NOVEX

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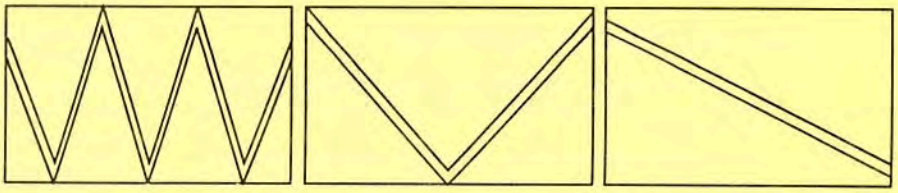


PROCEDURES FOR SPLICING NOVITANE® CONVEYOR BELT

Due to its thermoplastic-like properties, all styles of **NOVITANE** conveyor belting can be easily and quickly spliced endless, either by heat welding with the use of a Hot Air Gun and **NOVITANE** Weld Rod or by curing the prepared belt ends in a water cooled vulcanizer.

We recommend that you read this bulletin and determine which splice method best satisfies your requirements.

SQUARE ENDS

The first step in preparing the **NOVITANE** Conveyor belt for splicing is to accurately square the belt ends to insure correct belt tracking. The CENTER LINE METHOD is most commonly used to square the belt ends, which are not necessarily square when you received the belt.

To determine the belt center line, begin near the belt end and measure the belt's width at five points approximately 10" apart; however, on short length belting use 5" increments. Then, divide each transverse measurement in two and mark the center points on the belt surface. Then, using a straight edge ruler, draw the center line using the "five" center points. Next, with a carpenter square or tee square, draw a "cut line" across the width of the belt near the belt end. Using the "cut line" as the guide, cut off the end of the belt with a sharp utility knife. This entire procedure should then be repeated on the other end of the belt.

In order to check the accuracy of the squared and cut end, measure 50" or 25" for short belts, along each edge from the end of the belt, then make two diagonal measurements. They should be equal and should intersect on the center line of the belt.

Suggested precautions and protective measures should be followed during the welding procedure.

SAFETY BULLETIN

Hot Air Welding Novitane®

A. Hot air welding of Novitane products with polyurethane weld rod is safe when proper hot air welding procedures are followed.

B. Overheating the polymer by improper welding technique will result in polymer breakdown forming irritating and/or potentially toxic fumes. Avoid inhaling any fumes that may form during welding. The presence of any such condition is an indication of improper welding techniques.

C. Suggested heat range for thermal hot air welding is 550° F to 590° F.

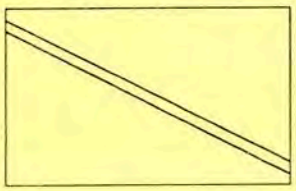
D. Suggested precautions and protective measures include the following

1. Conduct hot air welding work in a well ventilated area.
2. Prolonged or extended periods of hot air welding will require forced ventilation or portable exhaust, so any fumes being generated are directed away from the welding operator.
3. Avoid excess heat during welding. Apply only enough heat to melt product, allow joint to flow together.
4. Do not allow tip of welder to come in contact with NOVITANE product, or NOVITANE weld rod. However, if this should occur, allow welder to cool down, and remove residue from tip.
5. Do not smoke or eat during welding operation.
6. If fumes are generated, do not inhale.
7. Weld at arm's length to minimize fumes and smoke contact in the event of accidental fume or smoke generation.

The information and data contained herein are based on information we believe reliable and is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of NOVEX.

The choice of splice profiles will be determined by the belt size, motor horsepower, tension and belt speed. However, the three most commonly used splice profiles for NOVITANE conveyor belts are:

BIAS SPLICE



(22 DEGREES BIAS OR MORE) -- Adequate for light weight and low tension service applications with an operating tension of less than 90 PIW and the belt will not be subjected to any back bending or back flexing. Will provide an operating tension safety factor of 4:1.

Draw the ends together and overlap making sure the "center point" of the one belt end matches up with the "center point" of the other belt end. "Center-to-center" matching is critical for proper belt tracking.

To determine the amount of belt required to make a 22 degree bias, multiply 0.4 times the belt width. Then having overlapped the belt ends and matched them center point to center point, clamp the work area in place so that it will not move during the cutting and welding operations.

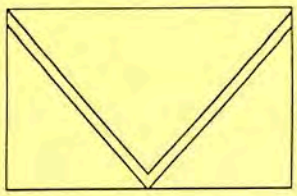
Position a straight edge for the 22 degree bias cut across both the overlapped belt ends. With the use of a sharp utility knife, slit through both belt ends. The knife will have to be drawn back and forth several times to cut fully through each belt end. (Use a little water to lubricate knife blade).

