

HANDLING AND STORAGE RECOMMENDATIONS

for Welding Consumables



General Recommendations

Böhler Welding filler and cladding materials and fluxes will keep their promised performance and properties when being stored properly under the described conditions. For storage conditions or periods deviating from recommended, a visual control and a welding test can verify the functionality. Depending on the type and individual properties of the material longer storage periods can be accepted. The start date of the storage period is the date where the consumables arrive at the ordering company. The storage management should follow the first in first out principle to avoid over-aging.

Basic Guide Lines

- Welding consumables should be kept in their undamaged original packaging.
- The storage environment must be dry, clean, and free of dust.
- No direct exposure to sunlight.
- No direct contact of the packaging with walls and floor.
- Welding consumables must be stored frost free.
- Temperature drops below the dew point should be avoided.

Recommended storage conditions

Temperature	Relativ humidity
5 – 15 °C	< 50 % RH.
18 – 25 °C	< 60 % RH
25 – 35 °C	< 40 % RH
> 35°C	< 30 % RH

These recommendations do not release the user from his duty to convince himself of the proper condition of the welding consumables before use.

Covered Electrodes

Quality packaging

Depending on the type of electrode and the application, stick electrodes need to be protected against moisture pick up from the atmosphere. The electrodes need to be stored in a dry room in their undamaged original packaging.

Covered electrodes can be stored in their undamaged and unopened original packaging for 2 years following the recommended storage conditions above. The preferred condition is: 18 – 25 °C at < 60 % RH.

Covered electrodes in opened, broken or damaged packaging must be stored in a separate, heated room at higher temperatures. The re-drying time and temperature before use depends on type, kind of packaging and application. Individual information is provided on the electrode package.

Stick electrodes where no re-drying recommendation is given can be dried at 100 - 120 °C / 1 h.

Cellulosic electrodes must not be re-dried.

Electrodes exposed directly to water, oil or grease must not be used.

General recommendations for redrying of stick electrodes:

Classification EN ISO	Application	Type	Redrying	Temperature (°C)	Time (h)
2560	Non and low alloyed	A, RA, C, RC, R, RR, RB	no	–	–
		B	yes	250 – 350	2 – 10
18275	High tensile steel	B	yes	300 – 350	2 – 10
3580	Crepp resistant steel	R	no	–	–
		B	yes	300 – 350	2 – 10
3581	Stainless steel (soft-) martensitic and heat resistant ferritic steel	R	yes	250 – 300	2 – 10
		B	no	–	–
		B, R	yes	300 – 350	2 – 10
14172	Ni and Ni-alloys	R, B	yes	250 – 300	2 – 10

Deviations from these recommendations are possible and provided on the individual product packaging.

In case of hydrogen content in weld metal of < 5 ml / 100 g weld deposit, re-drying at 350 °C / 2 h is necessary.

Before re-drying, the electrodes should be removed from the packages with the appropriate care and laid in the preheated (80°– 100° C) baking oven. The stacked height of the electrodes in the oven should not exceed 50 mm.

The electrodes should stay for at least 2 h in the oven after reaching the required re-drying temperature. Before taking the electrodes out let them cool down in the opened oven to 70°– 90 °C. After re-drying they can be kept in a drying cabinet at 120°– 200°C up to four weeks or in a quiver at 100°– 200°C for up to 8 hours.

DRY SYSTEM Premium Packaging – Ready-to-use covered electrodes

From the advanced Böhler Welding metal Can or the premium DRY SYSTEM vacuum pack, covered electrodes can be welded without re-drying. Using our special moisture resistant coated electrodes is possible up to 9 hours after opening. See detailed information on the label. DRY SYSTEM offers different packaging sizes matching the average consumption of one shift. Unused electrodes can be stored and re-dried as described before. DRY SYSTEM offers simple and save handling of covered electrodes under workshop and construction site conditions. Dry and optimal conditioned electrodes are available at all time.

Covered electrodes from the Böhler Welding DRY SYSTEM premium vacuum pack or the advanced metal Can have a nearly unlimited shelf live as long as the packs are neither opened nor damaged.

Flux for Joining and Cladding

Quality packaging

Fluxes for joining and cladding can be stored in their undamaged and unopened original packaging for 2 years following the recommended storage conditions above. The preferred condition is: 18 – 25 °C at < 60 % RH.

