

A new aqueous transfer coating system for splits

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Transfer coating of splits is a well-known and established process in leather finishing. The physical properties and the optical advantages are significant. At present the state-of-the-art technology is solvent-based systems, applied either via spraying technology or with rollers and doctor blades onto silicone matrices. These matrices have to be made individually and, because of the sensitivity, have to be handled and stored very carefully.

The conventional finishing of splits

When applying a base coat onto a split using conventional techniques, that is either by spraying or reverse roller-coating, the first coat has to seal the surface. An additional embossing or plating then follows in order to close the film and flatten the surface by pressing down the leather fibres. The following finishing coats will then be built up on this surface.

To avoid orange peel effects, the fibres should be as short as possible before finishing and the first coat has to seal the surface completely. The penetration of the first coat may cause a remarkable hardening of the split and the print retention sometimes is affected. This can cause the embossed grain to disappear after some time or lose its uniformity across the surface.

Current transfer coating

The transfer system works in a different way. Instead of the finish being applied directly to the split surface, it is applied either onto a silicone matrix or on a transfer paper. The matrices can be made in many different designs. For example, an aniline leather surface can be used as a master to be copied into a negative form, and this can be replicated many times. This means that the finished split will show the same surface structure as the surface of the original master sample. The pattern or design of the release paper is in negative form, with the finish transmitted on a one-to-one basis onto the surface of the leather. Because the finish is applied onto a matrix/transfer paper, a very even finish application can be achieved without any influence from penetration as is experienced with normal split finishing.

This is known as Transfer Coating and is performed conventionally by using solvent-based products. Once the whole finish has been applied to the matrix or transfer paper, the split-precoated with adhesive—is placed onto the finished

matrix/paper. Once adhesion between the finish and the split is complete, the matrix/paper is removed to reveal the finished split.

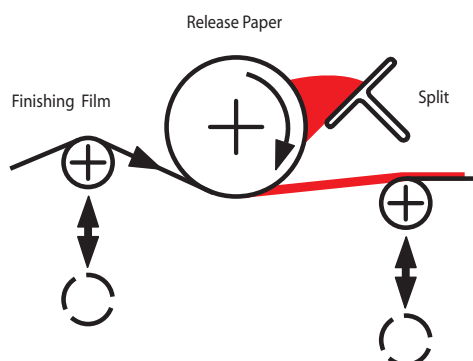
The advantage of this application is that the film is placed onto the surface of the split, and so an equal coverage is guaranteed. There is no uneven penetration into the surface of the split, or hardening of thick fibres. An orange peel effect is thus avoided, as well as an irregular embossing pattern. The disadvantage of this system is the use of solvent-based products.

Aqueous transfer coating with the Melio Coater System

Instead of being a solvent-based technique, the Melio Coater System uses water-based finishing products. Another very important difference is that the finish is not applied onto silicone matrices, but only onto a release paper. This offers many advantages as the creation and the storage of individual matrices are no longer necessary, thus easing the operation.

The build-up of the finish on the release paper follows the same principle as the solvent-based transfer coating system described in the previous section, namely that it is the first application onto the release paper that is destined to become the topcoat of the finished split, with the second application becoming the base coat. The adhesion coat can either be applied as a final coat onto the base-coated release paper, or onto the surface of the split. An example of the finish being applied to the release paper is illustrated in *Panel 1*:

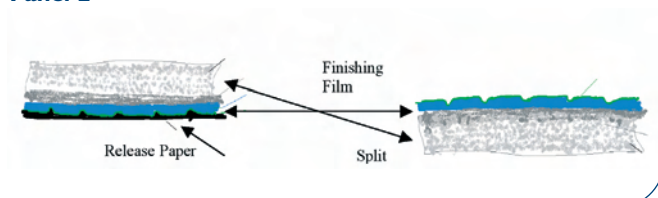
Panel 1





Panel 2 shows the split being offered to the coated release paper, with the embossed coated split after the paper has been peeled away.

Panel 2



These papers are produced in many different designs, so imitations of natural grain can be made as well as any artificial surface effect. Moreover, these release papers are available on large rollers, so the result is a very economical finishing process.

