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DURA-LASTIC Worksheet

An introduction to the basic theories, calculations, and procedures of using
DURA-LASTIC.

Plus some informal hints to make the process a whole lot more fun!

DURA-LASTIC is a breakthrough Water Catalyzed Urethane (WCU) resin with entirely new capabilities and versatility's that were never available with the "old technology" moisture cure materials.

With "old technology" urethanes, you needed to spread the material in paint like thin coats, then wait up to 24 hours for each coat to cure from moisture derived from the air before application of the other thin coats required to build up any meaningful membrane thickness. Solvent shrinkage, odors, mediocre physical properties and high labor costs resulting from multiple application steps are additional limitations.

The addition of 25% of plain tap water catalyzes the DURA-LASTIC - and also lowers the cost by 25%! - so that now any thickness of membrane can be applied in a single coat. Now a coatings contractor can spread a solvent - free, odorless, extra tough and flexible urethane coating knowing that he has control of the pot-life of his mixture, the thickness of his membrane and the time of its cure. (Never add less than 15% water because there might not be enough of the catalyzing water to completely react the DURA-LASTIC and out-gassing may occur.)

Waterproofing membranes, "T" - expansion and seismic joints, flexible sloping under-layment, crack filling, caulking, animal habitat seamless Mono-Mat Systems to a movie studios use for casting special effects props. DURA-LASTIC uses are only limited by your imagination.

Such a wide range of versatility could lead one to think that DURA SYSTEM Materials and Systems are complicated and difficult to work with. **Nothing** could be further from the truth!

It is this tremendous versatility - coupled with user friendliness - that is at the very heart of DURA SYSTEM technology and application capabilities.

As with anything new, it only takes a bit of hands-on trial & error to relieve such apprehensions. A little experience and a little ingenuity can result in a combination that will help the contractor successfully increase his bottom line of job satisfaction and monetary gain.

HINT: Make copies of the following worksheet pages to use as on-the -job reminder sheets.

The primary, and one of the most unique materials, in the **DURA SYSTEM** product line is the **DURA-LASTIC**. This comes in two forms:

DURA-LASTIC Solvent-Free

Solvent Free Dura-Lastic has a Shore A hardness of about 65 and cures to an extremely TUFF flexible membrane for hard usage decks and roofing applications.

The **three** most important and unique things about both DURA-LASTIC is:

1. They are concentrated; so various fillers can be added.
2. They are catalyzed; by adding 25% plain tap water.
3. The 25% water adds to the yield, and actually lowers the cost!

Far from being complications, these three facts are the backbone of the DURA-LASTIC Materials **Simplicity**, **Versatility** and **Economy**.

Water is the catalyst, and by adding the water, you also increase the yield by 25% and lower the end use cost by 25%. The advantage of a catalyzed material is that you can apply the DURA-LASTIC Membrane “*thicker & quicker*” than the “*old technology*” elastomerics and save time & money.

It's that simple!

A bit later, we will review even more DURA SYSTEM materials & advantages, such as how to save additional labor and materials costs while solving some really unique problems.

Understanding and Calculating Yield.

The basic “Catalyzing” and “Yield” formulation is the addition of 25% water to each unit of **DURA-LASTIC**. This increases the yield by 25% and consequently, lowers the cost by 25%.

One unit of DURA-LASTIC plus 25% water, yields 1.25 units of membrane.

For example, a 5 gallon pail of DURA-LASTIC X 1.25 **yield** = 6.25 gallons of membrane.

Total cost (Material cost + tax + shipping, etc.), divided by 1.25 yield = \$____, this gives you the true per gallon cost of a mixed gallon unit of membrane.

DURA-LASTIC overlay systems normally begin with proper surface preparation and priming, then the application of a base membrane of either **40-mils** on smooth surfaces, such as well finished concrete or metal ship decks, or **62.5-mils** (1 /16 inch) on plywood or other less smooth surfaces. DURA-LASTIC has also been used for 1/2-inch (500-mil) seamless elephant habitat pads as described in our Mono-Mat System brochure and literature!

There are 1,600-mil sq. ft. (msf) per gallon of liquid. If you divide 1,600 by 40 mils thickness you get 40 sq. ft. of coverage. When 25% water is added to DURA-LASTIC to act as the catalyst, the water also acts as a “*filler material*” increasing the “*yield*” of the material by 25% to 2,000 mil sq. ft. (1 gallon of DURA-LASTIC + 25% water = 1 1/4 gallons of ready-to-use membrane. An extra quart of material for free!) Divide 2,000 mils by 40 mil thickness = 50 sq. ft. coverage per 1 1/4 gallon of membrane, 10 sq. ft. increase in coverage for the “free” cost of the water!

