BLENDING BEST PRACTICES

Auto-Chlor® SYSTEM

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BLENDING

BLENDING

PURPOSE:

This guide provides a comprehensive overview and recommendations for the branch blending process, aiming to ensure that all personnel involved follow consistent and effective practices. By adhering to these guidelines, we maintain high standards of quality, safety, and operational efficiency. The document covers key aspects such as pre-batch preparations, personal protective equipment (PPE) requirements, batch sheet handling, post-batch cleanup, and practical tips for enhancing the blending process.

SCOPE:

This document applies to Branch Blending departments

DEFINITIONS:

- Chemical Blending: The process of combining two or more chemicals to form a new, permanent chemical compound. Once blended, the ingredients cannot be separated.

RECORDS:

- Batch Sheet: Maintain either physical or digital records of all batch sheets.
- Tank Cleaning Form: Attach to batch records to document that the tank was cleaned both before and after the batch.

DOCUMENTS:

- Batch Sheet
- Tank Cleaning Form

RESPONSIBILITY:

- Production/Blending Staff: Execute the blending process according to these guidelines.
- Branch Manager: Ensure adherence to the procedures and oversee compliance.

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1 PRE-BATCH PREPARATIONS

CLEAN & ORGANIZE:

Ensure the blending area is spotless, organized, and free of any residues from previous batches.

EQUIPMENT CHECK:

Confirm that all necessary tools and equipment are available, in good condition, and ready for use.

BATCH SHEET PREPARATION:

Print out a new batch sheet and thoroughly review it to understand the specific requirements of the batch.

RAW MATERIAL VERIFICATION:

Gather all required raw materials, verify their quantities against the batch sheet, and inspect them for any irregularities.

2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

REQUIRED PPE:

The blending process requires specific PPE, including rubber/nitrile gloves, safety goggles, a chemical-resistant coat or uniform, rubber boots, and a rubber apron. Additional PPE like plastic sleeves, face shields, chemical-resistant jackets, and bump caps are available upon request.

PPE FITTING & MAINTENANCE:

Ensure all PPE fits properly and provides adequate protection. Regularly inspect and maintain PPE, replacing any worn or damaged items.


Nitrile Gloves


Face Shield


Safety Goggles


Bump Cap

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3 LOCATING THE BATCH SHEET

Batch sheets are available on the Auto-Chlor Web Portal in the Formulations Folder. If unavailable, contact Memphis Customer Service for assistance.

REVIEW & DOCUMENTATION:

Carefully read through the batch sheet to familiarize yourself with the requirements. Record all relevant data during the blending process, ensuring entries are legible, accurate, and signed off by responsible personnel.

4 POST-BATCH CLEANUP

EQUIPMENT & AREA CLEANING:

Thoroughly clean all equipment and the blending area to prevent cross-contamination with future batches.

WASTE DISPOSAL:

Dispose of waste materials according to company protocols.

FINAL INSPECTION:

Conduct a final inspection to ensure the blending area is clean, organized, and ready for the next batch.

5 TIPS & TRICKS

Always triple-check raw material weights and measurements to ensure accuracy. Write down target weight on drum so you don't need to keep the paperwork near potential exposure to wetness. Write down initial weight so you can determine volume removed if your scale loses memory (or anything else goes wrong). If pulling chemical from multiple containers, note the weight added before pumping chemical

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from the last drum so you can calculate the exact amount removed from that drum. If counting is involved (i.e. 50lb bags of powder), pre-stack exactly what you need by the tank before adding any (and triple check the count). Need to eliminate the risk of losing track of your count as you're adding things to the tank and can't double check what's been added mid blend. Double check the contents of all the drums on a pallet before pumping from them. Don't assume that because 3 drums are one raw material, that the 4th is also that material.

BLENDING BY WEIGHT:

It is recommended to blend by weight rather than volume as it is much more accurate if you keep your scales calibrated and regularly serviced.

