Technical Report

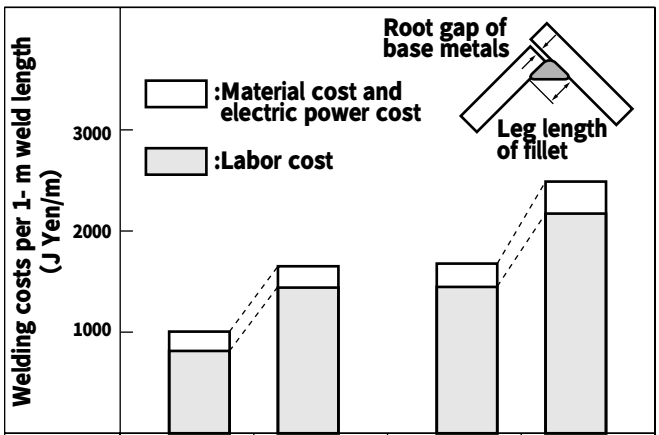
DW-100V

(AWS A5.20 E71T-1)

The use of DW-100V flux-cored wire can reduce welding costs due to its superior usability in vertical-up CO_2 arc welding at higher currents, wider root-gap, and higher travel speeds.

DW-100V is Highly Economical

Fig. 1 compares DW-100V with a conventional all-position type flux-cored wire in terms of the total welding cost in vertical-up welding. Total welding cost includes the cost of materials, electric power, and labor. It is clear, in Fig. 1, that DW-100V can reduce the total welding cost by 20-50% (using Japanese wage levels), depending on the joint root gap and required fillet leg length.



Wire	DW-100V	Ordinary wire	DW-100V	Ordinary wire
Leg length	6 mm		9 mm	
Root gap	0 mm		3 mm	

Fig. 1 — Welding costs calculated for vertical-up welding with DW-100V flux-cored wire (wire dia: 1.2 mmϕ) in comparison with that for a conventional flux-cored wire

How DW-100V Provides Advantages

DW-100V can use higher welding currents and tolerate a lager joint root gap than conventional flux-cored wires, as shown in **Fig. 2**. That is why DW-100V can weld faster by saving the arc time and the time for strict adjustment of the joint root gap.

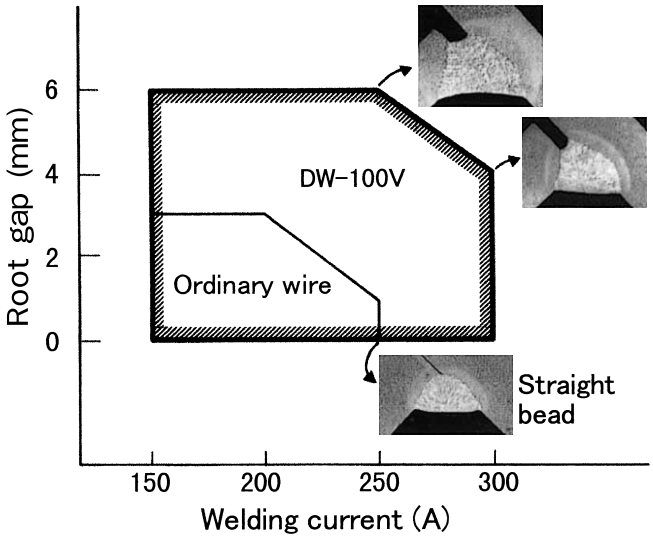


Fig. 2 — Proper welding current ranges of DW-100V and a conventional flux-cored wire in vertical-up welding (wire dia: 1.2 mmϕ)

DW-100V can weld at higher speeds due to better slag covering in vertical-up welding. This characteristic permits the use of the straight technique in vertical-up welding; therefore, a small leg length fillet can easily be made at faster speeds, as shown in **Fig. 3**. Welding amperage is another factor that governs fillet leg length; when the welding speed is constant, higher welding amperage results in a larger leg length, because the deposition rate increases. The darker areas in Fig. 3 show proper ranges for the straight technique, using higher travel speeds for smaller leg lengths. In contrast, conventional all-position flux-core wires may cause convex weld beads in the use of the straight technique in vertical-up welding. Therefore, they require the weaving technique to be used in order to make flat beads, which often results in larger leg length and slower welding speeds. **Fig. 4** shows typical bead profiles of DW-100V offering smooth bead surfaces and sufficient joint penetration provided by both the straight technique and weaving technique.

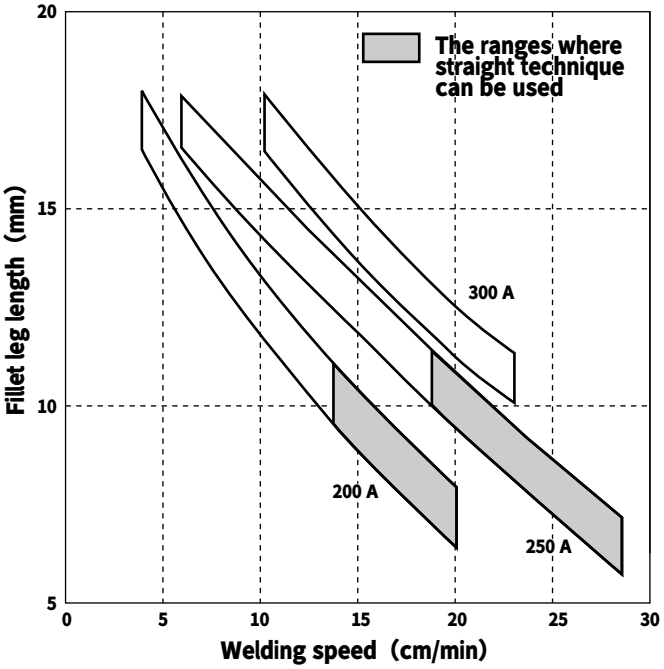


Fig. 3 — The relationship between fillet leg length, welding current, and travel speed in vertical-up fillet welding (wire dia: 1.2 mmϕ)

