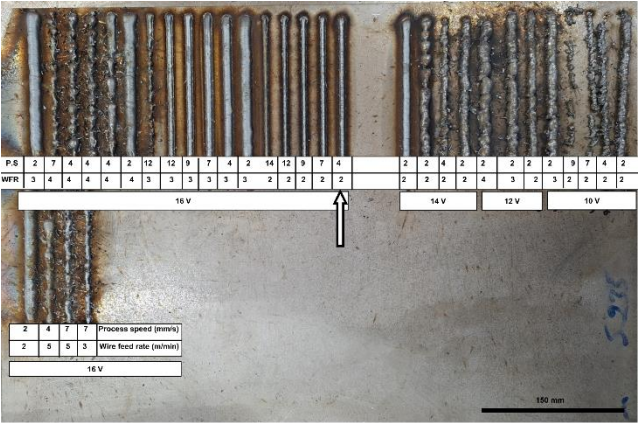
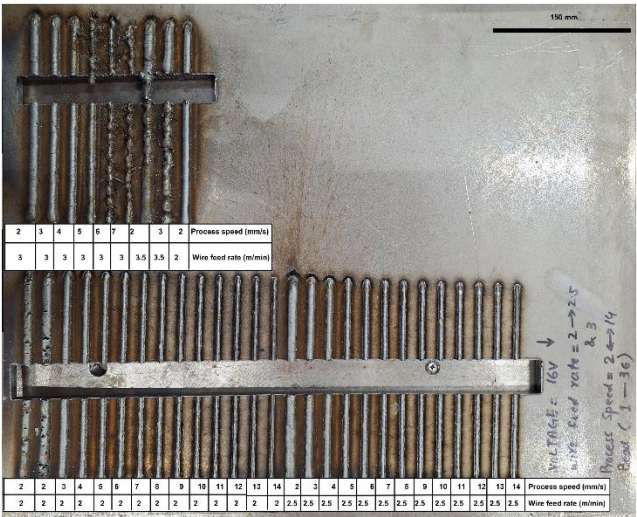


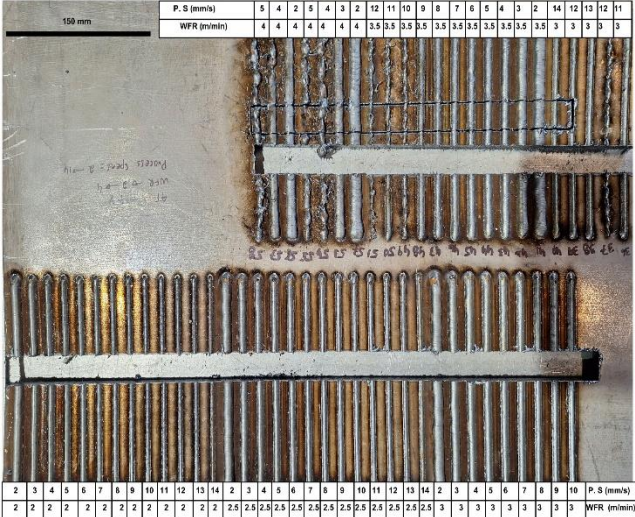
Supplementary Data



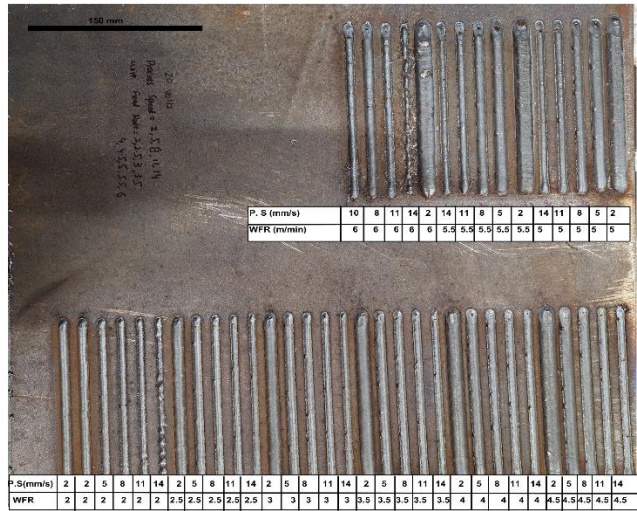
Supplementary Fig. 1 Initial study to find the baseline line voltage, wire feed rate and travel speed



Supplementary Fig. 2 Single bead deposition at 16V



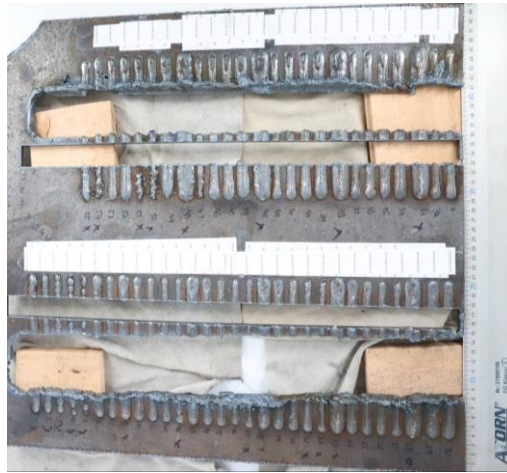
Supplementary Fig. 3 Single bead deposition at 17V



