



# APPLICATION MANUAL

## SOUTHWEST FIREPROOFING PRODUCTS

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### APPLICATION MANUAL AND RECOMMENDATIONS FOR TYPES 5GP™, 5MD™, 5AR™, 7GP™, 7HD™, 7TB™ and DK3™

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### SECTION -. REVISION SUMMARY

Revision	Date	Amendments
A	10.04.19	First revision
B	08.05.20	3.1.2, and 3.2 add Southwest Type 7GP Accelerator information
C	12.28.20	Revisions to Appendix A, Simplified Yield Charts

## SECTION 1: Project Setup

### 1.0 Product Description and Use

Southwest Fireproofing cementitious fire protection materials are spray applied using either piston or rotor stator or squeeze type pumps. These products are mixed with water, using conventional plaster or continuous mixers. They are a mixture of plaster, cement, vermiculite and proprietary ingredients, specifically formulated to be applied at high production rates.

Southwest materials are listed in the Underwriters Laboratories, Inc. Fire Resistance Directory in many designs, and have been in production since the early 1970's. The products covered in this manual are:

**Type 5GP™:** general purpose, low density gypsum based product

**Type 5MD™:** medium density gypsum based product

**Type 5AR™:** extended set, low density gypsum based product (Appendix C)

**Type 7GP™:** medium density cement based product

**Type 7TB™:** medium density cement based Thermal Barrier use over plastic foam insulation. (Appendix C)

**Type 7HD™:** high density cement based product

**Type DK3™:** cement based spattercoat bonding agent

These products are produced under license from the Southwest Fireproofing Products Co. in several regional facilities and are distributed from strategically located warehousing operations.

All Southwest Fireproofing products must be applied to meet UL minimum densities as listed in appropriate designs.

For additional technical data and assistance, please reference the product literature, or call

#### **Carboline (USA):**

Tel: 800 848 4645 or 314 644 1000, Fax: 908 362 7520 [www.carboline.com](http://www.carboline.com)

### 1.1 Material Storage

All Southwest Fireproofing products must be stored in a dry environment, off the ground and protected from weather.

Material must remain dry or clumping may occur, materials subjected to moisture should not be used. Storage under inside dry conditions should not exceed 12 months.

Rotate stock at all times.

### 1.2 Pump Station Recommendations

Choose a location on a project that will allow for a permanent location for the duration of the project. The area should drain well, and if necessary should have a base of crushed rock, to minimize collection of mud during rain or cleaning of equipment. When materials trailers are to be dropped, build a sturdy and safe platform at the height of trailers, for easy unloading of palletized materials. The platform size should accommodate at least 4 pallets of product, the mixer and water metering system, and adequate area for proper and safe mobility.

The entire platform should be properly covered, so that pumping operations are not compromised during inclement weather.

Position the mixer, so that discharge of mixed product can be easily poured into the hopper of the pump. Pumps should be located on the ground, directly below the mixer. When using continuous mixers, be sure the pump tube is centered over the middle of the hopper.

It is recommended that pump hopper sides are elevated, as most are too low to contain excess mixed materials. This will prevent spillage and a sloppy work area around the pump.

Finally, it is suggested that a portable pallet jack is on hand to move product from the trailer to the work platform.

### 1.3 Water Requirements

Potable water (drinking water) is required. Be sure you obtain a dedicated water source to ensure that an uninterrupted water supply is always available. This is very important if using continuous mixers. When using regular paddle mixers, use a water measuring system as described later in this procedure.

### 1.4 Equipment

#### 1.4.1 Mixers

**Paddle Type Mixers:** Be sure that the mixer capacity exceeds the pump capability. It is recommended that 2 bag mixes be used. Material should not be over the center bar of the mixer when mixing. Therefore, the mixer must have a capacity of at least 12 cubic feet. Mixer blades should be equipped with replaceable rubber tips, so that the interior of the mixer hull is wiped fairly clean during the mixing process. This also promotes easier clean-up and removal of residual matter from prior mixes. The speed of the mixer should be approximately 40 RPM. If too slow or too fast, the product will not mix properly, resulting in poorer yields and productivity.

**Continuous Mixers:** There are several quality continuous mixers on the market today. See Section 6 for details. Be sure when buying and using such mixers, they are made for plaster based materials and have the capacity to mix product adequately for the production rates you anticipate. An important requirement is the ability of the mixer to vary the water ratios sufficiently that low, medium and high-density products can be mixed.

#### 1.4.2 Pumps

Southwest products can be pumped with a wide range of acceptable piston, rotor/stator and squeeze pumps, designed to pump cement/plaster materials. Manufacturers of pumps must state that their pumps are capable of pumping these products, specifically at high volume rates. Be sure to use proper hoses and observe the maximum recommended length suitable for each type of equipment – reference section 1.4.4. All connections and fittings should be tapered to allow for unrestricted flow of materials. Refer to Section 6 for a list of recommended pump, mixer manufacturers and distributors.

Piston pump pressures may reach 800 psi, therefore use pumps rated with pressure relieve valves rated at 800 – 1000 psi (56 – 70 kg/cm<sup>2</sup>) at the pump manifold. Hoses must also be able of withstanding such pressures, with a large margin of safety. Delivery rates for pumps are generally rated in bags per hour, which can vary greatly with each pump and products used. Call Carboline Fireproofing Technical Service before making a purchase to make sure a particular pump is in compliance with our recommendations and specifications.

**Compressors:** on pumps should be able to maintain a minimum of 40 psi at the nozzle, and capable of producing 20 cfm of air (570 liters/min.)

#### 1.4.3 Water Measuring Systems

Water measuring devices, such as sump pumps, water meters (such as Neptune or Fill-Rite) and quick fill tanks are recommended to assure an effective operation. Again, these systems are available from several distributors, or you can make your own system using 55 gallon barrels as water reservoirs.

#### 1.4.4 Material Transfer Hoses, Couplings and other Hose Equipment

**Stand Pipes and Hoses:** Aluminum pipes used for stand pipes or rubber hoses for lateral transfer should be a minimum 2" I.D. to allow for unrestricted flow of products. Couplings should be smooth bore, and reducers must be tapered. The conveying system should follow these recommendations from the pump forward:

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Length/Inside Diameter	Recommended Length (ft.)
2" transfer hose or aluminum conduit	Maximum practical length before 1-1/2" line
1-1/2" transfer hose	50
1-1/4" transfer hose	25
1-1/4" – 1" whip hose	15

**2" Ball Valves:** A ball valve should be attached to the manifold, prior to attaching the hose. This will allow the disconnection of the hose for cleaning pump and/or hoses at end of the workday, by inserting a sponge to facilitate cleaning the hoses. It is recommended that a second ball valve is attached to the other end of the 2" material hose.

**Note: All Hoses and pipes should be rated to withstand a minimum of a 1000 psi. Remember to keep hose and pipe connections and reducers to a minimum for optimum production and minimizing backpressures.**

**Couplings:** Couplings for hoses should be screw types or quick release systems. Couplings must be tapered to allow unobstructed flow of materials. Standpipe couplings should be the tapered threaded type. Double female swivels, victualic couplings, or "Kam Lock" connector couplings are types of connectors typically used.

**Note: Do not use brass or aluminum couplings or reducers. Be sure to use only tapered connectors.**

**Standpipes:** Use only metal standpipes, 2" ID. It is suggested that standpipes are used on high rise projects. Do not use threaded connections. Use only clamps or Kam Lock type connectors to facilitate a quick connection and disconnection process. If you use "quick disconnect" connectors be sure they do not have internal restrictions.

**Elbows:** Should be 2" with a minimum radius of 2".

**Spray Nozzle Assembly:** Use a regular plaster type nozzle with a minimum 1" ID, with a shut off valve and a swivel. Pole guns are not recommended, except when certain job conditions require it. Pole guns are sometimes effective in low ceiling applications, when a scratch coat is necessary, such on roof systems requiring multiple coats, or when applying Type DK3 spatter coat to decks. Be sure the nozzle has a proper air shut off valve.

**Orifice Tips and Shields:** Have a supply of nozzle tips at all times. We suggest typical "blow off" tips with "mini shields" that will assist in controlling the spray pattern. Orifice sizes should be 9/16" to 5/8" ID.

ON/OFF switches for material flow should be comfortably located and taped securely to the nozzle and hoses.

**Air Supply:** A minimum 5/8" ID air supply hose should be used. Air must be minimum 20 psi, preferably up to 40 psi continuous pressure. Type 7 products may require higher air pressure. Be sure the air stem is always free and can be easily adjusted to allow for a proper and desired spray pattern.

**Note: Use the minimum spray air in order to achieve maximum product yield. Excessive air pressure will result in higher densities.**

**Scaffolds:** Wheels should be 8" to 12" in diameter, for ease of movement. Use open steel grate type flooring with guardrails. Do not use wooden planks, as these will not allow overspray to fall thru and can cause slippery conditions. Any cantilever sections must be properly secured and balanced to allow for adequate safety for spraying spandrels and perimeter columns. Be sure that all scaffolds meet current OSHA and/or project safety regulations. Scaffolds should be at least 5'x10'.

**Tarps and Masking:** Use lightweight tarps that allow for airflow in summer working conditions. For cold climate conditions use canvas tarps. Be sure to mask off and protect adjacent areas and surfaces from overspray as Southwest Fireproofing products may be difficult to remove from sprayed surfaces and may permanently discolor surfaces such as anodized aluminum.

## SECTION 2: Project Conditions and Preparations

### 2.0 Substrate and Surface Conditions

All surfaces must be clean, free of loose scale, free of dirt and other substances that would prevent adequate adhesion. This includes untested primers not approved by UL or Carboline. Refer to the UL guidelines when primers are on steel to be sprayed.

**Oily Decks:** Note, that at times steel deck manufacturers use non – evaporative roll oils to form galvanized decks. This condition will prevent adhesion of any fire protection materials. In order to check for oily decks, spray a fine mist of water to deck and note if water collects into “fish eye” droplets. Another way is to use a clean white cloth and wipe the deck surface: black oily residue should be noticed. Contact deck manufacturer for cleaning method.

**Flexible Decks:** Only UL rated steel decking is approved for application of fire resistive materials. Refer to specific UL fire test design for a list of approved decks. If decking on the project is not listed in the UL fire test design, call Carboline Fireproofing Technical Service for recommendations.

**Roof Decks:** All roof work, including the placement of air handling units and other roof equipment must be completed prior to the application of Southwest Fireproofing products. Check for residual roll oils on the decking by wiping the surface with a white cloth. Any such oils will definitely prevent proper adhesion, and must be removed. Carboline requires the use of Type DK3 spatter coat on all flexible roof decks.

**Clips, hangers and other supports such as pipe clamps:** These attachments should be in place before fireproofing commences. Please refer to AWC Technical Manual 12-A for recommendations.

**Note: Commencement of application of fire protection to steel surfaces effectively results in the applicator's acceptance of these surfaces. Do not commence if conditions exist that may compromise adhesion, until this situation is resolved with the General Contractor**

#### 2.0.1 Use of Type DK3 Spatter Coat

Type DK3 spatter coat must be used as a bonding agent on all cellular decks and roof decks as per UL design requirements. Refer to Type DK3 datasheet for additional details and application instructions.

Type DK3 materials are Portland cement based products and may be used both as an adhesive and over coat. They can be pumped through the main plaster pump used to apply any Southwest Fireproofing product, or with smaller separate pumps. Generally, it is better to use a smaller pump to apply DK as this product is quite wet and will go on fast.

