

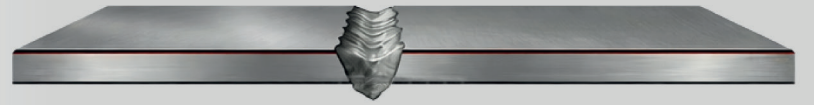
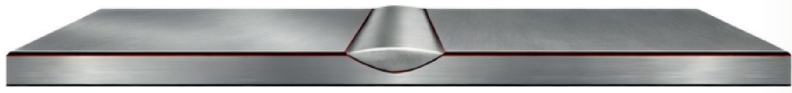
VISUAL PARAMETER GUIDE: MS20 LASER WELDER

Effect of variables on penetration and appearance

LOWER

POWER

HIGHER



- PENETRATION
Less strength

+ APPEARANCE
Smooth finish

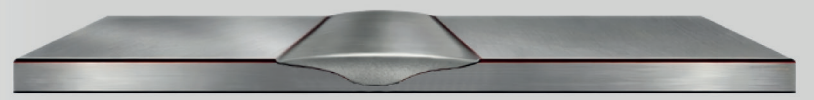
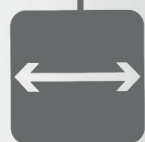
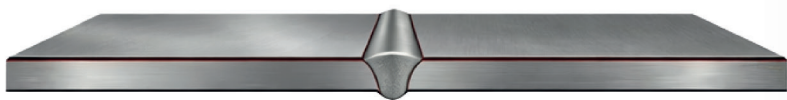
+ PENETRATION
Risk of burn-through

- APPEARANCE
Irregular surface

LOWER

BEAD WIDTH

HIGHER



+ PENETRATION
Concentrated energy

- APPEARANCE
Narrow crown

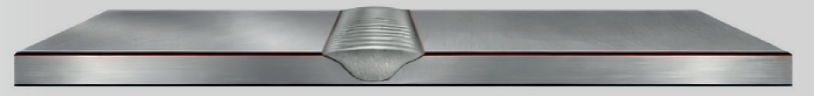
- PENETRATION
Energy dispersion

+ APPEARANCE
Wide and uniform

LOWER

FREQUENCY (HERTZ)

HIGHER



+ PENETRATION
Slow and hot arc

- APPEARANCE
Pulse marks

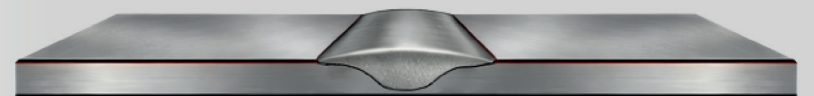
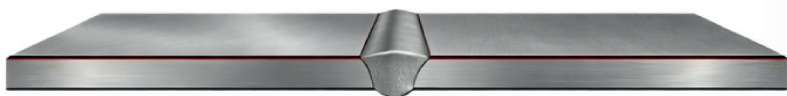
- PENETRATION
Fast and cold arc

+ APPEARANCE
Fine micro-marks

LOWER

FEED SPEED

HIGHER



+ PENETRATION
Higher base heat input

- APPEARANCE
Less filler

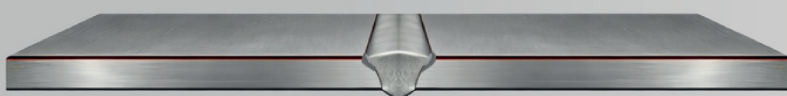
- PENETRATION
Lower base heat input

+ APPEARANCE
More reinforcement

SINGLE WIRE / SMALLER DIAMETER

FILLER AMOUNT

DOUBLE WIRE / LARGER DIAMETER



+ PENETRATION
Higher base heat input

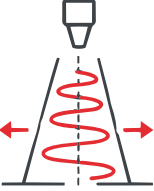
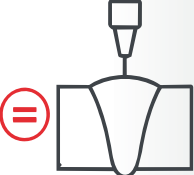
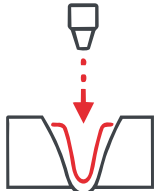
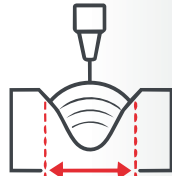
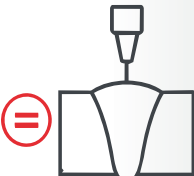
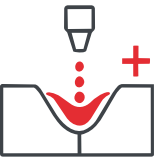
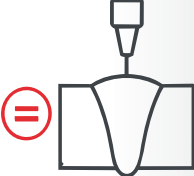
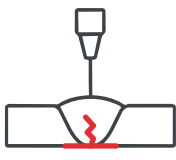
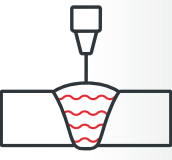
- FILLER
Less filler

- PENETRATION
Lower base heat input

+ FILLER
More reinforcement

QUICK DIAGRAM: OBJECTIVE AND REQUIREMENT

Suggested adjustment order: speed -> frequency -> ller feed -> power.
Adjustments should be made one at a time, performing a test sample between each adjustment.

OBJECTIVE	REQUIREMENT	RECOMMENDED ADJUSTMENT
Increase amplitude 	Without losing too much penetration 	1. Decrease speed 2. Decrease frequency 3. Adjust power
Increase penetration 	Without narrowing the weld bead too much 	1. Decrease speed 2. Decrease frequency 3. Increase power
Improve aesthetics 	Without losing too much penetration 	1. Increase amplitude 2. Increase frequency 3. Adjust power
Increase filler 	Without losing too much penetration 	1. Use double filler feed 2. Increase filler wire diameter
Avoid burn-through 	Without weakening the weld 	1. Increase amplitude 2. Increase speed 3. Decrease power