



Procedure Manual
Admixture



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Introduction

What is Admixture?

Pouring fresh concrete is a time-sensitive project and unexpected delays can cause major problems. With the use of admixtures, a contractor can have more control over his concrete. Admixtures can restore loads of concrete that might need to be rejected due to delays or other complications. They can improve the performance of problem concrete by modifying its characteristics and enhancing workability.

Admixtures are additions to a concrete mix that can help control the set time and other aspects of fresh concrete. Common admixtures include accelerating admixtures, retarding admixtures, fly ash, air entraining admixtures, and water-reducing admixtures.

Chemical Admixtures

Five Functions

Admixtures are classed according to function. There are five distinct classes of chemical admixtures: air-entraining, water-reducing, retarding, accelerating, and plasticizers (superplasticizers). All other varieties of admixtures fall into the specialty category whose functions include corrosion inhibition, shrinkage reduction, alkali-silica reactivity reduction, workability enhancement, bonding, damp proofing, and coloring. Air-entraining admixtures, which are used to purposely place microscopic air bubbles into the concrete, are discussed more fully in Air-Entrained Concrete.

Water-reducing admixtures usually reduce the required water content for a concrete mixture by about 5 to 10 percent. Consequently, concrete containing a water-reducing admixture needs less water to reach a required slump than untreated concrete. The treated concrete can have a lower water-cement ratio. This usually indicates that a higher strength concrete can be produced without increasing the amount of cement. Recent advancements in admixture technology have led to the development of mid-range water reducers. These admixtures reduce water content by at least 8 percent and tend to be more stable over a wider range of temperatures. Mid-range water reducers provide more consistent setting times than standard water reducers.

Retarding admixtures, which slow the setting rate of concrete, are used to counteract the accelerating effect of hot weather on concrete setting. High temperatures often cause an increased rate of hardening which makes placing and finishing difficult. Retarders keep concrete workable during placement and delay the initial set of concrete. Most retarders also function as water reducers and may entrain some air in concrete.

Accelerating admixtures increase the rate of early strength development, reduce the time required for proper curing and protection, and speed up the start of finishing operations. Accelerating admixtures are especially useful for modifying the properties of concrete in cold weather.

Superplasticizers, also known as plasticizers or high-range water reducers (HRWR), reduce water content by 12 to 30 percent and can be added to concrete with a low-to-normal slump and water-cement ratio to make high-slump flowing concrete. Flowing concrete is a highly fluid but workable concrete that can be placed with little or no vibration or compaction. The effect of superplasticizers lasts only 30 to 60 minutes, depending on the brand and dosage rate, and is followed by a rapid loss in workability. As a result of the slump loss, superplasticizers are usually added to concrete at the jobsite.

Corrosion-inhibiting admixtures fall into the specialty admixture category and are used to slow corrosion of reinforcing steel in concrete. Corrosion inhibitors can be used as a defensive strategy for concrete structures, such as marine facilities, highway bridges, and parking garages, that will be exposed to high concentrations of chloride. Other specialty admixtures include shrinkage-reducing admixtures and alkali-silica reactivity inhibitors. The shrinkage reducers are used to control drying shrinkage and minimize cracking, while ASR inhibitors control durability problems associated with alkali-silica reactivity.

What are Sika's Expectations from Venezia Drivers?

Simply put, a clean, trouble and contamination free delivery at each stop! Loading, hauling and delivering Admixture can be a very demanding process at times. Because of the many different products and their chemical compositions, because of the possible consequences that will occur if the wrong product goes into an important or high volume concrete pour, and, because of the fast paced tempo in a very tight space that occurs naturally at busy batch plants; it is imperative that you are very thorough in your process and it's very important that you follow established procedure each and every time you transfer product both onto your trailer during the loading process, and off of your trailer during delivery. It all starts the moment you arrive at Sika to load. Follow the same steps from the beginning of the process to ensure no mistakes are made during the deliveries that you will be making.

Stepping out of the set routine can very easily cause a driver to miss a (what may seem to be a minor and inconsequential) step which could cause a contamination that will have serious effects on more than what is seen.

On our end Venezia will have to pay the cost of all the contaminated product, disposal, and any other related construction delays, etc. As for the driver causing this, the consequences can be very severe.

The way to avoid this from happening to you is;

- Have a plan for each stop before you get there
- Follow procedure exactly as you are trained every time
- Know what product was and is in your trailer compartments
- Start with a clean hose, pump and meter
- Check/confirm the product that is in the tank you intend on delivering into
- Make sure there is enough room in the tank you are delivering to including clean out
- Clean your hose, pump and meter before switching products.