Please note that cement products will set up any residual plaster materials in the equipment and hoses; hence if using the same equipment for both products, it is essential that equipment and hoses must be thoroughly flushed out prior to spraying Southwest Type 5 or Type 7 series products.

Reference Appendix C for further information in relation to Type DK3.

#### 2.0.2 Use of A/D TC-55 Adhesive/Sealer

A/D TC-55 adhesive should be used on all concrete decks and painted, primed or hot dip galvanized steel. The product is applied just prior to the application of Southwest Fireproofing products at a WFT of 4 mils. A/D TC-55 must remain tacky to wet when Southwest Fireproofing products are applied.

A/D TC-55 can be used as a topcoat/sealer over Southwest Fireproofing products to enhance the physical characteristics, reduce air erosion losses and surface sealant. A/D TC-55 is normally supplied as a clear sealer, but is also available in blue, white or black.

Reference Appendix C for further information in relation to A/D TC-55 adhesive/sealer.

### 2.03 Painted/Primed Steel Decks, Structural Steel – Beams, Columns and Joists

**Decks:** Unless specifically listed in the UL fire test design, painted or primed steel decks will require the installation of metal lath, prior to application of Southwest Fireproofing products. Metal lath must be secured to all deck surfaces in accordance with the UL requirements.

**Beams and Columns:** Painted/primed structural steel is generally not approved by UL as an acceptable substrate for SFRMs unless the paint or primer was included in the fire test and/or UL listed for SFRM applications to structural steel. UL has established conditions that must be satisfied for application to primed or painted structural steel, including: minimum bond strength criteria; dimensional limitations for the structural members; use of a bonding agent or adhesive such as A/D Type TC-55 Sealer; use of metal lath to provide a mechanical bond; or, use of mechanical breaks of metal lath strips or steel pins and disks.

**Joists:** Painted or primed steel joists do not require adhesive, lath or fastening devices. It is acceptable to apply fire protection directly to painted and primed steel joists. Fiberglass mesh or metal lath can be used as an optional application aid to reduce overspray, waste and cleanup time. To minimize material loss and improve application efficiency, it is recommended that fiberglass mesh be used with all application of Southwest Fireproofing products, when applied to steel joists. Please contact Carboline Fireproofing Technical Service or Sales Representative for further details on products and application procedures.

Refer to the UL Fire Resistance Directory-Volume 1 for details or contact Carboline Fireproofing Technical Service before applying Southwest Fireproofing products to any painted/primed steel decks, beams or columns.

### 2.1 Communications

Have available "walkie-talkies" or other communication devices to allow for smooth operations and trouble shooting. Be sure the remote control on the pump is working properly. If using "Y" (dual hose) systems from a large pump, be sure that all sprayers have duplicate set-ups and communication devices to talk with the pump operator.



### SECTION 3: Application Procedures & Recommendations

#### 3.0 Equipment Setup

**Working Platform:** The pump should be at ground level, next to the mixer, which should be raised to allow for easy dumping of mixed product. No matter what mixer is used be sure that a sufficient material supply is near and available, so that one person can handle this operation. Minimizing operator fatigue will allow for maximum speed of operations.

**Product Storage:** Southwest Fireproofing materials should be stored in dry conditions at all times. Use pallets to store products above dirt floors to prevent them from getting wet. If using trailers, be sure that they are positioned properly for ease of delivery and removal of empty vans. Be sure that at least one day of material is always on hand to allow for unexpected delivery delays.

**Pump Placement:** The pump / mixer operation should be as close to the building as possible. Allow for drainage necessary for clean out and start up procedures.

**Mixer Preparations:** Whether using a paddle or a continuous mixer, it is important to prime the pump and hoses with water. With blades stopped, charge at least 40 gallons of water into mixer, then start mixer for a few moments and dump water into the pump hopper. When using a continuous mixer, fill the pump hopper with water and pump to nozzle. Begin product mixing cycles.

**Note: For paddle mixers, blades should be stopped except when actually mixing the product, so as to minimize the generation of foam.**

**Pump Preparations:** Be sure nozzle is detached, and nozzle valve is open. Commence all pumping in low gear, until water is flowing freely from end of hose. Prepare the first mix, attach nozzle and commence pumping. Be sure sprayer is aware that material is being pumped, so that application of Southwest Fireproofing products can commence immediately. Mix according to instructions - do not over-mix, as this will result in lower density and poorer pumpability.

**Injection Pump Preparations:** Set up mixer, hoses and spray pump per the application instructions in the Accelerator A-20 datasheet. Use Injector Unit with one or two 55-gallon plastic drums, 110V electric agitators to stir the solution, and 110V electric injection pump to move Accelerator A-20 solution through 3/8" hose to the injector housing on the material hose. Injector pump is controlled by an on/off toggle switch and pump rate by a dial valve. Dial valve has rates in percentages (0 – 100%). Run the injection hose from the pump to the injection housing, attachments should be made with quick disconnect fittings. Attach the injection housing at the start of the whip hose. Injector housing is a 2" long 1" diameter pipe with a 1/2" diameter pipe feeding in at a 45° angle. It attaches to the whip hose by cup locks or cam lock fittings. The injection housing is attached to the material hose 15' to 25' back from the nozzle (This depends on the length of the whip hose). A backflow valve on the housing prevents material from pushing back into the injection hose. A shut off valve upstream or prior to the backflow valve is used to turn off the Accelerator A-20 solution flow through the injector housing.

#### 3.1 Product Mixing

**Paddle Type Mixers:** Mix Southwest Fireproofing products for approximately 2 minutes using the correct water volume per product as listed below. Do not over mix. Also, remember that maximum water content will increase product yield, but may limit the thickness per pass. More water will increase the mix density and increase product yield. Over mixing will decrease the mix density. Mixer capacity should be at least 12 cubic ft. to handle a 2 bag mix. Always be sure that water is in mixer before adding dry materials and that mixer blades are stopped – blades should be always be stopped except for specified mixing time so as to minimize the generation of foam.

**Water Metering Units:** Water meters are available from a number of sources as identified in Section 6. Generally, a 40 to 55-gallon barrel is used with a water metering system that can be adjusted to introduce the correct amount of water into the mixer. Remember, it is important that water usage be consistent.

**Continuous Mixers:** When using continuous mixers, adjust the water flow so that the mixed material pouring into the pump hopper is properly mixed and free flowing.



### 3.1.1 Water Ratio Recommendations

The following water ratios are recommended for these products. However, it is important to consider recommendations and adjustments that may be necessary as discussed above under Section 3.2 Product Mixing.

Product	Water to be Used per 50 lb bag, gal
Type 5GP™	8.0 – 10.0
Type 5MD™	8.0 – 10.0
Type 7GP™	10.0 – 11.0
Type 7TB™	10.0 – 11.0
Type 7HD™	6.5 – 7.5
Type DK3™	9.0 – 10.0

### 3.1.2 Accelerator A-20 Mixing Procedures

When injecting Southwest Type 5GP or Southwest Type 5MD to achieve a 15 lbs. per cubic foot density (pcf), the standard mix is one 50 lbs. bag of Accelerator A-20 with 8.5 gallons of clean potable water, or four bags of Accelerator A-20 with 34 gallons of water. The total solution volume will be 44 gallons.

The Accelerator A-20 solution concentration can be checked with a hydrometer or by weight of a known volume. By hydrometer measurement, the target specific gravity for 15 lbs. pcf is 1.260 with range of 1.250 to 1.270. To check by net weight of a filled container, a full 1-liter container should weigh 1260 grams  $\pm$  10 grams.

When injecting Southwest Type 5MD to achieve a 22 lbs. per cubic foot density (pcf), the standard mix is one 50 lbs. bag of Accelerator A-20 with 12.5 gallons of clean potable water, or three bags of Accelerator A-20 with 37.5 gallons of water. The total solution volume will be 45 gallons.

When injecting Southwest Type 7GP to decrease the set time, the standard mix is one 50 lbs. bag of Accelerator A-20 with 8.5 gallons of clean potable water, or four bags of Accelerator A-20 with 34 gallons of water. The total solution volume will be 44 gallons.

The Accelerator A-20 solution concentration can be checked with a hydrometer or by weight of a known volume. By hydrometer measurement, the target specific gravity for 22 lbs. pcf is 1.200 with range of 1.190 to 1.210. The target specific gravity for Southwest Type 7GP is 1.275, with a range of 1.250 – 1.300. To check by net weight of a filled container, a full 1-liter container should weigh 1200 grams  $\pm$  10 grams.

Refer to the Simplified Yield Charts for all Southwest Fireproofing products attached to Appendix B.

Continue mixing until Accelerator A-20 powder is dissolved completely. Re-circulate Accelerator A-20 solution back into the mixing tank for 5 minutes allowing all bubbles to come out of the solution.

Set injection pump flow rate to 30-40% for Southwest Type 5GP and Type 5MD, adjust as necessary to increase or decrease the flow rate to achieve desired density. Set injection pump flow rate to 10-20% for Southwest Type 7GP adjust as necessary to increase or decrease the flow rate to achieve desired set time. Refer to the Southwest Type 5GP, Southwest Type 5MD or Southwest Type 7GP Simplified Yield Charts for additional information.

## 3.2 Application Techniques

Air: Use the minimum air to get a proper spray pattern. The air "sound" should achieve a low pitch.

Material Flow: Commence initial application with pump in low gear and increase as required. It is recommended to run pump in low gear. This results in adequate production of applied product, but substantially reduces line pressures.

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**Nozzle:** Hold the nozzle perpendicular to the spray surfaces whenever possible. Use a circular motion. Hold nozzle about 20 to 25" from the substrate. Use the minimum nozzle extension so that you are close to the spray surface. Using nozzle extensions generally results in increased waste. Use a 9/16" or 5/8" orifice, with a mini-shield.

**Nozzle Density Checks:** Perform nozzle density checks a minimum of 2-3 times per day to verify yield in accordance with the instructions below.

### Injected Application (Type 5 Series only)

1. Set the accelerator flow rate to 30% - 40%. (this can be adjusted to suit target density)
2. Commence spraying and pump for roughly 60 seconds until the system stabilizes.
3. After 60 seconds, spray Type 5GP or Type 5MD directly into the Carboline 1000 ml cup. Position the nozzle 12-18" above the cup and overfill.
4. Strike off any excess Type 5GP or Type 5MD and level to the top of the container. Wait a further 60 seconds or until such time the material has stopped swelling. Again, strike level with the top of the container.
5. Place an empty container on the scale and press "on/tare"
6. Replace the tared container with the identical container, filled with Type 5GP or Type 5MD and record the net weight.
7. Reference Simplified Yield Charts attached to Appendix A to verify proper density and yield.

The use of Accelerator A-20 allows for fast set, continuous application of Type 5 series products. Materials are ready to be re-coated after the initial coat has set which is between 10 – 20 minutes.

### Injected Application (Type 7GP only)

1. Set the accelerator flow rate to 10% - 20%.
2. Commence spraying and pump for roughly 60 seconds until the system stabilizes.
3. After 60 seconds, spray Type 7GP directly into the Carboline 1000 ml cup. Position the nozzle 12-18" above the cup and overfill.
4. Strike off any excess Type 7GP and level to the top of the container.
5. Place an empty container on the scale and press "on/tare"
6. Replace the tared container with the identical container, filled with Type 7GP and record the net weight.
7. Reference Simplified Yield Charts attached to Appendix A to verify proper density and yield.

The use of Accelerator A-20 allows for fast set of Southwest Type 7GP. Materials are ready to be re-coated after the initial coat has set which is 4 hours.