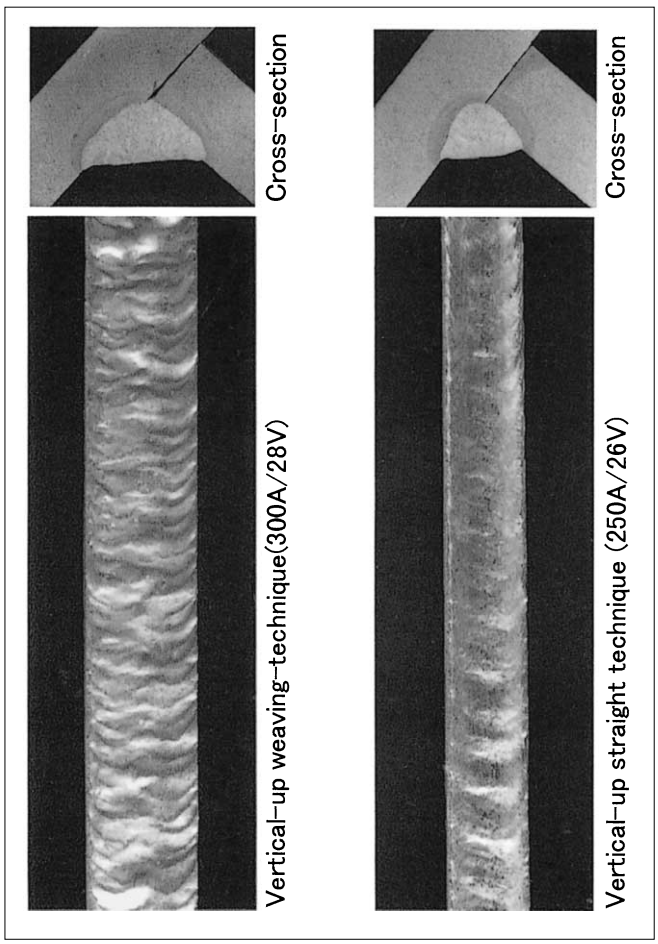


Fig. 4 — Typical bead profiles of DW-100V, offering smoother surface and sufficient weld penetration in vertical-up welding by means of the weaving and straight techniques (wire dia: 1.2 mmϕ)

What Applications Highlight DW-100V

DW-100V can use a high, proper welding current in the range of 120-300 ampere (for 1.2 mm**ϕ** wire) in all positions without adjusting the welding current position by position. This advantageous performance makes DW-100V more suitable for a job that, because of the inherent difficulty in positioning the work, requires all-position welding. DW-100V can produce a steady molten crater more resistible against dropping in vertical-up position and tolerate a larger joint root gap. These features of DW-100V are very advantageous in robotic welding (**Fig. 5**).

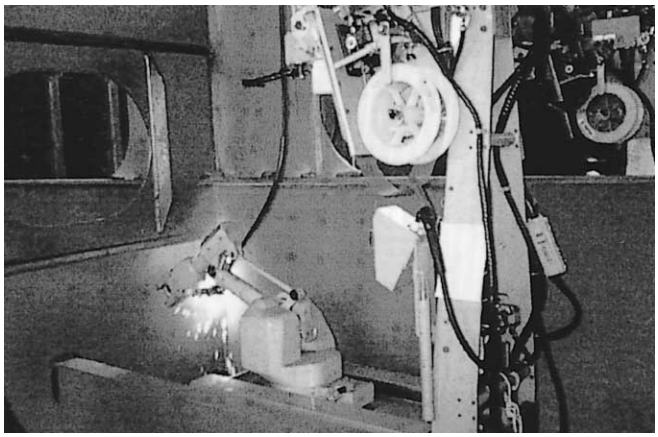


Fig. 5 — The application of DW-100V in robotic welding of cross joints of longitudinal and transverse components (wire dia: 1.4 mmϕ)

Key Points in Vertical-Up Welding

Use the weaving patterns as shown in **Fig. 6** to control leg lengths of fillets, directing the torch horizontal or at up to 10 degree upwards.

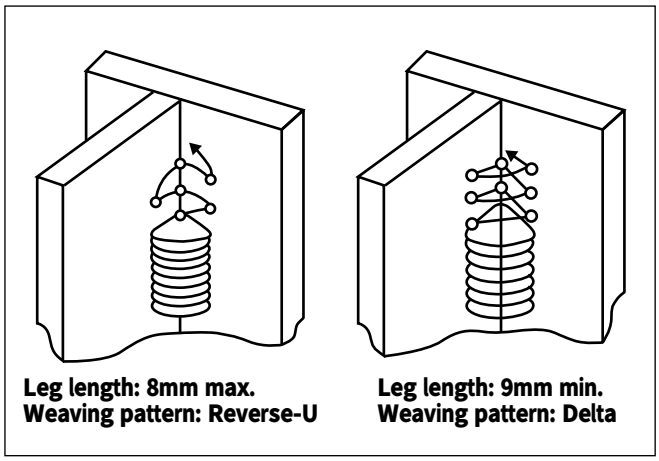


Fig. 6 — Typical weaving patterns suitable for vertical-up fillet welding