

TECHNICAL BULLETIN No. 41

DESCRIPTION

The purpose of this Technical Bulletin is to describe the recommended methods of seam welding FloorworX Fully-flexible Vinyl, Linoleum and Rubber materials.

INTRODUCTION

Seam welding is the accepted process of joining Homogeneous and Heterogeneous Fully-flexible Vinyl, Linoleum, and Rubber floor coverings. The welding operation involves the joining of two adjacent sheets or tiles by application of either a heated vinyl welding rod into a pre-cut groove, or chemically fusing two sides together. Welding provides a watertight joint which prevents the ingress of fluids, dirt and bacteria beneath the flooring. Furthermore, in hospitals and other institutions, it is recommended practice to weld the flooring to the skirting to ensure a hygienic, aesthetically pleasing impervious finish.

Welding should only take place 24 to 48 hours after installation is completed to allow the adhesive sufficient time to cure.

PROCEDURES FOR WELDING THE VARIOUS FLOOR COVERINGS

A. HOMOGENEOUS VINYL - FULLY FLEXIBLE (Uncoated) [Hot Welding]

B. HOMOGENEOUS VINYL - FULLY FLEXIBLE (Coated with a PU or PUR finish) [Hot Welding]

C. HETEROGENEOUS VINYL - FULLY FLEXIBLE (Coated with a PU or PUR finish) [Hot or Cold Welding]

D. LINOLEUM SHEETING [Hot Welding]

E. RUBBER SHEETING [Hot or Cold - Liquid Wax Method or Masking Tape Method]

A. HOMOGENEOUS VINYL - FULLY FLEXIBLE (Uncoated) [Hot Welding]

This is a thermo-fusion process - a combination of melting and fusion between the rod and the flooring material

Hot Welding is performed in five stages: Butting, Grooving, Welding, Trimming and Glazing.

1. BUTTING

When flooring is to be welded, adjacent sheets or tiles must be tightly butted together. It is preferable to overlap the sheeting, scribe the join using an under scriber, and then cut the material - thereby removing the factory edge - in order to achieve a relatively tight butt joint.

2. GROOVING

Do not groove immediately after laying the vinyl flooring. Allow 24 hours for the adhesive to set. The groove must be cut immediately prior to welding. This prevents dirt and dust collecting in the groove, which will adversely affect the strength of the weld. The groove must be cut along the butt joint, using either a hand grooving tool (usually a P-type or triangular groover) or an electrically powered grooving machine. Cut the groove to a depth of approximately 70% of the flooring's thickness or two thirds through the material.

3. WELDING

When welding, use either a hand-held hot air welding gun and feed roller or a hot air welding gun fitted with a speed nozzle. The temperature of the hot air supplied by the welding gun is adjustable; therefore it is important that the appropriate temperature setting is selected in order to achieve a good weld. A good weld has been achieved when a fine bead of molten material can be seen on either side of the welded joint. It is good practice to establish the correct temperature settings prior to welding therefore it is recommended that physical testing be carried out on a sample piece.

3.1. Hand-held Hot Air Welding with Feed Roller

The hot air welding gun is held in one hand and the feed roller in the other. The welding rod is fed through the handle of the feed roller, around the brass wheel and into the groove previously cut into the flooring. The feed roller is drawn along the groove in the flooring, feeding the welding rod into the groove. Simultaneously the hot air welding gun is also lightly drawn along the groove in front

of the feed roller. The hot air from the nozzle of the welding gun melts both the surface of the groove and the welding rod. Hand pressure on the feed roller and the speed at which the roller travels along the groove must be kept constant.

3.2. Hot air welding gun fitted with a 5.0mm speed nozzle

The speed nozzle effectively replaces the feed roller mentioned above, making it possible to weld with one hand. The welding rod is fed through the heated tube of the speed nozzle and is pressed into the groove. In order to produce a uniform weld, both the speed at which the welding gun is drawn along the groove and the pressure on the welding rod must be kept constant.

Welding too fast will compromise the procedure and the joint will not be secure, however welding too slow will damage and possibly discolour the material on either side of the weld due to the excessive heat.

4. TRIMMING

4.1 Using a Spatula Knife and Spatula Guide Plate

The weld or joint seam is trimmed in two stages. While the welding rod is still warm, trim off most of the top half using a spatula knife and spatula guide plate which fits over the welding rod. Carry out the final trimming using the spatula knife only, when the welding rod has completely cooled.

4.2 Using a Mozart Knife 0.5mm

The weld or joint seam is trimmed in two stages. During the pre-cut the spacer claw is swung in place below the blade so that, as the cut is performed, a residual seam remains. For the subsequent trimming cut, swing the spacer claw 90 degrees to the side and trim the seam flush with the material.