### Un-Injected Application (Type 5 and 7 Series)

1. Spray un-injected Southwest Fireproofing product directly into the Carboline 1000 ml cup. Position the nozzle 12-18" above the cup and overfill.
2. Strike off any excess Southwest Fireproofing Product and level to the top of the container.
3. Place an empty container on the scale and press "on/tare"
4. Replace the tared container with the identical container, filled with Southwest Fireproofing Product and record the net weight.
5. Reference Simplified Yield Charts attached to Appendix A to verify proper density and yield.

The application of un-injected Southwest Fireproofing products allows for recoat to occur after the initial coat has set which is approximately 24 hours.

## 3.3 Shut Down Procedures

1. After the last batch is dumped into the pump hopper, run material low in the hopper
2. Add water to mixer and dump into hopper as the last of the material is being pumped out
3. Spray product on to steel surfaces until too thin to adhere
4. Wash down the mixer and sides of pump hopper
5. Slow down the pump speed

6. Continue pumping clean water until it reaches the nozzle
7. Stop pump at the nozzle with the remote switch, and relieve pressure at the pressure relieve valve
8. Close ball valve at the end of the hose, disconnect 2" line and insert sponge
9. Remove nozzle, and disconnect at the 2" connection and whip hoses; put end of nozzle in water
10. Reconnect hoses and start to pump water until the sponge exits the end of the 2" line
11. Repeat procedures for all hose sections.
12. At pump, shut off material valve and detach surge hose with valve. Open and allow standpipe and/hose water to flush out.

It is recommended that a sponge be passed through all transfer hoses to provide additional cleaning of hoses. Have drums on the spray floor for wastewater, if unable to pump onto the ground. With continuous mixers, perform the same functions, making sure that the mixer tube is clean of any remaining product.

**Note: Ensure area is cleaned adequately before leaving premises. Always reference pump manufacturers recommendations for cleaning, maintenance and service.**

### 3.4 Cold Weather Applications

If overnight outside temperatures were below freezing, steel temperatures may take a long time to reach the minimum acceptable temperature of 40 degrees F. Maintain air and substrate temperatures of 40° F for 24 hours prior, during, and for a minimum of 24 hours after application of fireproofing. Be sure adequate ventilation, i.e.: forced air drying is provided until adequate drying has occurred, otherwise adhesion will be compromised, as interface dew point freezing may occur.

Use forced air-drying in enclosed areas whenever possible. Use appropriate ventilation, to allow moisture removal from the area. These areas should have at least 4 complete air changes per hour.

Additional notes on Cold Weather Applications pertaining to pump cautions:

1. After clean out at end of day, be sure that all water is drained from hoses and nozzle. Turn off ball valve at the manifold. Attach a secondary hose, open ball valve and drain water from pump.
2. It may be prudent to remove the manifold, and make sure balls and seats are dry, so that they do not freeze up overnight. You may use windshield washer fluid and run it thru the pump if you do not remove the manifold. That will assist in preventing ice built up in the pump parts.
3. Air Lines: As all compressors will take in humid air, be sure that air lines are also checked for water collection to prevent ice built up in these lines.

**Note: It is important during winter operations that the pump is in a heated environment, and exhausted to the outside air.**

### 3.5 Patching & Repair Procedures

Types 5GP, 5MD, 7GP, 7HD & 7TB may be hand patched in all designs, in areas up to 144 sq. in., following the guidelines listed below:

1. Completely remove the Southwest Fireproofing product slightly beyond the damaged area, using a grinder, utility knife, chisel. The patch area should be left at a 90° butt joint.
2. Remove all dust and debris in and around the patch area.
3. Clean steel surface of any dust, dirt, grease or any other material that may impair bond and reapply primer if the existing primer is damaged (if applicable).
4. Wet the area with water just prior to applying the patch repair to prevent water being drawn out of the patch area.
5. Mix a full bag of Southwest Fireproofing following the written application instructions and using the correct amount of water specified. When patching by hand, use the lowest amount of water required to achieve a thicker consistency suitable for hand packing or trowel application. Apply the Southwest Fireproofing material to the thickness specified for the required hourly protection by means of trowel or spray application.

### 3.6 Controlling Density

Density is controlled by several factors that must be monitored, these are:

- A. Proper water and material ratios
- B. Distance of nozzle and angle of nozzle relative to the substrate
- C. Pump pressures and air pressure
- D. Use of orifice “mini shields and orifice size: use 9/16” or preferably 5/8” orifices with mini-shield
- E. Mixing time: under mixing will result in higher densities, overmixing will result in lower densities.
- F. Accelerator A-20 concentration and flow rate.

### 3.7 Thickness Control

Thickness control is extremely important in order to achieve minimum product usage. The use of a thickness gauge is very important to eliminate guesswork. The thickness gauge should be attached to the sprayer's wrist and used frequently. See appendix for details of gauge availability.

Since some projects require several thickness passes to be applied, a proper check list should be available at all times for reference at the job site.

Thickness gauges are available from Hydro Cone: 1 800 673 2437 or Carboline upon request.

### 3.8 UL Application Requirements

Be sure to carefully read all appropriate UL designs for specific recommendations, when applying products to items such as electrified floors, trench headers, primed steel, flat plates, lath requirements etc.

Also, be sure minimum densities are achieved. Refer to specific UL designs and Carboline / Southwest Fireproofing product datasheets for further information.

### **SECTION 4: Inspection Procedures and Safety**

#### **4.0 Inspection Procedures**

Refer to AWCI Technical Manual 12-A, Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire-Resistive Materials, an Annotated Guide. This should be used as the standard guideline for testing and inspection of applied Southwest Fireproofing products.

This document can be obtained from Carboline or by contacting AWCI: 703-534-8300, [www.awci.org](http://www.awci.org)

#### **4.1 Personal Protective Equipment**

Carboline / Southwest Fireproofing products do not contain asbestos and have no known health hazards, either during mixing or application.

Follow all safety precautions on the product Safety Data Sheets. It is recommended that personal protective equipment be worn, including spray suits, gloves, eye protection and respirators. Mixer personnel should wear respirators with replaceable disposable filter masks, protective goggles, gloves and eye shields protection. All fireproofing products can be slippery when wet and therefore proper precautions must be taken. It is suggested that caution signs be posted to alert other trades.

## SECTION 5: Equipment Manufacturers and Suppliers

### 5.0 Pumps

Southwest Fireproofing™ products can be pumped with a wide range of piston, rotor/stator and squeeze pumps designed to pump cement/plaster materials, including the following:

Manufacturer	Model	Type	Size
Essick	FM9/FME51	Rotor / Stator	2L4
Muller	R - Tex	Rotor / Stator	2L6
Goldblatt	Supertex	Rotor / Stator	2L6
Graco	ToughTEK F340e	Patch Pump	-
Graco	ToughTEK F800e	Piston	-
Hy-Flex	HZ-30E	Rotor / Stator	2L6
Hy-Flex	H321E	Piston	-
Hy-Flex	HF-15 Spray Buddy	Patch Pump	-
PFT	ZP3 (HM2)	Rotor / Stator	-
Mayco	PF30	Piston	-
Strong	Spraymate 60	Rotor / Stator	2L6
Putzmeister	Thomson PTV 700	Piston	-
Putzmeister	S6EV	Rotor / Stator	2L6

**Note: Marvel kit must be removed from piston pumps.**

We suggest you contact the Carboline Company for up-to-date information before purchasing equipment.

### 5.1 Preventive Maintenance

1. Be sure that all pump and mixer manufacturers' guidelines are followed regarding safety, lubrication, filter changing, oil replacement, etc.
2. Check to make sure all pressure gauges are in good working condition
3. Routinely check to make sure optimum production levels are being achieved
4. Do keep logs of all activity, so that changes are noted and can be attended to

### 5.2 Mixers

There are many mixer companies to choose from. Paddle mixers must have a speed of about 40 RPM, with safety grid and preferably with dust covers. It is recommended that all mixers have rubber tipped replaceable blades, which will wipe the drum of the mixer. These blades should be replaced periodically. Mixer should be a minimum 12 cubic feet capacity to accommodate a 2 bag mix.

Continuous mixers may also be used.

*If using a continuous mixer made specifically for the Thomsen–Putzmeister “Big Blue” machine, contact Carboline for specific recommended changes that must be made to the mixing tube to accommodate **Southwest** materials. The blades should have 32 –34 flights.*

<b><u>Paddle Mixers</u></b>	<b><u>Continuous Mixers</u></b>
Essick	Hy-Flex
Spray Force	Stone Type FP
Donnelly	Sun Spray

Multi Quip	Putzmeister
Stone	-

### 5.3 Hoses, Nozzles and Miscellaneous Equipment

Most pump manufacturers supply all types of accessories. Below listed is the regional supplier we recommend for equipment and pumping expertise:

The Donnelly Co. T: 1-585-924-0640



## APPENDIX A

### SIMPLIFIED YIELD CHARTS

### Simplified Target

Yield: **43.7 BF/BAG (4.06 m2)**

	TARGET	RANGE	UNIT
ACCELERATOR A-20	1260	1250 – 1270	g/l
WATER	8.5	8.0 – 9.0	gal/bag
NOZZLE DENSITY	533	514 – 551	g/l

**HOLD POINT:** Yields measured in excess of 45.1 BF/Bag will result in dry densities below the minimum 15 PCF as published in the Underwriters Laboratories Inc.® Fire Resistance Directory.

**Simplified Range** (Carboline recommends nozzle yields be taken a minimum, 3 times per day. Carboline recommends the use of a 9/16 I.D orifice)

Yield (*)				8.0	US/G	8.5	US/G	9.0	US/G	9.5	US/G	10.0	US/G	Dry Density (PCF)
				30	L	32	L	34	L	36	L	38	L	
3.81	m <sup>2</sup>	41.0	BF	547		567		586		606		626		16.5
3.93	m <sup>2</sup>	42.3	BF	531		550		569		588		607		16.0
4.06	m <sup>2</sup>	43.7	BF	514		533		551		569		588		15.5
4.19	m <sup>2</sup>	45.1	BF	498		515		533		551		569		15.0

(\*) Yield based on 1-inch (25.4mm) thickness. All weights shown are measured in grams. Cup weights are based on an actual 1000ml (1l) cup as supplied by Carboline (contact your local Carboline Fireproofing representative for cups).

**Non-Carboline alternate cups can be purchased from major home improvement suppliers, these cups average 1038 ml when filled to the top. If utilizing these cups, multiply the cup weight by an average of 1.038 to provide accurate density/yield values.**

### Supplementary Information

#### Accelerator A-20 Mixing

(mix four 50 lb Bag/34 Gallons Water (total solution equals 44 gallons))

- Mix accelerator A-20 as directed on the product data sheet. Allow bubbles in the solution to pop before checking density.
- Use a 1-liter plastic container, place on scale and zero/tare container.
- Fill the container level to the top with A-20 solution.
- If weight is below 1265 g/l, add additional A-20 to mix until target is reached.
- As an alternate to 1-3 above, place a hydrometer in the solution and determine the specific gravity.