SEQUENTIAL MIXING:

Fully mix each raw material before adding the next to ensure proper integration.

EQUIPMENT CLEANING:

Clean pumping equipment between each new raw material to prevent reactions and contamination.

TROUBLESHOOTING LOG:

Maintain a log of common issues encountered during the blending process and how they were resolved. Share relevant issues with the Memphis lab for assistance.

COMMUNICATION & REVIEW:

Maintain open communication with team members, regularly review blending procedures, and reach out to the Memphis R&D lab for process improvements.

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6 USING APPROPRIATE EQUIPMENT

IDENTIFY REQUIREMENTS:

Determine equipment needs based on the product being manufactured.

SELECT & MAINTAIN EQUIPMENT:

Choose suitable equipment and maintain it according to the manufacturer's recommendations. Regularly calibrate and keep records of all equipment activities.

TRAIN PERSONNEL:

Ensure staff are trained on proper equipment use, maintenance, and the importance of equipment reliability.

DOCUMENT EVERYTHING:

Keep detailed records of all equipment-related activities, ensuring they are accessible and retained for an appropriate period.

7 TROUBLESHOOTING

OUT OF SPEC BLEND:

Causes may include incorrect raw material measurements or incomplete mixing.

1. Solution:
   Recheck measurements and ensure thorough mixing.

2. Contact Memphis R&D lab for more detailed recommendations.

EQUIPMENT MALFUNCTION:

Causes may include improper maintenance or incorrect calibration.

Solution:
Refer to the equipment manual, perform recalibration, or contact maintenance.

HOLD TANK/BLENDER WASHOUT SHEET

Auto-Chlor SYSTEM

HOLD TANK/BLENDER _____

TANK # _____

LAST PRODUCT _____

UPDATE MIXER BOARD _____

BATCH # _____

CLEANED BY (OPERATOR) _____

INSPECTED BY (MIXER) _____

DISCHARGE VALVE CLOSED? YES NO

QC TESTING

QC TESTING

PURPOSE:

The purpose of this document is to establish standardized procedures for conducting Quality Control (QC) testing within the manufacturing process. By providing clear guidelines, this document ensures that all personnel involved in QC testing adhere to consistent practices, thereby maintaining product quality, ensuring regulatory compliance, and safeguarding customer satisfaction. The document covers the location and usage of QC test methods, identifying necessary QC tests for each batch, performing the tests accurately, and managing chemical retains.

SCOPE:

This document applies to all personnel involved in the Quality Control processes within the production department, including but not limited to, production managers, blending staff, and QC personnel. It is relevant for all products manufactured within the facility.

RECORDS:

- QC Test Results: All results must be meticulously recorder on the batch sheet, ensuring accuracy and completeness. These records must be securely stored, either physically in a locked file cabinet or electronically in a designated and secure database.

DOCUMENTS:

- QC Test Procedures
  - Appearance- G18(001)
  - Odor- G46(001)
  - Specific Gravity- G14(009)
  - pH Determination- G12(001)
  - Free & Total Acidity- G1(001)
  - Free & Total Alkalinity- G2(001)
  - Viscosity- G15(006)
  - Bleach Content
  - Quat Content- G10(001) & C072
- Batch Sheet: A critical document that outlines all necessary QC tests and is used for recording test results.

RESPONSIBILITY:

- Production Manager: Ensures QC procedures are followed and that all necessary resources are available for testing.
- Blending Staff: Performs QC tests and records results accurately.
- QC Personnel: Oversees the entire QC process, ensures compliance with procedures, and provides guidance as needed.

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1 LOCATING QC TEST METHODS

QC test methods are available on the company's web portal. These should be printed and kept in a binder located in the QC testing area.

Ensure the test methods are current and approved. If uncertain, verify the latest version on the web portal.

2 IDENTIFYING REQUIRED QC TESTS FOR EACH BATCH

Review the batch sheet thoroughly to identify all required QC tests.

Confirm that you have the correct methods and materials to perform the necessary tests.