Items highlighted, or in a box are of a high degree of importance.

Yellow boxes relate to safety,

Red boxes relate to product integrity, contamination and equipment.

In the unload section; Blue highlighted text pertains to gas operated pumps,

Green highlighted text pertains to Hydraulic operated pumps.

Please pay special attention to instructions found in these boxes.

Table of Contents

Section

- 1) Tools and Fittings required and PPE**
- 2) Dispatch**
- 3) Arriving at Sika and Preparing Paperwork**
- 4) Prepping Trailer For Loading/Loading**
 - A. Trailer Compartment Wash Out**
 - B. How to Determine Hose Capacity**
 - C. Loading Trailer**
- 5) Product Hose and Manifold Cleanout Procedure Product Hose and Manifold Cleanout Procedure**
- 6) Making deliveries and operating trailer**
 - A) Determine if product will fit in customer tank**
 - B) Operating Hydraulic Pump Trailer**
 - C) Engaging P.T.O.**
 - D) Operating Gas Pump Trailer**
- 7) Finalizing Delivery**
- 8) Maintenance Items**

1. Tools/Fittings and Required PPE

PPE:

The following items will be supplied by Venezia and must be worn:

Hardhat, Safety Glasses or Goggles, Reflective Vest, Rubber Gloves

Sika requires reflective vests, hardhat, safety glasses.

Sika's Customers (Concrete Batch Plants) vary by location.

Steel Toe Boots are required at all batch plants.

To determine what you will need while at the customer, notice what people outside of their equipment have on. You must wear required PPE while out of the truck. Penalties for not following requirements can be very severe. Hard sole steel toe shoes with leather uppers and a defined heel are required and must be supplied/worn by the driver.

Items Supplied by Venezia

Fittings and equipment required

1. Two- 2" male to 2" male
2. Two- 1.5" male to 1.5" male
3. One- 2" female to 1.5" male.
4. One- 2" female to 2" female
5. One- 1.5" female to 1.5" male 90 degree elbow
6. One- 1.5" male to 1" female
7. One- 1.5" male to 1" male
8. One- 2" male to 1½" female jumper hose with shutoff valve
9. Six- Orange straps- 1" wide
10. One- Drip pan
11. Chemical gloves

1: 40' plastic hose with 2" Male fitting on one end and 1.5" Female ball valve on other end

1: Container for gas if trailer is equipped with a gas pump

1: Container for fuel for pump/hose box heat

TOOLS: (not supplied)

A very bright Flashlight is a must!

18" Pipe Wrench

6" Adjustable (monkey) Wrench

¾" Open and Box End Wrench

Assorted Sizes of Flat and Phillips Head Screwdrivers

2. Dispatch:

- Drivers will receive loads Via Qualcomm and/or verbally by phone.
- Load times are typically 04:00-15:00 with some variations.

You must arrive 15 minutes early (or more) for appointments

- In order to complete paper work and be ready to pull into bay to load at the appointed time, arrival at least 15 minutes prior to scheduled time is mandatory! If you arrive late and don't notify dispatch, you will wait for a spot to open to load. This could take up to 12 hours.
- Appointments are set for every hour; because of this it is crucial to be early **ready to load by your appointment time.**
- If you are going to be late for designated time, there are protocols to follow for notification and rescheduling. **Communication with dispatch is essential!**
- All loads are considered "load and go" unless otherwise directed. There is very seldom an appointment made for deliveries, but it is expected that deliveries are made within a reasonable amount of time.
- These loads are multi stop loads and some deliveries are made with no one present at point of delivery and after hour deliveries.

3. Arriving at Sika and Preparing Paperwork

The following must be done before you drive into the Loading Bay

Enter the office area and:

- Locate your bin and pull the paperwork for your load
- Separate out the stops – make sure the customer, Sika and Venezia all get copies of Sika bill of lading for each stop and each product
- Adjust the load out sheet according to how the trailer will be loaded. The top of the load sheet has what was in the trailer last, the bottom line will have what is being loaded. (see attached)
- Some batch plants could also require State Certification Documentation if the intended product is going to be used for D.O.T. projects.

Once this is done open the door and pull your truck and trailer into the loadout bay, in the winter months; close the door behind you.

4. Prepping trailer for loading:

If there is left over product on the trailer because it could not be delivered; tell the loader and follow his instruction. Do not dump it on the floor without checking with the loader.