Bags/HR	Accelerator A-20 Flow Rate (15 pcf)	
	Seconds to fill 1-liter cup	Alum. Pump Setting (%)
5	318	5
10	129	14
15	84	24
20	63	33
25	51	43
30	43	52

#### Nozzle Density

- Set the accelerator flow rate to a quick dribble.
- Commence spraying and pump for roughly 60 seconds until the system stabilizes.
- After 60 seconds, spray TYPE 5GP directly into the Carboline 1000ml cup. Position the nozzle 12-18" above the cup and overfill.
- Strike off any excess TYPE 5GP and level to the top of the container. Wait a further 60 seconds or until such time the material has stopped swelling. Again, strike level with the top of the container.
- Place an empty container on the scale and press "on/tare"
- Replace the tared container with the identical container, filled with TYPE 5GP and record the net weight.
- Cross reference the above chart to determine yield and adjust injection flow rate as required.

### Simplified Target

Yield: **31.4 BF/BAG (2.91 m2)**

	TARGET	RANGE	UNIT
WATER	8.5	8.0 – 9.0	gal/bag
NOZZLE DENSITY	741	716 - 767	g/l

**Simplified Range** (Carboline recommends nozzle yields be taken a minimum, 3 times per day. Carboline recommends the use of a 9/16 I.D orifice)

Yield (*)				8.0	US/G	8.5	US/G	9.0	US/G	9.5	US/G	10.0	US/G	Dry Density (PCF)
				30	L	32	L	34	L	36	L	38	L	
2.29	m²	24.6	BF	911		944		976		1009		1041		28.0
2.47	m²	26.5	BF	846		876		906		937		967		26.0
2.67	m²	28.8	BF	781		809		837		865		893		24.0
2.91	m²	31.4	BF	716		741		767		793		818		22.0

(\*) Yield based on 1-inch (25.4mm) thickness. All weights shown are measured in grams. Cup weights are based on an actual 1000ml (1l) cup as supplied by Carboline (contact your local Carboline Fireproofing representative for cups).

**Non-Carboline alternate cups can be purchased from major home improvement suppliers, these cups average 1038 ml when filled to the top. If utilizing these cups, multiply the cup weight by an average of 1.038 to provide accurate density/yield values.**

### Supplementary Information

#### Nozzle Density

1. Spray un-injected TYPE 5GP directly into the Carboline 1000ml cup. Position the nozzle 12-18" above the cup and overfill.
2. Strike off any excess TYPE 5GP and level to the top of the container.
3. Place an empty container on the scale and press "on/tare"
4. Replace the tared container with the identical container, filled with TYPE 5GP and record the net weight.
5. Cross reference the above simplified range to determine yield and adjust water, mixing time and/or air pressure accordingly.

#### Calculation

To calculate yield, follow the formula noted below:

$$\text{Yield} = 12 \times (\text{Gallons H}_2\text{O/Bag} \times 8.34 + \text{Bag Weight}) / \text{Nozzle Density}$$

To convert g/L to pcf for Nozzle Density, follow the formula below:

$$\text{g/L} \times 0.06243$$

### Simplified Target

Based on minimum pcf requirement as shown.

(>434 psf Bond Strength at a **target dry density of 15.5 pcf**)

Yield: **43.7 BF/BAG (4.06 m2)**

	TARGET	RANGE	UNIT
ACCELERATOR A-20	1260	1250 – 1270	g/l
WATER	8.5	8.0 – 9.0	gal/bag
NOZZLE DENSITY	533	514 – 551	g/l

(>1,000 psf Bond Strength at a **target dry density of 16.5 pcf**)

Yield: **41.0 BF/BAG (3.81 m2)**

	TARGET	RANGE	UNIT
ACCELERATOR A-20	1260	1250 – 1270	g/l
WATER	8.5	8.0 – 9.0	gal/bag
NOZZLE DENSITY	567	547 - 586	g/l

(>3000 psf Bond Strength at a **target dry density of 22 pcf**)

Yield: **30.8 BF/BAG (2.86 m2)**

	TARGET	RANGE	UNIT
ACCELERATOR A-20	1200	1190 - 1210	g/l
WATER	8.5	8.0 – 9.0	gal/bag
NOZZLE DENSITY	756	730 - 782	g/l

**HOLD POINT:** Yields measured in excess of 45.1 BF/Bag will result in dry densities below the minimum 15 PCF as published in the Underwriters Laboratories Inc.® Fire Resistance Directory.

**Simplified Range** (Carboline recommends nozzle yields be taken a minimum, 3 times per day. Carboline recommends the use of a 9/16 I.D orifice)

Yield (*)				8.0	US/G	8.5	US/G	9.0	US/G	9.5	US/G	10.0	US/G	Dry Density (PCF)
				30	L	32	L	34	L	36	L	38	L	
2.86	m <sup>2</sup>	30.8	BF	730		756		782		808		834		22
3.49	m <sup>2</sup>	37.6	BF	597		618		640		661		682		18.0
3.81	m <sup>2</sup>	41.0	BF	547		567		586		606		626		16.5
4.06	m <sup>2</sup>	43.7	BF	514		533		551		569		588		15.5

(\*) Yield based on 1-inch (25.4mm) thickness. All weights shown are measured in grams. Cup weights are based on an actual 1000ml (1l) cup as supplied by Carboline (contact your local Carboline Fireproofing representative for cups).

**Non-Carboline alternate cups can be purchased from major home improvement suppliers, these cups average 1038 ml when filled to the top. If utilizing these cups, multiply the cup weight by an average of 1.038 to provide accurate density/yield values.**

### Supplementary Information

#### Accelerator A-20 Mixing

*(15.5- 16.5 PCF: mix four 50 lb Bag/34 Gallons Water (total solution equals 44 gallons)*

*(22 PCF: mix three 50 lb Bag/37.5 Gallons Water (total solution equals 45 gallons)*

1. Mix accelerator A-20 as directed on the product data sheet. Allow bubbles in the solution to pop before checking density.
2. Use a 1-liter plastic container, place on scale and zero/tare container.
3. Fill the container level to the top with A-20 solution.
4. If weight is below 1265 g/l, add additional A-20 to mix until target is reached.
5. As an alternate to 1-3 above, place a hydrometer in the solution and determine the specific gravity.

Bags/HR	Accelerator A-20 Flow Rate (15 pcf)	
	Seconds to fill 1-liter cup	Alum. Pump Setting (%)
5	318	5
10	129	14
15	84	24
20	63	33
25	51	43
30	43	52

Bags/HR	Accelerator A-20 Flow Rate (16.5 pcf)	
	Seconds to fill 1-liter cup	Alum. Pump Setting (%)
5	1637	1
10	278	6
15	163	11
20	117	16
25	93	21
30	77	27

#### Nozzle Density

1. Set the A-20 solution flow rate to a quick dribble.
2. Commence spraying and pump for roughly 60 seconds until the system stabilizes.
3. After 60 seconds, spray TYPE 5MD directly into the Carboline 1000ml cup. Position the nozzle 12-18" above the cup and overfill.
4. Strike off any excess TYPE 5MD and level to the top of the container. Wait a further 60 seconds or until such time the material has stopped swelling. Again, strike level with the top of the container.
5. Place an empty container on the scale and press "on/tare"
6. Replace the tared container with the identical container, filled with TYPE 5MD and record the net weight.
7. Cross reference the above chart to determine yield and adjust injection flow rate as required based on bond strength requirements. A minimum density of 16.5 pcf is required to meet 1,000 psf bond strength.

#### Calculation

To calculate yield, follow the formula noted below:

$$\text{Yield} = 12 \times (\text{Gallons H}_2\text{O}/\text{Bag} \times 8.34 + \text{Bag Weight})/\text{Nozzle Density}$$

To convert g/L to pcf for Nozzle Density, follow the formula below:

$$\text{g/L} \times 0.06243$$

### Simplified Target

Based on minimum 22 pcf. Requirement

Yield: **31.4 BF/BAG (2.91 m2)**

	TARGET	RANGE	UNIT
WATER	8.5	8.0 – 9.0	gal/bag
NOZZLE DENSITY	741	716 - 767	g/l

**Simplified Range** (Carboline recommends nozzle yields be taken a minimum, 3 times per day. Carboline recommends the use of a 9/16 I.D orifice)

Yield (*)				8.0	US/G	8.5	US/G	9.0	US/G	9.5	US/G	10.0	US/G	Dry Density (PCF)
				30	L	32	L	34	L	36	L	38	L	
2.29	m <sup>2</sup>	24.6	BF	911		944		976		1009		1041		28.0
2.47	m <sup>2</sup>	26.5	BF	846		876		906		937		967		26.0
2.67	m <sup>2</sup>	28.8	BF	781		809		837		865		893		24.0
2.91	m <sup>2</sup>	31.4	BF	716		741		767		793		818		22.0

(\*) Yield based on 1-inch (25.4mm) thickness. All weights shown are measured in grams. Cup weights are based on an actual 1000ml (1l) cup as supplied by Carboline (contact your local Carboline Fireproofing representative for cups).

**Non-Carboline alternate cups can be purchased from major home improvement suppliers, these cups average 1038 ml when filled to the top. If utilizing these cups, multiply the cup weight by an average of 1.038 to provide accurate density/yield values.**

### Supplementary Information

#### Nozzle Density

1. Spray un-injected TYPE 5MD directly into the Carboline 1000ml cup. Position the nozzle 12-18" above the cup and overfill.
2. Strike off any excess TYPE 5MD and level to the top of the container.
3. Place an empty container on the scale and press "on/tare"
4. Replace the tared container with the identical container, filled with TYPE 5MD and record the net weight.
5. Cross reference the above simplified range to determine yield and adjust water, mixing time and/or air pressure accordingly.

#### Calculation

To calculate yield, follow the formula noted below:

$$\text{Yield} = 12 \times (\text{Gallons H}_2\text{O}/\text{Bag} \times 8.34 + \text{Bag Weight})/\text{Nozzle Density}$$

To convert g/L to pcf for Nozzle Density, follow the formula below:

$$\text{g/L} \times 0.06243$$

### Simplified Target

Yield: **43.7 BF/BAG (4.06 m2)**

	TARGET	RANGE	UNIT
ACCELERATOR A-20	1260	1250 – 1270	g/l
WATER	12.0	11.0 – 13.0	gal/bag
NOZZLE DENSITY	569	551 - 588	g/l

**HOLD POINT:** Yields measured in excess of 45.1 BF/Bag will result in dry densities below the minimum 15 PCF as published in the Underwriters Laboratories Inc.® Fire Resistance Directory.

**Simplified Range** (Carboline recommends nozzle yields be taken a minimum, 3 times per day. Carboline recommends the use of a 9/16 I.D orifice)

Yield (*)				9.0	US/G	10.0	US/G	11.0	US/G	12.0	US/G	13.0	US/G	Dry Density (PCF)
				30	L	32	L	34	L	36	L	38	L	
3.81	m <sup>2</sup>	41.0	BF	547		567		586		606		626		16.5
3.93	m <sup>2</sup>	42.3	BF	531		550		569		588		607		16.0
4.06	m <sup>2</sup>	43.7	BF	514		533		551		569		588		15.5
4.19	m <sup>2</sup>	45.1	BF	498		515		533		551		569		15.0

(\*) Yield based on 1-inch (25.4mm) thickness. All weights shown are measured in grams. Cup weights are based on an actual 1000ml (1l) cup as supplied by Carboline (contact your local Carboline Fireproofing representative for cups).

**Non-Carboline alternate cups can be purchased from major home improvement suppliers, these cups average 1038 ml when filled to the top. If utilizing these cups, multiply the cup weight by an average of 1.038 to provide accurate density/yield values.**

### Supplementary Information

#### Accelerator A-20 Mixing

(mix four 50 lb Bag/34 Gallons Water (total solution equals 44 gallons))

- Mix accelerator A-20 as directed on the product data sheet. Allow bubbles in the solution to pop before checking density.
- Use a 1-liter plastic container, place on scale and zero/tare container.
- Fill the container level to the top with A-20 solution.
- If weight is below 1260 g/l, add additional A-20 to mix until target is reached.
- As an alternate to 1-3 above, place a hydrometer in the solution and determine the specific gravity.