Double-check that all reagents are within their expiration dates and that equipment is calibrated.

3 PERFORMING QC TESTS

1. **SAMPLING:** Use a dipping wand to collect a 1-pint sample from the batch.
2. **TEST EXECUTION:** Follow the QC test methods precisely to ensure consistent and reliable results.
3. **PREPARATION:** Gather all required reagents, equipment, and samples before beginning the tests.
4. **ENVIRONMENT:** Conduct tests in a clean and controlled area to avoid contamination and ensure accurate results.

BEST BLENDING PRACTICES

5

RECORDING: Document all results on the batch sheet, noting any deviations or anomalies, and report them to the Production Supervisor or Branch Manager.

6

EQUIPMENT CALIBRATION: Regularly calibrate and verify the performance of all testing equipment according to the manufacturer's instructions.

4 IMPORTANCE OF EACH QC TEST

APPEARANCE:

A key indicator of product quality, ensuring the product is mixed correctly and remains stable.

ODOR:

Reflects formulation accuracy and ingredient stability, influencing user experience and safety.

pH:

Critical for the effectiveness and safety of the product, impacting its cleaning properties and user safety.

SPECIFIC GRAVITY:

Verifies formulation accuracy and consistency, ensuring correct ingredient proportions.

FREE & TOTAL ALKALINITY:

Important for cleaning efficiency and safety, particularly in neutralizing acids and breaking down organic materials.

FREE & TOTAL ACIDITY:

Essential for effective cleaning and safety, especially in neutralizing bases and dissolving inorganic deposits.

VISCOSITY:

Crucial for products dispensed through dispensers, ensuring consistent flow and controlled usage.

CHLORINE CONTENT:

Determines the efficacy of chlorine-based sanitizers in killing harmful microorganisms.

QUAT CONTENT:

Ensures the effectiveness of sanitizers using quaternary ammonium compounds, critical for disinfection.

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5 CHEMICAL RETAINS

PURPOSE OF RETAINS:

Retains serve as reference samples for future analysis in case of customer complaints, stability studies, or regulatory reviews; and they verify the product's consistency and quality over time.

STORAGE GUIDELINES:

Store retains in a designated, secure area, maintaining conditions similar to expected storage for finished goods.

Clearly label each retain with the batch number, date of manufacture, and product name.

Use appropriate containers to prevent degradation, such as sealed glass or plastic containers.

Maintain a log of all retains, including storage location, quantity, and condition, and regularly check them to ensure they remain intact.

Retains should be kept for one year, which aligns with the typical shelf life of most products, except for chlorine products, which should be retained for six months.

QUALITY CONTROL TEST METHOD (APPEARANCE)

PURPOSE:

The purpose of this procedure is to ensure that all products manufactured by Auto-Chlor meet the required appearance standards before release for distribution. This includes visual inspection for color, clarity (or designated opacity/haziness), consistency, and the absence of any foreign particles.

PRINCIPLE:

This procedure applies to all products produced in the plant that require appearance checks as part of their Quality Control (QC) process, including those that are designed to be hazy or opaque.

APPARATUS:

500mL Glass Beaker
Previous batch remains (for comparison, if applicable)

PROCEDURE:

1. Color Check:
   A. Hold the sample against a white background in a well-lit area.
   B. Compare the sample's color to the previous batch retains or the specified color standard in the product specification.
   C. Document any deviations from the expected color.
2. Clarity or Opacity Check:
   A. If the product is designed to be clear, observe the sample to ensure it is free from haze or cloudiness.
   B. If the product is designed to be hazy or opaque, confirm that the appearance matches the previous batch retains or the specified appearance criteria.
   C. Document the clarity, haze, or opacity is consistent throughout the sample.
3. Consistency Check:
   A. Swirl the sample gently and observe the consistency. The product should appear uniform without any separation or layering.
   B. For opaque products, ensure that the opacity is consistent throughout the sample.

