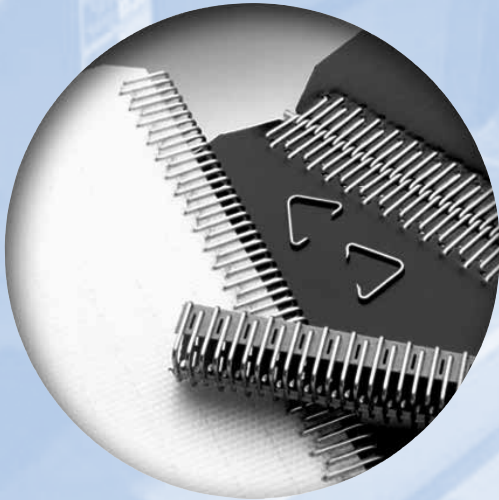
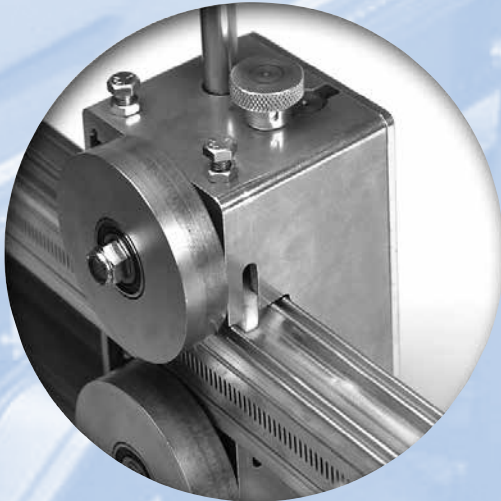


# Clipper® Wire Hook Training Manual



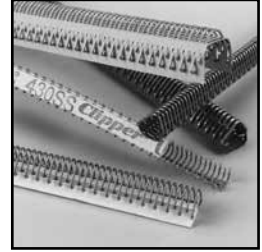
**CLIPPER® LIGHT-DUTY BELT FASTENERS**



## Clipper® Wire Hook Overview

### Advantages of the Clipper® Wire Hook System:

- Machine installed. Clipper offers a variety of lacers to meet specific needs (low volume lacing, high volume lacing, on-site lacing).
- Low profile splice.
- Ideal for light-duty belts.
- Low cost splice alternative.
- Many size and material options to select from.



### Two Styles of Wire Hook Fasteners:

**Carded Hooks:** Individual hooks are loaded onto a 'carding paper'.

Two Types of Carding Paper:

1. Removed prior to installation (see Fig. 1). Hook sizes 25, 1, 2, 3, 4, and 4-1/2 RHTX.
2. Removed after installation (see Fig. 2). Hook sizes 30, 4-1/2 round, 5, 6 and 7.

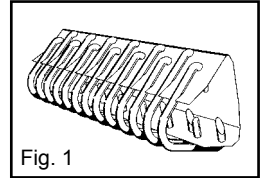


Fig. 1

**Unibar® Hooks:** Each hook is welded to a common bar (Fig. 3).

Advantages of Unibar:

- Easier handling.
- Hook legs remain parallel when installed. Leads to easier meshing of belt ends and easier pin insertion.
- No 'belt wave'.
- Minimal chance of an individual hook dislodging.
- Patented Safety Strip protects fingers from hook points.
- Custom lengths 4 - 60".

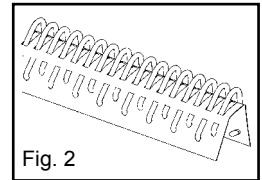


Fig. 2

Unibar is not recommended in the following applications:

- System with bias splices.
- System with crowned pulleys.
- System troughs belts.
- System with back bends greater than 45°.

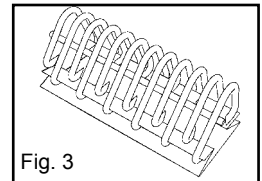


Fig. 3

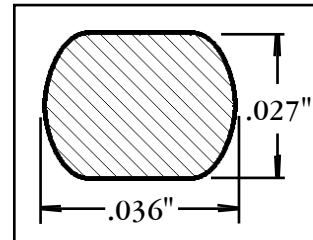


# Clipper® Wire Hook Overview

HOOK SERIES			
Series	Hook Sizes	Wire Diameter	Hooks/Inch
#25	25	.025" (0.6 mm)	15
#36	36/UCM36	.036" x .027" (0.9 x 0.7 mm)	10
#1 (40)	1/UX1	.040" (1 mm)	8
Regular (54)	2-7, U2-U7	.054" (1.4 mm)	7

## 36 Series:

- Ideal for European style belting and Filter Media materials.
- Shaped Wire: .027" high x .036" wide (.7 mm x .9 mm)
- Low profile splice with added strength.
- Available in carded or Unibar® configurations.





# Steps to Select the Proper Clipper® Fastener

## Step 1: Measure Belt Thickness

- Measure belt thickness with Clipper® hook gauge, micrometer, or caliper (Fig. 1).
- If the belt has an impression cover, skive the impression off prior to measuring the thickness (Fig. 2).

## Step 2: Measure Pulley Diameter

Inspect the beltline for the smallest pulley that has a belt wrap of at least 90 degrees. This will be your 'minimum pulley diameter' measurement (Fig. 3).