Bags/HR	Accelerator A-20 Flow Rate (15 pcf)	
	Seconds to fill 1-liter cup	Alum. Pump Setting (%)
5	318	5
10	129	14
15	84	24
20	63	33
25	51	43
30	43	52

#### Nozzle Density

- Set the accelerator flow rate to a quick dribble.
- Commence spraying and pump for roughly 60 seconds until the system stabilizes.
- After 60 seconds, spray TYPE 5AR directly into the Carboline 1000ml cup. Position the nozzle 12-18" above the cup and overfill.
- Strike off any excess TYPE 5AR and level to the top of the container. Wait a further 60 seconds or until such time the material has stopped swelling. Again, strike level with the top of the container.
- Place an empty container on the scale and press "on/tare"
- Replace the tared container with the identical container, filled with TYPE 5AR and record the net weight.
- Cross reference the above chart to determine yield and adjust injection flow rate as required



### Simplified Target

Yield: **32.7 BF/BAG (2.94 m2)**

	TARGET	RANGE	UNIT
ACCELERATOR A-20	1275	1250 – 1300	g/l
WATER	10.5	10.0 – 11.0	gal/bag
NOZZLE DENSITY	809	784 - 833	g/l

**HOLD POINT:** Yields measured in excess of 32.7 BF/Bag will result in dry densities below the minimum 22 PCF as published in the Underwriters Laboratories Inc.® Fire Resistance Directory.

**Simplified Range** (Carboline recommends nozzle yields be taken a minimum, 3 times per day. Carboline recommends the use of a 9/16 to 5/8 I.D orifice)

Yield (*)				9.0	US/G	9.5	US/G	10	US/G	10.5	US/G	11.0	US/G	Dry Density (PCF)
				34	L	36	L	38	L	40	L	42	L	
2.68	m²	28.8	BF	835		863		891		919		947		25.0
2.79	m²	30.0	BF	802		829		855		882		909		24.0
2.91	m²	31.3	BF	768		794		820		845		871		23.0
3.04	m²	32.7	BF	735		760		784		809		833		22.0

(\*) Yield based on 1-inch (25.4mm) thickness. All weights shown are measured in grams. Cup weights are based on an actual 1000ml (1l) cup as supplied by Carboline (contact your local Carboline Fireproofing representative for cups).

**Non-Carboline alternate cups can be purchased from major home improvement suppliers, these cups average 1038 ml when filled to the top. If utilizing these cups, multiply the cup weight by an average of 1.038 to provide accurate density/yield values.**

### Supplementary Information

#### Accelerator A-20 Mixing

(mix four 50 lb Bag/34 Gallons Water (total solution equals 46 gallons))

1. Mix accelerator A-20 as directed on the product data sheet. Allow bubbles in the solution to pop before checking density.
2. Use a 1-liter plastic container, place on scale and zero/tare container.
3. Fill the container level to the top with A-20 solution.
4. If weight is below 1250 g/l, add additional A-20 to mix until target is reached.
5. Target flow rate for Accelerator A-20 to fill a 1-liter cup is 120 seconds.

#### Nozzle Density

1. Set the accelerator flow rate to a quick dribble.
2. Commence spraying and pump for roughly 60 seconds until the system stabilizes.
3. After 60 seconds, spray TYPE 7GP directly into the Carboline 1000ml cup. Position the nozzle 12-18" above the cup and fill.
4. Place an empty container on the scale and press "on/tare"
5. Replace the tared container with the identical container, filled with TYPE 7GP and record the net weight.
6. Cross reference the above chart to determine yield and adjust injection flow rate as required.

### Simplified Target

Based on minimum 22 pcf. Requirement

Yield: **32.7 BF/BAG (2.94 m2)**

	TARGET	RANGE	UNIT
WATER	10.5	10.0 – 11.0	gal/bag
NOZZLE DENSITY	809	784 - 833	g/l

**Simplified Range** (Carboline recommends nozzle yields be taken a minimum, 3 times per day. Carboline recommends the use of a 9/16 to 5/8 I.D orifice)

Yield (*)				9.0	US/G	9.5	US/G	10	US/G	10.5	US/G	11.0	US/G	Dry Density (PCF)
				34	L	36	L	38	L	40	L	42	L	
2.68	m²	28.8	BF	835		863		891		919		947		25.0
2.79	m²	30.0	BF	802		829		855		882		909		24.0
2.91	m²	31.3	BF	768		794		820		845		871		23.0
3.04	m²	32.7	BF	735		760		784		809		833		22.0

(\*) Yield based on 1-inch (25.4mm) thickness. All weights shown are measured in grams. Cup weights are based on an actual 1000ml (1l) cup as supplied by Carboline (contact your local Carboline Fireproofing representative for cups).

**Non-Carboline alternate cups can be purchased from major home improvement suppliers, these cups average 1038 ml when filled to the top. If utilizing these cups, multiply the cup weight by an average of 1.038 to provide accurate density/yield values.**

### Supplementary Information

#### Nozzle Density

1. Spray un-injected TYPE 7GP directly into the Carboline 1000ml cup. Position the nozzle 12-18" above the cup and overfill.
2. Strike off any excess TYPE 7GP and level to the top of the container.
3. Place an empty container on the scale and press "on/tare"
4. Replace the tared container with the identical container, filled with TYPE 7GP and record the net weight.
5. Cross reference the above simplified range to determine yield and adjust water, mixing time and/or air pressure accordingly.

#### Calculation

To calculate yield, follow the formula noted below:

$$\text{Yield} = 12 \times (\text{Gallons H}_2\text{O/Bag} \times 8.34 + \text{Bag Weight}) / \text{Nozzle Density}$$

To convert g/L to pcf for Nozzle Density, follow the formula below:

$$\text{g/L} \times 0.06243$$

### Simplified Target

Based on minimum 22 pcf. Requirement

Yield: **31.6 BF/BAG (2.94 m2)**

	TARGET	RANGE	UNIT
WATER	9.5	9.0 – 10.0	gal/bag
NOZZLE DENSITY	786	760 - 811	g/l

**Simplified Range** (Carboline recommends nozzle yields be taken a minimum, 3 times per day. Carboline recommends the use of a 3/8 to 5/8 I.D orifice)

Yield (*)				9.0	US/G	9.5	US/G	10	US/G	10.5	US/G	11.0	US/G	Dry Density (PCF)
				34	L	36	L	38	L	40	L	42	L	
2.59	m <sup>2</sup>	27.8	BF	864		893		922		951		979		25.0
2.69	m <sup>2</sup>	29.0	BF	830		857		885		913		940		24.0
2.81	m <sup>2</sup>	30.3	BF	795		821		848		875		901		23.0
2.94	m <sup>2</sup>	31.6	BF	760		786		811		836		862		22.0

(\*) Yield based on 1-inch (25.4mm) thickness. All weights shown are measured in grams. Cup weights are based on an actual 1000ml (1l) cup as supplied by Carboline (contact your local Carboline Fireproofing representative for cups).

**Non-Carboline alternate cups can be purchased from major home improvement suppliers, these cups average 1038 ml when filled to the top. If utilizing these cups, multiply the cup weight by an average of 1.038 to provide accurate density/yield values.**

### Supplementary Information

#### Nozzle Density

1. Spray un-injected TYPE 7TB directly into the Carboline 1000ml cup. Position the nozzle 12-18" above the cup and overfill.
2. Strike off any excess TYPE 7TB and level to the top of the container.
3. Place an empty container on the scale and press "on/tare"
4. Replace the tared container with the identical container, filled with TYPE 7TB and record the net weight.
5. Cross reference the above simplified range to determine yield and adjust water, mixing time and/or air pressure accordingly.

#### Calculation

To calculate yield, follow the formula noted below:

$$\text{Yield} = 12 \times (\text{Gallons H}_2\text{O/Bag} \times 8.34 + \text{Bag Weight}) / \text{Nozzle Density}$$

To convert g/L to pcf for Nozzle Density, follow the formula below:

$$\text{g/L} \times 0.06243$$

### Simplified Target

Based on minimum 40 pcf. Requirement

Yield: **18.6 BF/BAG (1.63 m2)**

	TARGET	RANGE	UNIT
WATER	7.0	6.5 – 7.5	gal/bag
NOZZLE DENSITY	1121	1078 - 1164	g/l

**Simplified Range** (Carboline recommends nozzle yields be taken a minimum, 3 times per day. Carboline recommends the use of a 1/2 I.D orifice)

Yield (*)				6.5	US/G	7.0	US/G	7.5	US/G	8.0	US/G	8.5	US/G	Dry Density (PCF)
				24	L	26	L	28	L	30	L	32	L	
1.63	m²	17.5	BF	1145		1191		1237		1282		1328		42.5
1.73	m²	18.6	BF	1078		1121		1164		1207		1250		40.0
1.84	m²	19.8	BF	1010		1051		1091		1132		1172		37.5
1.97	m²	21.3	BF	943		981		1018		1056		1094		35.0

(\*) Yield based on 1-inch (25.4mm) thickness. All weights shown are measured in grams. Cup weights are based on an actual 1000ml (1l) cup as supplied by Carboline (contact your local Carboline Fireproofing representative for cups).

**Non-Carboline alternate cups can be purchased from major home improvement suppliers, these cups average 1038 ml when filled to the top. If utilizing these cups, multiply the cup weight by an average of 1.038 to provide accurate density/yield values.**

### Supplementary Information

#### Nozzle Density

1. Spray un-injected TYPE 7HD directly into the Carboline 1000ml cup. Position the nozzle 12-18" above the cup and overfill.
2. Strike off any excess TYPE 7HD and level to the top of the container.
3. Place an empty container on the scale and press "on/tare"
4. Replace the tared container with the identical container, filled with TYPE 7HD and record the net weight.
5. Cross reference the above simplified range to determine yield and adjust water, mixing time and/or air pressure accordingly.