It is efficient to mix in half-pail quantities (2 1/2 gals. of **DURA-LASTIC** plus 2 1/2 quarts of catalyzing water) because pouring water into a full 5-gallon pail would cause it to overflow. Each 5-gallon pail of **DURA-LASTIC** plus the catalyzing 25% of free water yields 6 1/4 gallons of usable membrane. 1 1/4 gallons of additional material for **free!**

40 mil system calculations:

1 gallon of DURA-LASTIC + 1 quart (25%) water = 1 1/4 gallons of membrane /2000 msf. Divide by 40 mil thickness = 50 sq. ft. of coverage per mixed unit (1-gallon of DURA-LASTIC + 1-quart of water). A 1/2 pail mixing unit of **DURA-LASTIC** (plus its 2 1/2 quarts of water) will cover 125 sq. ft. and a full 5 gallon pail of **DURA-LASTIC** (plus its 5 quarts of water) will cover 250 sq. ft. at 40 mils thickness.

62.5 mil system calculations (1/16th inch.):

1 gallon of **DURA-LASTIC** + 1 quart (25%) water = 1 1/4 gallons of membrane /2,000 msf. Divide by 62.5 mil thickness = 32 sq. ft. of coverage per mixed unit (1-gallon of **DURA-LASTIC** + 1-quart of water). Half pail mixing unit of **DURA-LASTIC** (plus its 2 1/2 quarts of water) will cover 80 sq. ft. and a full 5-gallon pail of **DURA-LASTIC** (plus its 5 quarts of water) will cover 160 sq. ft. at 62.5 mils thickness.

Calculating the DURA-LASTIC required for a 1,000 sq. ft. job

40 mil thickness: One gallon of **DURA-LASTIC** + 25% water covers 50 sq. ft. at 40 mils. A 1,000 sq. ft. job divided by 50 = 20 gallons or 4 – 5 gallon pails of **DURA-LASTIC** needed for the job. After adding the 25% of catalyzing water, the resulting yield is 25 gallons of ready-to-use membrane. (One 5 gallon pail of additional material for the “cost” of the water!)

62.5 mil thickness: One gallon of **DURA-LASTIC** + 25% water covers 32 sq. ft. at 62.5 mils. A 1,000 sq. ft. job divided by 32 = 31 1/4 gallons or a little over 6 – 5 gallon pails of **DURA-LASTIC** needed for the job. After adding the 25% of catalyzing water, the resulting yield is 38 gallons of ready-to-use membrane. (About 7 + gallons of additional material for the “cost” of the water!)

As with any building material, a “safety factor” allowance should be figured in to compensate for uneven substrates, joint taping, patching and waste.

Another way of figuring material usage:

1 gallon **DURA-LASTIC** = 1,600 mil square feet
(msf) 1 quart water = 400 mil square feet
1 1/4 gallons = 2000 msf in 1 1/4 gallons of membrane

Divide by the desired thickness. **Example:**

1/4 inch = 250 mils, divided into 2,000 mils (1 1/4 gal. membrane) = 8 sq. ft. at 1/4 inch thick.

Divide the cost per gallon of DURA-LASTIC by 2,000 msf to get the per mil cost and then multiply by the mils thickness needed to figure the membrane cost per sq. ft.

“How To” and miscellaneous ramblings”

When the **DURA-LASTIC** is mixed with water, you have about 15 - 20 minutes +/- to apply the **membrane** and still have it flow freely and self level easily.

On large jobs that will require multiple mixing cycles, so normally mix in half pail units as the job progresses. The mixer person is the key and he must time the mixing to keep a wet edge and not get ahead or behind the applicators. (It's a lot easier than it sounds. It just takes communication, practice and experience.)

The rule of thumb when applying the **membrane** is “The quicker the better!” In other words, don't hesitate. You can detail before and after the membrane is applied, but try not to “dawdle” while the material is setting up in the pail. The quicker it goes down, the better the material will lay out and smoothly self-level.

Hint: In *HOT* weather you can add *COLD WATER* to slow down the catalyzing rate and in *COLD* weather, *HOT WATER* to speed it up. As with everything else in life, experience and practice will make things easier as time progresses. Life is a learning curve!

Set Up Time

When the water is added, the final set up time will still depend on the weather and temperature. Additional chemical catalyst (The **green** colored vile.) is another tool to help meet your job needs. One vial of “green” is shipped with each pail of **DURA-LASTIC** and should be added as needed, during cooler weather. The catalyst is added when the pail is boxed and mixed (in order to get the settled solids off the pail bottom) and prior to the addition of water. If this vial of green catalyst is not used during cooler weather, the material will just take a little longer to set up. (But don't ever forget the water!!!) In really cold weather, additional “**green**” chemical catalyst may be added to speed up the cure time. One additional 1 oz. vial per half pail mixing unit will maximize the curing time (1 for “normal” and 2 additional = 3 total per 5 gallon pail of RBC). The additional cost is only 2 to 3 cents per sq. ft. and it really speeds things up! The working time does not measurably change, just the end cure time, which means that you can get back on the cured membrane earlier to finish the job quicker.