## Step 3: Determine Hook Choices

Referencing the Fastener Selection Chart on page 5, identify possible fastener choices based on the belt thickness and minimum pulley diameter. Note: For any given belt thickness there are a number of hooks that can be selected.

## Step 4: Select Wire Diameter/Shape

Fasteners made from a smaller diameter offer:

- Less noise as the splice contacts conveyor components.
- Less wear on conveyor components.

Fasteners made from a larger diameter offer:

- Added strength for the increased wire mass.
- Added wear resistance.

## Step 5: Choose Style: Carded or Unibar®

## Step 6: Select Material

Note: Not all hooks are available in all sizes. See chart on Page 6.

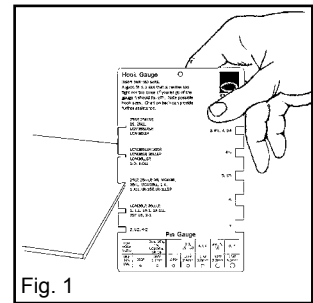
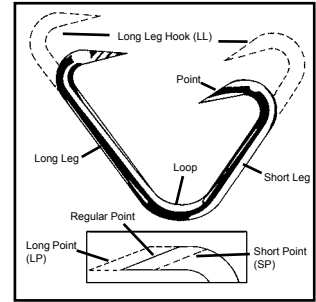


Fig. 1

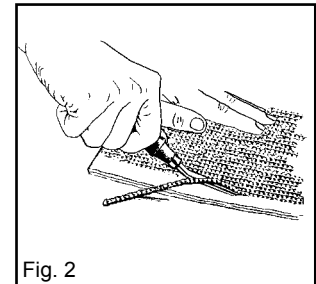


Fig. 2

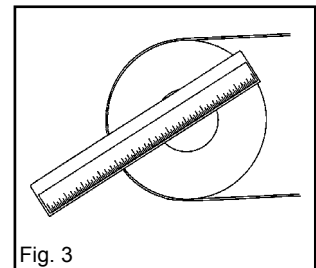


Fig. 3

HOOK ABBREVIATIONS	
XSP	Extra Short Point
SP	Short Point
LP	Long Point
SL	Short Leg
LL	Long Leg





# Clipper® Fastener Selection Chart

Clipper®

This chart represents common hook sizes. Additional sizes are available or can be custom made for specific application requirements.

FASTENER AND PIN SIZE SELECTION CHART														
Minimum Pulley Diameter	Wire Diameter	Connecting Pin Size	Belt Thickness											
			Up to 3/64"	1/16"	3/32"	1/8"	5/32"	3/16"	7/32"	1/4"	9/32"	5/16"	11/32"	25/64"
			1.2mm	1.6mm	2.4mm	3.2mm	4.0mm	4.8mm	5.6mm	6.4mm	7.1mm	7.9mm	9.0mm	10.0mm
15/16" 24mm	.025"	.065"/1.7mm	25SP*											
	.025"	.065"/1.7mm	25*											
	.036"x.027"	.065"/1.7mm	UCM36SL XSP											
	.036"x.027"	.065"/1.7mm		UCM36SL SP										
2" 51mm	.036"x.027"	.065"/1.7mm	UCM36 XSP											
	.036"x.027"	.065"/1.7mm		UCM36 SP*										
	.036"x.027"	.065"/1.7mm		36 SP*										
	.040"	.065"/1.7mm		1 XSP*										
	.040"	.065"/1.7mm		UX-1 SP*										
	.036"x.027"	.065"/1.7mm			UCM36*									
	.036"x.027"	.065"/1.7mm			36*									
	.040"	.065"/1.7mm			1 SP*									
	.036"x.027"	.065"/1.7mm				UCM36 LP*								
	.040"	.065"/1.7mm				1*								
	.040"	.065"/1.7mm				UX-1*								
	.054"	.093"/2.4mm				U2 SP								
	.054"	.093"/2.4mm				2SP								
	3" 76mm	.054"	.093"/2.4mm					U2						
.054"		.093"/2.4mm					2							
4" 102mm	.054"	.109"/2.8mm						U3						
	.054"	.109"/2.8mm						3						
	.054"	.125"/3.2mm						U4						
5" 127mm	.054"	.125"/3.2mm							4					
	.054"	.125"/3.2mm							4 1/2					
6" 152mm	.054"	.156"/4.0mm								5				
	.054"	.156"/4.0mm								U5				
7" 175mm	.054"	.156"/4.0mm									6			
	.054"	.156"/4.0mm									U6			
7" 175mm	.054"	.156"/4.0mm										7		
	.054"	.156"/4.0mm										U7		

\* Long leg configuration available. Allow for 1" larger minimum pulley diameter when choosing long leg hooks. Hook designations beginning with "U" are Unibar style fasteners. All others are Carded style fasteners.

FOR BELTS WITH MECHANICAL FASTENER RATINGS UP TO:		
Hook Series	P.I.W.	kN/m
# 25	60	10.3
# 36	75	12.9
# 1 (40)	75	12.9
Regular (54)	125	21.5
4 1/2 RHTX	200	34.4

Note: Fastener ratings are subject to many variables including belt composition, age, speed, cycles, etc. These ratings are conservative and are intended to serve as a general guide in determining the appropriate fastener for the application.