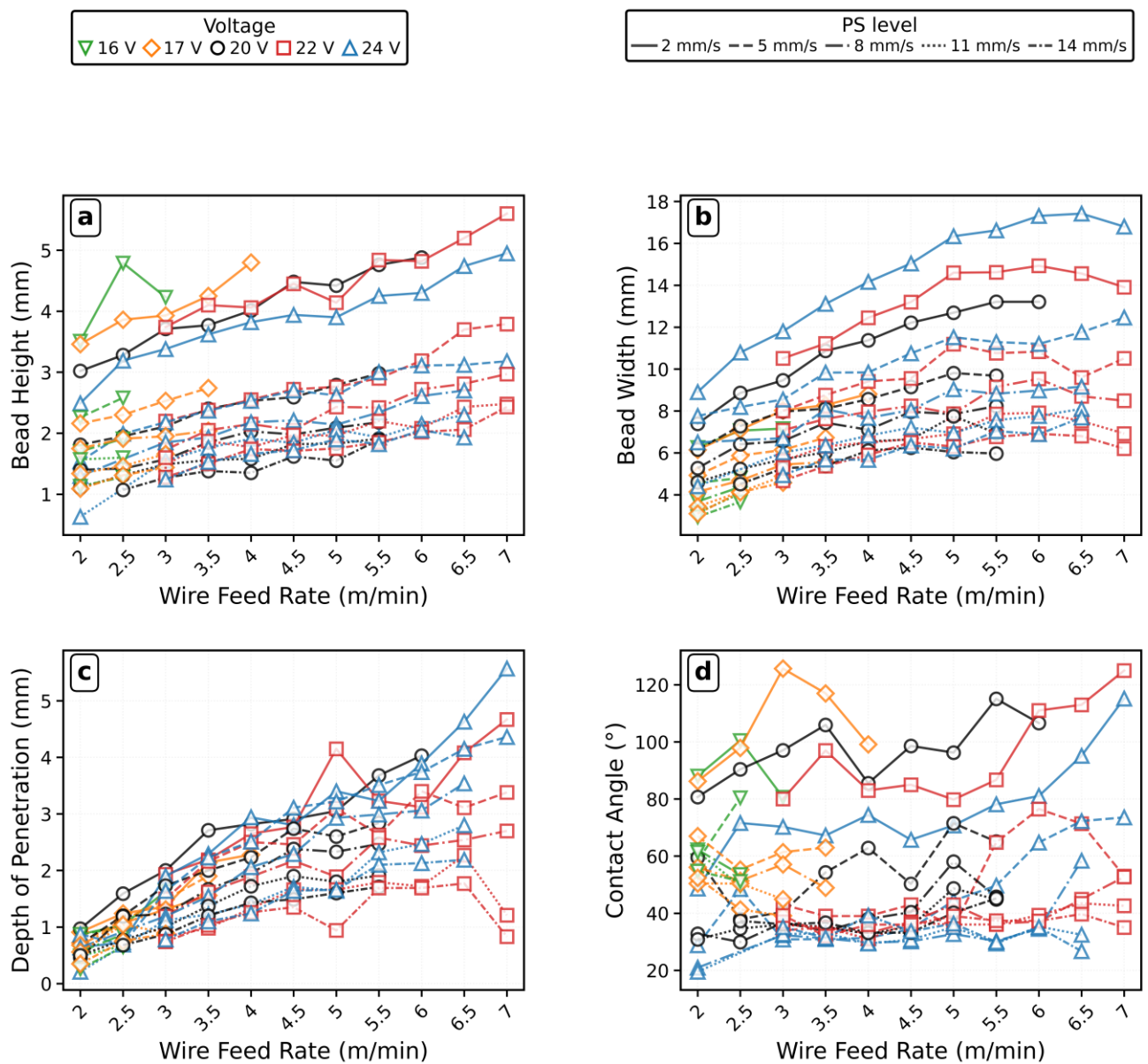
Supplementary Fig. 4 Single bead deposition at 20V