Waste water disposal at the Sika Fairless Hills plant is very expensive. No “slop water” is to be returned to Sika. Trailers must be washed thoroughly to prevent cross contamination, but we must reduce waste water where possible.

All trailer compartments must be cleaned when loading unless loading on top of a compatible product. 95% of products loaded in Admixture are water-based. The following steps are to be taken prior to loading at Sika every time

A) Trailer Compartment Washout

- Pull tractor/trailer through the load out lane and stop so that all dome lids will be inside the fall protection cage at the wash out area.
- On the ground – remove and store prior product tags from compartment valves
- Tag the compartment valves with the product that you will be loading in that compartment
 - **This is a crucial step and must be done at this time**
- Open trailer compartment valves.
 - All but a few products can get drained down directly onto the floor of the plant. Check with the loader if you are unsure or if you are bringing back a large amount of product
- Climb the steps and lower the fall protection cage over top of the trailer, an alarm will sound the entire time the cage is lowered.
- Release the lock and lower the gang way/steps out to the trailer.

DO NOT CANCEL THE ALARM

A). Trailer Compartment Washout (cont.)

- Open all dome lids
- Use the short hose and wand to rinse dome lid and crash box – moving the truck may be necessary to reach all lids.
- Place the spinner in the first compartment
- Secure the top plate to the dome rim, engage at least one dome lid wing nut to keep the spinner from coming out of the trailer
- Open the valve on top of the spinner plate.
- Some products take more time rinsing than others; take the time to clean compartment thoroughly. The cycle will last from 2 to 6 minutes max.
- Watch the ground to see that the water coming out of the trailer is clean

One wash cycle, in most cases will be sufficient. However, some products may require more than one wash cycle until the water discharging from the compartment is clear

- Move spinner to next compartment and repeat the process.
- Once trailer is rinsed inside – place the spinner back where you found it. Protect the spinner and the hose. Make sure it will not make contact with anything when the cage is lowered on the next trailer.
- Close and secure all dome lids.
- Raise fall protection cage – the alarm will cease.
- Raise steps/gangway – make sure the ramp is locked.
- Once back on the ground – flush out each of the compartment product lines including the ball valves.
- While water is entering trailer at the product line; open and close the ball valve several times to rinse the ball valve. **This is a crucial step that must not be skipped!** Do this as many times as it takes so that the water coming out is clear.
- Wash out hoses, pumps and meter, verify water is clear.
- Rinse out all caps fittings and pump/hose box as well as the pump/meter/hose until water is clear
- Fill water void with wash water.
- Hang load sheet so that you can refer to it as you are tagging and loading compartments.
- Tag all compartment valves for loading. (if not done so already)

Note: On the load sheet generated by Sika, the compartment illustration is listed from left to right. On the trailer compartment #1 on the curb/loading side is right to left. On our trailers; Compartment # 1 is always closest to the tractor. This is a point of confusion. Make sure you are not loading the trailer backwards! A contamination could result.

B). How to Determine Hose Capacity

Note to Trainers:

This procedure must be gone over with the trainee when his/her permanent trailer is assigned, to determine hose capacity. Guessing capacity wrong will cause a contamination.

This step is important so that you know exactly how much water is needed to push product completely out of the hose without causing product contamination Do this while loading at Sika the first time with any trailer to determine exact hose capacity.

- Start with a completely empty hose
- Reset meter to zero
- With a compartment filled with enough wash water to completely fill the hose - run water through the pump, meter and hose keeping an eye on the hose end.
- When water comes out of the hose; note the exact gallons showing on the meter.
- This is the exact hose capacity. This will come in handy when making deliveries when you must clean out the hose by pushing product through with water when switching products.

C). Loading trailer

- All valves need to be tagged marking which product will go into which compartment. Before the loading process begins
- After tagging and washing the trailer; alert the loader that your trailer is ready to load.
- The loader will direct you to which spot to pull the trailer to for loading product.
- You will be moving the hose connection from compartment to compartment on the trailer during the loading process.
- Confirm the correct product, the correct compartment and the valve is open and all tags and paperwork match before putting each product on the trailer.
- The loader will tell you what product he has in the line, you and he will verify by saying back to him which compartment you are hooking to on your trailer and the amount of product to be loaded.
- The loader will tell you when he has pushed all of the product into the compartment – close the compartment product line valve.