CLIPPER® WIRE HOOK SELECTION



# Steps to Select the Proper Clipper® Fastener

METAL PROPERTIES CHART						
Metal	Magnetic	Abrasion Resistance	Chemical Resistance	Rust Resistance	Available Hook Sizes	Sparking/ Non-sparking
Galvanized	Yes	Good	Poor	Good	25, 1, Reg.	Sparking
Coated Steel	Yes	Good	Poor	Poor	U2-U3	Sparking
High Tensile Steel	Yes	Good to Excellent	Fair	Good	1, Reg.	Sparking
Steel	Yes	Good	Poor	Poor	U4-U7	Sparking
Rectangular High Tensile Steel	Yes	Good to Excellent	Fair	Good	4½	Sparking
430 Stainless Steel	Yes	Good	Fair to Good	Good	1, Reg., UX-1, U1-U5	Sparking
316L Stainless Steel	Slightly	Good	Good to Excellent	Excellent	All	Sparking
Monel 400	Slightly	Fair	Excellent	Excellent	25, 1, 2-4	Sparking
Inconel 600	No	Fair	Excellent	Excellent, even at elevated temperature	2-4	Sparking
Phosphor Bronze	No	Good	Poor	Good	2-4	Non-sparking
Hastelloy C-22	No	Good	Excellent	Excellent	30, 36, UCM36, Reg.	Sparking
Black Oxide	Yes	Good	Poor	Fair	25	Sparking

## Practice Selecting the Proper Hook:

### Example 1:

Belt Thickness: 1/4" (6.4 mm)  
 Minimum Pulley: 4" (102 mm)  
 Application: Very abrasive

Selection: 4-1/2 HT or 4-1/2 RHTX

### Example 2:

Belt Thickness: 1/8" (3.2 mm)  
 Minimum Pulley: 2" (51 mm)  
 Application: Need high strength fastener, prefer Unibar® style

Selection: U2SP

### Example 3:

Belt Thickness: 1/8" (3.2 mm)  
 Minimum Pulley: 2" (51 mm)  
 Application: Product scratches easily, prefer Unibar style

Selection: UCM36



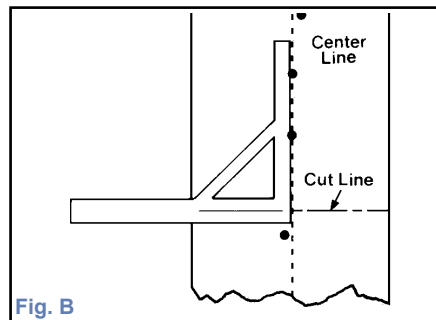
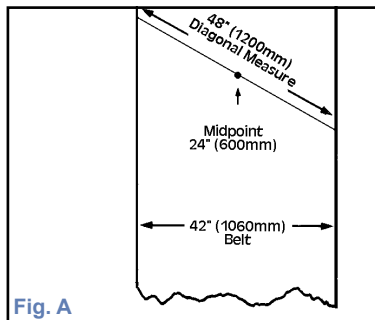


# Proper Belt End Preparation

## Importance of a Square Cut

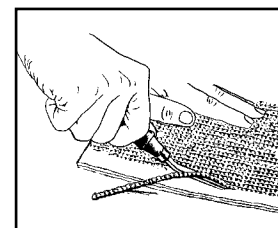
To prevent mistracking and extend splice life, it is critical to obtain a square cut off from the centerline of the belt. To achieve this, follow these simple steps:

1. Prior to any work on your conveyors, make certain that the power has been turned off and the belt is "locked out".
2. Mark the actual center points in belt width at intervals of 3 to 5 feet, for a distance of 15 to 20 feet back from the intended splice area (Fig. A).
3. Using either a steel rule or a chalk line, mark the average center line through the points measured in Step 2 (Fig. B).
4. Using a square, draw a line perpendicular to the average center line across the belt width (Fig. B).
5. Using the Clipper® 845LD Cutter, cut the belt on the line drawn in Step 4.



## Skive Impression Cover Before Fastener Installation

It is important to skive off the impression cover of a belt in the area where fasteners will be applied. This allows the proper size fastener to be selected and for proper penetration/clinch. Two tools are available to assist in this process:



### Rough Top Belt Skiver

This simple-to-use, hand-held tool skives off the impression cover when pushed along the belt cover.



### RB-1 Grinder

This air-drill attachable tool is made with carbide to cut the impression cover off the belt instead of burning it, like many standard grinders do, which actually heats up and damages the belt.



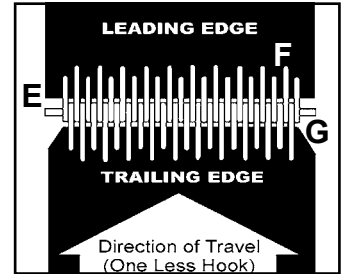
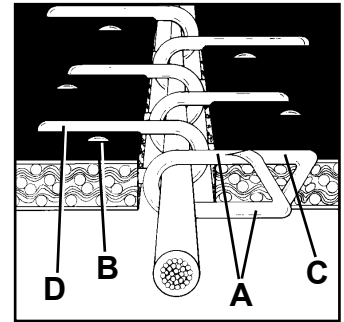




## Identifying a Properly Installed Splice

### The Hook is Properly Sized & Clinched When:

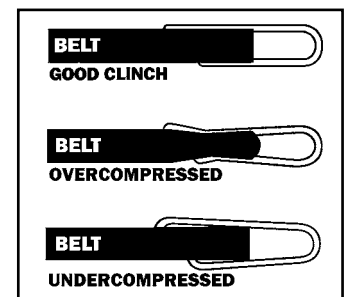
- A. Hook legs are parallel.
- B. Points slightly penetrate opposite side of the belt.
- C. 1/3 to 1/2 of the wire diameter is embedded into the belt.
- D. Hook knuckles are not higher than the legs when installed.
- E. 1/4" (6.4 mm) on each belt edge is left unlaced.
- F. One more hook is installed on the leading end than the trailing end of the belt.
- G. Trailing end of the splice is chamfered/notched.
- H. Edges of the belt line up.
- I. Hooks are secure in the belt.