#### Calculation

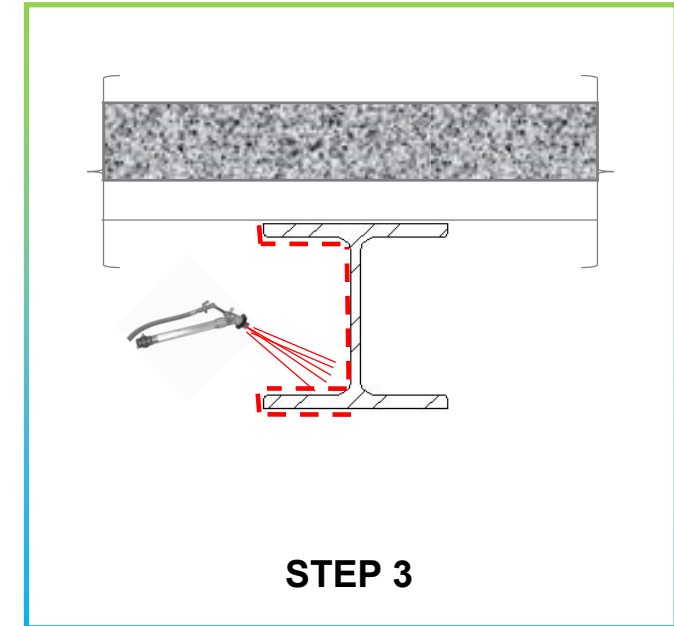
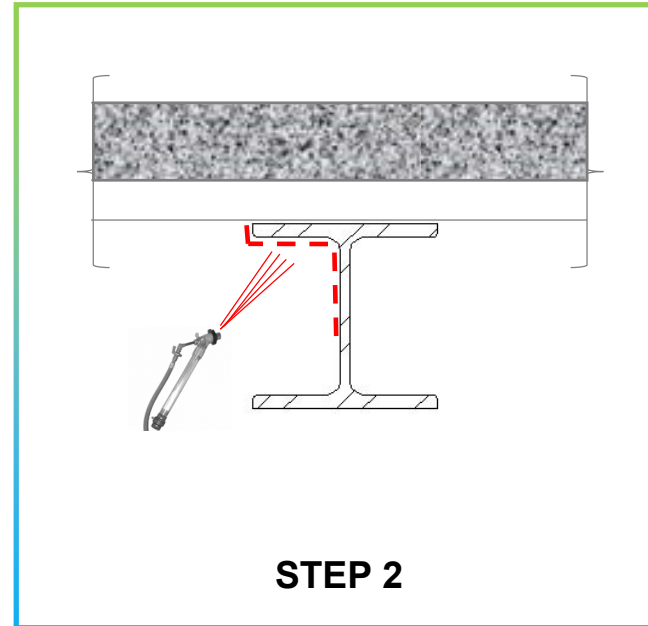
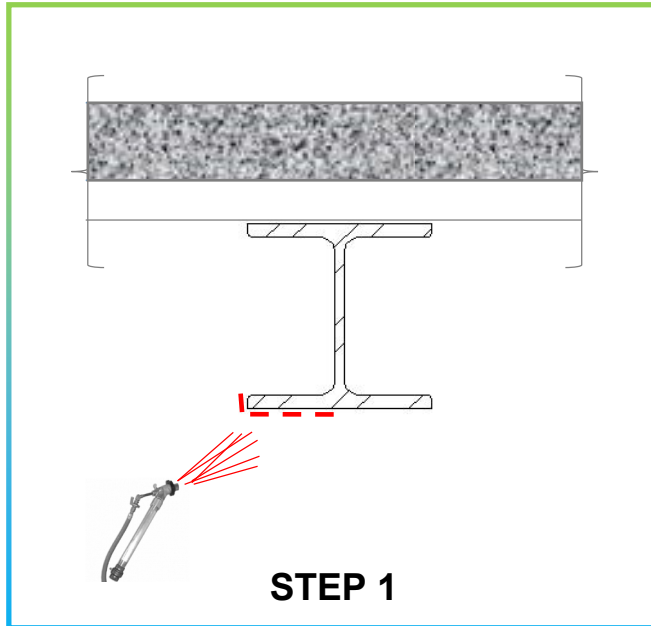
To calculate yield, follow the formula noted below:

$$\text{Yield} = 12 \times (\text{Gallons H}_2\text{O}/\text{Bag} \times 8.34 + \text{Bag Weight})/\text{Nozzle Density}$$

To convert g/L to pcf for Nozzle Density, follow the formula below:

$$\text{g/L} \times 0.06243$$

**APPENDIX B**  
SIMPLIFIED SPRAY SEQUENCE



**Step 1:** Commence spray application at the bottom flange with nozzle facing up, angled slightly. Spray the bottom flange tip whilst letting overspray spatter onto the web.

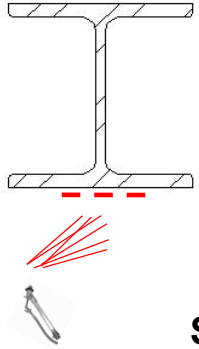
**Step 2:** Raise the nozzle, ensuring the same angle and apply to the upper web and flange.

**Step 3:** Proceed to spray the down shot, paying attention to rolling the flange tips.

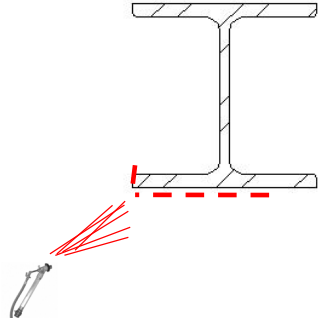
Repeat Steps 1-3 on the opposite side of the beam.

Ensure Flute Fill to Beams that run perpendicular to deck.

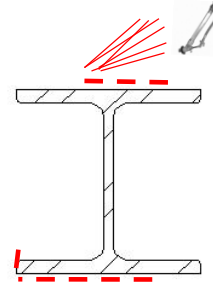




**STEP 1**



**STEP 2**



**STEP 3**

**Step 1:** Stand facing the web of the column and begin application by holding the nozzle tight to the steel at a 90° angle, applying material up the centre of the column.

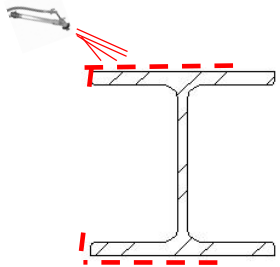
**Step 2:** Begin to build thickness in light coats, from the bottom to the top of the column and back, working from the centre to the flange tip and inside web. Ensure the nozzle is held at 45° and roll flange tips ensuring overspray goes into the web portion of the column to minimize loss.

**Step 3:** Flip the nozzle and repeat Step 1 on the adjacent face.

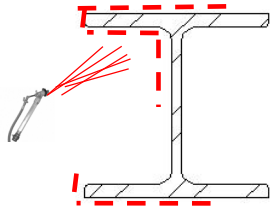
**Step 4:** Repeat Step 2.

**Step 5:** Position the nozzle at a 45° angle to the inside web, build thickness in light coats starting from the bottom and working towards to the top of the column. Control the nozzle distance based on the width of the column to minimize loss.

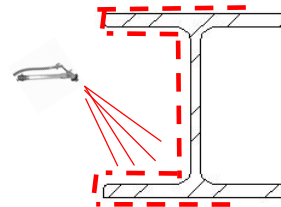
**Step 6:** Repeat Step 5.



**STEP 4**



**STEP 5**

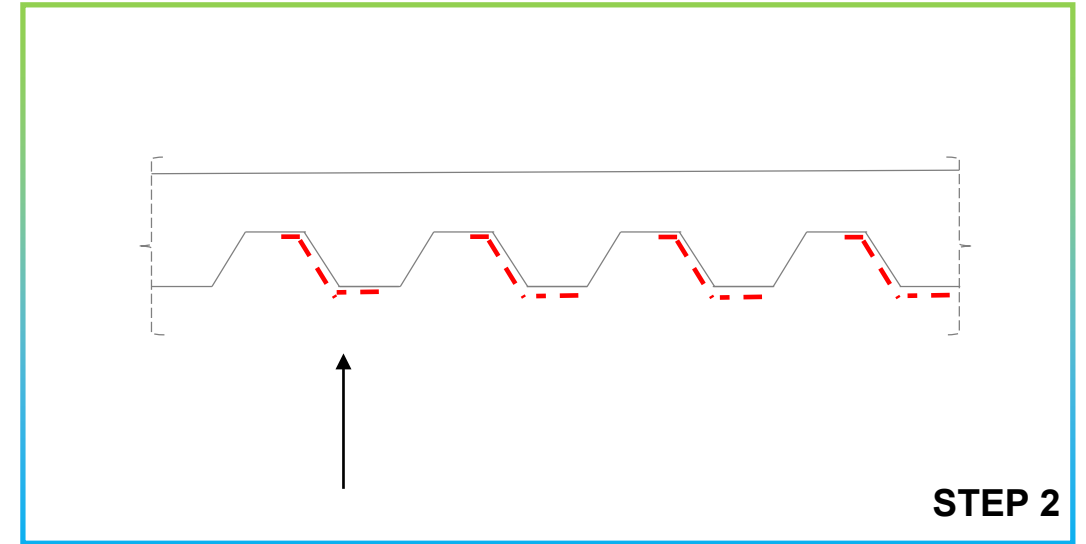
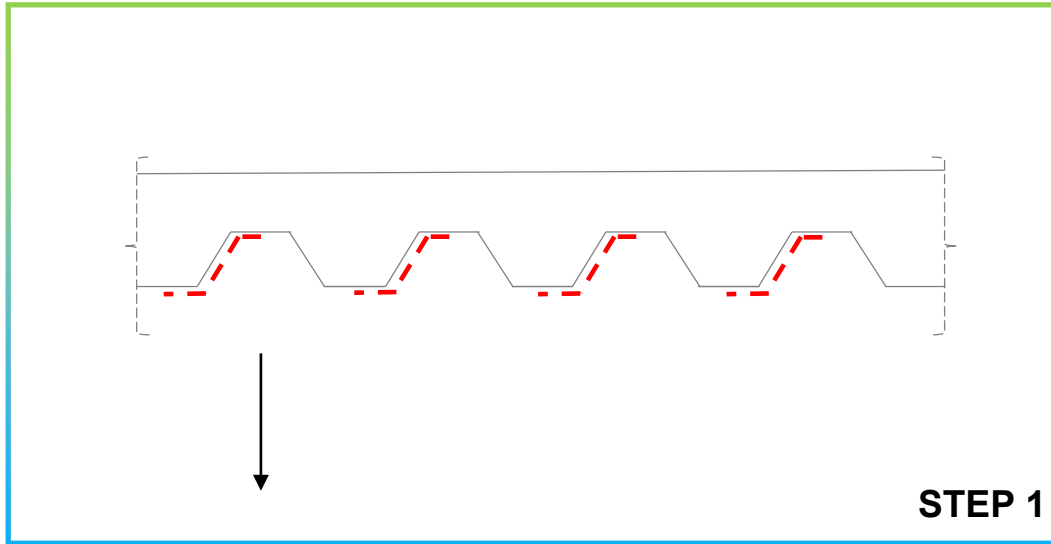


**STEP 6**

Repeat steps 2, 4, 5 & 6 on opposite side of the column

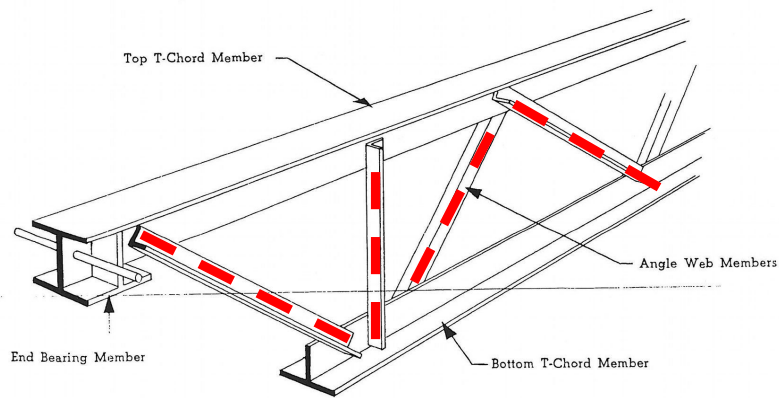




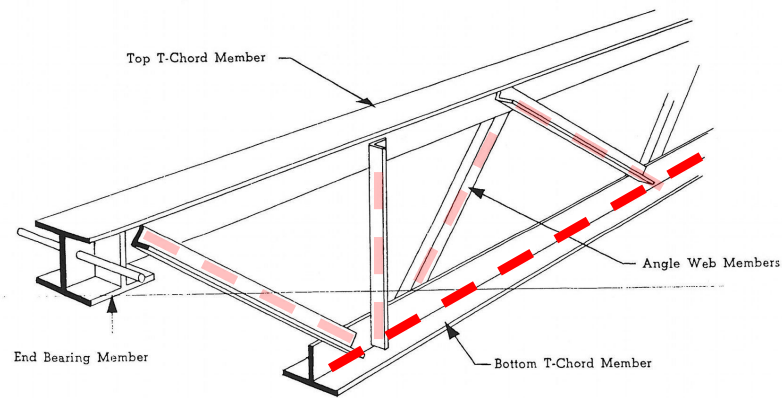


1. Position yourself in the centre of the section.
2. Walk away from the sprayed area (directional arrow as shown)
3. Angle the nozzle to ensure application from center of the bottom crest to the center of the valley.
4. Apply in a Sweeping motion.
5. Turn around and repeat to complete Step 2.