It is essential that, irrespective of the tool used, the process is carried out in two stages. If both cuts are performed whilst the welding rod is still hot, there will be severe concaving on the joint.

5. GLAZING

The trimmed welding rod will tend to soil more rapidly than the sheeting. It is therefore important to glaze the

surface of the trimmed welding rod. This is accomplished by directing the hot air jet from the speed nozzle onto the surface of the trimmed welding rod about 20-25mm above the welded joint. This will then glaze the weld to match the sheeting.

B. HOMOGENEOUS VINYL - FULLY FLEXIBLE (Coated with a PU or PUR finish) [Hot Welding]

This is a thermo-fusion process - a combination of melting and fusion between the rod and the flooring material.

Hot Welding is performed in five stages: Butting, Grooving, Welding, Trimming and Glazing.

The process and steps are the same as in A. above however the welding gun speed nozzle as qualified in A 3.2 has to be changed to from a Speed Nozzle to an Anti-glaze Welding Nozzle.

C. HETEROGENEOUS VINYL - FULLY FLEXIBLE (Coated with a PU or PUR finish) [Hot or Cold Welding]

HOT SEAM WELDING

This is a thermo-fusion process - a combination of melting and fusion between the rod and the flooring material

Hot Welding is performed in five stages: Butting, Grooving, Welding, Trimming and Glazing.

The process and steps are the same as in A. above however the welding gun speed nozzle as qualified in A3.2 has to be changed to from a Speed Nozzle to an Anti-glaze Welding Nozzle.

COLD SEAM WELDING

Cold welding is also called chemical welding, because it uses a solvent to fuse the two sides of a seam together.

Process of Cold Seam Welding

- Overlap the adjacent sheets preferably between 30 to 50 mm (where the material has a design or pattern, ensure that it is correctly aligned)
- Cut overlapped sheets using straight or hook blade and remove excess material or trimmings
- Butt adjacent sheets tightly together

- Affix masking tape centred over the seam
- Roll masking tape with small hand roller
- Cut masking tape over seam using a knife with a straight blade
- It is preferable to warm surface area over join with heat gun
- Force cold weld into seam
- Allow to dry
- Remove masking tape.

D. LINOLEUM SHEETING

[Hot Welding]

This is a bonding process between the linoleum and the welding rod, where the linoleum welding rod acts like a glue stick; therefore the methodology is different to heat-welding vinyl sheeting. There are three major differences in heat welding linoleum to sheet vinyl: the groove is deeper, the rod does not stick immediately, and the trimming has to be done while the rod is warm.

Hot Welding is performed in four stages: Butting, Grooving, Welding and Trimming.

1. BUTTING

When the flooring is to be welded, adjacent sheets must be tightly butted together. Overlap the sheeting, scribe the join using an under scribe, and then cut the material – thereby removing the factory edge – in order to achieve a relatively tight butt join.

2. GROOVING

Allow 24 hours for the adhesive to set before grooving. Groove immediately prior to welding the linoleum as this prevents dirt and dust collecting in the groove, which will adversely affect the strength of the weld.

The grooving depth is important and should be cut down to the jute backing, whereas vinyl sheeting should only be cut 2/3 of the thickness of the wear surface. The reason for this is cutting the groove depth down to the jute improves the bond between the rod and the linoleum. A shallow cut linoleum seam tends to open up over time.

3. WELDING

When welding, use either a hand-held hot air welding gun and feed roller or a hot air welding gun fitted with a speed

nozzle. The temperature of the hot air supplied by the welding gun is adjustable; therefore it is important that the appropriate temperature setting is selected in order to achieve a good weld. A good weld has been achieved when a fine bead of molten material can be seen on either side of the welded joint. It is good practice to establish the correct temperature settings prior to welding therefore it is recommended that physical testing be carried out on a sample piece.

The welding methodologies are the same as in A. 3.1 & 3.2 above.

4. TRIMMING

4.1 Using a Spatula Knife and Spatula Guide Plate

The weld or joint seam is trimmed in two stages. The first trimming pass with the spatula knife and the spatula guide plate must be done immediately after the completion of the weld. Do not let the rod cool down as allowing the seam to cool down too much makes it difficult to trim. The second trimming pass should be done immediately after the first pass. Be sure the temperature on the job is not too cold as the final trim will become difficult if the job temperature is too cold.