**Good Clinch:** Legs are parallel, 1/2 of the wire diameter is embedded, points have penetrated opposite side.

**Over Clinch:** Functional, but not optimal.

**Under Clinch:** Embed further. Failure to do so will result in the hook opening up or in cracks in the knuckle area.





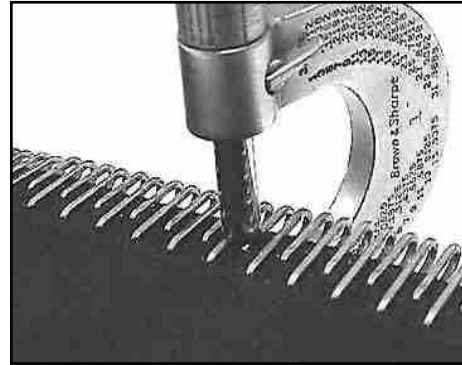


# Identifying a Properly Installed Splice

PROPERLY INSTALLED SPLICE

## Proper Technique to Measure a Splice:

Selecting the correct fastener based on the belt thickness, minimum pulley diameter, and application conditions is the first step to properly installing a Clipper® splice. The second, and most crucial factor, is ensuring that the leg of the hook is embedded 1/3 to 1/2 its thickness into the belt. It's easy to measure/inspect the splice for proper embedment; simply follow these four steps:



1. Measure the belt thickness.
2. Install the fasteners into the belt.
3. Use a micrometer or caliper to measure the finished splice. Be sure to capture both the short leg knuckle and the adjacent long leg in one reading. See picture.
4. If you have properly embedded the fasteners, your measurement should be between: 1) Original belt thickness plus the value in column C, and 2) Original belt thickness plus the value in column D. See the example and chart below.

### Example:

Belt thickness = .100"

Hook size = #1 (.040" wire diameter)

Finished splice thickness should measure .140" - .153" (.100" + .040" = .140" and .100" + .053" = .153").

	A	B	C	D
Hook Size	Wire Diameter	Plus: (1/2 Wire Diameter Embedded)	Plus: (1/3 Wire Diameter Embedded)	
25	.025"	.025"	.033"	
36, UCM36	.027"	.027"	.036"	
1, UX1	.040"	.040"	.053"	
2-7, U2-U7	.054"	.054"	.071"	
4-1/2 RHTX	.062"	.062"	.082"	





## Connecting Pin Selection

Important component of the splice, but often overlooked. Clipper® connecting pins are available in a wide variety of materials and wire diameters.

### CONNECTING PIN SPECIFICATIONS

Connecting Pin Types	Pin Wear Factor	Hook Wear Factor	Rigidity	Magnetic	Flexibility	Composition
Nylosteel	Good	Good	Good	Yes	Good	Nylon & Music Wire
Nylostainless	Good	Good	Good	Slightly	Good	Nylon & 316 SS Spring Wire
Nylon-Covered Cable	Good	Good	Average	Slightly	Excellent	Nylon and 316SS Cable
DuraStainless™	Excellent	Excellent	Good	Slightly	Good	Wear-resistant Nylon & 316 SS Spring Wire
Nylon Plus	Good	Excellent	Average	No	Excellent	Nylon
Duralink™	Excellent	Excellent	Average	Slightly	Excellent	Wear-resistant Nylon & 316 SS Cable
Cold-Rolled Steel	Average	Fair	Excellent	Yes	Fair to Poor	Mild Cold-rolled Steel
Stainless Steel	Average	Fair	Excellent	Slightly	Fair to Poor	302 or 316 SS
Bare Stainless Cable	Average	Fair	Average	Slightly	Excellent	316 SS Cable

### AVAILABLE SIZES

Connecting Pin Types	.053" 1.4mm	.065" 1.7mm	.079" 2.0mm	.093" 2.4mm	.109" 2.8mm	.125" 3.2mm	.156" 4.0mm
Nylosteel	♦	♦	♦	♦	♦	♦	♦
Nylostainless	♦	♦	♦	♦	♦	♦	♦
Nylon-Covered Cable		♦		♦		♦	♦
DuraStainless™		♦		♦	♦		
Nylon Plus	♦	♦	♦	♦	♦	♦	♦
Duralink™		♦		♦	♦	♦	
Cold-Rolled Steel	♦			♦			
Stainless Steel	♦			♦			
Bare Stainless Cable	♦			♦			