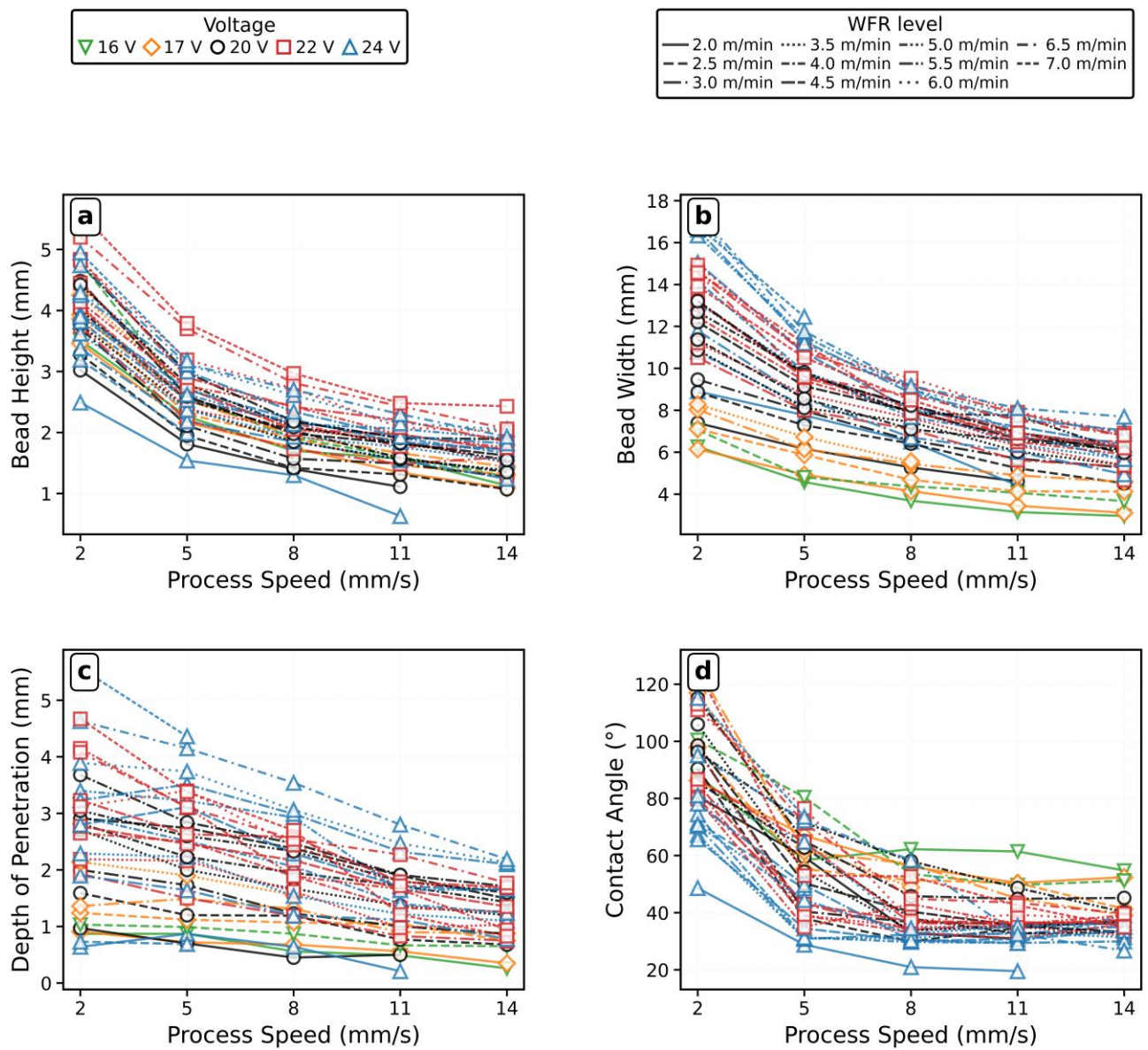


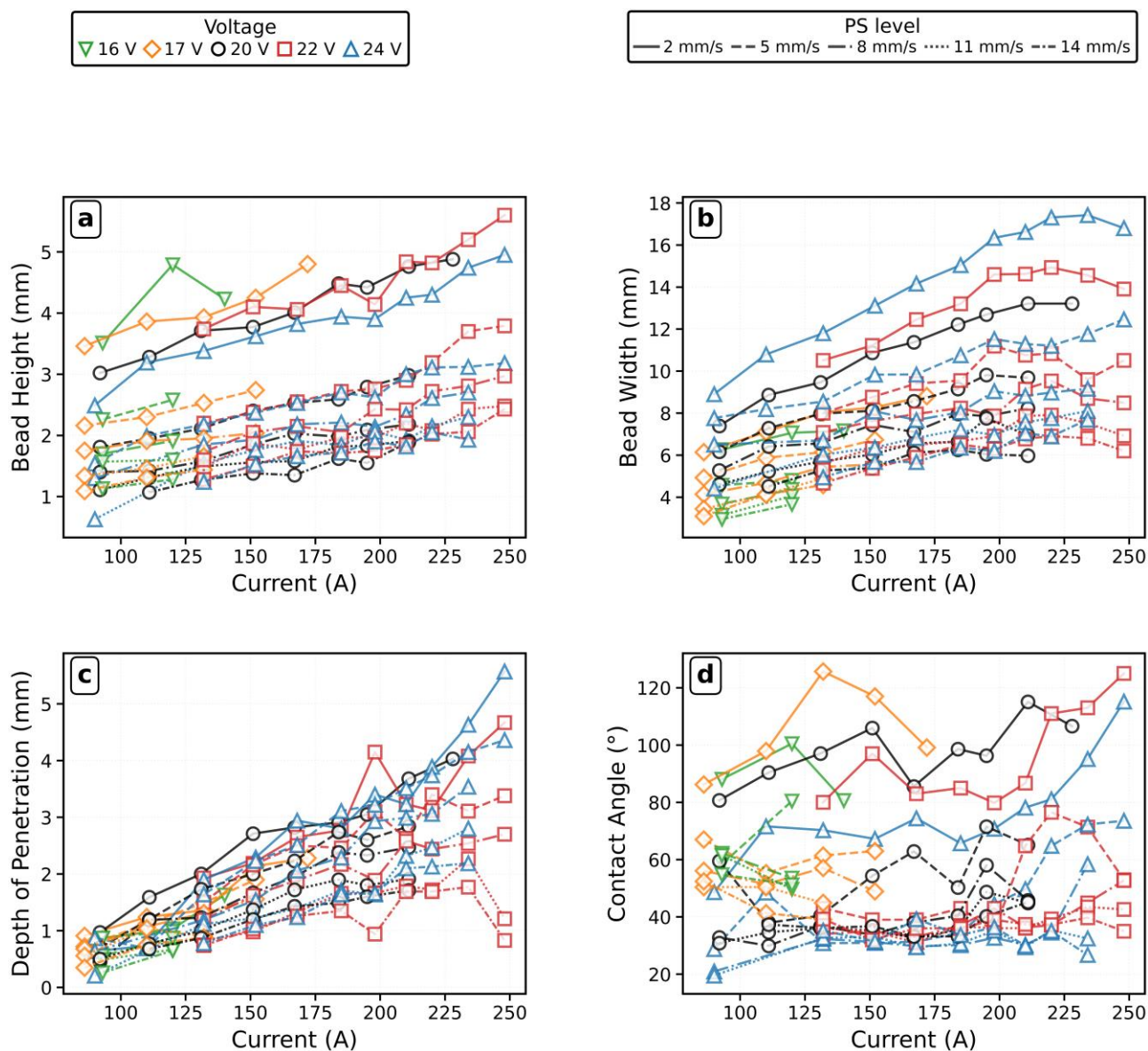
Supplementary Fig. 5 Single bead deposition at 22V