Flux from damaged packs must be used or repacked immediately.

Basic fluxes need to be re-dried before use to avoid the risk of cold cracking when coming in standard packaging (Plastic bag, paper bag with plastic liner, standard Big Bag).

Re-drying of agglomerated fluxes is generally done at 300-350°C for 2-4 hours or for FB types for two hours at 350 – 450°C to ensure the H4 resp. H5 classification.

General recommendations for re-drying of agglomerated fluxes:

Type	Re-drying	Temperature [°C]	Time [h]
FB	yes	300 – 350 (450)	2 – 10
AB	yes	300 – 350	2 – 10
AR	yes	150 – 200	2 – 10

Detailed re-drying recommendations are displayed on the product packaging.

The construction of the re-drying oven should avoid local over heating by means of a dry blend screw and ensure good ventilation. When applying static drying the height of the flux is restricted to 50 mm. The flux may be re-dried several times; we recommend a maximum cumulative holding time within a temperature range of 300 - 350°C of approximately 10 hours. After re-drying, unused flux can be stored up to 30 days at a temperature of about 150 °C.

When working at higher temperatures >30°C and rel. humidity >80% it is recommended to maintain the flux at a temperature of 110 - 150 °C.

In a well-designed flux re-circulation system characterized by low flux travel speeds, no sharp bends and minimized flux travel distances, the flux can be re-circulated several times without damaging the agglomerate. A central flux hopper should be re-filled with fresh or re-dried flux when approximately 50% of the content is consumed.

Fine particles or dust formed during re-circulation should be limited to 5% with a grain size of <200 µm by using dust filters.

The re-circulated flux must be kept free of all foreign particles such as welding slag, rust, plate scale or grinding dust.

The compressed air used in any sucking or re-circulation system shall be clean and dry. Devices such as a frost condensation driers and oil traps should be used.

DRY SYSTEM Premium Packaging – Ready-to-use fluxes

Flux from the advanced Böhler Welding metal bucket or the premium DRY SYSTEM Bag or BigBag can be used right away without re-drying.

The particular characteristic of the DRY SYSTEM packaging reliably prevents moisture pick up of the flux during transport and storage.

Böhler Welding flux for joining and cladding in unopened and an undamaged metal bucket, DRY SYSTEM Bag or DRY SYSTEM BigBag can be stored for longer periods than two years.

Cored Wires

Flux cored wires can be stored in their undamaged and unopened original packaging for 2 years following the recommended storage conditions above, independent of the type as seamless or folded cored wire. The preferred condition is: 18 – 25 °C at < 60 % RH.

At storage temperatures below 10 °C there is a risk of condense forming on the wire surface when being opened and unpacked in a warmer environment. This can lead to porosity and gas marks at the beginning of the weldment. Acclimatized wires and rods should be used, only. After finishing welding broken spools should be removed from the welding machine and stored in the original packaging at a dry place.

Redrying of cored wires is not necessary and is not recommended in general.

Solid Wires and Rods

Solid wires and rods can be stored in their undamaged and unopened original packaging for 2 years following the recommended storage conditions above. The preferred condition is: 18 – 25 °C at < 60 % RH. For stainless steel products longer storage times do normally not lead to restrictions in their properties.

At storage temperatures below 10 °C there is a risk of condense forming on the wire surface when being opened and unpacked in heated environment. This can lead to porosity and gas marks at the beginning of the weldment. Acclimatized wires and rods should be used, only. After finishing welding broken spools should be removed from the welding machine and stored in the original packaging at a dry place.

Aluminium Wires and Rods

During transport and storage of aluminum alloys conditions leading to condensation of air humidity on the surface must be avoided to minimize the risk of hydrogen diffusing into the oxide skin as main source for porosity during welding.

Prior to welding aluminium welding consumables should be stored in their unopened original packaging in the welding area for 24 hours before use to enable a temperature relieve and avoid condensation.

Aluminium welding wires must be stored in a dry room with constant temperature in their unopened and undamaged original packaging. High humidity, air flow and quick temperature changes must be avoided.

Aluminium wires and rods can be stored up to two years under these conditions if the original packaging is unopened and not damaged.

Opened material is to be stored in the re-closed original packaging and must be kept away from each kind of contamination, contact with other metals, temperature and humidity changes. Under these conditions the material can be stored up to one year.