

# *Innovative* ENGINEERING

Dave McGuinness, International Business & Product Manager, Schoenbeck GmbH & Co. KG, Germany, presents a new hydraulic spreader bar that is specially designed for deploying concrete coated pipes.

**D**ue to customer demand, Schoenbeck GmbH & Co. KG has developed a further unique piece of pipe handling equipment specially designed for deploying concrete coated pipes in the coating industry.

Schoenbeck is globally recognised as one of the leading manufacturers of diesel and electrically powered vacuum-based lifting equipment, all of which carry the brand name 'ELITE vacuum pipe lifter'. Schoenbeck's main office in Nienstaedt, Germany is experiencing a growing trend of technical requests for solutions outside their standard scope of vacuum-based lifters. Many of these requests are of great interest to Schoenbeck and will consequently result in new challenges and products being introduced to the global market during 2011. The first newcomer to Schoenbeck's equipment scope will be commissioned in March 2011 and expands the lifting platform of tools and equipment available by this German-based company.

In general, 'spreader bars' are very common in many industrial sectors around the world. They fall under various categories, from straight-forward (non-powered) steel girder-like beams, which are hung below single/double hook cranes and utilised when deploying pipes or other objects. Additionally, spreader bars can also be powered electrically or hydraulically for crane or out rigger lifting applications.

On request, Schoenbeck has developed and manufactured a new state-of-the-art hydraulic spreader bar concept for large sized excavator applications (Figure 2). This particular project request received a great deal of interest due to its general rarity. The rarity being that the manufactured machines will be coupled with the heavy family of Hitachi SuperEX 1100 excavators operating in Malaysia. The application will be to deploy concrete coated pipes in a coating plant located in Kuantan. The characteristics of the concrete coating at hand did not allow for a safe

Figure 1. Concrete coated pipes.





Figure 2. The spreader bar is designed for for large sized excavator applications.



Figure 3. The outer 'stationary' telescope arms are pre-set to lift a particular range of pipe lengths.



Figure 4. The pins (pipe carrying arms) are equipped with purpose manufactured durable rubber padding situated at both lifting ends of the tool.

pipe lift when utilising vacuum pipe lifters, regardless of vacuum sealing types available.

### The ELiTE HYD-SB-14

This unit is engineered to harmonise as a lifting attachment with suitably sized excavators. This particular 'below the hook' material handling tool is hydraulically driven. Electrical units are also available for cranes, out-riggers and numerous other carriers. Many traditional hydraulic spreader bars are manufactured to suit one or two particular pipe lengths only. The ELiTE HYD-SB-14 is engineered for flexibility when confronted with handling numerous pipe lengths.

Four integrated telescope arms (2 x active and 2 x stationary) allow the ELiTE HYD-SB-14 to lift pipes from 9000 mm up to 14 000 mm. The inner 'active' telescope arms (actual pipe grab) are driven by two hydraulic cylinders, each of which have an individual brake force (load hold) of 6000 kg. The brake force of 6000 kg is required to eliminate the possibility of a pipe pushing the hydraulic cylinders/pipe pins open during an uneven pipe lift (i.e., uneven ground level) or swinging of the pipe during a lifting manoeuvre.

The outer 'stationary' telescope arms are pre-set to lift a particular range of pipe lengths before the lifting application is started. If a pipe of 10 000 mm is to be lifted, a pre-setting or positioning of 9 - 10 will be carried out. This is possible by lining up both telescopes to coincide with clearly marked templates visible on the outer sides of the stationary telescope arm, (Figure 3). Such a pre-setting or positioning is carried out in a matter of minutes.

In order that pipe lifts are safe and efficient, both hydraulic cylinders operate simultaneously. A specially designed mechanical governor is incorporated to ensure that this important safety feature works without failure.

Today, the vast majority of newly manufactured excavators are equipped with valves that can be adjusted to accommodate various oil pressures and oil flowrates needed when utilising the numerous tools and attachments available on the market. In the event that such values and adjustments are not possible, the ELiTE HYD-SB-14 can accommodate with its own 'onboard' hydraulic system. All onboard values are pre set during Schoenbeck FAT QM procedures but can naturally be adjusted easily onsite to fit individual customer preference if required.

When lifting a pipe with clamps or other methods of internal pipe contact, it is naturally of great importance not to damage the pipe structure, pipe bevelled ends or internal pipe lining. The pins (pipe carrying arms) are equipped with purpose manufactured durable rubber padding situated at both lifting ends of the tool (Figure 4). The top layer is designed to make contact with the pipes inner (upper) internal area and carry the pipe without causing damage to the pipe, welds or lining. A further rubber protection of the same material has been incorporated and situated at the spear tip ends of the pins (pipe carrying arms). This protection prevents damage to the pipe bevel/pipe ends in the unlikely event that the pipes collide during pipe alignment manoeuvres. Finally, red bronze plate padding has been incorporated at possible pipe contact points.

Table 1. Basic dimensions (relevant for this model only)		
Length	Closed/retracted telescope arms	10 300 mm
Length	Open/extended telescope arms	16 000 mm
Width		900 mm
Height	Excluding rotator assembly	2000 mm
Height	Including rotator assembly	3450 mm
Weight	Excluding rotator assembly	4320 kg
Weight	Including rotator assembly	4945 kg
SWL	ELiTE HYD-SB-14	14 000 kg

It is an absolute necessity that all manufactured lifting and handling tools are sufficiently equipped with suitable warning signals, which are foreseen to protect all concerned during, before and after a lifting operation. This signal should be clearly visible, not only for the operator but also for the surrounding environment. However, the more sophisticated these warning signs get, the more vulnerable the equipment may become in terms of maintenance and servicing. For this reason, Schoenbeck kept the pre-design concept as it was originally planned with hydraulic power and durable mechanical functionality. The incorporated warning signals on the ELiTE HYD-SB-14 are extremely durable, effective, purely mechanical and very visible. The big 'lollypop' signal is commonly known from railway track signals. In the case of the ELiTE HYD-SB-14, light pressure is applied by the pipe being clamped, this automatically produces a

mechanical movement that activates the signals indicating to the operators and surrounding environment that the pipe is correctly seated and can be lifted. This signal is clearly visible at both ends and both sides of the lifter.

In order that the ELiTE HYD-SB-14 can be positioned and handled as required, Schoenbeck has incorporated an 18 000 kg (SWL) hydraulic power rotator with a newly modified additional twin oscillation pendle braking assembly. This new addition now accompanies the standard disc assembly making it more effective and durable for this size-handling tool. The combination and modification has lead to a further reduction of swinging and rocking during lifting by 50%. Naturally, zero stress/yield transformation at steel parts is accounted for.

As with all Schoenbeck lifters carrying the brand name 'ELiTE', the HYD-SB-14 can be delivered with a standard dedicated yoke, which will fit one particular excavator size only. Optionally, the extremely popular 'multi yoke' concept from Schoenbeck is also available and accommodates for 99% of all excavator models and sizes manufactured on the world market today.

Due to the concept simplicity, friendly service and an HSE conformed approach in design and engineering, the ELiTE HYD-SB-14 will without doubt soon be the first of many similar spreader bar lifters manufactured by Schoenbeck. The next projects for our riggers and offshore pipelayers have all ready arrived at the engineering desks in the German-based headquarters. **WP**