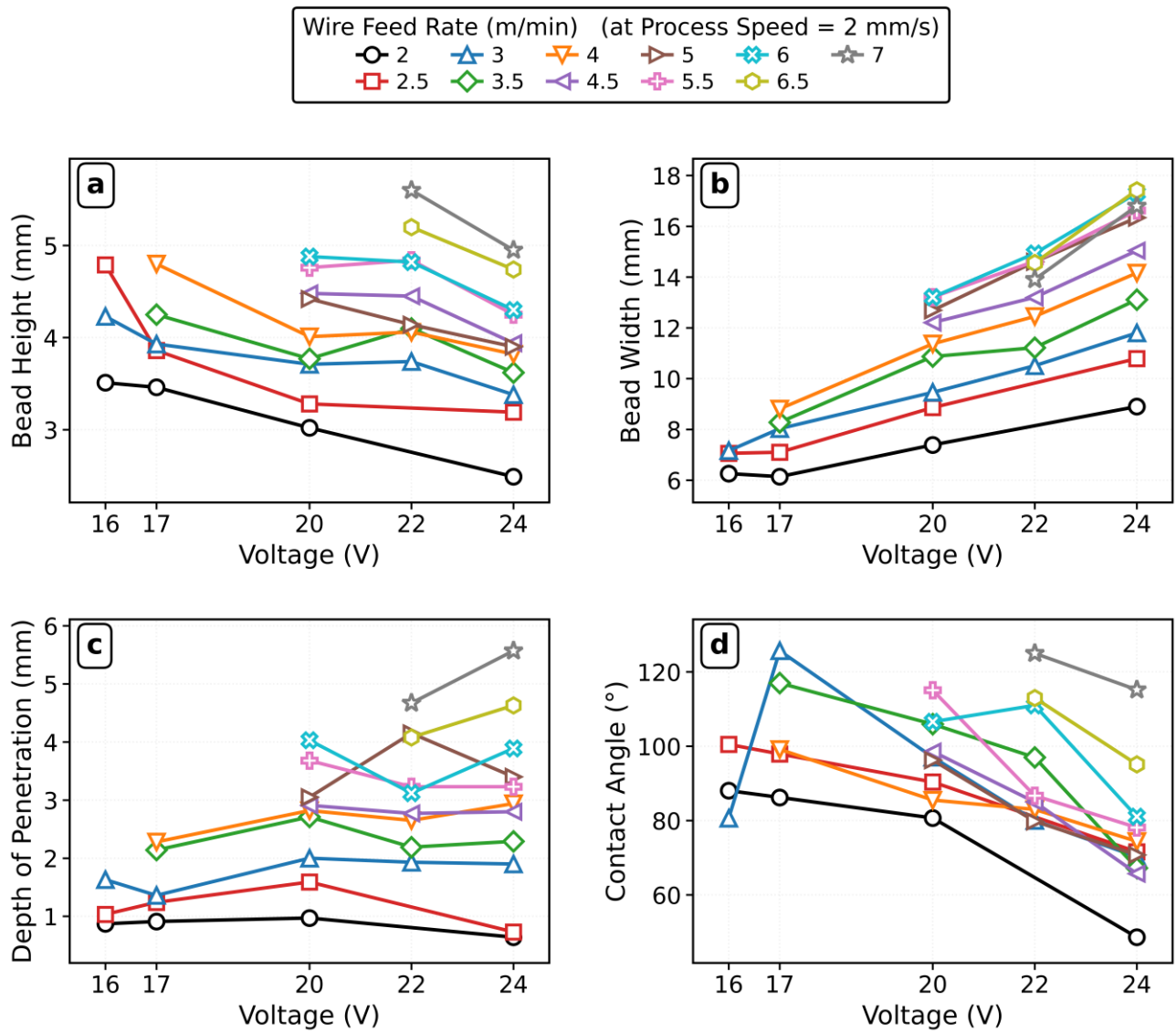
Supplementary Fig. 6 Single bead deposition at 22V