After cutting the ends from your straight edge, put a small bevel on the edges of both ends (approximately 60 degrees) in order to accommodate the triangular shaped weld rod. Then place a straight edge along the center lines and clamp the belt flat prior to welding.

NOTE: Do not subject a bias spliced belt to any back bending or back flexing, since it will cause the splice to fail prematurely.

"V" TYPE SPLICE

Recommended for service applications, where the belt will be subjected to back bending or back flexing. Will provide an operating tension safety factor of 7:1.

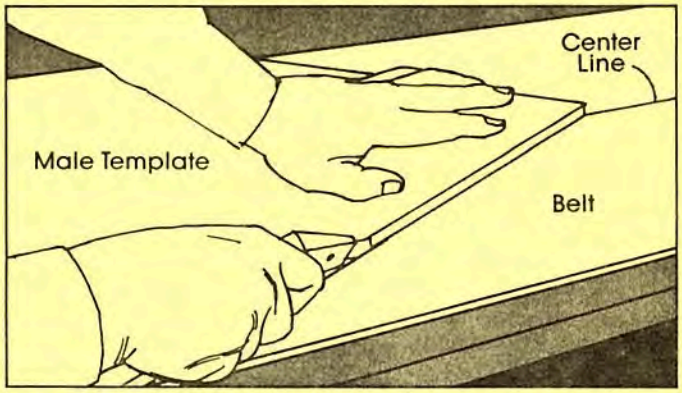


Align belt ends properly and make sure "center point" of one end matches with "center point" of other end. "Center-to-center" matching is critical for proper belt tracking.

Square belt ends properly and use care in making accurate measurements to insure proper fit of male to female ends for welding. The ratio of the "V" depth should be 1" of depth for each 1" of belt width.

"V" TYPE SPLICE (Continued)

Cutting Belt



For belt widths exceeding 12", in order to reduce the amount of work area to make the welded splice and to conserve the amount of belt required to make the "V" type splice, it is recommended that multiple "V" type fingers be utilized. For example, if the belt is 18" wide, consider using 2 each 12" long x 9" wide "V" fingers or if the belt is 36" wide, use 3 each 12" long x 12" wide "V" type fiongers.

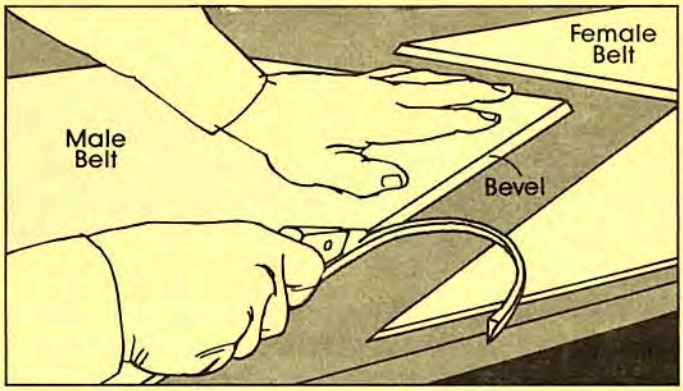
There may be situations (i.e.) short center distance, high belt speed or simply a lack of space for a long single "V" type splice. In these cases, please contact NOVEX for a recommendation.

Position a straight edge from the center point at the belt end to the depth mark at one belt edge. Using a sharp utility knife with a little water for lubricant, draw the knife back and forth until you have cut clearly through the belt. Repeat from opposite edge to belt center end to complete the male end.

Repeat above procedures for the female belt end except make edge marks at belt end and the center mark at the base of the "V". Use care to square the belt ends properly and make accurate measurements to accomplish a proper fit of male to female end.

After slitting belt ends, put a small bevel on the edges to be welded (about 60 degree bevel). This will accommodate the triangular shaped weld rod. Then place a straight edge along the center lines and clamp the belt flat prior to welding.

Trimming Belt

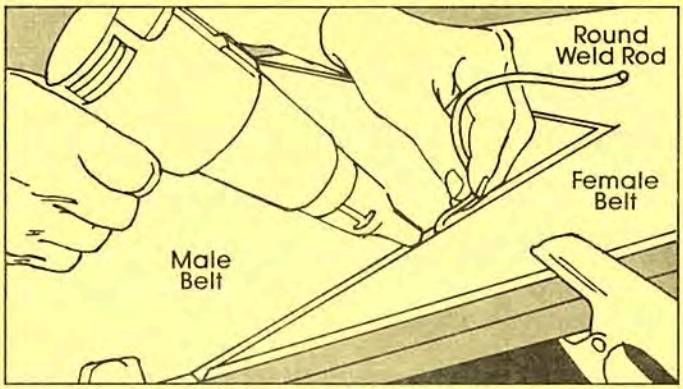


The splice area may have become soiled with dirt, oil or grease during the installation. Make sure to clean this area with either MEK or Acetone and then allow the solvent to evaporate.

