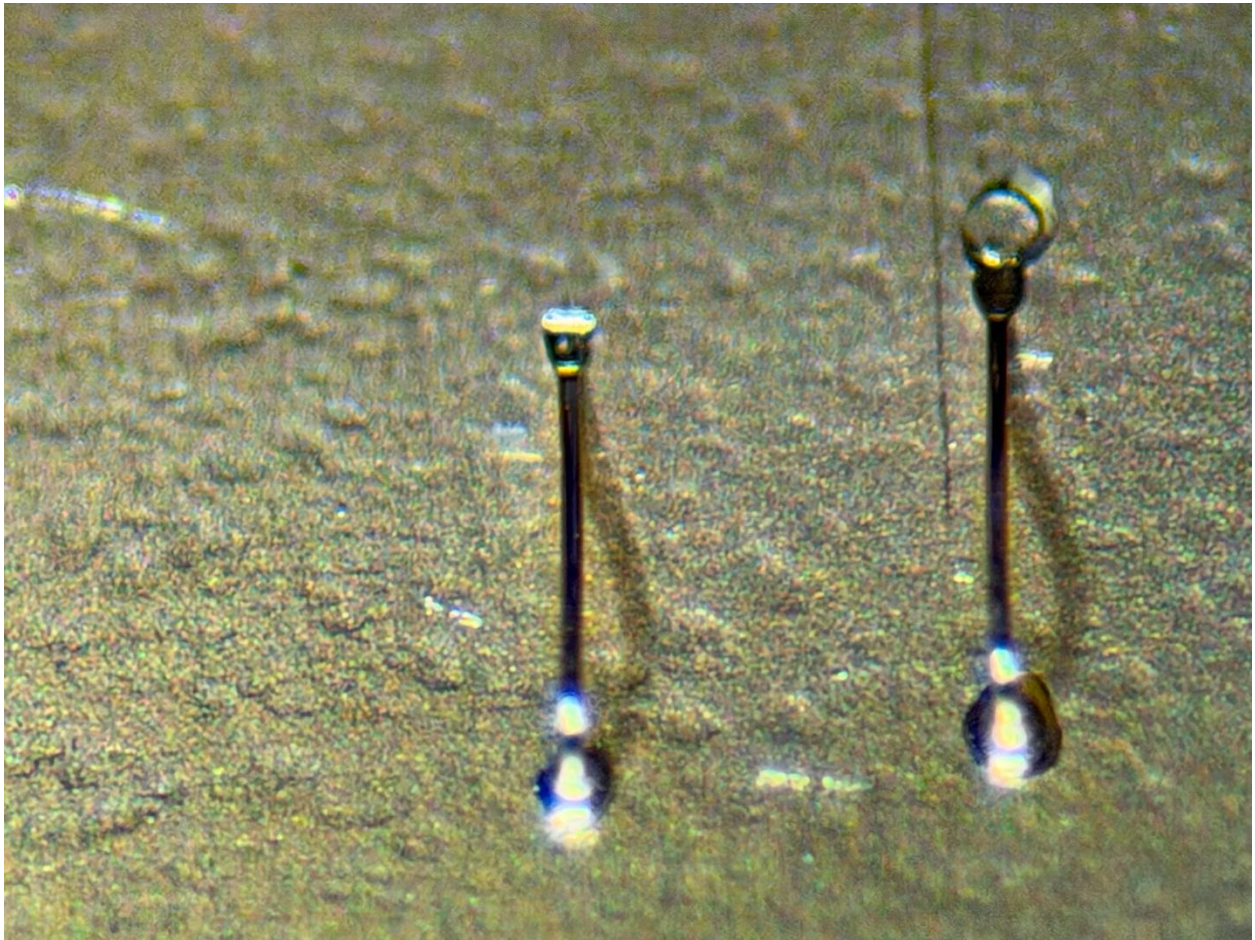


EquipX WestBond 4KE SN: 22539



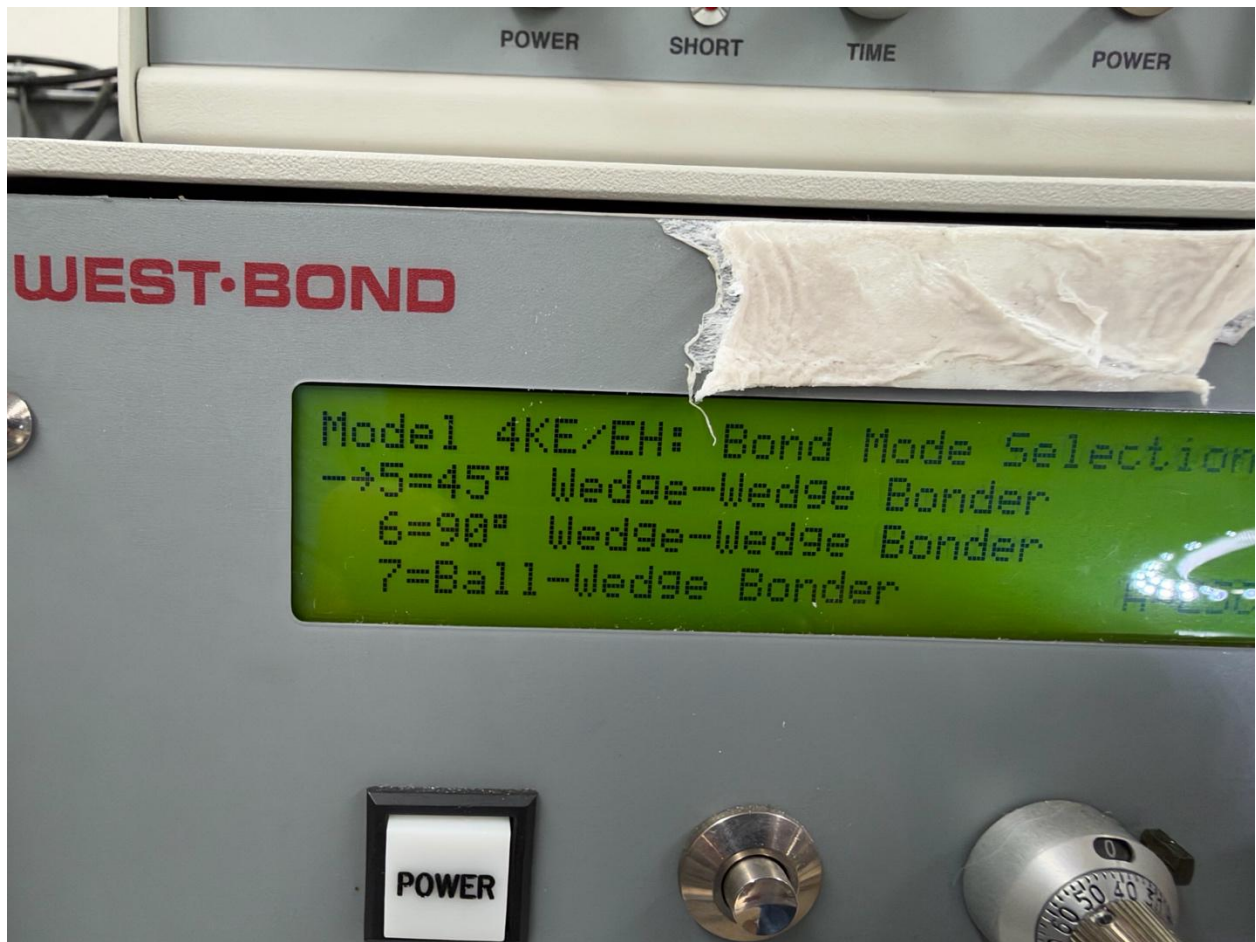
EquipX WestBond 4KE SN: 22539

Ball bonds on thin film



EquipX WestBond 4KE SN: 22539