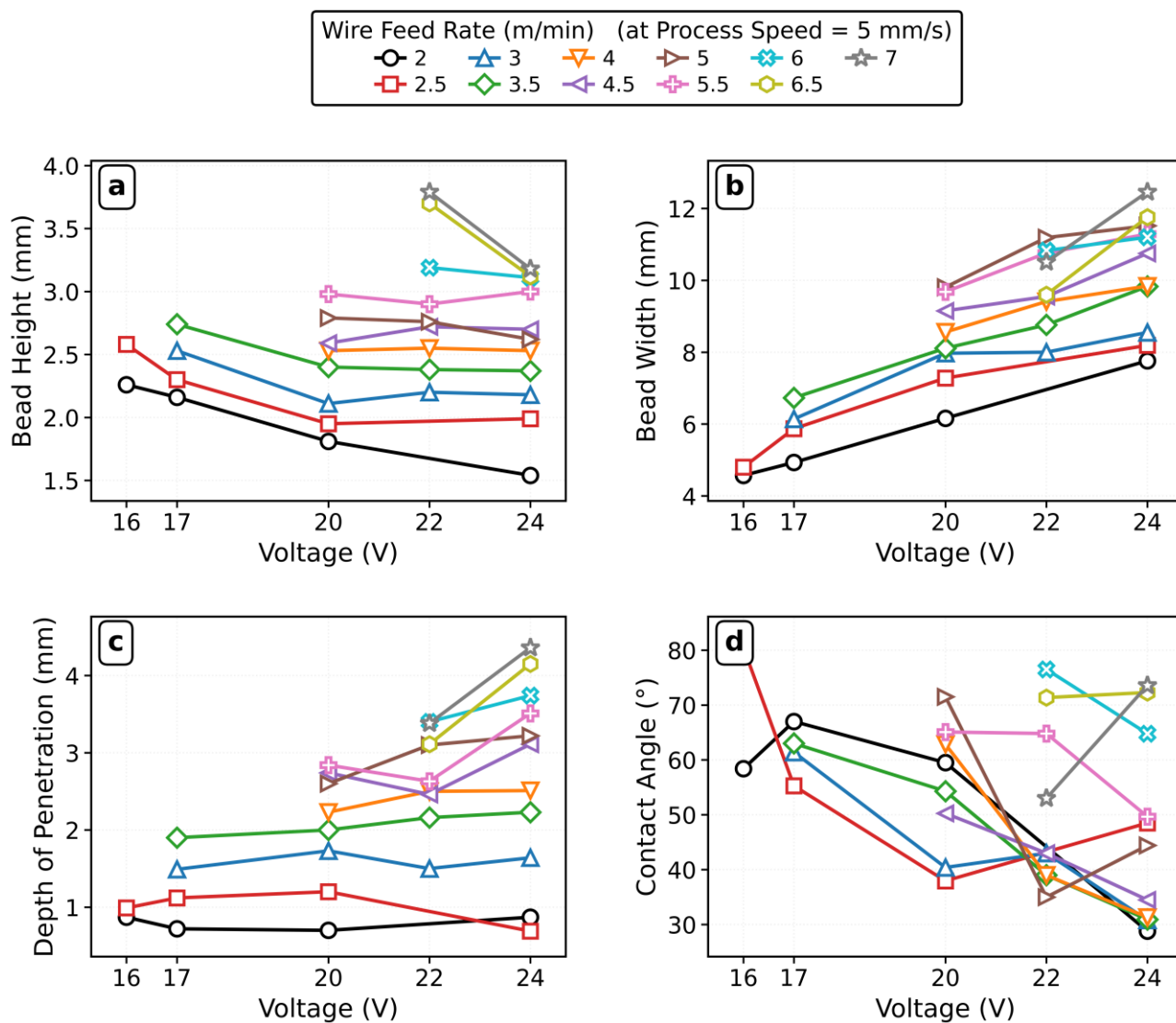




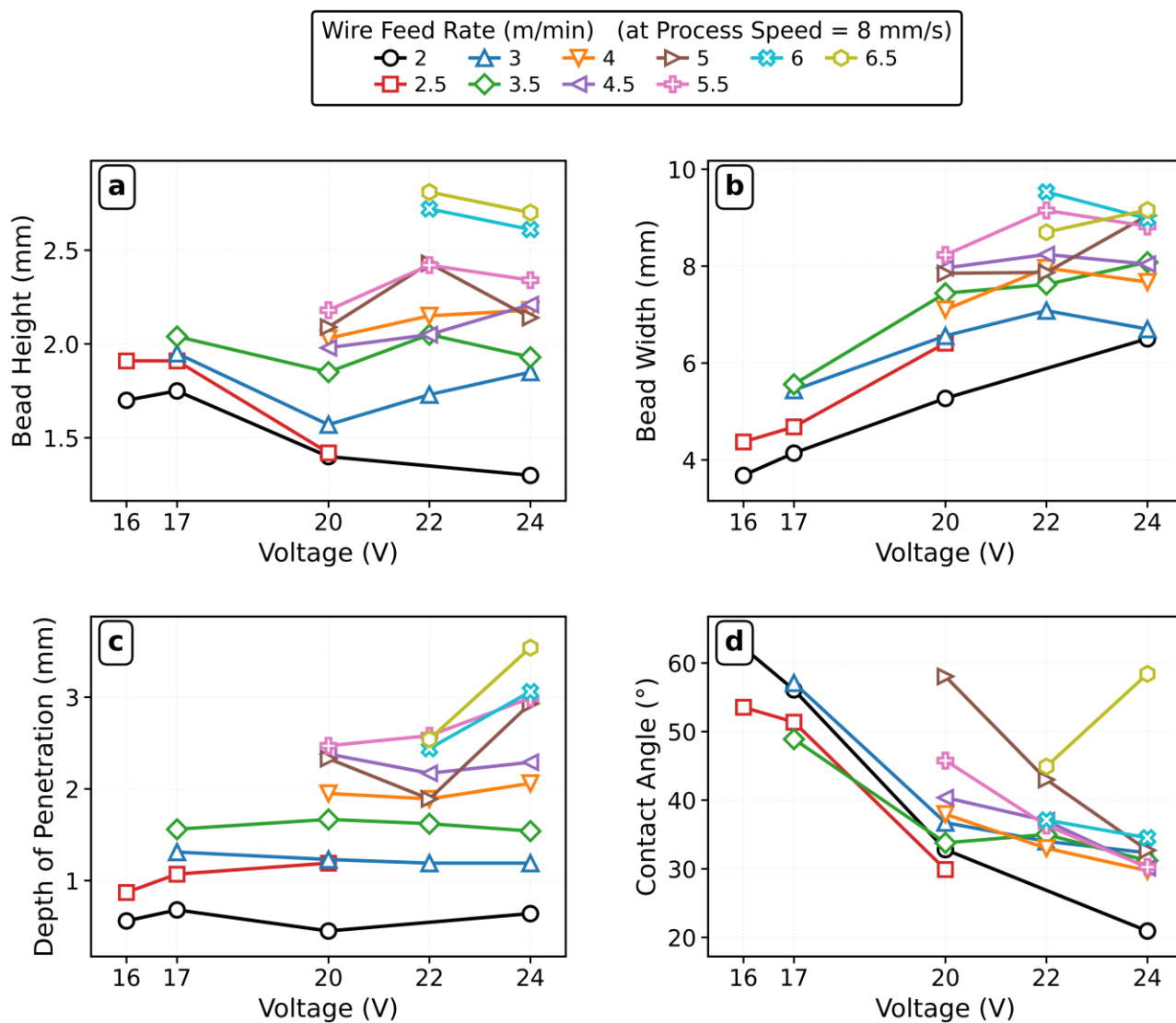
Supplementary Fig 9 Effect of Current on (a) bead height, (b) bead width, (c) penetration depth, and (d) contact angle at process speeds of 2,5,8,11 and 14 mm/s and Voltage of 16,17,20,22 &24V