NOTE: When subjecting a welded "V" type splice to any back bending or back flexing, the recommended minimum pulley diameters should be increased by two (2) inches.

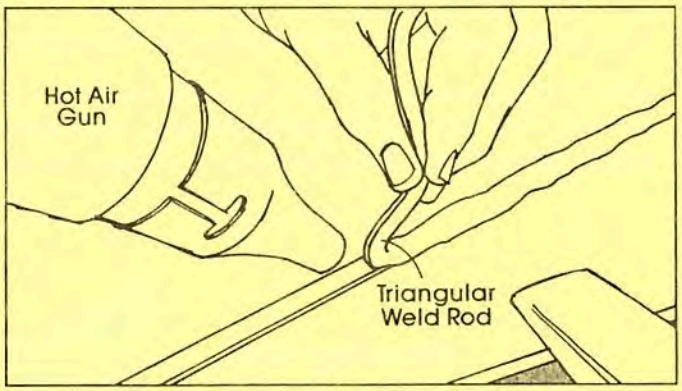
HOT AIR WELDING Hot air welding of **NOVITANE** conveyor belt is accomplished with the use of a hot air gun (approximately 750-1550 watts) and **NOVITANE** weld rod. Position a piece of teflon coated fiberglass fabric of sufficient width and length under the belt ends to be welded. Then position the beveled belt ends together allowing an 1/8" gap at the base of the belt edges. Then firmly secure the belt ends in place with a clamping device or by simply tacking the belts ends to a 1/2" thick piece of plywood or particle board with roofing nails. Adjust the hot air gun to the proper temperature setting and direct the gun to the point where the weld seam will be started on the edges of the belt ends. The tip of the hot air gun should be in close proximity of the belt splice area (approximately 3/4" - 1") and the heat flow directed so that it will penetrate the beveled area of the belt and the weld rod at the same time.

Splice-welding belt



Maintain pressure against the weld rod to cause a radius of the rod and force it into the beveled seam area. Force the rod downward to reach the bottom of the carcass. Keep the flow of heat directed in a manner that will heat the beveled edges and the underside of the weld rod simultaneously. (See illustration).

Maintaining pressure during welding



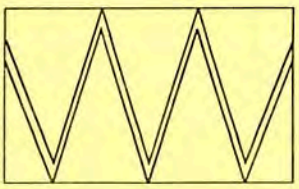
The **NOVITANE** belt cover will develop a gloss at the proper fusion temperature and the welding rod surface will become pliable and viscous. Draw the heat gun and weld rod towards you while you point the heat flow in the opposite direction and proceed to weld the seam.

We recommend the use of the small 1/8" diameter round weld rod on the first pass to the very bottom of the carcass. Then, weld directly over the round rod with either the 5/32" or the 1/4" triangular shaped weld rod depending upon the overall belt thickness to overfill the beveled gap.

After the welded splice has been allowed to cool down for approximately 10 minutes, remove the clamping devices or nails and remove the excess weld rod on the belt cover surface using either a hand held electrical high RPM router, or a high RPM hand held electrical drill with a 60, 80 or 100 grit sanding disk. The nail holes in the belt's cover surface can be resealed, simply by directing the flow of hot air from the hot air gun over hole area for several seconds. The newly welded spliced belt should be allowed to cool down for at least 30 minutes prior to starting the conveyor to insure maximum splice life.

VULCANIZED FINGER SPLICE

Recommended for application where 100% of the belt's recommended operating tension is required or where a smooth splice surface area is required



Using the center line you developed in squaring both belt ends, measure in 5" from each belt end to determine the center point. With either a template, straight edge or preprinted finger tape, lay out the "fingers" which will be a minimum of 3" long or deep x 1" wide, starting from the center point of each belt end. The lined "fingers" can then be cut with either a utility knife or a steel rule die.

