*Technical Report*

# LB-52-18

**(AWS A5.1 E7018)**


**LB-52-18 is a low-hydrogen electrode with a high deposition rate for mild steel and 490N/mm² high tensile steel. It is an excellent choice for a variety of applications.**

## Inception of LB-52-18

LB-52-18 was developed around 1962. "L" stands for low hydrogen, while "B" symbolizes a slag-shielding covered electrode. "52" refers to the typical tensile strength of deposited metal at the time the electrode was developed. "1" shows that it can be used in all positions, while "8" is the designation for "iron powder, low hydrogen" as in the AWS E7018 specification.

## High Deposition Rate

The deposition rate is the weight of metal deposited per unit of time. Typical deposition rates of LB-52-18 and an ordinary E7016 electrode, as a function of welding current, are shown in **Fig. 1**. It is clear that the deposition rates are dependent on welding current, and LB-52-18 provides approximately 20% higher deposition rates when compared with the E7016 electrode.

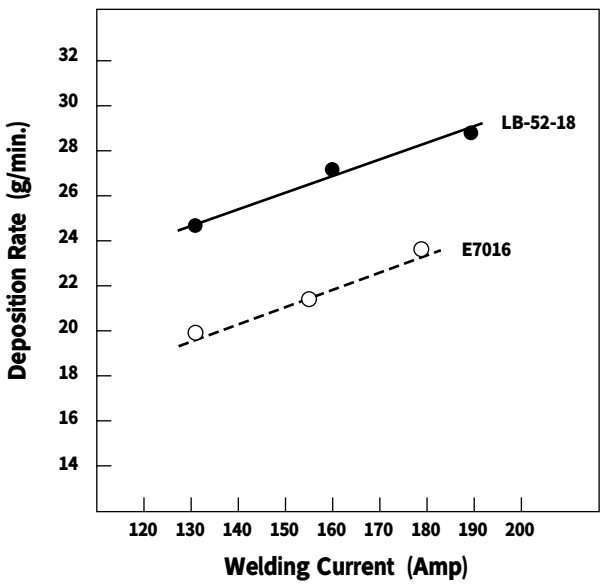


*Fig.1 - A Comparison between LB-52-18 and an Ordinary E7016 Electrode on Deposition Rate*

The deposition rate is an important variable in welding economics. A higher deposition rate necessarily results in a faster speed or shorter time for welding a certain mass of groove. Shorter welding time can reduce labor costs. LB-52-18, therefore, can provide savings by up to 20% over ordinary E7016 electrodes when the costs for material and overhead are kept constant.

## Outstanding Features of LB-52-18

The features that help LB-52-18 stand apart from ordinary E7018 electrodes are:

(1) Superior welding performance with either DC or AC currents. It is the Number 1 electrode among the various low hydrogen electrodes that use DC.

(2) Superior mechanical properties: constant tensile strength and high impact value

(3) Superior crack resistibility

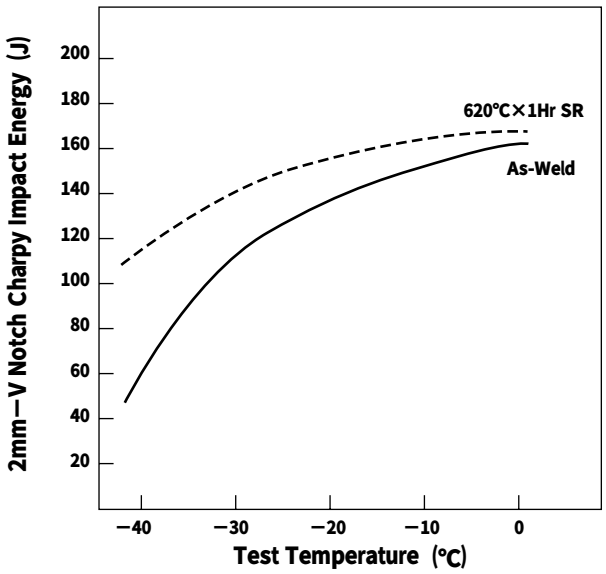


*Fig.2 - Typical Impact Energy of LB-52-18 Deposited Metal*

**Fig. 2** shows the results of Charpy impact tests on LB-52-18 deposited metal using 2-mm-V-notch specimens at various testing temperatures. This high

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impact strength makes LB-52-18 suitable for low-temperature applications down to −20℃, in addition to applications at room and elevated temperatures.

