Paper Backed Lath:
The Old Is New Once Again

By Gary J. Maylon

Many years ago, to prevent wood sheathing or studs from absorbing moisture from freshly applied wet stucco or to prevent moisture penetration into the wall cavity, the applicator’s only choice was to wrap the entire project with 15-pound felt paper, which was the only product available. He then applied expanded metal lath on top of the felts.

Given the fact that this method of application was very labor intensive and, therefore, very costly, the industry was in need of cost-saving alternatives. American ingenuity came through with the realization that paper could be glued directly to the lath to provide a product that would allow for the application of lath and paper in one application.

On the surface this sounds like a simple, straightforward process. In fact, much thought and many months of experimentation were needed to discover the correct method of application, the proper type and amounts of glue to be used, the optimum amount of glue, a method of drying the glue prior to packaging and shipping the product, and finally the proper type of paper.

We have discovered that in addition to the benefits provided by the various types of paper discussed in the following paragraphs, one other major benefit was realized. Paper attached to metal lath greatly improves the keying of the plaster or Portland cement stucco. When pressure is applied by the applicator with a trowel or gun, the stucco is forced through the diamond shaped openings. When this material hits the paper backing, it is forced to lock around or key to each individual strand of the metal lath. Since the lath is there to act as a structural base for the stucco, this optimum keying action allows the lath to become a completely embedded component of the stucco membrane.

Many types of paper backing are used today, depending on the desired application. These papers are generally governed by Federal Specification UU-B-790A, which lists papers by their composition. East of the Rocky Mountains, 99% of the paper used is Type I, Style 2, Grade D. This paper is asphalt impregnated kraft paper which is water-resistant but remains vapor permeable, i.e., it must allow a minimum of 35 perms of vapor penetration. When installed in a ship or roof lap arrangement, i.e., upper sheets placed over lower sheets, the paper allows for the shedding of moderate amounts of moisture while still allowing for moisture vapor to escape from the wall cavity. Thus wall cavity vapor control is facilitated. Should this moisture be allowed to condense and remain in the wall cavity, it could be highly detrimental to the cavity insulation and cause corrosion to metal stud components.

On rare occasions we have seen requests for plain kraft paper. Generally this has been requested for use in the spray application of stucco to minimize the loss of stucco into the wall cavity. Since this paper serves no other practical purpose, and because its cost is nearly that of grade D paper, most applicators opt for the latter.

West of the Rocky Mountains, two additional papers are used to a limited extent. Type I, Style 2, Grade B is described in the federal specification as moderately water vapor resistant, water resistant and allowing a maximum of six perms. You see from this description that this paper is expected to be more water resistant and highly resistant to vapor permeability. There are problems inherent in this product. Expanded metal lath and welded wire type lath tend to have sharp edges or weld points. When these paper-backed products come off the production line they are perfect, but when they are bundled, stacked, compressed and shipped over even short distances they often end up with pin holes and cuts. This breach of the integrity of the paper precludes its ability to perform as intended.

The industry has done much to overcome these problems, including moving to much heavier paper at increased cost. However, most feel that the use of grade B paper is overkill, and that in most instances grade D paper would be more than adequate.

We occasionally see a call for Type III, Style 1, Grade F paper, a fire resistant, water-repellent paper as described Federal Specification UU-B-790A.

Because Grade D paper is water-resistant and also vapor permeable, it serves two functions which make it the best product for use with stucco. First it sheds excess moisture which may be present during the application of stucco due to any moisture penetration through the stucco membrane. More importantly, it allows for the release of moisturevapor...
Changes in Design Have Made This Possible

from the wall cavity. As mentioned earlier, this moisture, if not allowed to escape, can be very harmful. It is my feeling that under most conditions grade D paper would be the best choice for use with lath and Portland cement stucco.

Frequently paper backed lath is used in conjunction with painted studs, or anywhere on-site welding might occur after installation of the paper backed lath. Obviously, this is done to minimize the risk of fire.

Out With the Old

We have looked at why there was a need for paper backed lath, and the various types of paper available in today’s market. Now we need to look at recent changes in the paper backed lath market.

Several years ago, we noticed more and more applicators returning to the old labor-intensive practice of wrapping a project with construction paper in its entirety prior to applying the metal lath. Our research indicated that installation problems with paper backed lath, and an increased occurrence of cracks in the stucco—generally occurring horizontally at the lap joints—had led to discontent with paper backed lath in general.

Once again, the industry responded to a problem and went to work to find the answers. First, let’s look at a description of the original paper backed lath, the code requirements for lapping procedures, and the problems inherent in its design.