### PIN SIZE SELECTION

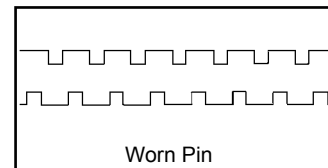
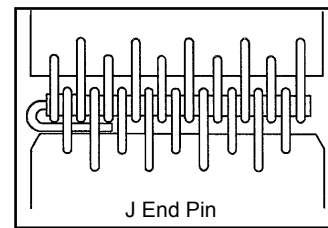
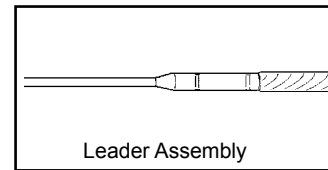
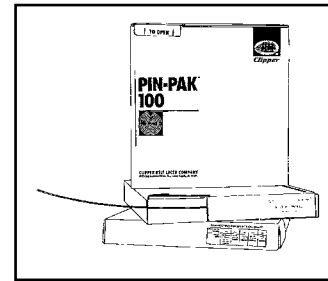
Pin Diameter	.065" (1/16") 1.7mm	.093" (3/32") 2.4mm	.109" (7/64") 2.8mm	.125" (1/8") 3.2mm	.156" (5/32") 4.0mm
Clipper® Hook Size	25's, 36's, 1's, UCM36's, UX-1's	2, 3, U2SP, U2, U3	4 & U4	4-1/2, 5, U5	6, 7, U6, U7



# Connecting Pins

## Pin Configurations:

- Coil lengths
- Pre-cut lengths
- Pin Paks™: 100-ft. dispensing units.
- Leader Assemblies: Smaller diameter, rigid music wire is swaged onto a flexible pin. Eases pin insertion into splices.
- Stripped Leaders: Nylon coating is stripped off from Nylosteel or Nylostainless pins, forming a leader. This eases pin insertion into splices.
- J End Pins: 1/2" (13 mm) of nylon coating is stripped off from Nylosteel or Nylostainless pins. The stripped portion is then bent back forming a 'J'. The 'J' end is tucked back into the splice and locks the pin in place to avoid pin migration.

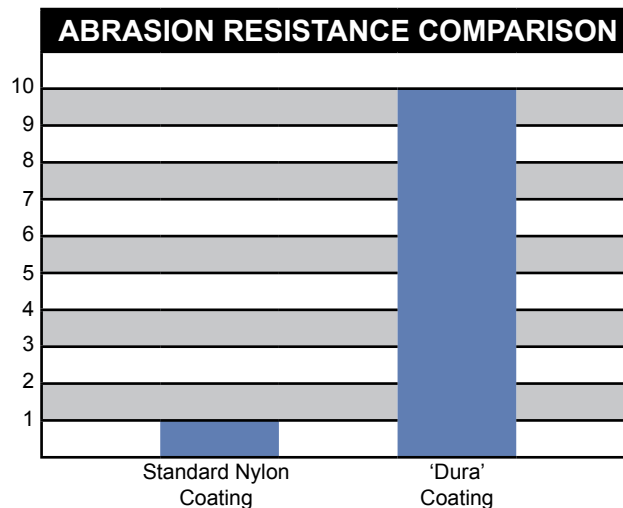


## Replace Pins If:

1. Grooves worn by fastener loops exceed 25% of pin diameter.
2. Pin is damaged or if a portion of the pin is missing.
3. Multiple pins are present within the splice.

## Extend Pin Life by 10 Times with Duralink™ or DuraStainless™ Pins

Duralink™ and DuraStainless™ are produced with a proprietary, filled-nylon coating that offers 10 times greater abrasion resistance than our standard nylon coating, which is used on Nylosteel, Nylostainless or Nylon Covered Cable. The formula also offers improved lubricity for reduced fastener loop wear. Whether replacing pins in a high-abuse application or simply looking to maximize pin life, either Duralink or DuraStainless is the obvious choice!

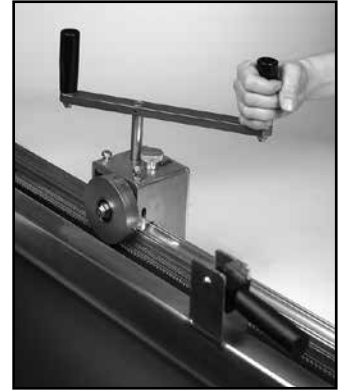




## Maintenance Lacers

### Roller Lacing Technology™:

- Dual rollers embed hooks by rolling the hooks into the belt. One roller is positioned on top of the hooks and another on the bottom.
- The adjusting knob controls the amount of pressure the rollers apply to the fasteners.
- By indexing the lacing head the splice is installed across the width of the lacer.
- The lacers are made from lightweight aluminum, making the tools easy to carry to the job site.
- Note: #25 hooks cannot be laced with a Roller Lacer or Microlacer.



### Roller Lacer® Gold Class™:

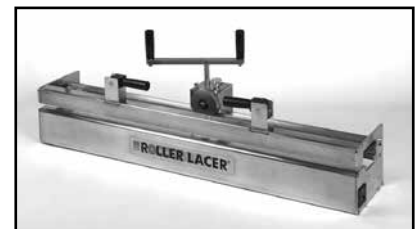
A power-assisted lacer designed to reduce installation time and operator fatigue. Available in four widths: 24", 36", 48" and 60" (600, 900, 1200, 1500mm). Ideal for larger operations with wide belts. Unmatched speed and ease of use.