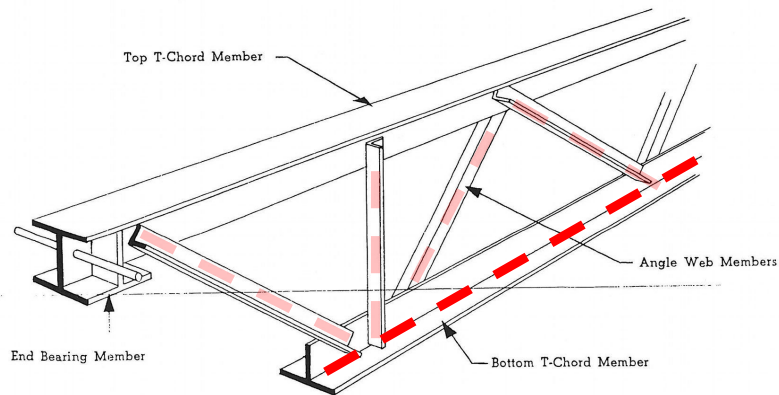




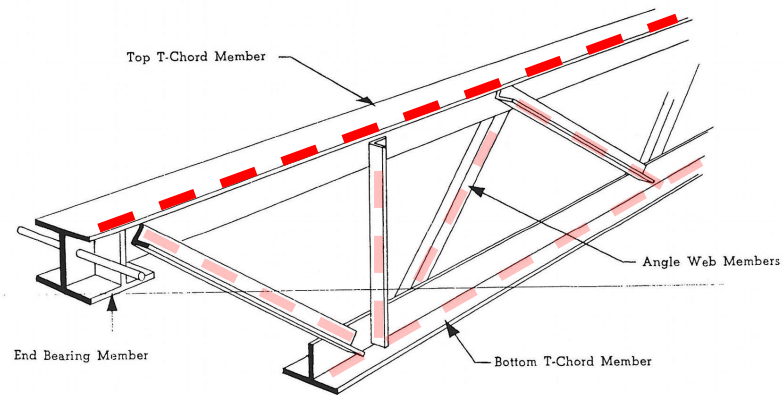
**STEP 1**



**STEP 2**



**STEP 3**



**STEP 4**

**Step 1:** Start the application of diagonal web members. Follow the contour to within a comfortable reach. The distance the nozzle is held from the OWSJ is critical in controlling waste.

**Step 2:** Hold the spray nozzle fairly tight to the bottom chord. Spray the bottom flange while focusing on flange tip coverage.

**Step 3:** Rotate the nozzle and commence down shots on the “top” of the bottom chord.

**Step 4:** Raise the nozzle to the top chord and commence application by holding the nozzle tight, ensuring that flutes are also being filled above the top chord on perpendicular members.

**TIP:** The use of EIFS MESH or similar scrim will facilitate the application and assist in reducing overspray and waste.



**APPENDIX C**  
SUPPLEMENTARY TECHNICAL INFORMATION

### PRODUCT DATA

1. An extended set, gypsum based, spray applied fire resistive material (SFRM) designed for the fire protection of interior structural steel. Type 5AR can be left in the equipment and lines for up to 4 days without setting. It was developed to be used as a holding material to leave in the equipment and lines to reduce start up and clean up times when using the Southwest Type 5 materials.
2. This material requires injection with Accelerator A-20 to reach final set. It is intended for use with Southwest Type 5GP and Southwest Type 5MD for application to interior structural columns, beams, joists, decks, walls, roofs, girders, floors and pre-cast concrete units.
3. Material is green in color so that it can be readily distinguished from the Type 5GP and Type 5MD materials.

### MIXING PROCEDURES

1. Mix with clean potable water, using a mechanical plaster mixer, rotating at 35-45 RPM. Use about 11-13 gallons of water per bag (33-39 for a 3-bag mix). It is recommended that a 3-bag mix be used.
2. The amount of water necessary will depend on the amount of time the material will be left in the equipment and lines:

**Overnight: 11 gallons**

**2-3 days: 12 gallons**

**4 days: 13 gallons**

**Note:** The maximum time the material can be left in the equipment and lines is 4 days.

3. Mix product for about 1.5 - 2 minutes, until slurry is uniform. The mix will appear wet. Agitate occasionally, to prevent settling of ingredients.

### APPLICATION

1. Pump: Use same standard cementitious pumping equipment as used for Southwest Type 5GP and Type 5MD.
2. When the material hopper is empty after the last batch of Type 5GP or Type 5MD, turn off the Accelerator A-20 injection pump. Turn off the feed valve to the material nozzle.
3. Mix the Southwest Type 5AR material with 11-13 gallons of water (depending on the amount of time the material will be left in the equipment). Mix the material for 2 minutes.
4. Fill the hopper with the Type 5AR slurry. Pump the material until the green color is coming out at the spray nozzle. Continue pumping the material until the hopper is almost empty then cover with plastic to keep the material from drying out. Remove the orifice and place end of spray nozzle in container of water to prevent drying.
5. When spraying commences, mix solution of Accelerator A-20 following the product's mixing procedures. Remove the plastic from the hopper and replace the nozzle orifice.
6. Mix a batch of Southwest Type 5GP or Type 5MD following the product's mixing procedures. Pour material into hopper. Begin spraying the material with injection of the Accelerator A-20 solution following the Southwest Fireproofing Injection Procedures for High Production (this enables the material to set).
7. The material should be sprayed out in a thin coat (1/2"-5/8"). A color change back to tan indicates that all of the Southwest Type 5AR has been pumped out. A thin coat of Southwest Type 5GP or Southwest Type 5MD can then be applied over the Southwest Type 5AR for uniform color.

### CAUTIONS

1. After applying Type 5AR, the same equipment will be used to pump the Type 5GP or Type 5MD fireproofing mix. Type 5AR cannot be left in the pump and lines for greater than 4 days. If it is left in the equipment longer than this, it will begin to set in the equipment and lines.

# TYPE 5AR EXTENDED SET

## SUPPLEMENTARY TECHNICAL INFORMATION

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2. If applying Type 5AR at the end of each working day or as a holding material over the weekend, it is not necessary to clean out the equipment when commencing with the fire protection application.
3. Be sure to either mask or clean immediately all surfaces that may be exposed after fire protection is complete. Staining may occur.
4. After completion of application of Type 5GP or Type 5MD, be sure to completely flush out and wash all equipment and hoses. All equipment, lines and nozzle must be thoroughly cleaned with soap and water after each use.

### DESCRIPTION

A 22 lbs./ft<sup>3</sup> density cementitious thermal barrier fire protection material designed primarily to be used over foam plastics. Type 7TB is specifically formulated to resist exposure to high humidity and for direct application to rigid urethane and polystyrene.

### DELIVERY AND STORAGE

**Delivery:** All material is to be delivered in original unopened packages bearing the name of the manufacturer, the brand and proper Underwriters' Laboratories, Inc. label for fire resistance classification.

**Storage:** The material shall be kept dry until ready for use. Packages of material shall be kept off the ground, under cover and away from sweating walls and other damp surfaces. All bags which have become wet before use shall be discarded. Stock of material is to be rotated and used before its expiration date.

### PROJECT SETUP

Using the right and functioning equipment is paramount. Too many contractors are lax in this area, expect performance from smaller application units, and are as a result disappointed. Again, assuming the above medium size project, the following are what we suggest as an optimum set up: Also see last page of the current application manual for further details.

- Pumps:** Hyflex 321E  
Putzmeister: Tommy gun, also electric or diesel piston pumps "Big Blue" high production pumps, S6-EV  
Mayco: FP 30-piston pump  
Excalibur  
Western
- Mixers:** Sunspray Continuous units, Big Blue Continuous units  
Stone Hydro Blend FP continuous mixer  
Various paddle mixers, 12 –16 cu. ft. size with rubber tipped blade
- Water:** An uninterrupted potable water supply of at least 5 gallons per minute flow. If using a paddle mixer use a 55-gallon barrel surge supply, with automatic shut off valve, water meter and pump to supply mixer. Also available from pump distributors.
- Hoses:** Always use a 3" or larger I.D. surge hose from the manifold, for the 1<sup>st</sup> 15 -25 feet of the material transfer hose. Then use a 16" tapered fitting to a 2" I.D. hose until reaching the spray area, then taper to 1 ¼" or 1" whip hose no longer than 25 feet. If running short lengths of hoses, using 2" lines will be acceptable, but always use a larger surge hose. Do not use a smaller ID whip hose.
- Note:** The I.D. of material transfer hoses is important, as restrictions will cause excess back pressures and increase maintenance of pumps.
- Standpipe:** Use 2" aluminum tubing with quick external disconnections. Use large radius elbows at the ground floor to standpipe as well as at other end of standpipe.
- Airlines:** Minimum 30 psi required. Tape airline to material hose whenever practical

# TYPE 7TB APPLICATION

## SUPPLEMENTARY TECHNICAL INFORMATION

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**Staging:** Typically, it is best to build a large platform as close as possible to the building at an area where materials can be delivered conveniently, and most importantly trailers can be switched. This platform should be at least 10' x 15' and covered for rainy days. Equally, the rolling scaffold on the floor should be of similar size, but not smaller than 6" x 10' whenever practical, meet OSHA guidelines, and have large wheels for ease of mobility.

### MIXING & PUMPING STATION

The entire working and storage area should be covered from rain and construction water with the material stored to prevent contact with water on the floor. All wet bags must be discarded. The pump should be as close as possible to the work. This permits hose length to be minimized. Place the mixer next to and above the pump hopper. It should be high enough to permit full rotation to the complete dump position. Wash water should be drained away from the pump area.

### MIXING PROCEDURE

1. Check to make sure mixer bowl and blades are clean.
2. Adjust the mixer speed to 30-40 rpm.
3. Add water to the mixer first. Use approximately 10 U.S. gallons per bag of Type 7TB™ Thermal Barrier. This is the recommended starting point of water addition.
4. Add bags of Type 7TB™ Thermal Barrier with the mixer blades turning.
5. Mix for approximately 60 seconds. Adjust the water as required to obtain the desired mix consistency for spraying or trowelling.
6. Let the mixer blades turn for approximately 10 seconds to re-blend before dumping. Dump entire batch. The mixer must empty completely when dumped to avoid leaving any old mix to be reworked in succeeding batches.
7. Wait until enough material has been pumped out of the hopper to allow sufficient room for the addition of the entire new batch from the mixer.
8. If the pump hopper will not take an entire batch, stop the mixer until the remaining material can be discharged. Restart the mixer for 10 seconds before dumping the remaining material.
9. Mixing by hand is specifically not recommended for Type 7TB™ Thermal Barrier.
10. Type 7TB™ Thermal Barrier should not be reworked. Normal working time is 30 minutes at 75°F (24°C). Always clean mixer to prevent contamination of fresh material with partially set material.

