



## POLYUREA COATINGS COMMERCIAL DAIRIES CONCRETE SURFACES

EXAMPLE ONLY – See Disclaimer

### General Polyurea Application Statement

Custom Linings Polyureas are commonly used in waterproofing and anticorrosion applications and protection for concrete surfaces and structures.

The formulation of Custom Linings primer and polyurea utilized, and the requisite dry film thickness levels (DFT) are specified based on the specific project conditions and requirements. Concrete surfaces in commercial dairies are subject to a number of corrosion and waterproofing related conditions including: cleaning chemicals, high and low-pressure water and cattle feces.

Custom Linings polyurea performs exceptionally well in these environments, with absolutely no reaction to water, urine, feces, and most cleaning products. Custom Linings polyurea also performs well in the abrasive conditions caused from cattle, tractors, brushes, movement of large equipment, and other abrasive and damaging conditions.

### Areas to be Coated

Just as dairies vary in size, design and operational management techniques, there are also a number of different waterproofing and corrosion problems that can be solved with Custom Linings polyurea. The areas to be coated will vary from region to region and even from ranch or operation to ranch or operation. Some of the potential areas to be coated include, but are not limited to, the following:

- Milking parlor—this area has constant human foot and cattle traffic. It is typically cleaned with high pressure water and chemicals throughout the day. While cattle are shuttled in and out of the milking parlor as efficiently as possible, the presence of urine and feces is guaranteed. While not quite sterile, this area is tightly regulated by the national food and drug administration.
- Stables—in most commercial dairies, the cattle bed down in dirt or sand that is separated by metal or wood fences. The limited amount of concrete surfaces utilized require protection. Some dairies use covered, concrete stables. These areas are subject to constant cattle traffic, and long-term contact with urine, feces, water and other materials used in preparing the stables. These areas are likely cleaned with front-loading tractors and high pressure water.
- Manger—like the milking parlor, the feeding area is obviously subject to repeated, long-term, very channeled cattle traffic. The cattle will always stand in the same place day in and day out. Consequently, in addition to the spilled feed and water, cattle feces and urine will also be very concentrated. The manger is typically cleaned with a front loader or a blade of some sort being drug behind a tractor. This area is also washed down from time to time with high pressure water.
- Infirmary—both for storage of sick and birthing cattle, the infirmary is not susceptible to the same rigors of the stables or mangers, but the area must be cleaned with sanitizing chemicals and high-pressure water to prevent cross contamination.
- Silage Pits—the concrete storage areas in which feed, typically corn, is preserved through partial fermentation. The silage pits are typically loaded and unloaded using large, abrasive front loaders. They are also susceptible to the corrosive nature of the fermentation process caused by chemicals, moisture, and temperature. When cleaned, this area is cleaned with front loaders, shovels, and high pressure water.
- Grain storage facilities—silos or other facilities where grain is stored, must be kept clean, dry and free from contaminants. They are dry areas, that must dry quickly and immediately available for use. The constant loading and unloading of grain is also very abrasive.



- Walkways, alleys, and walls—in addition to the applications listed above, there are a number of walkways, alleys, and walls that need to be protected for both corrosion and waterproofing purposes.

Regardless of which of the above applications you are coating, the surface preparation for concrete applications is roughly the same.

### **Surface Preparation**

Surface preparation requirements include either water or abrasive blasting to expose voids (bug holes) and remove surface contaminants and latent materials that can inhibit adhesion to the substrate including existing coatings. The selection of which preparation method to use is determined by the applicator or contractor, with their determination based on the relevant site conditions and the required coating surface finish

All raised edges, concrete form work spew lines or raised joints and other irregularities must be removed by either timber floating when concrete is still green or by mechanical grinding methods on cured concrete. Edges and other irregularities in the concrete will telegraph through the polyurea, but in addition to the aesthetic implications spew lines and other irregularities can reduce adhesion and possibly create voids in the coating preventing an integral, seamless membrane. After exposure of the voids and removal of latent materials, filling of the exposed bug holes and grinding scars is required. Filling of these voids can be accomplished using one of our epoxy based primers (Epoxy Block Filler or Poly-epoxy primer 21 or 2180) or for expansion joints or saw cuts you may use a fast set polyurea based caulking/adhesive manufactured by Custom Linings (Hand Mixed Polyurea Poly Caulk or machine processed Polyurea Poly Caulk). To ensure an integral, seamless coating, all bug holes must be filled.

Custom Linings EBF or other material should be applied as outlined on the product data sheet, but a rough application outline is as follows: Custom Linings EBF is mixed and applied by trowel, roller or brush. The product includes adhesives and accomplishes priming functions at the same time and is applied to a smooth finish, cures quickly and can receive coatings when tack free. Talk with a Custom Linings technical advisor regarding which primer is best designed for your facility.

It should be noted, and will be discussed below in further detail as well, that skid prevention in commercial dairy applications are extremely important. There are a number of ways to accomplish this, but one method would be to score the concrete. Should this or any other method where the concrete has been specifically prepared for skid resistance be used, in most cases those preparations should be utilized and not removed. Meaning, the outline above calls for grinding down all raised edges in the concrete. However, if they are designed for skid resistance, then they should not be ground down without completely evaluating the application in great detail.