Originally paper backed lath was designed with the paper cut to the same dimension as the metal lath and glued so that all edges were flush. Since ASTM C1063 (Standard Specification for Installation of Lathing and Furring for Portland Cement Based Plaster) requires that the side laps of each sheet be lapped, metal-over-metal and paper-over-paper, a laborious and difficult task ensued in order to satisfy this requirement. ASTM C1063 requires a metal lap of a minimum of 1/2 inch at the sides and one inch at the ends, and all sides of the paper shall be lapped a minimum of one inch. Note in Detail #1 that when installing subsequent sheets, all previously applied sheets of lath and paper must be sandwiched in between the lath and paper of the next sheet being applied.

We discovered that the worker often folded down or tore off the paper edges to make application easier, creating a situation where the paper membrane was not continuous. This allowed moisture penetration and could have created an environment in which portions of stucco membrane might cure at different rates and thus become more susceptible to cracking. Also, many installers were simply lapping the entire sheet of lath and paper over the metal portion of the sheet below, resulting in paper overlapping metal (see Detail #2). When this happens the stucco cannot key into both sheets of metal lath at their joining. Therefore a structurally weak area exists which will be more likely to crack.

Note: No lath-to-lath keying in this area. Stucco not allowed to key into both sheets of metal lath due to blockage created by improper lap of paper. A crack will more likely occur at this point.

In With the New

With the development of offset paper backed lath, in which the paper is displaced laterally in width and length direction, the problems described above should be avoided, once again providing tremendous labor savings to the applicator and a quality lath and stucco application. What’s so revolutionary about offset paper Ti-lath? Let’s examine Detail #3 to find out.

You will notice immediately that instead of the paper fitting flush on all edges, it is now offset from the lath edges. The paper is recessed on one long edge and one short edge of the sheet and allowed to overhang on the two opposite edges. By starting the first sheet in the bottom right hand corner of the wall, all that is necessary for succeeding sheets is to place the
next sheet edge on top of the previous sheet with the appropriate lap. This operation automatically places paper over paper and metal over metal with the proper amount of lap in compliance with ASTM C1063.

One word of caution: since the paper is recessed on the bottom edge of the first row of sheets, prudent practice would be to place the unpapered edge over the concrete slab. If, however, a foundation drip screed is to be used, common practice is to start by placing a 6" to 8" strip of construction paper at the bottom of the wall. This will allow for a continuous coverage of paper on the entire surface of the exterior wall.

**Optimum Installation**

Many things can contribute to cracking in Portland cement stucco. Often these are things that are difficult to control. Briefly I would like to look at several techniques which can be used to create a stucco exterior that will maintain lasting beauty and durability.

In addition to proper lathing products and techniques, we highly recommend the use of the proper types of accessories as required by specification. Cracking is often the result of uncontrolled expansions and contractions created by temperature variation, building movement or shrinkage. Use of the proper stucco mix and care to monitor climate conditions will help to minimize shrinkage cracks. However, use of control/expansion joints will greatly help to reduce the effects of all three problems. A two-piece expansion joint is recommended at construction joints and where structural assemblies constructed of dissimilar materials join, such as where a metal stud wall meets a masonry wall. ASTM C1063, 7.10.1.4 states that the metal lath should not be continuous, i.e., it should cut at the control joint and tied on each side with 18 gauge galvanized annealed steel with a maximum of 12 inches O.C. This method of assembly creates separate, free moving panels which can better handle the stress of expansion and contraction.

When using paper backed lath, section 7.8.3 and 7.8.3.1 suggest that the (paper) backing should be continuous to prevent water penetration; a 6" strip of felt or grade D paper is recommended behind every control joint. The contractor should also attempt to lap these strips to prevent moisture penetration. This assembly is shown in Detail #4.

Another area that creates problems is at the foundation. We recommend the use of a #7 foundation weep screed. As shown in Detail #5, this product is available with various sizes of flashing legs and ground sizes. Holes punched in the grounds, combined with the slope of the ground, allow for moisture to escape from behind the stucco assembly. If this moisture were allowed to remain, it would be highly detrimental to the assembly. Use of a casing bead at this point is not recommended because it does not allow moisture to escape, and often when a galvanized bead is used early rust problems will occur.

Finally, we highly recommend the use of zinc alloy accessories (99% pure zinc) for all exterior applications. Galvanized accessories have a limited life expectancy, whereas zinc accessories will last for decades under most conditions.

We are currently seeing a resurgence in the use of Portland cement stucco. The use of elastomeric coatings and new innovations such as fiber reinforced stucco and synthetic finish coats, combined with good lathing practices, have done much to help this cause. Offset paper backed lath, if used properly, will also help to protect stucco finishes that will retain their beauty and durability for many decades.

Quality, value, and durability make for a system that is hard to beat. Portland cement stucco will continue to be used for many generations to come.

**About the Author:**

Gary J Maylon is manager of the Building Products Division of Alabama Metal Industries Corporation (AMICO), where he has worked for 13 years. He is active with AWCI and the Metal Lath/Steel Framing Association (ML/SFA) and currently serves as Vice Chairman of AWCI Technical Subcommittee 5 and the Task Force on Tolerances. He is also a member of ASTM Committee C-11.