4. Foreign Particles Check:
   A. Inspect the sample visually for any foreign particles, sediment, or other contaminants.
   B. Document the presence of any unusual or unwanted material.

QUALITY CONTROL TEST METHOD (ACIDITY)

PURPOSE:

To determine the acidity of a water-soluble liquid, paste, or powder using indicators.

PRINCIPLE:

Titration of a sample solution, while using a standard volumetric solution of Sodium hydroxide 1.00 Normal, in the presence of bromophenol blue and phenolphthalein.

APPARATUS:

- 250mL Beaker
- Magnetic Stir Bar
- Magnetic Stirrer
- Scale/Balancer
- Pipette
- Burette

APPARATUS:

- Sodium hydroxide solution 1.00 Normal
- Bromophenol blue solution
- Phenolphthalein solution

PROCEDURE:

1. Weigh 1.0 gram of sample into a 250mL beaker. Add100mL of water. Place sample on magnetic stirrer and stir the solution.
2. Add 4-5 drops of Bromophenol blue. Titrate the solution using Sodium hydroxide 1.00 N, until a blue color is reached.
3. Record the mL of titrant (T1) used. Add 4-5 drops of Phenolphthalein and continue titrating until the color changes from blue to a violet color. Record the mL of titrant used (T2).

CALCULATIONS:

- *Free Acidity*= (T1) x (W) x (N) x (4.9)
- *Total Acidity*= (T2) x (W) x (N) x (4.9)

DETERMINATION OF ACTIVE & TOTAL ALKALINITY

REAGENTS:

- Phenolphthalein Indicator
- Bromophenal Blue Indicator
- 1N Hydrochloric Acid

PROCEDURE:

1. Place 1 gram of alkaline material in a 300mL Erlenmeyer flask.
2. Add about 100mL of D1 water to the flask along with 3-5 drops of phenolphthalein indicator.
3. Titrate with 1N Hydrochloric Acid until pink color disappears.
4. Record mL of Hydrochloric Acid.
5. Add 3-5 drops of Bromophenol Blue indicator.
6. Continue titration until the color changes from blue to yellow.

CALCULATIONS:

- % Active Alkalinity= $\frac{\text{mL Hydrochloric Acid @ first endpoint *1.0 *0.031 *100}}{\text{wt. of sample}}$

- % Total Alkalinity (T)= $\frac{\text{mL Sulfuric Acid (total) *0.1 *0.031 *100}}{\text{wt. of sample}}$

FACTORS:

- Na20- 3.1 (0.031)
- K20- 4.7 (0.047)
- K0H- 5.61 (0.0561)
- NA0H- 4.0 (0.040)

QUALITY CONTROL TEST METHOD (ODOR EVALUATION G46 (001))

OBJECTIVE:

To assess and confirm that the odor of the product matches the specified fragrance and intensity described in the product specifications.

SCOPE:

This procedure applies to all liquid and gel cleaning products manufactured at the facility, as required by batch-specific quality control tests.

MATERIALS NEEDED:

Sample fo the product to be tested
Reference sample or description of the specified odor profile
Clean, odor-free testing area

SAFETY PRECAUTIONS:

Perform the test in a well-ventilated area to avoid inhaling vapors excessively.
Wear appropriate personal protective equipment (PPE), such as gloves and safety goggles, if needed based on the product's safety data sheet (SDS)

PROCEDURE:

1. Preparation
   A. Ensure that the testing area is free from any foreign odors that could interfere with the evaluation.
   B. Wash hands and avoid using scented lotions or perfumes before the test.
   C. Gather the product sample and any reference sample or detailed odor profile description.
2. Sample Evaluation
   A. Open the container holding the product sample carefully to minimize spillage or aerosol formation.
   B. Position the container approximately 6–8 inches away from your nose.
   C. Gently waft the odor towards your nose using your hand to prevent overpowering inhalation. Do not inhale the vapor directly from the container.