### **Polyurea Coating Application**

Like the surface preparation, the other preparation and coating for most of the applications outlined are similar. Some of the differences will include different dry film thickness of coating and the chosen method of skid resistance, if required.

Skid resistance can be accomplished in a number of manners including the following:

- Broadcast abrasive particles—in this application sand, silica, quartz or some other abrasive particle is broadcast into the polyurea basecoat. The size and type of particle used varies from fine sand to aluminum chips with the conditions dictating the optimum size and type.
- Concrete manipulation—the concrete can be poured or scored in a manner to increase skid resistance. When primed properly the basecoat of polyurea will telegraph the manipulated concrete providing the required skid resistance.



• Polyurea stipple (aggressive texture)—the most common, and easiest method of skid resistance is the application of a polyurea stipple. After the basecoat is applied to the necessary DFT, a stipple is applied using a unique application technique. The stipple can be as light as an orange peel or as heavy a texture as fine gravel, with a fine sand paper texture being the most common.

For most commercial dairy applications, all three options will be used based on the requirement of the application.

The required DFT is entirely a function of the application. Custom Linings recommends the following DFT's:

- Milking parlor
  - Primary thoroughfare for cattle 120 mils
  - Area around the milking equipment where the cattle constantly stand 120 mils
  - Side walls, coated minimum of 6 ft high @ 60 mils
  
- Stables
  - Primary thoroughfare for cattle 100 mils
  - Stalls, and other areas that will be cleaned with a front loader 125 mils
  - Side walls, coated minimum of 5ft high @ 60 mils
  
- Manger
  - Primary thoroughfare for cattle 120 mils
  - Area around the feeding trough 120 mils
  - Side walls, coated minimum of 5ft high @ 60 mils
  
- Infirmary
  - Primary thoroughfare for cattle 120 mils
  - Stalls, and other areas that will be cleaned with a front loader 125 mils
  - Side walls, coated minimum of 6ft high @ 60 mils
  
- Silage Pits
  - Walls and roof 60 mils
  - Floor, ramp, and other similar areas 125 mils
  
- Grain storage facilities
  - Walls and roof 60 mils
  - Floor, ramp, and other similar areas 125 mils
  
- Walkways, alleys, and walls—for human traffic
  - Areas to be cleaned repeatedly with sanitizing cleaners and high-pressure water 100 mils
  - Other walkways and alleys 60 mils
  - Walls that are not in the areas outlined above, coated minimum of 2 ft high @ 40 mils

The above dry film thickness levels are recommendations only and may vary based on specific conditions found in different commercial dairy facilities.

After the concrete surfaces have been completely prepared, the primer is tack free and ready to be coated, the Custom Linings 911 polyurea coating can be applied immediately. Apply Custom Linings 911 polyurea using a plural-component, high-pressure, high-temperature proportioning unit. Material must be applied at 170° F and a minimum of 2000 psi (accomplished with equipment). The initial first coat should be applied lightly and allow to dry. This will minimize the ingress of “pin holing” in the initial application. Continue to apply monolithic coats until the require DFT as outlined above. 911 dries immediately and may be recoated up to 12 hours. Where the 12-hour recoat window is exceeded the surface must either be wiped down thoroughly with MEK immediately prior to recoating or an intercoat adhesion primer must be used.



For detailed information on coated floors and walls, please contact Custom Linings at 719-395-4414 or see our statement on concrete walls and floors.

### **PERSONAL SAFETY REQUIREMENTS**

Observe the site owner's established safety policy at all times and obey all written and verbal instructions from site managers and representatives.

Wear all personal protective equipment at all times including hard hat, safety glasses, boots, gloves and masks as required. When preparing and applying coatings and chemical materials all personal protective equipment must be worn including gloves, safety glasses and protective paper masks. When using high pressure plural component spray equipment, all personnel working in the application area must wear double filter breathers with OSHA ratings or other approved respiratory protection.

### **NOTES AND CLARIFICATIONS**

Custom Linings 911 polyurea is 100% solids and contains no VOCs (Volatile Organic Compounds). Custom Linings 911 polyurea is not flammable and does not contain solvents or catalysts. MSDS for all products detailed within this statement are available and must be posted during application work.

For additional information contact:

Custom Linings  
Industrial Coatings Division  
15790 Fairway Drive  
Buena Vista, CO 81211  
1-877-POLYUREA  
Fax 719-395-4416

### Disclaimer

*This method statement is provided as a guideline and basic tool for the understanding of common polyurea application methodology. This statement is not intended for use as a project specification. Every project has variables in climate, surface contaminants, substrate quality and construction schedules, which must be identified and addressed within a formal technical specification, prepared specifically for each individual project. Project specifications are provided to our distributors and affiliates or clients on a case-by-case basis and only after provision of complete details from the end-user, which are incorporated into each individual technical specification we write.*

### **END OF METHOD STATEMENT**