

Problems with Gluing Thick Veneer Edges - is primer really the solution?

As there are problems not only when gluing thick veneer edges in the BAZ, but also in perfectly-equipped continuous edge banding machines from time to time, sometimes there is a demand ask for edges with primer, even though the edges are roughened on their back to ease the gluing process.

A primer is justified for a few application problems; however, it is not a universal remedy or a basic requirement for a good bonding with hot melt adhesive in comparison to PVC/ABS. It is hardly known that primer on a veneer edge compared to a veneer edge without primer reduces the temperature stability of the system (3-8°C) even if glued correctly.

Every manufacturer of hot melt adhesives has a wide range of products, fromfilled EVA and unfilled EVA to polyolefines as well as PUR mixed hot melt adhesives. Some of the manufacturers offer up to twenty different types of adhesives for the veneer edge processing, a fact that makes us wonder, why such a multitude of adhesives is offered, and how the choice for a special purpose of use, for the edge banding machine, and for the gluing of thick veneer edges can be made.

You should know that very big thick veneer edges in continuous rolls, e.g. 3mm, are prestressed because of their production on rolls, and the laminated side of the edge is intentionally rolled up on the inside so that a dense joint can be produced more easily at the edge of the board.

The decisive factor for the edge banding machine as well as for the BAZ process is to manage the prestress of the edge, or the stress caused by the profile in the temperature range between adhesion and binding, which needs to be done under pressure. The appropriate adhesive is helpful, but the best adhesive used in a wrong „system“ causes problems and often leads to a request for edges with primer.

If you receive boards already equipped with veneer edges which have, for example, an open joint at the outgoing side of approximately 2 to 10 cm located at the end of the board, it is always a sign for not matching parameters: hot melt adhesive, temperature, speed, or pressure. There are different approaches to solve this problem.

To use edges with primer should be the last choice, as the heat resistance of the system is reduced as mentioned above, and faults in the system are partly veiled, although they still exist, and the condition of the bonding is critical. If such items or pieces of furniture are transported by truck in the middle of summer, and are exposed to high temperatures, the veneer edges might easily be detached, and you cannot determine, if the fault lies in the edge, the primer or the adhesive.

To avoid such problems and those during the production process, you should check upon an appropriate adhesive, whereas the adhesive manufacturers offer quite a comprehensive overview and certainly help if asked. However, it is important to know

that the statement: „suitable for veneer edges“ does not necessarily mean: suitable for thick veneer edges. Adhesives should be chosen which are offered by the manufacturer as suitable for massive edges, PVC edges, ABS edges and PP edges, and perhaps even suitable for BAZ processing.

After having chosen the adhesive, which is supposed to be suitable, the matching processing temperature needs to be found out in connection with the machine's speed. That means that the adhesive needs enough heat at the first pressure roller in order to achieve the perfect bonding. Additionally, the adhesive must be able to cool down until the end of the pressure zone, possibly until crystallisation begins, or rather even further. It is generally known that this is a crucial moment in the BAZ processing; however, there are big differences in the various types of continuous edge banding machines as well.

There are compact-designed systems which are only for roll production, and there are combined systems which can be used for gluing solid wood edges as well as rolls. The decisive difference lies in the distance between the application of the adhesive and the first pressure roller, and thus in the expected reduction of the adhesive's temperature. Additionally, there are big differences in the pressure zone regarding its length and number of rolls.

The adhesive manufacturers explain that unfilled EVA adhesives compared to filled EVA adhesives mainly differ in the hot tack. The question if certain problems can simply be excluded by using unfilled adhesives needs to be discussed with reference to the purpose of use!

Apart from that, the user can only test the machine settings himself. This is essential, as you really have to bear in mind, where and how the temperature is needed during the gluing process with hot melt adhesive. You need to know that reducing the amount of adhesive causes an immediate reduction of the temperature at the first pressure roller. If the amount of adhesive is increased, the temperature is significantly increased at the same time. If the distance from the applicator head to the first pressure roller is relatively large as in combined systems, a reduction of the adhesive's temperature up to 70°C can occur in the worst case! However, in compact systems with short pressure zones, the adhesive has not yet cooled down enough at the last pressure roller. If the distance of the pressure roller is too long, the last pressure roller opens the glue joint at the board's outgoing side.

The user does not benefit from theory, so this is our suggestion for practical use: Before testing, the setting of the pressure zone needs to be checked regarding pressure, position and maximum distance. If there is too much pressure including a pressure roller having a distance which is too long, the edge will get distorted on the adhesive at the machine's feed, or the edge will be sheared off at the outgoing side. Often the latter can only be seen shortly before the end of the board when the joint looks different.

For the real test, the edge banding machine is put into operation at a relatively low temperature of the hot melt adhesive, and tests are executed in such a way that an approximately 10cm long, transparent scotch tape is put on the laminated side of the

thick veneer edge, if possible in the middle of the work piece. This spot is marked on the visible side of the edge.

After the board has left the edge banding machine and could cool down for a short period of time, the edge is separated by means of a saw in the field of the scotch tape so that it can simply be levered up with a knife or a mortise chisel. At the scotch tape there is, of course, no bonding; however, after removing the tape, you can already see the edge's strength in the area outside of the tape, and additionally, you might see the grid of the applicator roller. If the structure can be seen, either the pressure or the temperature is too low!

Now you can compare and control the changes by increasing the adhesive's temperature or by increasing the amount of glue, until you detect that the bonding is good, or that you approach the field in which problems might occur (open joints). You should really effect the series of tests until after receiving visible changes for the worse!

If you think that there is too little or too much glue, you should change the quantity at the same temperature, by that ,however, the adhesive's temperature in the pressure zone is changed as well!

If you know the range in which the adhesive can be applied with regard to the machine's speed, quantity and temperature setting, you can achieve a permanent and correct bonding in the upper end of the temperature range with a high degree of certainty.

The operating process should always be done in the higher range of temperature, because the refilling of adhesive granulates often leads to a reduction of the adhesive's temperature in smaller systems, but the process still runs in anacceptable zone.

The procedure described above is certainly not to be regarded as a universal remedy, but problems can be detected and limited, especially in smaller or medium-sized edge banding machines without a pressure melter. By means of the above procedure, you can even control the necessary amounts of adhesive relatively well and check upon the operating process by yourself from time to time or in case of altered settings.

It is generally known that cold edges and cold particle boards should not be further processed, only if the temperature of the adhesive is altered correspondingly. It goes without saying that this method can be used in other fields, such as softforming or profile wrapping; however, in this case the restoring forces cannot be compared to those of a thick veneer edge, even though the restoring forces of thin veneer edges and profile wrapping veneers are considerably stronger than in case of suitable plastics. Even in this case, the user is often closer to the adhesive's „hot tack“, and the control of the temperature can be influenced in a different way.

An edge must be glued dependably strong; for this the user only needs to use his machine and his system correctly in order to achieve a really good result.

We'd love to help you!