- Lacer is driven by a user's cordless drill (18 volt or higher), reducing installation time by 35%. A manual drive handle is supplied for use if the drill has lost its charge.
- Belt Support Shelf easily guides belt into the hook points reducing operator time and effort.
- Handle-actuated belt clamp system.
- Sturdy aluminum construction for on-site installation.
- Storage compartment for extra face strips and lacer pins.
- Continuous lacing feature for lacing belts wider than the tool's width.



### Roller Lacer®:

- 24", 36", 48", and 60" widths (600, 900, 1200, 1500mm).
- Continuous lacing feature allows belts wider than the lacer's width to be laced with multiple passes.
- Sturdy construction.



### Microlacer®:

- Utilizes Roller Lacing Technology™.
- Laces up to 14" (350 mm) at a time.
- Continuous lacing feature.
- Belt clamp is adjusted by turning knobs.

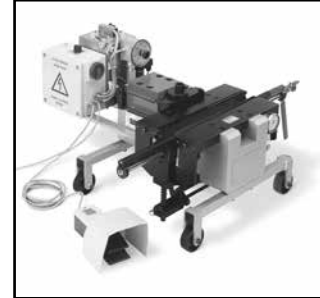




# Production Lacers

## Pro 6000 Lacer:

- Installs the optimal splice and offers maximum lacing versatility.
- Patented jaw action rotates jaws closed while simultaneously pulling the comb down.
- Multiple gauge pins allow the user to customize the loop profile based on the belt/application.
- Pressure, jaw closure time, and heat can all be adjusted. The use of a log book is recommended so that it can be a quick reference on how to lace jobs that have been completed in the past. This will save time and will ensure consistency when lacing specific jobs.
- Jaws can be heated to allow for easier penetration of fasteners and allows the fasteners to be embedded further. If the belt has a top or bottom cover, the covers will soften and begin to flow around the splice.
- Laces up to 14" (350 mm) at a time.
- Combs are available up to 60" long. Fasteners can be loaded across the width of the comb and then indexed in the machine as each 14" section is laced.
- Continuous lacing feature.
- Laces all sizes of Clipper® hooks and 00 - 15 Alligator® Lacing. A Final Setting Plate is also available for the Alligator Ready Set™ fasteners.



## Pro 600:

Same as the Pro 6000, except the lacer does not have the heated jaw option.



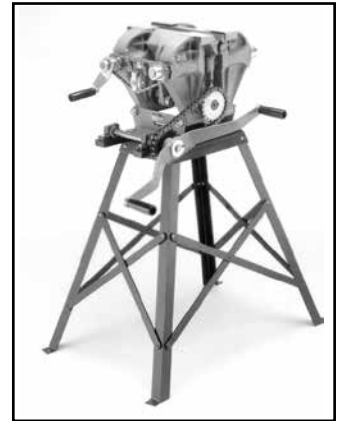
## Production Lacers

### Clipper® #12 Speed Lacer:

- Economical production lacer.
- Manually operated.
- Laces up to 12" (300 mm) at a time.
- Continuous lacing feature allows belts wider than 12" (300 mm) to be laced in multiple passes.
- Installs all sizes of Clipper fasteners.

### Clipper® Electric Hydraulic Lacers: 12", 25" and 38"

- High speed installation of all Clipper hooks.
- Ideal for high volume, repetitive lacing.
- Continuous lacing feature.
- Installs all sizes of Clipper fasteners.





## Specialty Lacers

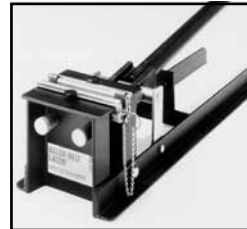
### Vise Lacers:

- Economical choice for installing Clipper hooks.
- Fits into shop vise.
- Continuous lacing feature.
- Vise Lacers available: R4", R7", R10", #1, #36, #25.



### Baler Belt Lacer™:

- Portable lacer that can be brought directly to the field to repair baler belts.
- 7" and 10" models available.
- Continuous lacing feature.



### LW 95 Lacer:

- Portable.
- Laces up to 6" (150 mm) at a time.
- Installs all Clipper fasteners, including #25 hooks.
- Continuous lacing feature.



### #25 Lever Lacer:

- Installs #25 hooks up to 2" (51 mm) wide.
- Lightweight, portable installation tool.
- Ideal for the laundry industry.



CLIPPER® LACERS



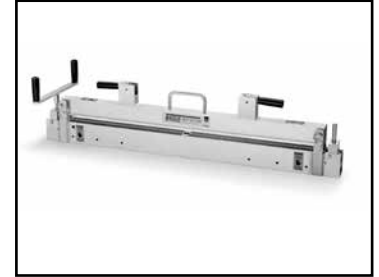




## Clipper® Belt Cutters

### Clipper® 845LD Belt Cutter:

- Portable cutter for belts up to 1/2" (13 mm) thick.
- Available in 36", 48", 60", and 72" (300, 600, 1200, 1500 mm) widths.
- Blade is enclosed for a safe operation.
- Quick method to achieve an accurate cut.
- Optional Belt Squaring Attachment is available.



### 14" Belt Cutter:

- Cuts belts up to 3/8" (9.5 mm) thick and 14" (350 mm) wide.
- Built-in squaring arm.
- Quick, one-stroke operation.
- Belts can be cut in the middle of the roll by opening the end of the cutter.



### #25 Tape Cutter:

- Cuts cotton woven laundry tapes up to 4" (100 mm) wide and 1/8" (3 mm) thick in one quick sliding motion.