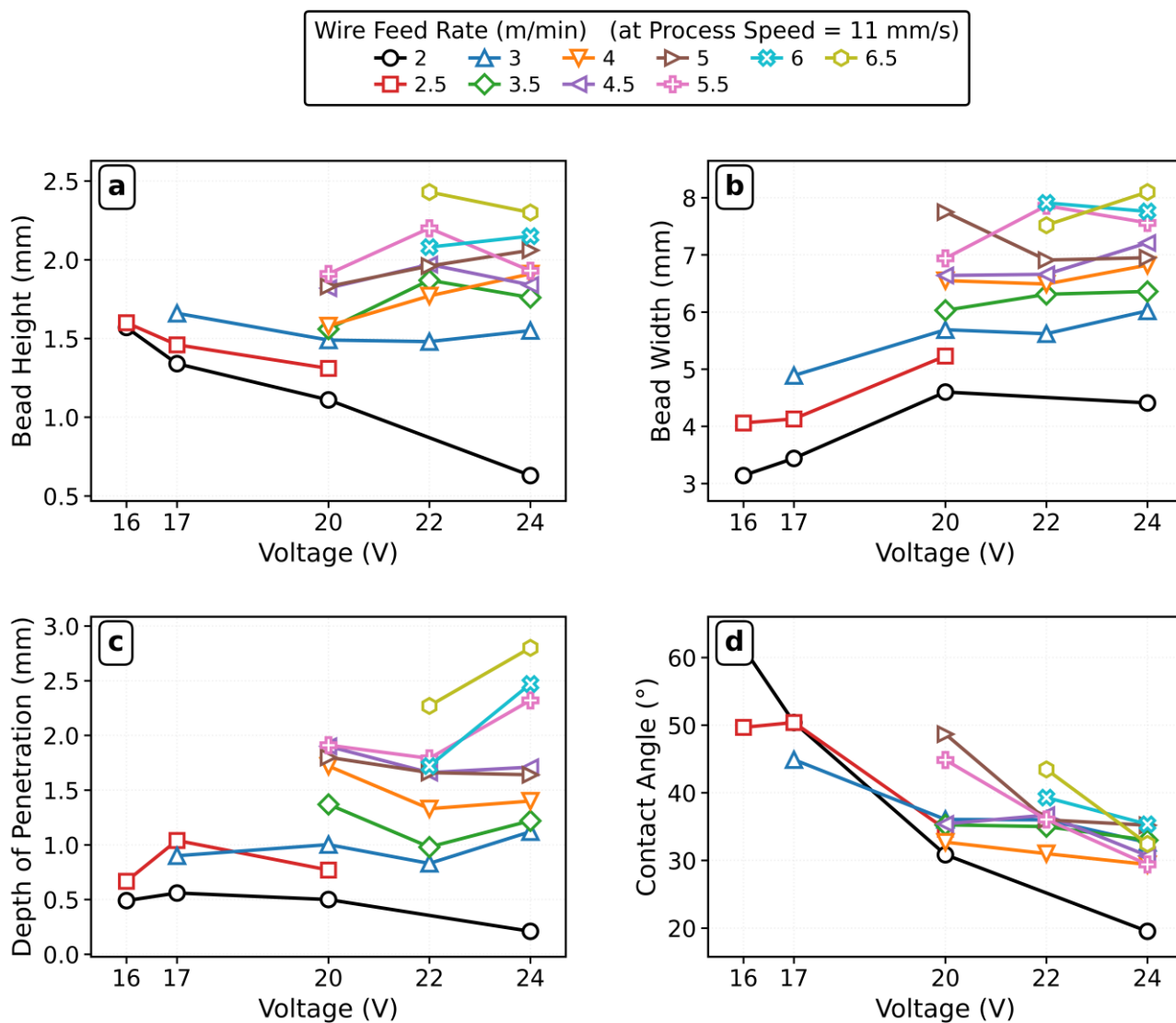
Supplementary Fig. 10 (a) Effect of Voltage on (a) bead height, (b) bead width, (c) penetration depth, and (d) contact angle at process speeds of 2 mm/s and WFR of 2-7 m/min



