MetalSawz Inc.

# Vertical Sawing Study

Why Vertical  Sawing is Safer and More Efficient than Horizontal Sawing

*The following is an in depth study which describes in detail the advantages of the MetalSawz™ MZ Series of vertical tilt-frame miter bandsaws over conventional saws used in industry today.*

## (1) SAFETY:

The MetalSawz™ MZ Series has all its controls and the work piece directly in front of the operator. This separates the operator from the moving blade or the Incoming saw head frame while he is setting up the workpiece, or for that matter at any other time during the cutting operation. This employment also places the **EMERGENCY STOP button directly in front of the operator at all times**!

Horizontal saws have their controls on separate remote consoles and often on top of the moving saw frame. This places the operator's head, hands and body close to the moving blade and descending saw frame. It also places the **EMERGENCY STOP button out of reach of the operator during most of the cutting operation**.

## (2) SAW TABLE HEIGHT:

The MetalSawz™ MZ Series has a large flat table surface set at a comfortable working height for an average person. This means there is less lifting of material required by the operator and also facilitates the movement of heavy material with less strain to the back area. Back injuries are one of the major causes of employee lost time and in turn rate increases in "Workmen's Compensation" for the steel working industry.

Horizontal saws have much lower working surfaces. They require more effort to operate and involve more bending on the operator's part to set the blade to a chalk line etc.

## (3) EFFICIENCY:

The MetalSawz™ MZ Series is "Front Loading". This allows the operator to load the saw from the front with all the controls, vises and the saw frame in full view at all times and within easy reach. The "Front Loading" capabilities along with the control positions and the comfortable table height make the MetalSawz™ truly "operator friendly".

## THIS RELATES TO:

(a) Faster set up times.
(b) Safer operation.
(c) Greater degree of control.
(d) Greater operator efficiency (more production).
(e) Material cut to closer tolerances.
(f) Less operator fatigue.

Horizontal saws have to be loaded from the back, which puts the vise controls etc. out of sight and reach of the operator most of the time. This results in a partial loss of control of the machine and a hit or miss attitude to cut material on a chalk line. This allows for a considerably longer set up time.

**(4) SPEED OF CUT:**
The MetalSawz™ MZ Series permits the cutting of an almost constant cross section in structural shapes and interrupted cuts. This simplifies critical blade tooth selection and allows for a considerable increase in production sawing. **"POSITIVEFEED"** action (exclusive to all MetalSawz Models) preloads the saw blade to increase tension between the blade guides by up to 15% This produces cutting rates approximately 20% faster than conventional saws with no appreciable loss of blade life. This feature also eliminates the need for expensive "Positive Rake" or "Hook Tooth" saw blades.

Horizontal saws either descend on a pivot or parallel to the material thus demanding the blade to cut dramatically variable cross sections decreasing blade efficiency and blade life.

**(5) FLOOR SPACE:**
The MetalSawz™ MZ Series requires less floor space due to its front loading ability. This shortens the required amount of infeed rollers. (i.e. to cut a 40'0" length in half only 20'0" infeed and 20'0" outfeed is required.)

Horizontal saws have to be loaded from the back of the saw frame because the material has to completely roll under the saw head. (i.e. to cut the same 40'0" length in half you must have 40'0" infeed and 20'0" outfeed.)

**(6) GEOMETRIC APPROACH TO WORK PIECE:**
The MetalSawz™ MZ Series frame support and the fixed saw blade guide arms are close to the work piece allowing for increased rigidity of the blade and straighter cuts.

Horizontal pivot type saws have the saw frame support and the fixed guide arm further away from the work piece.

**(7) CUTTING AIDS: COOLANT, BLADE BRUSHES**
The MetalSawz™ MZ Series has the cutting fluid applied in a direct line and uses gravitational force to keep the fluid on the blade. This result being the fluid is pulled into the cut and a total wash effect along the blade to the cleaning brush. This washing effect facilitates chip removal and enhances blade life.

Horizontal saws have the cutting fluid applied to the blade in direct opposition to gravitational force. This results in the cutting fluid breaking away from the blade before entering the cut or reaching the cleaning brush.

**(8) MATERIAL PLACEMENT:**
The MetalSawz™ MZ Series can cut the same material in the same position while maintaining narrower blade guide arm positions. This reduces blade deflection and vibration.

Generally horizontal saws have their largest capacity in the horizontal plane; i.e. 10" vertical x 16" horizontal. This requires any material over 10" to be cut with its largest dimension horizontally, placing the blade guide arms at their widest point.

## (9) VIBRATION AND NOISE LEVEL:

The performance capability of bandsaws in respect to cutting rates and tool life, i.e. the capability of exploiting high performance bimetal and sintered carbide tipped saw blades in the most economical way, is largely governed by the degree to which vibration In the work area can be reduced. The intrinsic self-dampening characteristics of bandsaw machines are poor; consequently, vibration must be reduced by appropriate design, which must be aimed at obtaining maximum stiffness at smallest possible mass. Many horizontal and vertical bandsaws are made with basic cast iron frame construction while the MetalSawz™ MZ Series is a welded fabrication construction.

**COMPARATIVE MEASUREMENTS TAKEN ON BANDSAWS WITH BASIC FRAME STRUCTURES OF CAST IRON AND ON MACHINES OF WELDED CONSTRUCTION SHOWED THAT CAST IRON DOESN'T PROVIDE A SIGNIFICANT INCREASE IN THE OVERALL DAMPENING EFFECT. DUE TO LOWER MODULUS OF ELASTICITY AND THE NEED FOR INCREASED MINIMUM WALL THICKNESS OF CAST PARTS COMPARED WITH THOSE OF STEEL PLATES IN WELDED FABRICATION, THE MASS/STIFFNESS RELATION OF CAST PARTS IS ACTUALLY LESS FAVOURABLE (SPATH, 1982).**