Section 3C Loading the Trailer continued:

- When the loader tells you to remove the hose – switch to the next compartment. **Do Not Switch the hose until you are told to do so.**
- Replace the product line cap with the cam locks at the 9 and 3 o'clock position. **This indicates a compartment that has product in it.**
- Continue loading in this fashion until all compartments/products are loaded.
- When finished loading make sure that all dome lids are closed, all valves are closed with caps in place.

Double and triple check tags and paperwork to make sure all match the way the trailer is loaded – one last time.

- ❖ In cold weather; Run the box heater on the trailer. Sika product are water based and will freeze in the hoses and the pumps making delivery nearly impossible

- Make sure hoses are dry (in winter) and in place and all compartment doors are secured for travel with heat on.
- Pull truck and trailer out of the bay
- Go back and close the overhead door.

While out side of the building, now would be a really good time to plan out your deliveries. Think about how you will run your stops, which products you will unload in which sequence to make time at stops efficient. Think about what you will need to wash out the hose/pump and meter for. Is the next customer getting the same product? If so, you can save yourself some time and a wash if you plan the stops out well.

Fill out the meter tickets now. Write on the rear exposed side of the ticket what product, what trailer compartment and quantity to be delivered. Place the meter tickets in stop/product sequence, as you planned out, in order on a clip board. This will help you to follow your plan.

5. Making deliveries and operating trailer

Section A: Arrival and Setup – making certain the correct product goes into the correct tank with sufficient room

- Upon arrival at the customer, place your truck and trailer into position so that you can access the ADMIX storage tanks, and so that you won't impede mixer, loader and aggregate delivery traffic.
- **If you have a hydraulic trailer, engage tractor PTO now**
- With the paperwork you prepared for this stop go to the tanks and verify what products you are delivering are going into which tanks and make sure there is enough room for the amounts to be delivered, and consider extra room needed in the tank to blow or wash your hose clean.
- If two tanks, containing the same product, are tied together by a hose and valve – close the valve to transfer into one tank at a time. You must reopen this valve when you are completely finished with this product.

Always replace customer tank valves to the position they were in when you leave. Keep the storage tank container clean and free of trip hazards. Do not get dirt/grease from your gloves on the storage tank as they are hard enough to see through.

- Note the tank graduation marks at the start before you put any product in to see that there is enough room. Do this for every tank before you open any valves. If a meter malfunctions this will help you to determine how much product you delivered.

Verify compartment, correct tank and correct product with your paperwork making sure again that meter ticket and tags on trailer all match.

- Once everything is verified – Reset pump meter to zero, place meter ticket into meter with your written instructions exposed.
- Remove the correct compartment product line cap.
- Hook the pump inlet/jumper hose to the correct compartment fitting, making sure again you are hooking to the correct compartment – **verify using the tag.**
- Drag product delivery hose to the tank into which you are going to deliver.
- Verify the tank/product is correct.
- Place a spill pan under the tank fitting and remove the cap.
- Hook the product hose to the bottom fill fitting/valve on the tank.

Section 5 - Making deliveries and operating trailer (cont.)

B) - Connecting pump hose to customer and correct manifold/compartiment to pump

BEFORE OPENING ANY VALVES, DOUBLE CHECK PAPER WORK AND BOTH ENDS OF DELIVERY LINE TO MAKE SURE ALL PRODUCTS MATCH

A contamination doesn't happen until you open valves. This is your FINAL opportunity to catch a problem before a possible contamination. This is your last opportunity to prevent a contamination!

- Once you are sure you are hooked correctly; open valve on manifold to start product gravitating to pump (**hydraulic pump only**)
- Check all fittings and valves to make sure nothing is leaking on the trailer end.
- Go to tank you are unloading into and open tank then hose valves checking connection for leaks.
- Go back to trailer and start the pump.
- For a hydraulic pump – engage the pump bypass lever
- **For a trailer equipped with a gas pump:**

Make sure pump fuel tank is full of fuel before you start pump!

- Start the pump by turning the engine switch on
- Pull the start cord. A cold motor may need to be choked.
- Open compartment/manifold valve
- Check all fittings, connections and valves again for leaks.
- Gauge product amount by using the numbers showing on the meter.
- While unloading; keep an eye out for leaks while making sure product delivery will not overflow the tank.
- When you reach the desired amount to be delivered, or, the tank is topped off; follow product hose clean out procedure in the next section

WARNING! Cleaning hose out into a tank that has been filled to the top will cause a spill! Always leave enough room in the tank at the end of a delivery to clean out the hose without blowing product out of the tank during the cleanout process.

