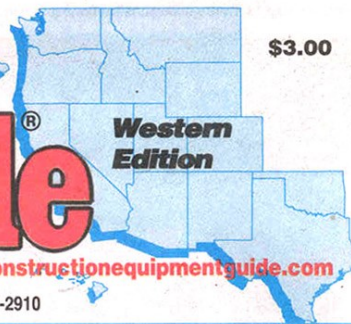


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H&L Tooth: A Long Tradition of Ground Engaging Tools

Since 1931, the H&L Tooth Company has provided quality ground engaging tools for the construction and mining industries.

Today, the company continues this tradition at its 200,000 sq. ft. facility in Tulsa, Okla. H&L operates horizontal machines known as upsetters. Under the roof in Tulsa are two 4 in. (10 cm) upsetter lines that have produced millions of small backhoe teeth.

Teeth forged on these machines range from less than 3 lbs. and up to 10 lbs. (1.3 to 4.5 kg). Two 6 inch upsetters produce teeth up to 30 lbs. (13.6 kg), but also allows the adaptation of the 4 inch upsetter tools that gives H&L multiple

options for the production of higher volume parts. Ripper and loader teeth of up to 100 lbs. (45 kg) are produced on a 7.5 in. (19 cm) upsetter. Large mining teeth in excess of 200 lbs. (91 kg) are made on a 9 in. (22.9 cm) upsetter.

Each forge production line also is equipped with up to six additional support machines, including electric induction heaters, vertical trim presses and hydraulic hole punches.

H&L's upsetters utilize a closed die design that offers several advantages over open die forging. These benefits include closer dimensional tolerances



Plastic models before tooling made.

and a reduced raw material requirement. These features combine to produce an economical advantage on high volume production. The upsetter forging process ensures the development of the maximum strength potential of the steel and helps maintain consistent mechanical properties from one tooth to another.

H&L is ISO9001 certified and requires that all steel be purchased from quality mills that produce material that meet or exceed the metallurgical specifications set by the ASTM. The mills are required to provide certification to demonstrate that the material is within the chemical tolerances.

The steel bars used by H&L have been reduced in size by the mill to refine the grain structure of the steel ingot. This process removes defects that are inherent in raw steel processing, promoting soundness and improvement in the quality of the alloy prior to forging.

The reduction operation reduces the cross section of the steel material, eliminating porosity and causing structure refinement of the base metal. Grain flow produces directional characteristics in the forged product, which enhances strength, ductility and resistance to wear.

see H&L page 48



High heat furnace hardening process.



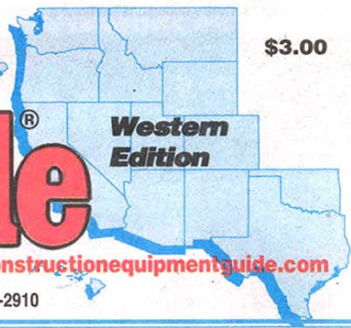
Forged finished ripper shanks.



Forged finish teeth.

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H&L's Forged Bucket Teeth Offers Strength, Durability



Finish forged part grinding.

H&L from page 46

H&L continues to offer teeth from 3 to 220 lbs. (1.4 to 54.4 kg) in many different exterior configurations and through the use of CAD (Computer Aided Design) has been able to create many unique designs for the construction industry. The most recent of these innovative products is the new Trident Tooth. The Trident offers triple tines that provide superior performance in tough digging conditions and has become a popular option in areas of the United States where ground penetration is difficult.

H&L also offers ground engaging tools for many different industries, including a complete line of forged ripper shanks for dozers of all sizes and forged trencher teeth for the pipeline industry.

A key aspect of H&L's longevity is its tradition of developing more user friendly tooth systems and the improvement of existing systems. The newest example of this refinement is the new top locking 233 tooth system. The 233 system is designed to fit on

see H&L page 52



Forge hole punching.



Induction to forge.

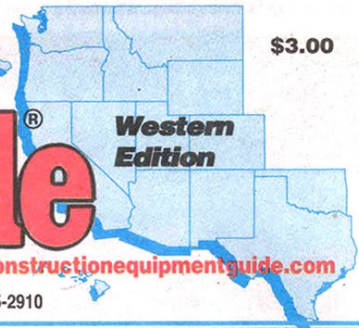


Swing ripper grinding.

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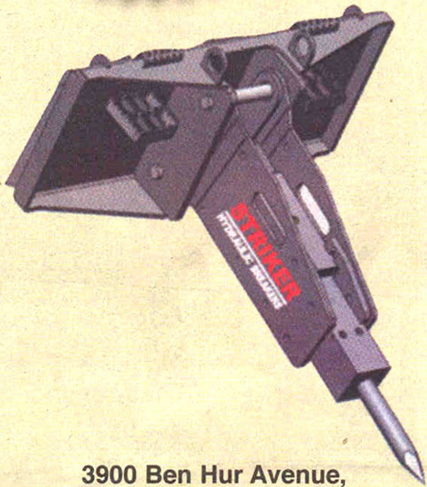
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H&L Poised to Meet Increasingly Competitive Marketplace Demands

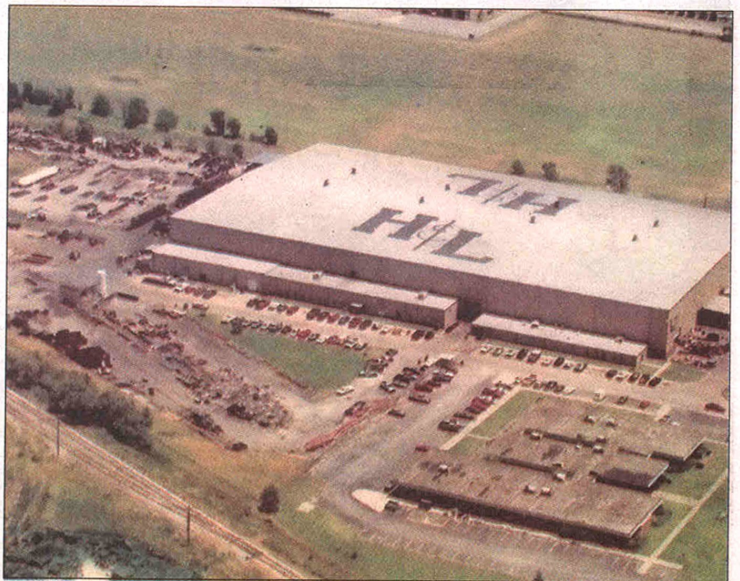
H&L from page 48

any standard side pinned backhoe shank that utilizes flex pins.

Without cutting or welding the 233 quickly converts any standard adapter to a convenient top locking system. This revolutionary concept has been adopted by many backhoe owners over the last two years and is now being developed for larger size machines.

With new product designs like the 233 and a continuing commitment to produce ground engaging tools of the highest quality, the H&L Tooth Company is prepared to meet the demands of an increasingly competitive market, according to the company.

(This story also can be found on Construction Equipment Guide's Web site at www.constructionequipmentguide.com.)



Tulsa forge plant.