Recommended Finger Dimensions

Specifications	Finger Length	Finger Width
FG/IG-55/85-COS (5)	3"	1"
FG-90/85-K (8)	3"	1"
FG-90/95-K (8)	3"	1"
FG-BLU-90/85-K (8)	3"	1"
IG-90/65-COS (12)	3"	1"
IG-90/75-COS (12)	3"	1"
FG/IG-90/85-COS (8)	3"	1"
FG/IG-90/85-COS (12)	3"	1"
IG-90/85-CBS (12)	3"	1"
IG-120/85-COS (12)	4"	2"
IG-120/85-CBS (16)	4"	2"
IG-150/75-COS (16)	5"	2"
IG-150/85-COS (16)	5"	2"
FG/IG-150/85-CBS (20)	5"	2"
IG-200/85-COS (16-20)	7"	4"
IG-200/85-CBS (24-32)	7"	4"
IG-200/95-COS (16-18)	7"	4"
IG-200/95-CBS (24)	7"	4"

If the splice area has become soiled with dirt, oil or grease during installation, clean the area with either MEK or Acetone and allow the solvent to evaporate before proceeding.

In setting up the water cooled vulcanizer, the bottom platen should be covered with Teflon coated fiberglass.

Having arranged the bottom platen, place the recommended number of plies of **NOVITANE** urethane foil on the top of the Teflon coated fiberglass, positioned so that the foil extends beyond the finger area by a minimum of one half inch.

Position the belt with the splice area on the foil and using either "C" clamps or spring loaded clamps, secure the belt ends in place, making sure the center line is aligned straight on both ends. Double check the squareness of the belt ends using a square before securing. Then position a square edge across the width of both belt ends to determine if additional plies of NOVITANE urethane foil are required to fill out any irregularities in the thickness of the belt ends.

Place metal edge irons along both edges of the splice area to serve as a side dam. Make sure the metal edge dams are .015" to .030" thinner than the thickness of the belt being spliced. Fill in the remaining open platen area with metal shims of the same thickness, do not use remnant pieces of the belt you are splicing. To insure that the belt will not slip or creep after the vulcanizer has been pressurized, place metal bars, approximately ¼" thick x 2" wide x sufficient width across the belt width on both sides of the vulcanizer. Then secure the metal edge irons and the transverse metal bars with "C" clamps. Finally, place the Teflon coated fiberglass and / or fiberglass epoxy board or steel cover plate over the splice area and assemble the top platen to the bottom platen.

FINGER SPLICE - (Continued)

Pressurize the platen to the recommended levels as shown and set the platens to the recommended temperature. After reaching the proper temperature, allow the splice to cure according to the recommended cure cycle. The cure cycle reflects time at temperature without consideration given to individual press situations. The press situation involves watt density of the press heaters versus various types of platen covers which can affect the heat-up rate of a belt. **In order to attain the recommended belt temperature levels, the temperature of the platens may have to be increased approximately ten degrees higher.**

SHAW-ALMEX VULCANIZING PRESS GUIDELINE FOR NOVITANE BELTING

BELT SPECIFICATIONS	TOP FOIL PLIES	BOTTOM FOIL PLIES	PLATEN PRESSURE	PLATEN TEMP.	BELT TEMP.	CURE CYCLE
FG/IG-55/85-COS (5)	2	0	50 PSI	345° F	335° F	3 Min.
FG-90/85-K (8)	0	2	50 PSI	345° F	345° F	4 Min.
FG-90/85-K (8) BLUE	0	2	50 PSI	345° F	335° F	4 Min.
IG-90/65-COS (12)	0	2	60 PSI	360° F	350° F	6 Min.
IG-90/75-COS (12)	0	2	60 PSI	360° F	350° F	6 Min.
FG/IG-90/85-COS (8)	0	2	50 PSI	355° F	345° F	4 Min.
IG-90/85-CBS (12)	0	2	50 PSI	355° F	345° F	5 Min.
IG-120/85-COS (12)	0	2	55 PSI	355° F	345° F	5 Min.
IG-120/85-CBS (16)	0	2	55 PSI	355° F	345° F	6 Min.
IG-150/65-COS (16)	0	2	60PSI	365° F	355° F	6 Min.
IG-150/75-COS (16)	0	2	60 PSI	365° F	355° F	5 Min.
IG-150/85-COS (16)	0	2	55 PSI	355° F	345° F	6 Min.
FG/IG-150/85-CBS (20)	0	0	55 PSI	355° F	345° F	7 Min.
IG-200/85-COS (20-24)	0	3	55 PSI	360° F	350° F	6 Min.
IG-200/85-CBS (24-32)	0	0	55 PSI	360° F	350° F	7 Min.
IG-200/95-COS (16-18)	0	3	55 PSI	360° F	350° F	6 Min.
IG-200/95-CBS (24)	0	0	55 PSI	360° F	350° F	7 Min.