6. Product Hose and Manifold Cleanout Procedure

Option 1: Use this option if you will be delivering the same product to the next customer and a pump hose clean out is not needed.

- shut off the compartment valve.
- Slowly release the camlock connection from the compartment fitting with pump running.
- Ease the jumper hose off of the compartment fitting. This will allow the pump to pull air through the jumper hose, which will clear remaining product from the jumper hose through the pump.
- Place product line back onto manifold and stop the pump.
- Proceed to storage tank, close the valve on the storage tank and the hose on the product line
- carefully disconnect product delivery hose from the customer tank fitting.
- Place cap onto fill line at bottom of storage tank and drag hose back to trailer. Pay close attention to other storage tanks around you so as not to accidentally open those valves.

Option 2: Use this method to flush out your pump hose

- Back at the trailer – using fittings; adapt as necessary so that product discharge end of hose (that you pulled off of customers tank) can be placed on to the trailer compartment that the product came from.
- Hook the pump inlet to the water tank/void on the trailer.
- Open the compartment valve

⚠ It is important to know what the water capacity of your hose is.

- Open the water valve and start pump.
- Watch the meter; allow water to push the product back into the correct trailer compartment.
- Stop when pump meter reaches known hose capacity.
- Close valves on the water tank and the trailer compartment.
- Stop the pump
- Remove hose ends and allow clear water to drain on the ground. (If possible)

Clear water only is permitted to drain on the ground. Do not let Sika product to hit the ground at any customer.

Section 6 Continued;

1. For Trailers with pumps driven by Gas Motors always do the following:

- a. Always Shut fuel valves off before Transit
- b. Bring the engine RPM's down to an idle for 10 seconds prior to shutting the pump motor off
- c. Flood the pump prior to starting the engine
- d. Drain the pump at all times in temperatures below 35 degrees
- e. Do not operate pumps with the doors closed

Section 7: Finalizing delivery

- Fully rewind hose on hose reel – stow for travel
- Replace all compartment product line caps
- Put all fittings away
- Gather all paperwork for this stop (meter tickets and invoice) and give to customer
- Stow fuel cans for travel
- When required; turn box heat on
- Close pump box door
- Disengage PTO

As of March 1st 2021 - All meter tickets must be signed by the customer in region 20, then returned to Sika with your paperwork.

Section 8: Maintenance Points

2. Water Tanks
 - a. Make sure Heater Elements are Shut Off When the tank is empty
3. Meters
 - a. Check Meter heads (Square Headed) hold down bolts DAILY for tightness
SEE ATTACHED PICTURE
4. Heaters
 - a. Prior to the colder weather check your heaters that they are operating properly.
 - b. Always use Quality Fuel when filling the heater tanks.
5. Stinger Cords
 - a. Make sure you have a stinger cord on your tractor before dispatch.
 - b. These cords provide current to your trailer for your Meters, Hose Reels, and Heaters.
 - c. Make sure the tractor is supplying consistent voltage if there is something operating in the trailer.





Sika Admixture Training

Fittings and equipment required

1. Two- 2” male to 2” male
2. Two- 1.5” male to 1.5” male
3. One- 2” female to 1.5” male.
4. One- 2” female to 2” female
5. One- 1.5” female to 1.5” male 90 degree elbow
6. One- 1.5” male to 1” female
7. One- 1.5” male to 1” male
8. One- 2” male to 1½” female jumper hose with shutoff valve
9. Six- Orange straps- 1” wide
10. One- Drip pan
11. One-pair of chemical gloves

Training Checklist:

- ____ Hydraulic Pump training
- ____ Gas Pump training
- ____ Trailer inspection
- ____ Trailer loading
- ____ Planning routes
- ____ Directions and customer information questions-know your Sika Tech
- ____ Arriving at customers + check in process

Unload process:

- ____ Locating tanks and confirming remote fill runs
- ____ Selecting unload sequence of products
- ____ Checking tank space
- ____ Hooking up and securing lines
- ____ Operating truck PTO, trailer pumps and reels
- ____ Moving product into the tanks
- ____ How to prevent overflow
- ____ Clearing the lines between products
- ____ Washing back into trailer
- ____ Reporting site hazards
- ____ Spills + emergency situations
- ____ Training is complete, trainee is ready to go out on his/her own.

(Signature of trainer)

Dates Trained: _____

Trainee name: _____

Trainer name: _____

Trainer Signature: _____