

# TIP SHEETS FOR SCREEDING

## Tip Sheet #3

### Tip Sheet

### Concrete Screeding – Walk-Behind Laser Screed

#### Problem:

#### Manual Screeding/Rodding

In its simplest form, concrete is a mixture of paste and aggregate (sand and rock). The paste, composed of cement and water, coats the surface of the fine (sand) and coarse aggregates (rocks) and binds them together into a rock-like mass known as concrete. This mixture and the ratios are critical to the workability, integrity and quality of the end product. The increased forces needed to screed/rod and rake can take their toll on the worker.

Screeding/rodding is the first step in the process of leveling and smoothing just-poured concrete. In one way or another, screeding/rodding involves pulling a device over the concrete in order to even out and fill in the surface prior to the completion of finer finishing processes such as floating or troweling. The awkward torso bending, high wrist/hand forces could lead to an overuse injury to the back, arm, wrist or hand.

#### One Solution:

#### Walk-Behind Laser Screed (aka, “CopperHead Screed”)

The “CopperHead” screed is a 660 lb., self-propelled, laser-guided, two-wheeled machine with a 10’ wide vibrating plow. The operator guides the machine into place, puts it into reverse at the chosen speed, guides it over the desired section of concrete, raises the plow off of the concrete (by pushing down on the handles), and guides it to the next section to be screeded. While it is self-propelled, it can be tiring on the arms to maneuver because of the pushing down on the handles to lever it up off the concrete and just getting it in place for the next section. The laser system maintains the plow at the desired height regardless of the direction the “CopperHead” is traveling. The walk-behind laser screed can be used only where accessible (usually ground floor jobs) and on jobs that have relatively few obstructions and are too small for the larger laser screed.



**CopperHead Laser Screed**

**FACTORS:**

- ? Lots of forward bending causes awkward torso posture 79% of the time
- ? Holding the “rod” (2” x 4” board) requires a pinch grip with extreme wrist flexion.
- ? Repetitive hand/arm activity (exceeds the ACGIH TLV for HAL)
- ? High hand forces are required to pull the “rod” to smooth the concrete.
- ? Frequent arm reaching (greater than 90 degrees) is required.

**FACTORS:**

- ? The design allows for an upright posture 95% of the time
- ? Pinch grips and wrist flexion are eliminated.
- ? Hand arm repetition is reduced to within moderate risk (ACGIH TLV for HAL)
- ? Minimal lifting is required
- ? Very low push/pull force required

**Concrete Screeding**

**How much does the “CopperHead” (walk-behind laser screed) cost?**

The cost of a Copperhead screed is approximately \$36,000 and requires only one operator

**What types of jobs are best suited for using the “CopperHead” screed?**

The walk behind laser screed can be used in medium to large jobs that may have some electrical or plumbing stubbing. If rebar and/or Styrofoam insulation under the slab is called for, the laser screed is ideal.

<p><b>How much difference does the “CopperHead” laser screed make?</b></p> <p>It is much faster than manual rodding with better quality screed. Productivity increases because the “CopperHead” laser screed can work up to 4000 square feet per hour with 1 operator and 2 laborers. Additionally, surface levelness and flatness are increased.</p>	<p><b>What are the ergonomic features of the “CopperHead” laser screed?</b></p> <p>The unit is self-propelled so there are minimal pushing and pulling forces. Easy to move forward and backward. Additionally, it has multidirectional capability which may reduce the material handling demands on the operator.</p>
<p><b>Where is it available?</b></p> <p>Somero Enterprises 82 Fitzgerald Drive Jaffrey, New Hampshire 800.314.8933 www.somero.com</p>	<p><b>Contact Information:</b></p> <p>This Tip Sheet was sponsored by NIOSH Project #29278419 It was produced by StewartPrezant Ergonomics Group and Build It Smart.</p> <p>Thanks to Poppoff, Inc., Yakima, Washington</p> <p>Contact: Build It Smart 360.596.9200 builditsmart@qwest.net</p>