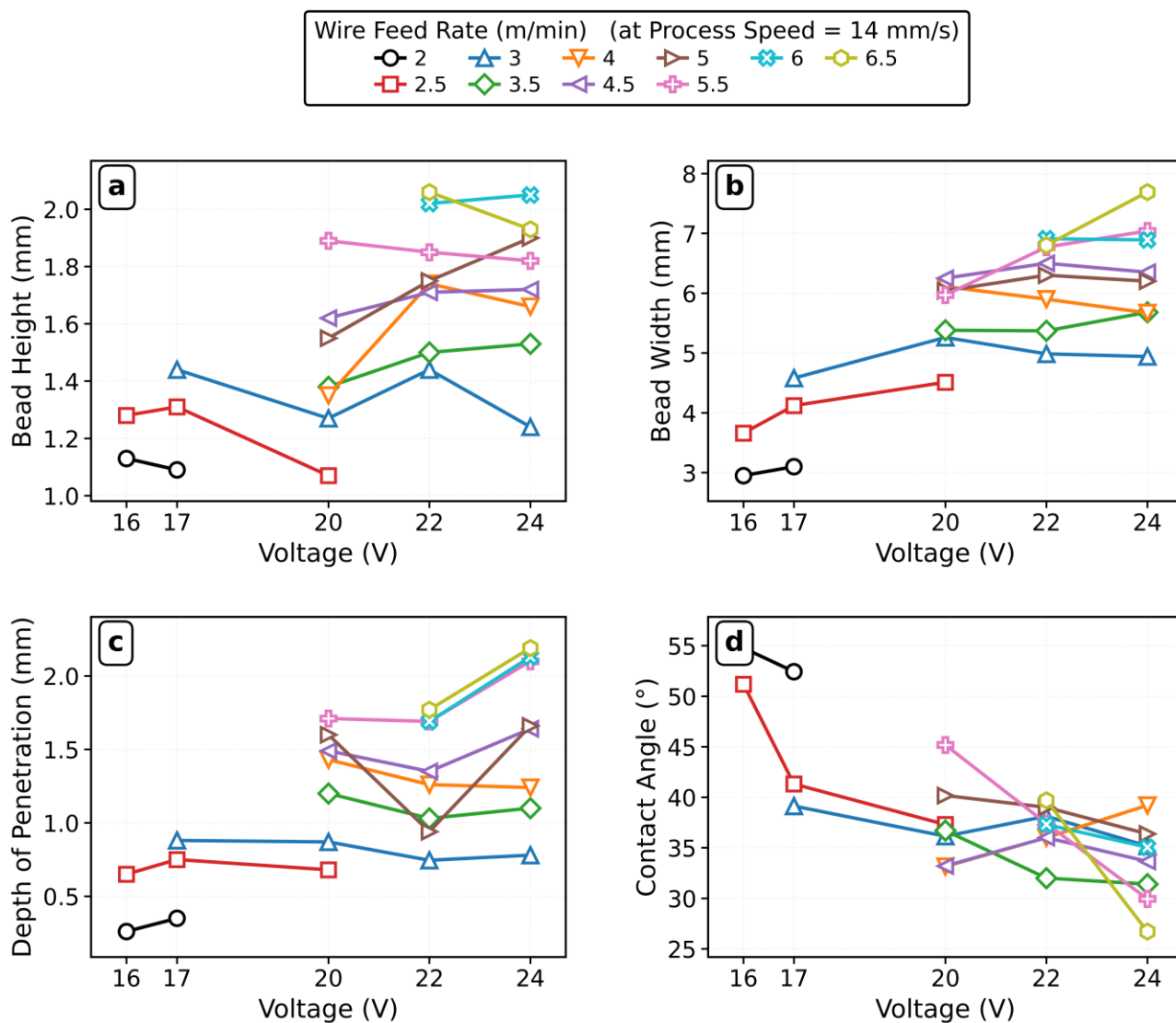
Supplementary Fig. 10 (b) Effect of Voltage on (a) bead height, (b) bead width, (c) penetration depth, and (d) contact angle at process speeds of 5 mm/s and WFR of 2-7 m/min



