



SOUTHWEST TYPE 5MD™

SIMPLIFIED YIELD CHART – INJECTED

Simplified Target

Based on minimum pcf requirement as shown.

(>434 psf Bond Strength at a **target dry density of 15.5 pcf**)
Yield: **44.9 BF/BAG (4.17 m²)**

	TARGET	RANGE	UNIT
ACCELERATOR A-20	1260	1250 – 1270	g/l
WATER	8.5	8.0 – 9.0	gal/bag
NOZZLE DENSITY	518	500 – 536	g/l

(>1,000 psf Bond Strength at a **target dry density of 16.5 pcf**)
Yield: **42.2 BF/BAG (3.92 m²)**

	TARGET	RANGE	UNIT
ACCELERATOR A-20	1260	1250 – 1270	g/l
WATER	8.5	8.0 – 9.0	gal/bag
NOZZLE DENSITY	551	532 - 570	g/l

(>3000 psf Bond Strength at a **target dry density of 22 pcf**)
Yield: **31.6 BF/BAG (2.94 m²)**

	TARGET	RANGE	UNIT
ACCELERATOR A-20	1200	1190 - 1210	g/l
WATER	8.5	8.0 – 9.0	gal/bag
NOZZLE DENSITY	735	710 - 760	g/l

HOLD POINT: Yields measured in excess of 44.9 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	
2.94	m ²	31.6	BF	710		735		760		786		811		22
3.59	m ²	38.7	BF	581		601		622		643		664		18.0
3.92	m ²	42.2	BF	532		551		570		589		608		16.5
4.17	m ²	44.9	BF	500		518		536		554		571		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:

$$\text{Yield} = 12 \times (\text{Gallons H}^2\text{o/Bag} \times 8.34 + \text{Bag Weight}) / \text{Nozzle Density}$$

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	8.5	8.0 – 9.0	gal/bag
NOZZLE DENSITY	735	710 - 760	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	
2.31	m ²	24.9	BF	903		935		968		1000		1032		28.0
2.49	m ²	26.8	BF	839		869		899		929		959		26.0
2.69	m ²	29.0	BF	774		802		830		857		885		24.0
2.94	m ²	31.6	BF	710		735		760		786		811		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:

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

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

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