## Clipper® Accessories

**Plastic Hook Gauge:** Assists with selecting the proper hook for the application.



**Carding Paper Remover:** Tool to simplify the removal of carding paper from hooks.



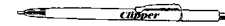
**Rough Top Belt Skiver:** Tool to remove impression covers from the belt prior to lacing.



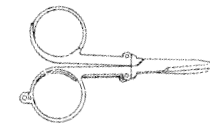
**Unibar® Wire Cutters:** Hand-held tool used to cut strips of Unibar fasteners.



**Silver Ink Belt Marking Pen:** Can be used to help square the belt, date splices, etc.

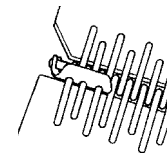


**Scissors:** Used when cutting down carded hooks to the appropriate length.



**Accessory Kits:** Hook gauge, carding paper remover, scissors, and skiver.

**Smart Locks™:** Small metal device that fits over the last three hooks on a baler splice to protect the splice from catching and ripping out.



**Tape Binder:** Used to bind cotton woven belts prior to installing Clipper® hooks in the laundry industry.





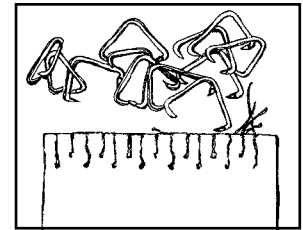
## Troubleshooting Clipper® Splices

Although Clipper® splices are very reliable, there are times when a splice may not be performing to the user's expectations. Following are some potential problems they may be facing:

### Hooks Open Up and Release From Belt End:

Possible Causes:

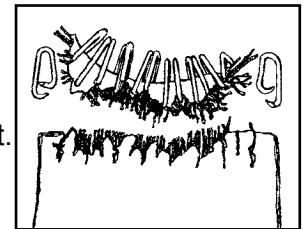
- Wrong size hook may have been selected.
- Tension may be too high for the strength of the hook.
- Hooks may be under-compressed.
- Belt may not be cut square.
- Belt may be mistracking.



### Hooks Pull Through (comb through) Belt End Without Opening Up:

Possible Causes:

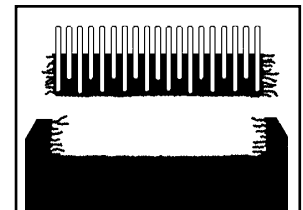
- Hooks may not be reaching back far enough into the belt.
- Wrong belt may have been selected.
- Belt end may not be cut square.
- Wrong size hook may have been selected.
- Hook may be too large for the minimum pulley.



### Belt Fractures Directly Behind Fasteners:

Possible Causes:

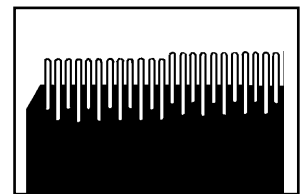
- Hook may be too large for the minimum pulley.
- Incorrect belt may have been selected.
- Wrong size hook may have been selected.



### Step in the Lacing:

Possible Causes:

- Incorrect installation procedures may have been used.
- Belt end may not be cut square.



### Hooks Rust or Corrode:

Possible Cause:

- Wrong hook material may have been selected.



# Troubleshooting Clipper® Splices

## Connecting Pin Fractures Prematurely:

Possible Causes:

- Connecting pin may be too rigid for the application.
- Belt may be mistracking.
- Wrong connecting pin may have been selected.

## Premature Connecting Pin Wear:

Possible Causes:

- Wrong connecting pin may have been used. Consider a connecting pin with more resistance to abrasion, such as Duralink™ or DuraStainless™.

## Connecting Pin Difficult To Insert Into Splice:

Possible Causes:

- Wrong connecting pin may have been selected.
- Pin may not be rigid enough. Consider using a solid core pin or a pin with a leader assembly.
- 'Belt Wave' may be occurring. Consider switching to Unibar®.
- Hooks may be improperly installed.

## Connecting Pin Migrates Out Of Splice:

Possible Causes:

- Belt end may not be cut square.
- Wrong pin material may have been selected.
- Smooth exterior of the pin might be allowing the pin to migrate out of the splice. Consider using notched steel or stainless pins.
- Pin may not be secure in the splice. Consider 'J End' pins.

## Hook Legs Fracture Prematurely:

Possible Causes:

- Hook size may exceed the recommended minimum pulley diameter.
- Hooks may have been over-compressed.
- Hooks may have been under-compressed.

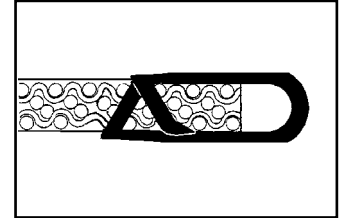


## Troubleshooting Clipper® Splices

### A Flat Spot Is Worn On The Hook Knuckle:

#### Possible Causes:

- Metal chosen for hook is not abrasion resistant enough for the application. Select a material that is more abrasion resistant (i.e. high tensile).
- Hooks may be under-compressed.
- Hooks may be over-compressed and have caused the knuckles to back out of the belt.



