MONOKOTE® Fireproofing Product

MONOKOTE® Z106®/HY® | Simplified Yield Chart

1 **First step in measuring nozzle yield is to determine the gallons of water per bag.**

For batch mixers use the charts below. For continuous mixers, instructions are provided to the right.

BATCH MIXER / Timed Sump Pump

Mix Water Chart (based on 3 bag mix)

Water drop in inches	Gallons per batch	Gallons per bag
14	24.00	8.00
14 1/2	24.75	8.25
14 3/4	25.50	8.50
15 1/4	26.25	8.75
15 3/4	27.00	9.00

*This is valid for 55 gallon drum with a **22.5 in diameter** and for 3 bag batches. To determine water used measure the water drop in inches and multiply by 1.72.*

CONTINUOUS MIXER / Inline Digital Flow Meter

1. Fill the continuous mixer hopper level to the top with dry material.
2. Zero the flow meter by depressing the on button for 3 seconds.
3. Start the continuous mixer and count the number of bags emptied into the mix hopper.
4. Run the mixer until 5 or more bags have been mixed. Start and stop operations are OK.
5. Stop the mixer level with the top as in step 1.
6. Once level, now read the number of gallons on the flow meter.
7. Divide the number of gallons by the number of bags mixed.

EX: 68 gallons divided by 8 bags = 8.5 gallons per bag.

2 **Once the water has been determined use the yield chart to find your target cup weight.**

NOZZLE YIELD FOR INJECTED APPLICATION (b)

Yield (a)		Water				
		8.0 U.S. gal 30 L	8.25 U.S. gal 31 L	8.5 U.S. gal 32 L	8.75 U.S. gal 33 L	Dry Density (PCF)
2.79 m²	30.0 BF	740	750	760	775	24.3
2.88 m²	31.0 BF	715	725	740	750	23.6
3.02 m²	32.5 BF	685	695	710	720	22.6

Yields in excess of 32.5 bf. per bag will result in dry densities below the 22 pcf minimum published in the Underwriters Laboratories Inc® Fire Resistance Directory.

NOZZLE YIELD FOR UN-INJECTED APPLICATION (b)

Yield (a)		Water				
		8.0 U.S. gal 30 L	8.25 U.S. gal 31 L	8.5 U.S. gal 32 L	8.75 U.S. gal 33 L	Dry Density (PCF)
2.70 m²	29.0 BF	750	760	775	790	24.8
2.79 m²	30.0 BF	730	740	750	765	24.1
2.88 m²	31.0 BF	705	715	730	740	23.3
3.02 m²	32.5 BF	670	680	695	705	22.2

***NOTE:** Nozzle yields should be taken 3 times a day more frequently if changes occur in the mixing or conveying process.*

Allow enough time for changes in mix time, water ratio, pump speed, and new accelerator mixes to reach the nozzlebefore taking the cups.

a) Yield based on 1 inch (25.4 mm) thickness
b) Cup weights are based on an actual 980 ml cup. Cup weights in table are in grams.

MONOKOTE® Z106®/HY® | Injected

Accelerator Mixing:
One 60 lb Bag/10 gallons water
Concentration 1270 g/liter cup (specific gravity)

Flow Rate: Set according to Z106HY pumping rate

Z-106/HY Pumping Rate	Net Wt. of Accelerator (15 seconds)*
20 bags per hour	210-220 grams
30 bags per hour	320-330 grams
40 bags per hour	430-440 grams
50 bags per hour	540-550 grams
60 bags per hour	650-660 grams

**Net weight in grams accumulated in the cup during 15 seconds taken at the nozzle (at constant flow).*

Z-106/HY fast sets with Accelerator.

Calculating bags per hour with a batch mixer

- Completely empty the mixer into the pump hopper.
- Mix a new 2 or 3 bag batch.
- Let the pump hopper run down until all most empty (do not draw air).
- Note the level of material remaining in the hopper.
- Empty the new batch into the pump hopper and start the stop watch.
- Time the mix until the new mix reaches the same level. (Continuous pumping is best).
- Stop the watch and record the time. Using the data recorded, calculate the bags per hour as demonstrated in the CALCULATION EXAMPLE presented later in this section.

Calculating bags per hour with a continuous mixer

- Fill the continuous mixer to the top with dry material.
- Let the pump hopper run down until all most empty (do not draw air).
- Note the level of material remaining in the pump hopper.
- With the pump pumping, start the mixer and stop watch.
- Continuous pumping is best. If the pumps stops and starts, then stop and start the stop watch as well.
- Continue to mix and convey at least 3 bags and make sure the dry mixer hopper is filled to the top as in step 1.
- Allow the 3 bags to run down until the pump hopper is at the same level noted.
- Once 3 bags have run down, stop the watch and record the time and calculate using the example below.

CALCULATION EXAMPLE: 5 minutes 45 seconds for 3 bag mix

5 minutes x 60 sec per minute =	300 sec
Remaining 45 seconds =	45 sec
Total seconds to pump:	345 sec
Divided by the 3 bags =	115 sec /bag

Divide the 115 seconds for 1 bag into: 3600 sec per hour

Equals 31.3 bags per hour

BAGS PER DAY

Pumping Rates

15 – 20 bags per hour = 90 – 120 bags per day[(a)]

20 – 30 bags per hour = 120 – 180 bags per day[(a)]

30 - 40 bags per hour = 180 – 240 bags per day[(a)]

a) assumes 6 hours of application time.