Display panel showing bonding modes

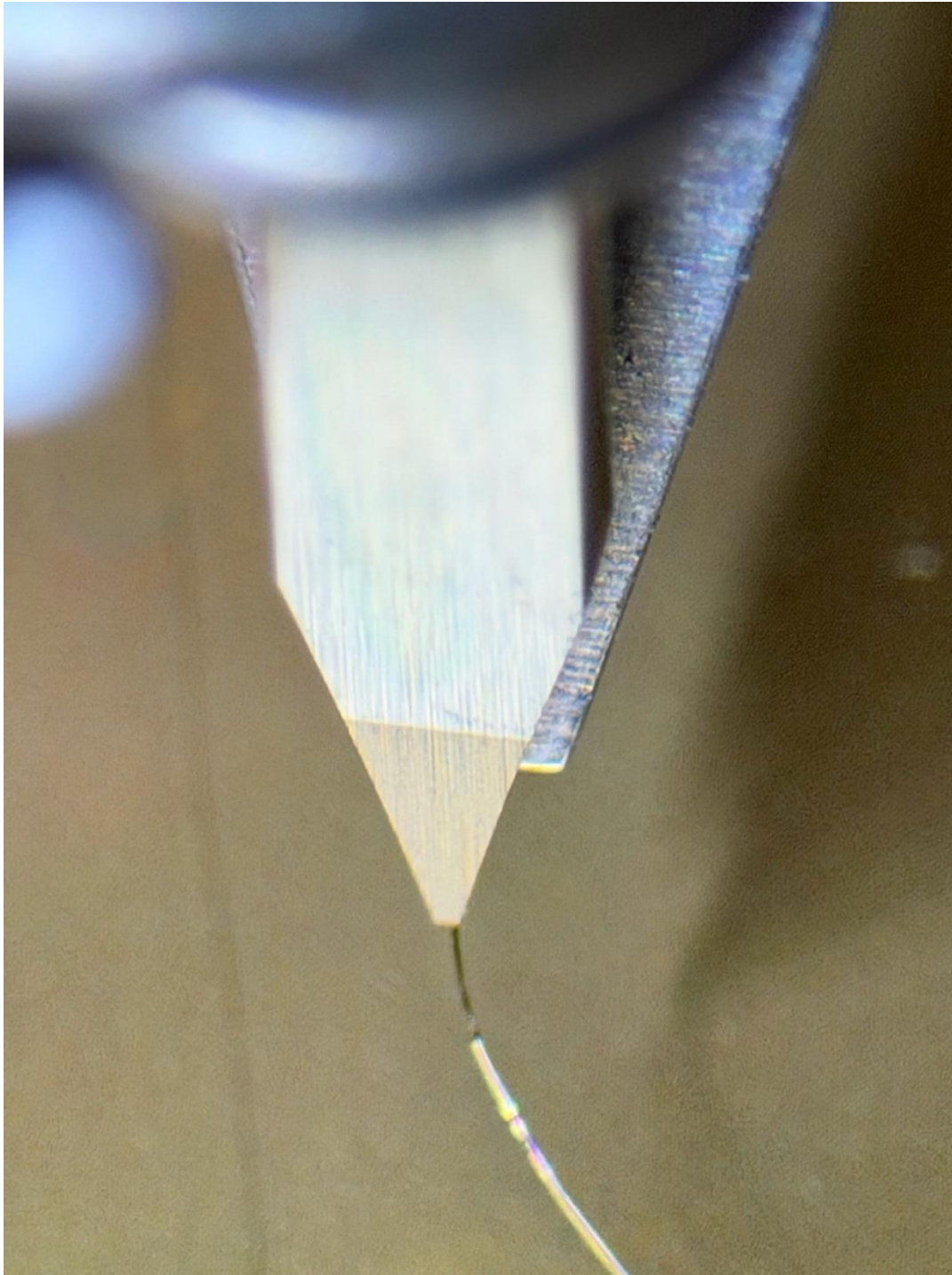


EquipX WestBond 4KE SN: 22539



EquipX WestBond 4KE SN: 22539

45 degree wire clamps and wedge



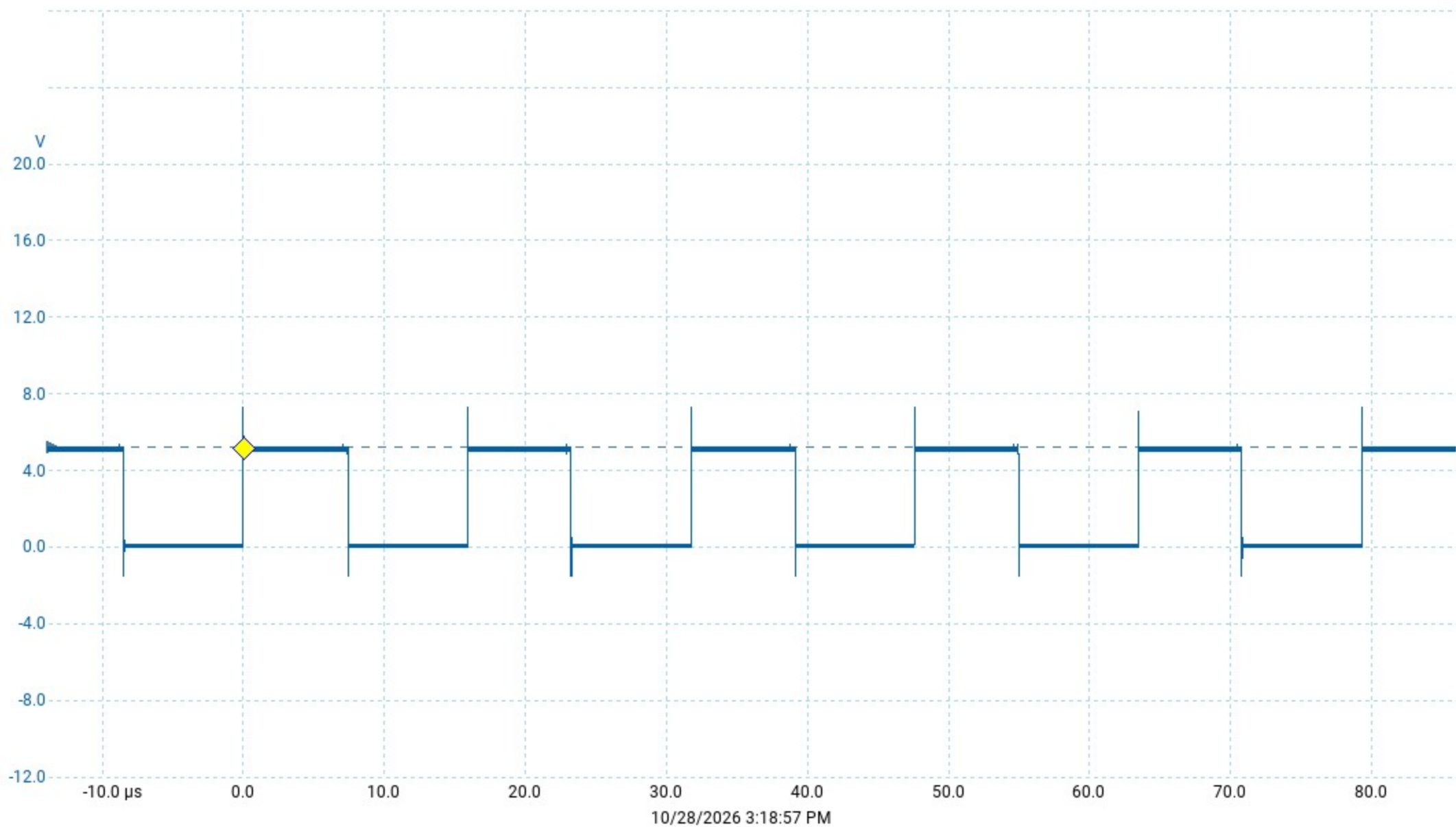
EquipX WestBond 4KE SN: 22539

Summary

Machine was transferred to EquipX with attention to detail. I have not seen a machine transferred with all accessories, loose parts, etc. accounted for. I have no concerns about the status of this machine or its ability to bond on a variety of materials, provided it is properly secured and packaged for transport. Highly recommend securing machine with WestBond shipping blocks for this specific model.