### Premature Loop Wear:

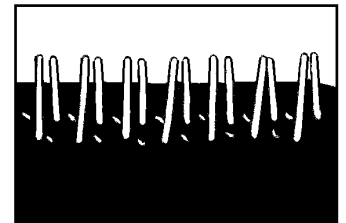
#### Possible Causes:

- Wrong connecting pin may have been selected.
- Connecting pin may need replacement.
- Metal chosen may not be abrasion resistant enough for the application. Select a material that is more abrasion resistant (i.e. high tensile).
- Hooks may be over-compressed, causing a “light bulb” loop shape.

### Hook Loops Lean Together In Pairs:

#### Possible Causes:

- Hooks may be under-compressed.
- May be using carded hooks. Consider using Unibar® hooks, where each individual hook is welded to a common bar, keeping the hook legs parallel.



### Hooks Twist:

#### Possible Causes:

- Hooks may be over-compressed.
- Hook points may be too long for the belt thickness.

### Splice Triggers Magnetic Detector:

#### Possible Causes:

- Hook selected may be magnetic. Consider switching to a material without magnetic properties: Bronze, Hastelloy, or Inconel. 316 Stainless Steel is only slightly magnetic and can often be used.



# Troubleshooting Clipper® Splices

## Splice Triggers Metal Detector:

Possible Cause:

- All Clipper® hooks will trigger metal detectors. Consider switching to a non-metallic fastener such as Alligator® Spiral or Alligator Plastic Rivet.

## Hook Points Twist (lay over) Instead of Properly Penetrating Belt:

Possible Causes:

- Belt may be too hard for the hook points to properly penetrate. Heat hook points or belt prior to installation.
- Hook points may be too long for the belt thickness.

## End Hooks Pull Out Of Splice:

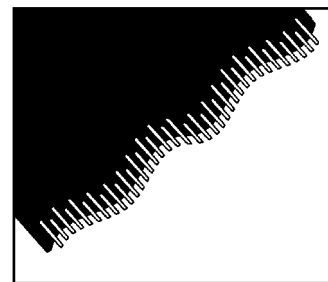
Possible Causes:

- Lacing may be too close to the edges. Leave 1/4 -1/2" unlaced on both sides of the belt.
- Hooks may be under-compressed.
- Tension load may be too high for the strength of the hook. Consider a larger size hook, a hook made from a larger diameter wire, and/or a hook made from high tensile wire.
- Pin may be too short, allowing the splice to snag on obstructions.

## Belt Wave:

Possible Causes:

- Hooks may be over-compressed.
- Belt displacement may have occurred during the installation of the splice. Consider switching to Unibar® fasteners. The welded bar keeps the splice flat and eliminates the belt wave.





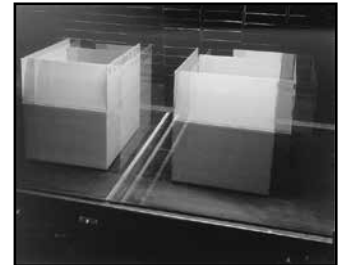
# Typical Markets for Clipper® Wire Hooks

## Package & Parts Handling:

- Parcel Post Services
- Postal Services
- Distribution Centers
- Airports
- Conveyor Original Equipment Manufacturers

### Products Used:

- High Tensile hooks
- Unibar® hooks
- Roller Lacers®, Microlacers®
- 845LD Belt Cutters
- Duralink™ and Durastainless™ pins



## Agriculture:

- Round Hay Balers
- Harvesting Equipment (grapes, beans, tomatoes, potatoes, etc.)
- Packing Sheds

### Products Used:

- High Tensile hooks
- Unibar hooks
- Roller Lacers, Microlacer
- Vise Lacer
- Duralink and DuraStainless pins



## Laundry:

- Commercial laundry services
- Hospitals
- Hotels

### Products Used:

- #25, 1, and UCM36 hooks
- Vise Lacers
- Pro 200EH lacers







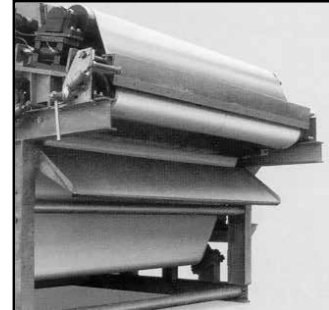
# Typical Markets for Clipper® Wire Hooks

## Filter Media:

- Industrial and municipal waste disposal
- Chemical processing
- Pharmaceutical
- Mining filter presses

### Products used:

- 36, UCM36, 1, UX1, 30 hooks in 316 Stainless Steel or Hastelloy.
- Pro 6000 and Pro 600 lacers

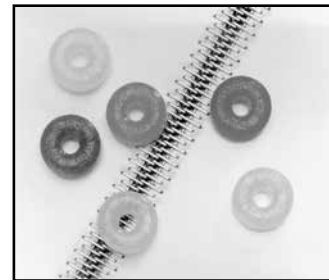


## Food Processing:

- Bakeries
- Meat and poultry processing
- Candy/confectioners
- Bottlers and breweries
- Canneries
- General food processing

### Products used:

- Stainless hooks
- Unibar® hooks
- Roller Lacer® and Microlacer®



## Miscellaneous Markets:

- Tobacco
- Lumber industry (veneer mills, chipping/debarkers, furniture, plywood, etc.)
- Printing (books, newspapers, etc.)
- Corrugator industry
- Recreation (bowling alleys, amusement parks)
- Grocery stores
- Building materials (shingle, brick, plaster board)
- Textile

CLIPPER® WIRE HOOK APPLICATIONS





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