### PUMP START-UP

1. About 2 gallons of water should be added to the mixer with the blades turning then dumped into the pump hopper.
2. The first Type 7TB™ Thermal Barrier mix should be prepared and the pump started. The mix is to be dumped into the pump hopper when the last of the water enters the pump intake. **DO NOT LET THE PUMP RUN DRY.**
3. Pumping should continue until the water and a small amount of Thermal Barrier has passed out of the end of the hose.
4. The nozzle is to be attached to the whip hose with the air stem pulled back and the air reduced at the nozzle. This leaves an unrestricted path for material to flow through the orifice.
5. After material flow has started, the air pressure is to be increased and the air stem adjusted to give an acceptable spray pattern.
6. If a blockage occurs at the orifice, the pump should be stopped, the rubber cap removed and the orifice cleaned.

### APPLICATION

**Water Ratios:** Having the right equipment, the proper amount of water, proper mix and proper nozzle set up is crucial to obtaining correct density and maximum yield. The water content should be about 9-11 gallons per bag. Use as much water as possible to apply thicknesses not to exceed 1/2" per single pass. It is less expensive to double - back than too try to spray excessive thicknesses per pass. This will usually result in excess overspray – waste and uneven applications, resulting in excessive corrections to the applied material to “fill in” low areas. Type 7TB will



# TYPE 7TB APPLICATION

## SUPPLEMENTARY TECHNICAL INFORMATION

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thicken as they are conveyed thru the hose, but may look “too wet” in the pump hopper. Hence, there is a tendency by mixer personnel to use less water than recommended.

**Thickness Control: ¾” thickness provides 15-minute thermal barrier over foam plastic insulation (polystyrene and urethane)**

This part of the application process is very crucial, and is controlled by several factors:

1. Air pressure and spray pattern
2. Amount of water
3. Thickness Control and size of spray tip (use of shield is always recommended)
4. Distance from substrate
5. The sprayer should have a thickness gauge in his hands at all times

### AIR PRESSURE

When too much air is used (observed by a high pitch sound) to create a beautiful smooth spray pattern, chances are that the impingement of material to the substrate will substantially increase the density. Use minimum amount of air to break up product, and create a reasonably smooth pattern.

### SPRAY TIPS

Use 9/16” to 5/8” spray tips. We prefer 5/8”, with a mini-shield.

### SUBSTRATE DISTANCE AND APPLICATION STEPS

Although this is not necessarily relative to density, the distance a sprayer is from the substrate will determine both the smoothness of the application and most importantly the amount of waste. Good applications will be less than 5% waste. In excess of 5% usually means lack of control, interest or training. A good nozzle distance from the substrate is 12 – 14”.

1. Minimum air and substrate temperatures of 400°F (4°C) shall be maintained for 24 hours before and after application of fireproofing.
2. Type 7TB™ Thermal Barrier must be applied to a firm base material which has set to form a sound substrate for the Thermal Barrier.
3. Type 7TB™ Thermal Barrier **MUST NOT BE APPLIED OVER A DIRTY OR DETERIORATED SUBSTRATE**. If the substrate is not in a sound condition free of grease, oil, dirt or other contaminants that would prevent adhesion of the Thermal Barrier, it must be cleaned, scraped or otherwise treated to provide a sound substrate.
4. The texture of the Type 7TB™ Thermal Barrier can be varied by the air pressure and air stem position at the nozzle. The recommended pressure is 15 psi, although a slightly higher pressure will result in a finer texture. Small orifices will also provide a lightly textured surface.
5. Type 7TB™ Thermal Barrier can be finish trowelled or dry brushed immediately after application to a smooth finish. Avoid overworking the trowelled surface.
6. Do not use additional water to finish the Thermal Barrier.
7. Type 7TB™ Thermal Barrier is to be applied in a nominal ½" thickness per coat.
8. Type 7TB™ Thermal Barrier may be painted to achieve a specific color once material is dry.
9. Masking is required to protect sensitive equipment, aluminum and other surfaces not scheduled to be coated which cannot be easily cleaned.
10. Over-spray of Thermal Barrier may be cleaned up with water before the material sets. Type 7TB™ Thermal Barrier adheres tenaciously to most surfaces when set and cured. Therefore, Thermal Barrier over-spray must be removed before it sets.

# TYPE 7TB APPLICATION

## SUPPLEMENTARY TECHNICAL INFORMATION

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### PUMP SHUT DOWN PROCEDURES

1. After the last mix of the day has cleared the hopper, the pumping speed should be reduced and large amounts of water pumped through the system. A sponge can also be pumped through the hose by removing the hose at the pump manifold and placing the sponge directly into the hose.
2. At least two minutes of clear water should pass through the nozzle before the pump is shut off.
3. After the pump is shut off, all fittings should be disassembled and cleaned.

### SPRAY CREW EFFECTIVENESS

This is an area often not as controllable as other application portions outlined above. Personnel are crucial to the success of any endeavor and project. So pick your lead sprayer carefully. Use incentive programs to achieve required daily bag counts (at the correct thickness)

Target daily productivity, and make sure you stay on track with a predetermined schedule. Use the minimum crew size. The above project example should not require more than 3 men. A mixer, a hose/clean up man and a sprayer. The hose man should be able to spray to relieve the sprayer.

### SAFETY

Type 7TB™ Fireproofing is slippery when wet. The general contractor and applicator shall be responsible for posting appropriate cautionary "SLIPPERY WHEN WET" signs. Signs should be posted in all areas in contact with wet fireproofing material. Anti-slip surfaces should be used on working surfaces such as scaffolding. Read and post the Material Safety Data Sheet.



# TYPE DK3 “SPATTERCOAT” ADHESIVE

## SUPPLEMENTARY TECHNICAL INFORMATION

### PRODUCT DATA

1. Adhesive: This product is listed in the UL Directory as Type DK3, and is a blend of cementitious materials, designated to be used with Southwest Fireproofing cementitious products as an adhesive, specifically when applying products onto cellular (flat) steel decking, and on all flexible roof deck assemblies. See Data Sheet for further details.
2. Coating Over Spray: Type DK3 may be used as an over spray for Southwest Fireproofing cementitious products to achieve greater durability and damage resistance. Use Type HC (“HARD CLAD”) coating when greater resistance to damage is required, such as in mechanical rooms or areas where occasional traffic is present.

### MIXING PROCEDURES

1. Mix with clean potable water, using a mechanical plaster mixer, rotating at 35 – 45 RPM. Do not use a continuous mixer. Use about 27 – 30 gallons for a 3-bag mix. It is recommended that a 3-bag mix be used.
2. Mix product for about 1 1/2 – 2 minutes, until slurry is uniform. The mix will appear wet. Agitate occasionally, to prevent settling of ingredients.

### APPLICATION

1. Pump: Use regular cementitious pumping equipment, preferably small rotor – stator pumps. Because of the liquid nature of Type DK3 it is not recommended to use a high efficiency piston pump.
2. Apply Type DK3 at the beginning of each day, and allow to set for a minimum of 30 minutes before applying fireproofing. It is acceptable to apply Type DK3 the prior day, but it is not recommended to exceed 24 hours before fireproofing is applied.
3. When used as an over coat, apply Type DK3 before fire protection is dry. If the application of Type DK3 is to be applied after the fireproofing is dry, then re-wet the fire protection, using a slight water mist from a garden hose. This will assure adhesion and prevent premature drying of the Type DK3 coating.

### APPROXIMATE COVERAGE

1. As an Adhesive: Apply product, so that coverage does not exceed 70% of the surface area. Adjust spray pattern to achieve a “spatter” coat consistency. Coverage per bag should be approximately 600 - 800 sq. ft. per bag. Be sure that at least 30% of the steel area is visible.
2. As an Over Coat: Apply product to moist or pre-wetted surface to achieve complete coverage. Expect coverage to be less than 125 sq. ft. per bag.

### CAUTIONS

1. After applying Type DK3, and you will use the same pump to pump the fire proofing mix, be sure to wash out all equipment and hoses completely. Type DK3 is a cement based product, and will react with plaster-based materials such as Southwest Fireproofing Type 5 products. It is suggested that a small quantity of retarder (“Red Top” or similar) be introduced with the first mix containing plaster materials.
2. If applying cement based fire protection, it is not necessary to clean out the equipment when commencing with the fire protection application.
3. Type DK3 contains cement. Be sure to either mask or clean immediately all surfaces that may be exposed after fire protection is complete. Staining may occur.
4. After completion of application of Type DK3, be sure to flush out all equipment with soap and water.

### PRODUCT DATA

1. **Adhesive / Bonding Agent:** This product is listed in the UL Directory and is used to promote/improve adhesion of Southwest Type 5GP & Type 5MD gypsum based products to steel, concrete and other substrates. It is a water based vinyl acrylic copolymer emulsion that is mixed with clean potable water onsite. This product is used as an adhesive when applying gypsum based products to primed substrates. See Data Sheet for further details.
2. **Sealer:** When applied as a topcoat/sealer, it improves most physical characteristics, reduces air erosion losses and may be used to color the fireproofing or insulation surface. Normally supplied as clear, but also available in blue, white and black.

### MIXING PROCEDURES

1. Mix with clean potable water, one-part adhesive to one-part water
2. Mix product for about 1.5 – 2 minutes, until solution is uniform. Agitate occasionally, to prevent settling of ingredients.

### APPLICATION

1. Pump: Use 0.75 gallon/minute electric airless or Hudson pump sprayer
2. Apply A/D TC-55 Sealer at 4 mils (100 microns)
3. Before applying A/D TC-55 Sealer, the surface must be free of all oil, grease, condensation, or other contamination. Do not use if concrete has been treated with curing solutions. Test patches may be required to ensure compatibility.
4. Film build and color intensity may vary significantly depending on dilution and application rate, and texture, density and finish of substrate being coated.
5. Where colored finish over fibrous and cementitious materials is desired, we recommend extra attention be given to preparation and application of the fibrous or cementitious surfaces. If used as an adhesive, A/D TC-55 Sealer should be tacky to wet when cementitious fireproofing is applied.

### APPROXIMATE COVERAGE

1. **As an Adhesive:** Approximately 400-500 ft<sup>2</sup>/gal (9.8-10.2 m<sup>2</sup>/L), when mixed one part water to one part adhesive.
2. **As a Sealer:** Apply product to surface to achieve complete coverage. Expect coverage to be less than 400-500 ft<sup>2</sup>/gal (9.8-10.2 m<sup>2</sup>/L). Color intensity and film build will vary depending on dilution and application rates and most importantly, texture, density and finish of surface being coated. Manufacturer cannot be held responsible for color variations onsite

### CAUTIONS

1. Film build and color intensity may vary significantly depending on dilution and application rate, and texture, density and finish of substrate being coated. Where colored finish over fibrous and cementitious materials is desired, we recommend extra attention be given to preparation and application of the fibrous or cementitious surfaces. If used as an adhesive, A/D TC-55 Sealer should be tacky to wet when cementitious fireproofing is applied.
2. Pump, mixer and hose should be cleaned with clean, potable water at least once every 8 hours at 70°F (21°C) and more often at higher temperatures. Wet overspray must be cleaned up with clean, fresh water. Cured overspray may be difficult to remove.
3. Be sure to either mask or clean immediately all surfaces that may be exposed after application is complete. Staining may occur.
4. Follow all safety precautions on the A/D TC-55 Sealer Material Safety Data Sheet. It is recommended that personal protective equipment be worn, including spray suits, gloves, eye protection and respirators when applying A/D TC-55 Sealer.