Curing Time

On a “normal” 70-degree +/- day, the set up without additional chemical catalyst will be about 3 to 4 hours. With the addition of the “green” chemical catalyst, (3 vials max. per pail on very cold days) the time can drop to about 2 to 3 hours, or even quicker in warmer weather. As always, experience is the only true teacher!

Adding filler material to the DURA-LASTIC

DURA-LASTIC can be thickened with rubber granules or sand in order to use it in some really unique and very cost-effective applications.

The two rules of thumb are:

1. If you need the DURA-LASTIC mixture thick, mix it thick. If you need it thin, mix it thin.
(Add more or less filler material.)
2. Don't ever forget the water!!!!!!

Yes, it's that simple. Mix thick or thin as needed and throw in 25% water. It's almost contractor proof!

By using the DURA-LASTIC mixtures as your caulking or sloping materials, you will not have the waiting time that you would if you used cementitious or non-DURA-LASTIC caulking materials. These other materials must be allowed to dry out, out-gas and cure completely by being left open to the air. The DURA-LASTIC mixtures are internally curing materials and may be covered with the next application step as soon as they cure firm enough so that they do not lift up when applied over. (We call this “materials receptive.” As long as you don't pull up more than you put down, you can proceed!)

Cove up the walls, patch the cracks, tape the joints, and slope to drain then cover those steps. with the membrane coat application. The materials will bond to each other and cure out as one flexible and monolithic unit. The entire deck can “rock & roll” as a unit. This really speeds up total completion time. Remember, time is money! When rubber granules are added to the DURA-LASTIC it obviously creates a more flexible system than when sand has been added. But, both rubber and sand have their place on the job site.

Rubber is usually used when “caulking” or “spackling” mixtures are needed for filling cracks or coving up walls. Even without filler materials, DURA-LASTIC figures out to be less than \$2.00 for a standard 11 oz. caulking tube. (We can't package in tubes because the water/catalyst has to be added. You can use bulk guns or disposable tubes after the material has been mixed.) With the fillers, the cost is even less. Try to find a tougher or better caulk

at any price, let alone for under two bucks! (Refer to the DURA SYSTEM SPECIFICATION: "CRACK FILLING AND CAULKING MATERIALS" and the DURA SYSTEMS "How to" Photo Job History: "Coving and Caulking with thickened DURA-LASTIC Materials" for further information.)

The DURA-LASTIC "Sand Slurry" is made with the "TUFF" material because you can add quite a bit of sand and it will still remain a very tough and structurally solid material. A mixture of 1/2 to 1 unit of sand will still be a very fluid and easy to work mixture for filling surface spalling and general patching. By adding 1 1/2 to 2 +/- units of sand (With corresponding per unit cost savings.) you can mix a stiff enough batch to form a sloping angle. If the deck flexes, the Sand Slurry will not crack or delaminate under the membrane like a cementitious or epoxy material would. This is why it works so well on plywood and twisting ship decks. (Refer to the DURA-SYSTEM SPECIFICATION: "SAND SLURRY SPECIFICATION and APPLICATION GUIDE".)

Readily available 20 or 30 mesh silica sand is fine for the Sand Slurries, and either the texture rubber or the finer ground black tire rubber can be used for the caulking or coving tasks. If a lot of rubber is needed, the black tire grindings are less expensive than the texture rubber.

"T" Joint

In the DURA-LASTIC "T" Joint system, the "SOFT" DURA-LASTIC is used in the expansion joint and the "TUFF" material is applied as a membrane over the top to form a monolithic "T" Joint. The joint will still be visible as it expands and contracts, but the edge wear, high heel shoe penetration problems and edge leakage are eliminated.

Many more uses for DURA-SYSTEM Materials can be found in our brochures, specifications book, on our web site www.silvertreedistributors.com and the Photo Job Histories on our CD, which is available through our web site or by calling our office.

Compatible solvents

Use caution, since solvents are flammable.

Always check your local V.O.C. limiting requirements when selecting solvents for clean up. Sometimes, in some regulatory areas, the primers and color coats can be cut with solvent for economy and/or ease of application. Please check the specific DURA SYSTEMS Technical Data Sheet for further info.

Xylene, Xylol, Toluene, Toluol, M. E. K. and P.M. Acetate are compatible for use with urethanes and epoxy primers. **Never** use a solvent that contains alcohol, it has a negative effect on urethanes.

Always read and understand the MSDS information for all materials used on the job site.