## Highly Reputed for 35 Years

Since it was launched, LB-52-18 has seen its features refined and its markets expanded. Kobe Steel pursues keen quality control in order to maintain the excellency of LB-52-18 produced in Japan and overseas. The maintenance of quality is an important factor in the high reputation LB-52-18 has persistently earned in such diverse fields as machinery, steel structures, bridge construction and shipbuilding.

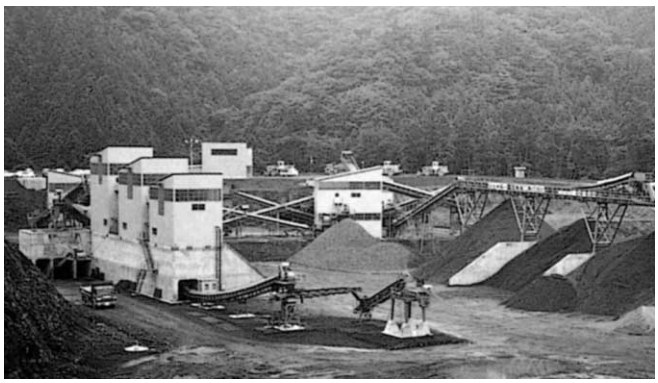

***Fig.3 - A High Deposition Rate of LB-52-18 is Valuable for the Maintenance Welding of Heavy-Duty Machinery in Crushing Plants***

## How to Use LB-52-18

When higher welding speeds or shorter welding times are required, ordinary E7016 electrodes can be switched to LB-52-18 in any application. In particular, LB-52-18 really shines in all-position welding of pipes using DC power sources, You will get unsurpassed arc stability and a superior weld bead profile through the girth weld of the pipes, in addition to higher deposition rates. However, you cannot obtain these merits unless you follow some of the following precautions.

(1) Re-dry LB-52-18 at 300 - 350℃ for 30 - 60 minutes before use for every four-hour exposure to air without wetting unless otherwise specified. This is because the coating flux tends to pick up moisture in the air as shown in **Fig. 4**. Moisture can be a cause of spatters, porosity, irregular bead appearance and cold cracking. The moisture content in the coating flux, therefore, should be maintained at 0.5% maximum by re-drying in order to prevent decreased usability and weldability.

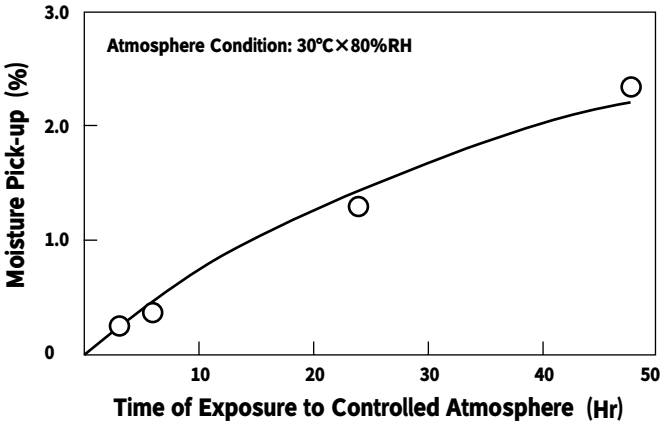


***Fig.4 - The Relationship between Moisture Pick-Up and Time of Exposure to Controlled Atmosphere***

(2) Use the backstep technique at arc starting to prevent the occurrence of porosity at the starting area of the weld bead as illustrated in **Fig. 5**. This figure shows the backstep technique in the vertical-up position when welding a horizontally fixed pipe. This is a common practice for all low hydrogen electrodes.

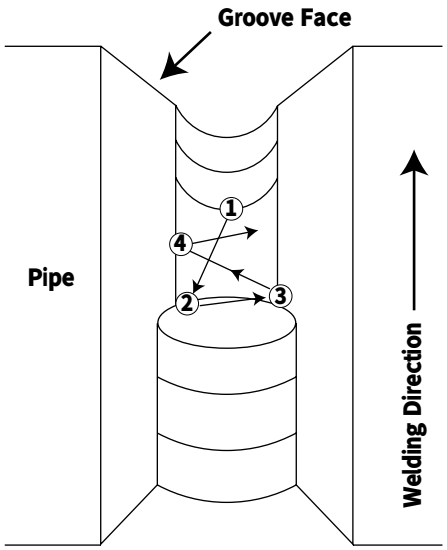


***Fig.5 - The Backstep Technique in Vertical-Up Position Welding of Pipes***
***① Arc Start***
***② Backstep***
***③ Following Step***
***④ Following Step***

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