MONOKOTE® Fireproofing Product

MONOKOTE® Z106®/HY® | Supplemental Field Application Information

BONDING AGENT REQUIREMENT

Prior to application of Monokote Z-106/HY,Firebond™ Concentrate bonding agent must be applied to all substrates at a rate of 500 SF per gallon. There are two exceptions to this requirement;

1. Firebond™ Concentrate is not required when Monokote Z-106/HY is applied uninjected to bare steel.
2. Firebond™ Concentrate is not required when bond tests run in accordance to the Coatings Materials section of the Underwriters Laboratories Fire Resistance Directory Volume 1 indicate that a bonding agent is not required for Monokote Z-106/HY in conjunction with the specific primed or painted structural steel.

FIREBOND™ APPLICATION

Coverage:

Full concentrated strength—up to 1000 ft^2/gal

Diluted 1:1 (with water)—up to 500 ft^2/gal

Container size 5 gallon bucket or 55 gallon drum. GCP recommends using an airless pump for Firebond™ application.

Target Weight - Mixer Density
610-690 grams

1. Mix Monokote as directed.
2. Place an empty GCP 980 ml container on the scale and press on/tare to tare the container.
3. Fill the container with Monokote, tapping lightly to remove air voids.
4. Place the container filled with Monokote on the scale and record the net weight.

   If the weight is above 690 grams, mix longer or speed up the mixing blades.

   If the weight is below 610 grams, mix for a shorter time or slow the mixer blades.

Target Weight - Nozzle Density Injected
685 - 720 grams

1. Set the accelerator flow rate to a “fast trickle”.
2. Start spraying and spray for about one minute until the system stabilizes.
3. After about one minute spray Monokote directly into the GCP 980 ml container. Position the nozzle above the container so that there is no overspray outside the container. Overfill the container.
4. Cut the Monokote level with the top of the container. Wait approximately one minute or until no further swelling is apparent. Again cut the Monokote flush with the top of the container.
5. For accurate readings cut to a smooth surface before the MK begins to set.
6. Place an empty container on the scale and press “on/tare”.
7. Replace the tared container with the identical container filled with Monokote and record the net weight.

Check the charts on page 1 to determine yield.

Target Weight - Nozzle Density Uninjected
670 - 705 grams

1. Start spraying and spray for about one minute until the system stabilizes.
2. After about one minute spray Monokote directly into the GCP 980 ml container. Position the nozzle above the container so that there is no overspray outside the container. Overfill the container.
3. Cut the Monokote level with the top of the container. Wait approximately one minute and cut again to allow for a more accurate cup weight reading.
4. Place an empty container on the scale and press “on/tare”.
5. Replace the tared container with the identical container filled with Monokote and record the net weight.

Check the charts on page 1 to determine yield.

MONOKOTE® Z106®/HY®

DELIVERY SYSTEM

- **PUMPS:** Piston, Hydraulic, rotor stator, squeeze pumps.
- **HOSES:** 800 psi plaster grout to 1500 psi Goodyear Gauntlet ¾" whip hose.
- **WATER DELIVERY SYSTEMS:** Timed sump pumps, Digital in-line meters, and Fil-Rite water meters.

APPLICATION

- **Orifice Selection:** The orifice should be as large as possible while still maintaining a proper spray pattern. Using a 7/16 in. orifice for 30-40 bph or 1/2" orifice 40-50 bph. This is very important for same day multiple pass operation!
- **Orifice Shield:** When injecting — **ONLY THE MINI SHIELD** is recommended!

  Super-shields can be used when not injecting:
  35-55 bph 9/16 in.
  45-55 bph 5/8 in.

- **Nozzle Air Pressure:** The nozzle air should be set as low as possible (approx. 15-20 psi) while still maintaining a well-defined spray pattern. The air pressure should make a dull buzzing noise rather than a high pitched whine.

Injected Application Thicknesses:

— 1st pass: 1/2" to 1"
— 2nd pass: 1/2" to 1-1/2"

Uninjected Application Thicknesses:

— 1st pass: 1/2" to 5/8"
— 2nd pass: 1/2" to 5/8"

Product Change Over

GCP recommends the use of 5 ounces of retarder per 3 bag mix, with Monokote on the first three batches when switching EITHER TO or FROM cement based Monokote products to gypsum based Monokote products.

Set Times

Set times vary due to job site conditions

With Injection: 1 -2 hours, longer in colder temperatures.

Without Injection: 6 - 8 hours before reapplication.

ADVANTAGES

- Low pumping pressures allow use of small diameter hoses for increased maneuver-ability and greater pumping distances
- Formulation allows use with GCP patented Injection System for high-yield and quick set.

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GCP Applied Technologies, Inc., 62 Whittemore Avenue, Cambridge, MA 02140.

In Canada, GCP Canada, Inc., 294 Clements Road, West, Ajax, Ontario, Canada L1S 3C6.

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