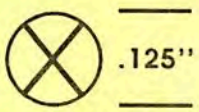
NOTE: The above parameters are suggested guidelines developed by using a Shaw-Almex Vulcaweld water cooled vulcanizer. Since there are a variety of water cooled vulcanizer presses in use, we recommend at least one splicing trial be conducted prior to doing the actual splice job, to determine if the above parameters should be modified in order to insure a satisfactory splice is made. NOVEX disclaims any responsibility or liability for a vulcanized spliced NOVITANE conveyor belt.

After the cure time has passed, immediately drop the temperature with cool water until the temperature falls below 100 degrees F. Then, depressurize the air bag and remove the spliced belt. The newly spliced belt should be allowed to cool down for at least three hours prior to start up to insure maximum splice life.

NOVITANE CONVEYOR BELT SPLICE AND REPAIR MATERIALS

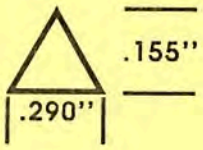
NOVITANE Weld Rods Extruded from compounds designed for use with **NOVITANE** conveyor belting. The material is translucent clear in color and manufactured from USDA approved compound. The formulation is suitable for either **NOVITANE** Industrial Grade belt or **NOVITANE** Food Grade belt. Sized and packaged as outlined below:

1/8" Round



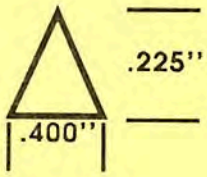
1/8" Round, 75 Ft. / coil. Used as the base weld for splicing all **NOVITANE** Food Grade & Industrial Grade belts.

5/32" Triangular



5/32" Triangular, 50 Ft./ coil. Used with 1/8" Round weld rod for splicing **NOVITANE** conveyor belts up to 1/4" thick.

1/4" Triangular



1/4" Triangular, 50 Ft. / coil. Used with 1/8" Round weld rod for splicing **NOVITANE** conveyor belts over 1/4" thick.

NOVITANE FOIL (Film) A high grade .006" gauge x 12" wide x 15 foot long translucent polyurethane foil or film used for vulcanized finger splicing of **NOVITANE** conveyor belting.

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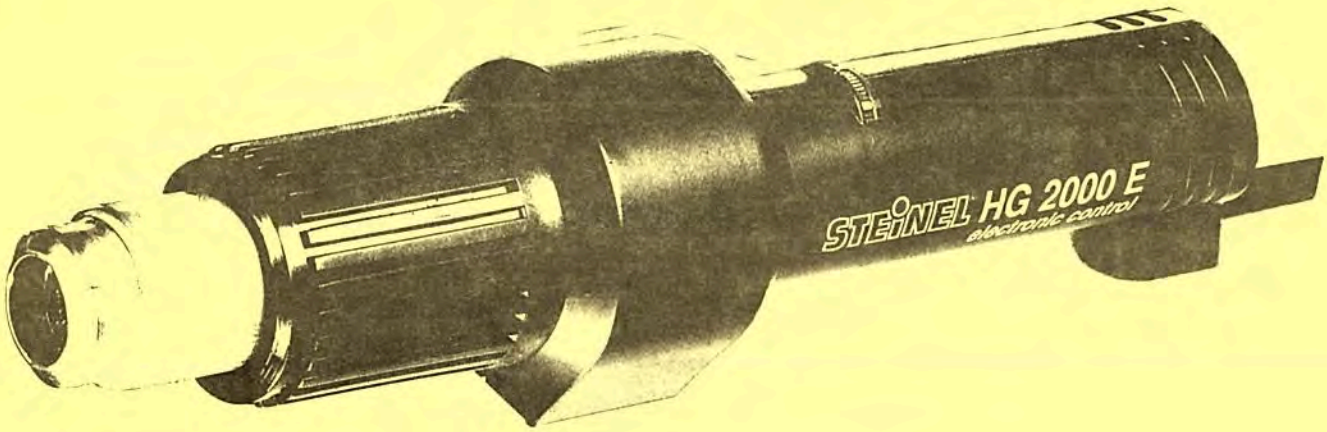
HOT AIR GUN Available for use with **NOVITANE** weld rod to splice or repair conveyor belt or sheet material. One style available as outlined below:

MODEL HG 2000 E

- Variable dial settings with temperature range from 212° F to 1100°.
- No "cool down" cycle required.
- One year warranty.
- Maximum output 1550 watts, 12.5 amps.
- Voltage: 120 volts AC.
- Air Flow: 17.6 CFM.
- Balanced, lightweight at 1.5 lbs.
- Heating element is ceramic encapsulated for durability.
- High-impact plastic housing for durability.
- European design and technology.

FLAMELESS HEAT



— Includes 9MM reduction nozzle

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