This environmentally friendly finishing method offers a wide range of final articles: high fashion shoe upper leathers can be made, leathers for fancy goods and also for upholstery purposes. And, because of the homogeneity of the finish film, superior physical properties are obtained, in particular the resistance to both rubbings and flexing.

In general the amount of finish needs careful attention. As soon as the finishing coat reaches a thickness of 150 µm or more the 'finished split' turns into a 'coated split', that is, the appearance of the water-based finish will be the same as the solvent-based one.

Important characteristics

The system described is purely water borne, so that both the finish created on the release paper and the adhesive used to bond the finish to the split is VOC-free. In addition, the pattern on the surface of the release paper is very accurately transmitted to the finish film.

This also means that the degree of gloss or dullness can be reproduced: a remarkable dullness can be achieved by using a dull paper thus avoiding the use of dulling agents! In this event, there is no danger of a grey break on folding or creasing. This is a special feature and leads to a very homogenous film. The absence of silica particles used for dulling means that the resin coat is not adulterated, so a high level of physical properties can be achieved.

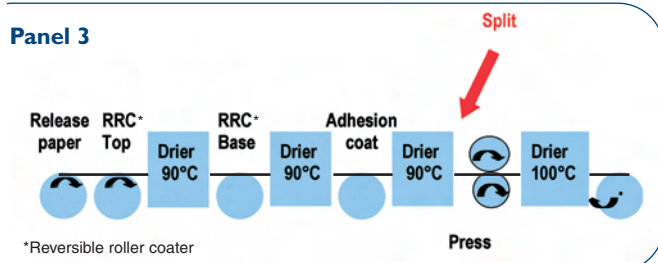
Two coating techniques

Due to the ongoing development in finishing machinery and technology, two different application methods are available:

METHOD 1:

- Apply the top coat to the transfer paper

Panel 3



- Apply the base coat to the transfer paper
- Apply the adhesion coat to the transfer paper
- Press the coated paper onto the split
- Tear the paper away

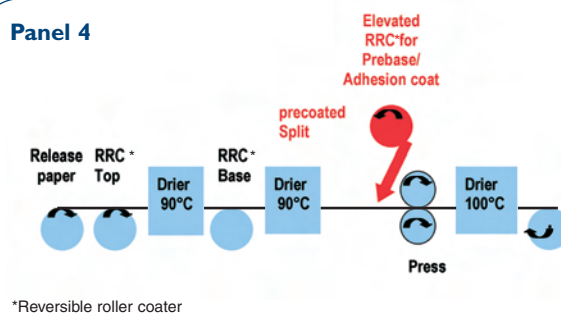
This is indicated in Panel 3:

METHOD 2:

- Apply the top coat to the transfer paper
- Apply the base coat to the transfer paper
- Apply the adhesion coat onto the split using a reverse roller coater
- Press the coated paper to the split
- Tear the paper away

This is indicated in Panel 4:

Panel 4



The advantages offered by Method 2 include:

- an increase of production speed
- a saving of chemicals
- the release paper lasts longer

The advantages of the aqueous transfer coating system

The advantages of this purely water-based coater system when compared with the solvent-based system are not just environmental. There are fewer dangers in storage, handling and flammability of products, and less extraction of fat or grease from the crust leathers. Moreover, there is an improved life span for the transfer paper: depending on the process a paper can be used up to 20-30 times. (This is also dependent upon the type of grain, as the finer the grain the shorter the lifespan of the paper, and the quality of the paper also has to be taken into account.)

For special articles—such as fashion shoe upper leathers or special effects—or for colour corrections, an overspray of the finished splits is possible. This enables the finisher to be very flexible; for example, two-tone-effects, feel coats or any other effect coat can be sprayed. To ensure intercoat adhesion of subsequent spray coats the topcoat can also be customised, but it should be remembered that, just as in normal leather finishing, if the top coat is highly cross-linked the time available for a safe overspraying is limited.

Today's requirements for finished split leathers are very high and will no doubt increase further. Also the finish properties pertinent to wear and use have to be of the highest level possible. In addition, the consumers of leathers want a high-appeal product, and will not accept leathers looking like finished splits.

This coating system is a truly ecological and environmentally friendly way of production, and is also very economical and efficient. 