

# SIM WELDER™

## Customizable Bead Tables and Equipment Settings

### Bead table

The ideal values and tolerances of a weld are defined in a bead table. These values define the acceptable travel angle, work angle, contact tip to work distance, and travel speed for each pass of a weld. The SimWelder ships with a preset table. However, in upgrades, these values can be customized.

The below shows an example bead table for a GMAW mild steel horizontal tee weld.

**Symbol:** 2F

**Joint:** Tee

**Position:** Horizontal (Fillet)

**Material:** 0.25" mild steel

| Pass | Bead Type | BSx,y,z             | MC<br>(inches) | MCt<br>(inches) | MTA<br>(degrees) | MTAt<br>(degrees) | MTS<br>(ipm) | MTSt<br>(ipm) | MWA<br>(degrees) | MWAt<br>(degrees) |
|------|-----------|---------------------|----------------|-----------------|------------------|-------------------|--------------|---------------|------------------|-------------------|
| 1    | String    | (0.0,0.0,0.0)       | 0.375          | 0.125           | 10 push          | 5                 | 14           | 2             | 45               | 10                |
| 2    | String    | (0.0,0.0,0.125)     | 0.375          | 0.125           | 10 push          | 5                 | 14           | 2             | 50               | 10                |
| 3    | String    | (0.0,-0.125,0.0)    | 0.375          | 0.125           | 10 push          | 5                 | 14           | 2             | 40               | 10                |
| 4    | String    | (0.0,0.0,-0.302)    | 0.375          | 0.125           | 10 push          | 5                 | 14           | 2             | 50               | 10                |
| 5    | String    | (0.0,-0.177,-0.177) | 0.375          | 0.125           | 10 push          | 5                 | 14           | 2             | 45               | 10                |
| 6    | String    | (0.0,-0.302,0.0)    | 0.375          | 0.125           | 10 push          | 5                 | 14           | 2             | 40               | 10                |
|      |           |                     |                |                 |                  |                   |              |               |                  |                   |

### Key

Bead Type String; Weave

BSx,y,z Optimum bead seam start position relative to the root of the weld at (0,0,0)

MC Contact tip to work distance, "stickout" distance, (assumed that the contact tip is flush with the end of the nozzle)

MCt Contact tip to work distance, "stickout" distance tolerance

MTA Travel angle; (assumed that the forehand technique will be used)

MTAt Travel angle tolerance

MTS Travel speed; (linear travel speed along weld axis)

MTSt Travel speed tolerance

MWA Work angle

MWAt Work angle tolerance

Tolerances are plus or minus the value of xxxt

SimWelder comes with preset equipment settings. These settings are customizable in upgrades. The below shows an example of a GMAW mild steel horizontal tee weld's equipment settings:

|                     |                  | Configuration |            |       | Symbol:2F           |  |
|---------------------|------------------|---------------|------------|-------|---------------------|--|
|                     |                  | Process       | Metal      | Joint | Position            |  |
|                     |                  | GMAW          | mild steel | tee   | horizontal (fillet) |  |
| Equipment settings: | Polarity         | DCRP          |            |       |                     |  |
|                     | Wire speed (ipm) | 360-380       |            |       |                     |  |
|                     | Voltage (volts)  | 17-23         |            |       |                     |  |
|                     | Gas flow         | 25            |            |       |                     |  |
|                     | Current (amps)   | 180-190       |            |       |                     |  |

The below shows an example bead table for a GMAW aluminum vertical open corner weld.

**Symbol:** 3F      **Joint:** Corner(Open)      **Position:** Vertical (Fillet)      **Material:** 0.50" aluminum

| Pass | Bead Type | BSx,y,z          | MC       | MCT      | MTA       | MTAt      | MTS   | MTSt  | MWA       | MWAt      |
|------|-----------|------------------|----------|----------|-----------|-----------|-------|-------|-----------|-----------|
|      |           |                  | (inches) | (inches) | (degrees) | (degrees) | (ipm) | (ipm) | (degrees) | (degrees) |
| 1    | String    | (0.0,0.0,0.0)    | 0.375    | 0.125    | 10 push   | 5         | 20    | 2     | 45        | 10        |
| 2    | Weave     | (0.0,0.0,-0.177) | 0.375    | 0.125    | 10 push   | 5         | 12    | 2     | 45        | 10        |
| 3    | Weave     | (0.0,0.0,-0.354) | 0.375    | 0.125    | 10 push   | 5         | 10    | 2     | 45        | 10        |
|      |           |                  |          |          |           |           |       |       |           |           |
|      |           |                  |          |          |           |           |       |       |           |           |
|      |           |                  |          |          |           |           |       |       |           |           |

**Key**

Bead Type String; Weave

BSx,y,z Optimum bead seam start position relative to the root of the weld at (0,0,0)

MC Contact tip to work distance, "stickout" distance, (assumed that the contact tip is flush with the end of the nozzle)

MCT Contact tip to work distance, "stickout" distance tolerance

MTA Travel angle; (assumed that the forehand technique will be used)

MTAt Travel angle tolerance

MTS Travel speed; (linear travel speed along weld axis)

MTSt Travel speed tolerance

MWA Work angle

MWAt Work angle tolerance

Tolerances are plus or minus the value of xxxt

SimWelder comes with preset equipment settings. These settings are customizable in upgrades. The below shows an example of a GMAW aluminum vertical open corner weld's equipment settings:

|                            |                         | <b>Configuration</b> |                 | <b>Symbol:3F</b>        |                          |
|----------------------------|-------------------------|----------------------|-----------------|-------------------------|--------------------------|
|                            |                         | <b>Process</b>       | <b>Metal</b>    | <b>Joint</b>            | <b>Position</b>          |
|                            |                         | <b>GMAW</b>          | <b>aluminum</b> | <b>full-open corner</b> | <b>vertical (fillet)</b> |
| <b>Equipment settings:</b> | <b>Polarity</b>         | DCRP                 |                 |                         |                          |
|                            | <b>Wire speed (ipm)</b> | 350-375              |                 |                         |                          |
|                            | <b>Voltage (volts)</b>  | 22-28                |                 |                         |                          |
|                            | <b>Gas flow</b>         | 30                   |                 |                         |                          |
|                            | <b>Current (amps)</b>   | 300                  |                 |                         |                          |