4.2 Using a Mozart Knife 0.7mm

The weld or joint seam is trimmed in two stages. During the pre-cut the spacer claw is swung in place below the blade so that, as the cut is performed, a residual seam remains and the cut is almost immediate. For the subsequent trimming cut, swing the spacer claw 90 degrees to the side and trim the seam flush with the material immediately after the first pass. Be sure the temperature on the job is not too cold as the final trim will become difficult if the job temperature is too cold.

It is essential that irrespective of the tool used, the process is carried out in two stages.

E. RUBBER SHEETING

[Hot or Cold - Liquid Wax Method or Masking Tape Method]

Hot Welding is performed in four stages: Butting, Grooving, Welding and Trimming.

1. BUTTING

When flooring is to be welded, adjacent sheets must be tightly butted together. It is preferable to overlap the sheeting, scribe the joint using an under scriber, and then cut the material - thereby removing the factory edge - in order to achieve a relatively tight butt joint.

2. GROOVING

Do not groove immediately after laying the rubber flooring, but allow 24 hours for the adhesive to set. The groove must only be cut immediately prior to welding, as this prevents dirt and dust collecting in the groove, which will adversely affect the strength of the weld. The groove must be cut along the butt joint, using either a hand grooving tool (usually a P-type groover) or an electrically powered grooving machine. Cut the groove to a depth of approximately 70% of the flooring's thickness or two thirds of the thickness of the flooring, or for acoustic products, two thirds of the top layer.

3. WELDING

When welding, use either a hand-held hot air welding gun and feed roller or a hot air welding gun fitted with a speed nozzle. The temperature of the hot air supplied by the welding gun is adjustable; therefore it is important that the appropriate temperature setting is selected in order to achieve a good weld. A good weld has been achieved when a fine bead of molten material can be seen on either side of the welded joint. It is good practice to establish the correct temperature settings prior to welding therefore it is recommended that physical testing be carried out on a sample piece.

The welding methodologies are the same as in A. 3.1 & 3.2 above.

4. TRIMMING

4.1 Using a Spatula Knife and Spatula Guide Plate

The weld or joint seam is trimmed in two stages. While the welding rod is still warm, trim off most of the top half using a spatula knife and spatula guide plate which fits over the welding rod. Carry out the final trimming using the spatula knife only, when the welding rod has completely cooled.

4.2 Using a Mozart Knife 0.7mm

The weld or joint seam is trimmed in two stages. During the precut the spacer claw is swung in place below the blade so that, as the cut is performed, a residual seam remains. For the subsequent trimming cut, swing the spacer claw 90 degrees to the side and trim the seam flush with the material. The finished weld should be smooth and on the same plane as the floor covering. If for any reason there is still any excess weld rod left after the final trim, it is necessary to remove this using the melting technique. After heating up a non-sharpened metal putty knife, gently push the putty knife down the seam weld. Excess weld material will collect on the knife resulting in a smooth and flat seam weld.

COLD WELDING (LIQUID WAX METHOD)

Performed in four stages: Butting, Preparation & Grooving, Application and Clean-up.

1. BUTTING

When flooring is to be welded, adjacent sheets or tiles must be tightly butted together. It is preferable to overlap the sheeting, scribe the joint using an under scriber, and then cut the material - thereby removing the factory edge - in order to achieve a relatively tight butt joint.

2. PREPARATION & GROOVING

Do not groove immediately after laying the rubber flooring, but allow 24 hours for the adhesive to set. To prevent bonding of the cold weld outside of the seam, using a clean cloth apply a thin even layer of Nora® liquid wax to both sides of the seam (approximately 100 mm total), and allow to dry.

The groove must only be cut immediately prior to welding, as this prevents dirt and dust collecting in the groove, which will adversely affect the strength of the weld. The groove must be cut along the butt joint, using either a hand grooving tool (usually a P-type groover) or an electrically powered grooving machine. Cut the groove to a depth of approximately 70% of the flooring's thickness or two thirds the thickness of the flooring, or for acoustic products, two thirds of the top layer.

3. APPLICATION

The use of gloves is recommended when using Nora cold weld. Cut off the tip of the cartridge at the first thread, screw on the nozzle and place the cold weld cartridge into a cartridge gun. Cut off the nozzle tip at a slight angle. Inject the Nora cold weld into the groove without gaps until a small bulb develops above the seam (about size of heat weld rod). Any Nora cold weld tracked or spilled on the flooring must be removed immediately using liquid soap and a clean cloth, as cleaning at a later stage may not be possible.

Press the Nora cold weld into the seam using a smoothing spatula, held nearly flat (22° angle), resulting in a smooth surface finish that is flush and on the same plane as the adjacent sheets/tiles.