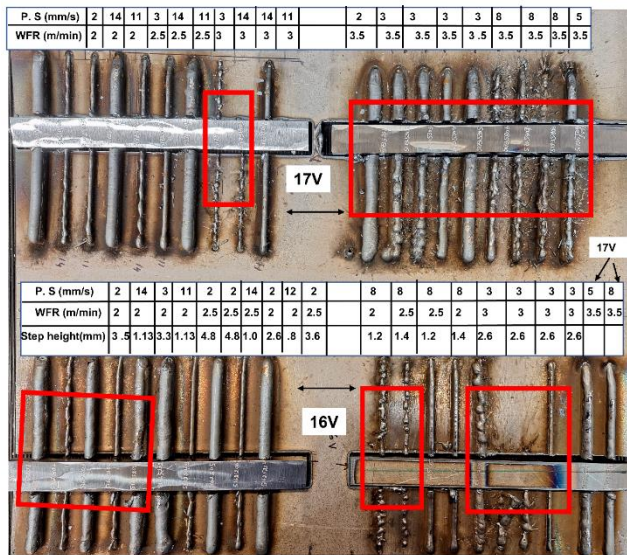
Supplementary Fig. 10 (c) Effect of Voltage on (a) bead height, (b) bead width, (c) penetration depth, and (d) contact angle at process speeds of 8 mm/s and WFR of 2-7 m/min



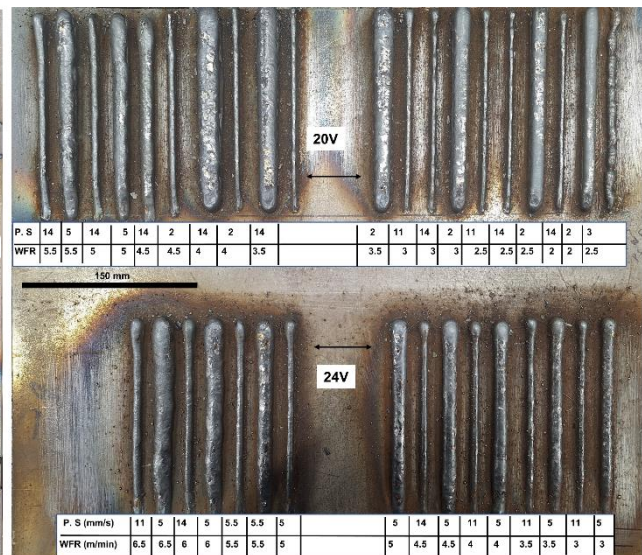
Supplementary Fig. 10 (d) Effect of Voltage on (a) bead height, (b) bead width, (c) penetration depth, and (d) contact angle at process speeds of 11 mm/s and WFR of 2-7 m/min



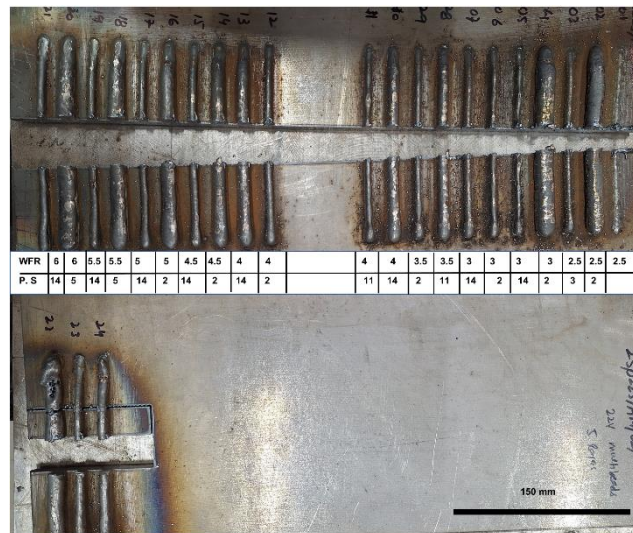
Supplementary Fig. 10 (e) Effect of Voltage on (a) bead height, (b) bead width, (c) penetration depth, and (d) contact angle at process speeds of 14 mm/s and WFR of 2-7 m/min



(a)



(b)



(c)

Supplementary Fig.11 (a) multi-bead printing at 16V (lower row of beads) & 17V (upper row of beads) (b) multi-bead printing at 20V (upper row of beads) & 24V (lower row of beads) (c) multi-bead deposition at 22V