

# Electrode holder innovation

Volker Müller describes an electrode holder development, featuring the latest manufacturing techniques and the highest reliability.

Electric heating has been common in glass melting furnaces for many years. It is used for:

- Performance increase in the furnace.
- Better glass quality.
- Control of convection currents in the glass melt.
- Accelerating colour change.
- Lowering melting costs by energy mix (exchange of fossil and electric energy because of energy prices).
- Reducing emissions due to evaporations of the melt.

Whereas for SORG all-electric furnaces, top electrodes are mostly used, fossil-fuel-fired furnaces (but also electric furnaces) are equipped with electrodes that are inserted in the furnace bottom or the sidewalls by means of electrode holders. Bottom and side electrodes have one thing in common, no matter where they are located: An electrode holder is needed to insert the electrodes (usually made of molybdenum) through the refractory material.

Electrode holders are a highly stressed component in the melting furnace. They are in contact with the glass melt and therefore, need constant water cooling.

As the electrodes are subject to



The latest SORG XD electrode holder.

wear during operation, they have to be advanced in the course of maintenance. Advancing means additional stress for the electrode holders – many holder constructions available on the market fail after repeated advancing of electrodes and have to be exchanged. Even without advancing, high mechanical stress exists in the material of the holder because of the significantly differing temperature loads (glass - cooling water). This often leads to tension cracks and thereby to failure of the holder, making an exchange of the holder necessary.

For many years, SORG has consistently developed its electrode holder technology further. This development process has repeatedly led to improvements. With thousands of electrode holders in operation worldwide, the failure rate of SORG holders is close to zero.

Despite the high performance level of its holders, the company has included further improvements in the technology and thus brought the electrode holders some decisive steps forward again. Extensive trials at the organisation's technical centre have accompanied this process.

Under the name XD electrode holder, SORG has introduced this latest level of development to the market.

## Design benefits

- The cooling head of the electrode holder is manufactured by deep-hole drilling from a single piece of special high temperature stainless steel. Small welded joints are only located at the very end of the head, which faces away from the glass. Due to this design, pre-stressing of the material by heat impact during the welding process, which can later lead to premature embrittlement cracks, is avoided.
- Significantly lower risk of cooling water leakage, even after many electrode advancing cycles.
- Compared to the previous XL type, the cooling head is prolonged. This ensures that the entire part of the holder embedded in the brick is cooled.
- The pressure drop of the cooling water channels has been reduced. Thus, the specified cooling water flow rate is reached, even at low water pressure.

All SORG XD electrode holders have the same overall dimensions and installation situation as the previous XL type, which was completely replaced in mid-2017. This design is held in stock and can be delivered in a short time. Different overall lengths are available as custom-made designs and larger outer diameters with heat-shrunk gasket are also available on request. ●

SORG Electrode Holder Type	Electrode Diameter	Electrode Holder Dimensions			Refractory Bore [mm]	Stock Type
		Outer Diameter [mm]	Inner Diameter (Electrode Bore) [mm]	Overall Length [mm]		
XD 32/63/700	32 mm 1½"	63	34	700	68	✓
XD 32/63/900				900		
XD 32/63/1250				1250		
XD 32/63/1500				1500		
XD 51/82/700	48 mm 2"	82	52,5	700	87	✓
XD 51/82/900				900		
XD 51/82/1250				1250		
XD 51/82/1500				1500		
XD 63/103/700	2½"	103	67	700	107	✓
XD 63/103/900				900		
XD 63/103/1250				1250		
XD 63/103/1500				1500		
XD 76/116/700	3"	116	81	700	122	(✓)
XD 76/116/900				900		
XD 76/116/1250				1250		
XD 76/116/1500				1500		

Technical parameters of the SORG XD electrode holder. (✓): Electrode holders for 3in electrodes are not in stock but are available on short notice.

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