Excess cold weld must be pressed away on each side of the seam. It is important to develop a slight gap between the excess weld and the weld within the seam for easy removal once cured.

For vertical corners, use a smoothing spatula to remove the excess cold weld and smooth the surface to approximately the required finish, then wait for approximately 10 minutes for the weld to skin over. Wet the fingertips using Nora liquid wax or water, then finish smoothing the weld by lightly manipulating it to a slightly rounded acceptable finish.

4. CLEAN UP

The excess cold weld can be removed after approximately 8 -12 hours, depending on thickness, temperature and ambient humidity. This can be done by simply peeling it off by hand. If the cold weld is still connected anywhere, then trim it off using a sharp Spatula Knife.

Prevent any traffic on the seams for approximately 12 hours until the Nora cold weld has cured.

The weld develops a skin after approximately 20 - 30 minutes at 20°C (68°F) and an ambient humidity of 50%. The skin formation is accelerated by higher temperatures and humidity, and slowed correspondingly by lower values. Do not wash or perform any maintenance of the floor for

a minimum of 72 hours after cold welding to allow it to cure. The initial maintenance will remove the residue of the liquid wax.

COLD WELDING (MASKING TAPE METHOD)

Performed in four stages: Butting, Preparation & Grooving, Application and Clean Up.

1. BUTTING

When flooring is to be welded, adjacent sheets or tiles must be tightly butted together. It is preferable to overlap the sheeting, scribe the join using an under scribe, and then cut the material - thereby removing the factory edge - in order to achieve a relatively tight butt joint.

2. PREPARATION & GROOVING

Do not groove immediately after laying the rubber flooring, but allow 24 hours for the adhesive to set. To prevent bonding of the cold weld outside of the seam, use masking tape to completely cover the seam that requires welding. Centre the tape over the seam and use a hand roller to firmly press the tape down to ensure a good bond.

The groove must only be cut immediately prior to welding, as this prevents dirt and dust collecting in the groove, which will adversely affect the strength of the weld. The groove must be cut along the butt joint, using either a hand grooving tool (usually a P- type groover) or an electrically powered grooving machine. Cut the groove to a depth of approximately 70% of the flooring's thickness or two thirds of the thickness of the flooring, or for acoustic products, two thirds of the top layer.

3. APPLICATION

The use of gloves is recommended when using Nora cold weld. Cut off the tip of the cartridge at the first thread, screw on the nozzle and place the cold weld cartridge into a cartridge gun. Cut off the nozzle tip at a slight angle. Inject the Nora cold weld into the groove without gaps until a small bulb develops above the seam (about size of heat weld rod). Any Nora cold weld tracked or spilled on the flooring must be removed immediately using liquid soap and a clean cloth, as cleaning at a later stage may not be possible.

Press the Nora cold weld into the seam using a smoothing

spatula, held nearly flat (22° angle), resulting in a smooth surface finish that is flush and on the same plane as the adjacent sheets/tiles. Excess cold weld must be pressed away on each side of the seam. It is important to develop a slight gap between the excess weld and the weld within the seam for easy removal once cured.

For vertical corners, use a smoothing spatula to remove the excess cold weld and smooth the surface to approximately the required finish, then wait for approximately 10 minutes for the weld to skin over. Wet your fingertips using Nora liquid wax or water, then finish smoothing the weld by lightly manipulating it to a slightly rounded acceptable finish.

5. CLEAN-UP

The masking tape may be removed carefully now or after it has fully cured, this will be approximately 8 - 12 hours, depending on thickness, temperature and ambient humidity. This can be done by simply peeling it off by hand. If the cold weld is still connected anywhere, then trim it off using a sharp spatula knife.

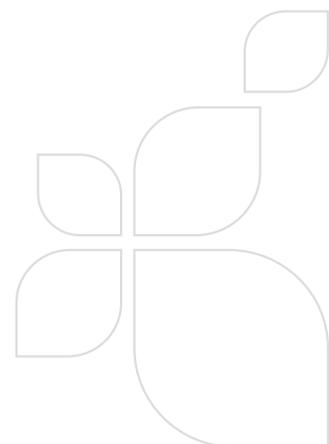
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The weld develops a skin after approximately 20 - 30 minutes at 20°C (68°F) and an ambient humidity of 50%. The skin formation is accelerated by higher temperatures and humidity, and slowed correspondingly by lower values.

Do not wash or perform any maintenance of the floor for a minimum of 72 hours after cold welding to allow it to cure. The initial maintenance will remove the residue of the liquid wax.



For more information please contact the **FloorworX TECHNICAL DEPARTMENT** by sending your query to technical@floorworx.co.za



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