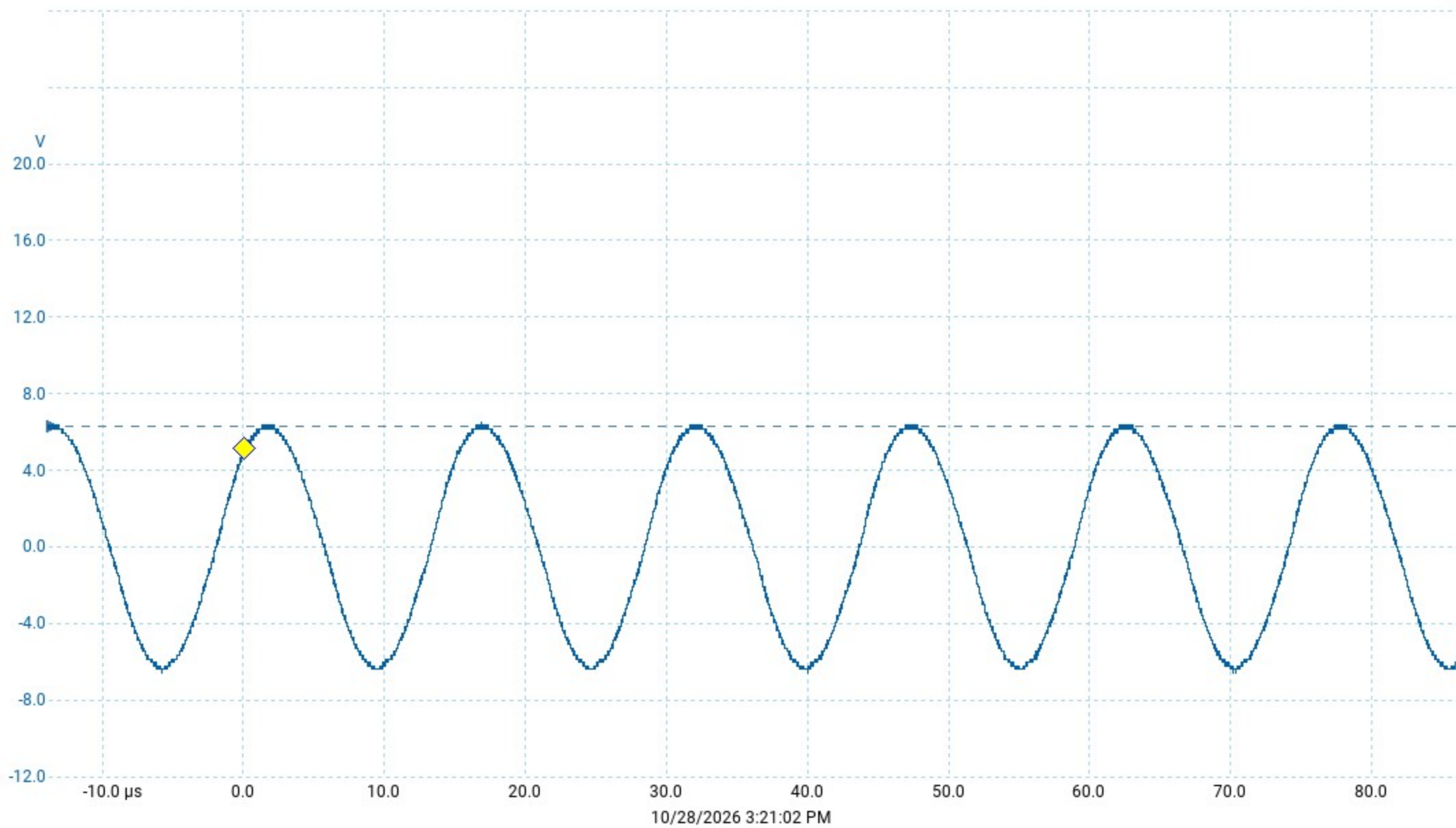
Addendum

See screen captures from Oscilloscope to illustrate objective validation of ultrasonic performance.



Measurements

Channel	Name	Span	Value	Min.	Max.	Average	σ
A	Frequency	Whole trace	63.04 kHz	63 kHz	63.07 kHz	63.03 kHz	99.92 Hz
A	Cycle time	Whole trace	15.86 μ s	15.85 μ s	15.87 μ s	15.86 μ s	19.71 ns
A	Peak to peak	Whole trace	8.807 V	8.807 V	8.995 V	8.825 V	34.5 mV
A	RMS	Whole trace	3.612 V	3.607 V	3.666 V	3.631 V	12.2 mV
A	Top	Whole trace	5.248 V	5.06 V	5.249 V	5.246 V	7.813 mV



Measurements

Channel	Name	Span	Value	Min.	Max.	Average	σ
A	Frequency	Whole trace	65.73 kHz	64.85 kHz	65.76 kHz	65.59 kHz	331.8 Hz
A	Cycle time	Whole trace	15.21 μ s	15.21 μ s	15.42 μ s	15.25 μ s	77.52 ns
A	Peak to peak	Whole trace	13.12 V	12.93 V	13.12 V	13.02 V	93.51 mV
A	RMS	Whole trace	4.51 V	4.429 V	4.514 V	4.498 V	30.79 mV
A	Top	Whole trace	6.263 V	6.192 V	6.313 V	6.248 V	42.25 mV