3. Odor Assessment
   A. Close your eyes and focus on identifying the primary fragrance and any secondary notes.
   B. Compare the odor of the product sample with the specified reference description or reference sample.
   C. Evaluate the following characteristics:
      I. Fragrance Match: Does the odor correspond to the expected fragrance (e.g., lemon, floral, unscented)?
      II. Intensity: Is the odor too strong, too weak, or at the specified level?
      III. Off-Odors: Are there any undesirable or unexpected scents present, such as chemical or rancid notes?

QUALITY CONTROL TEST METHOD (pH DETERMINATION (G12 (001))

Auto-Chlor SYSTEM

QC Test Method: G12(001)	Date Issued: May 12, 1993
Issued By: Watford CTC	Supersedes:
Reason For Issue: Transfer to New Format	Page: 1 of 1
Authorized By: R.D. Baker	Written By: L.F. Third

PURPOSE:

To determine the pH value of an aqueous solution using a pH meter.

SCOPE:

To determine the pH value of an aqueous solution by potentiometric measurement.

PRINCIPLE:

Potentiometric measurement using a commercial pH meter with glass and calomel electrodes immersed in an aqueous solution.

APPARATUS:

1. pH meter (capable of being read to ± 0.02 pH unites and accurate to ± 0.1 pH unit).
2. Glass electrode
3. Calomel reference electrode (a combination electrode may be used in place of the glass and calomel electrodes)

REAGENTS:

Two standard buffer solutions (whose pH values differ by no more than 6 pH units and whose values bracket the pH of the test solution).

PROCEDURE:

Immerse the two beakers containing the two portions of the test solution into a water bath to reach the specified measurement temperature. Calibrate the pH meter using the two buffer solutions according to the instrument manufacturer's instructions.

Weigh an amount of test sample and dissolve it to make up the required solution*. Immerse the electrodes in the test solution, stir, and record the pH value 30 seconds after a stable reading has been obtained. Repeat the measurement.

*see individual Q.C./R.M. specifications

QUARTERNARY AMMONIUM CHLORIDE TITRATION TEST METHOD C (072)

REAGENTS:

- Silver Nitrate, 0.1N
- Dichlorofluorescein Indicator, 0.1% solution in IPA
- Isopropyl Alcohol, 50% (50% IPA/50% water)
- Glacial Acetic Acid

PROCEDURE (TEST PRODUCT BEFORE ADDITION OF DYE):

1. Using 6cc syringe, add 6cc of sample into 250mL Erlenmeyer flask.
2. Add 50mL of 50% Isopropyl Alcohol solution.
3. Add 5-6 drops of Dichloroflurescein indicator.
4. Add 1 drop of Glacial Acetic Acid.
5. Titrate with 0.1 N Silver nitrate solution to a sharp pink endpoint.

CALCULATION:

% Active Quat= mL of Silver nitrate x 0.595

50% Isopropyl Alcohol Solution: Premix 250mL of Isopropyl Alcohol with 250mL of water. Store in quart bottle labelled as 50% Isopropyl Alcohol Solution.

VISCOCITY DETERMINATION

EQUIPMENT:

- Stop Watch
- Thermometer
- Zahn Cup-Type Viscosimeter

PROCEDURE:

1. Collect sample to be measured in a container at least 4” deep and 3” diameter (a 500cc beaker works well).
2. Adjust the sample temperature to 70°F ± 2°F.
3. Stir the sample well.
4. Place the viscosimeter into the sample submerging it completely.
5. Lift the viscosimeter completely out of the liquid and start the stop watch when the bottom of the viscosimeter breaks the liquid surface, beginning to drain the sample through the orifice in the viscosimeter.
6. Stop the stop watch when the steady flow of liquid suddenly breaks from the orifice of the viscosimeter. Record the time in seconds.
7. Repeat steps 4 through 6 until consistent results are obtained. Average the times for results to verify product quality determined by the product specification.
8. Clean the stainless steel viscosimeter with mild detergent (hand dish product) and warm water. Dry with a soft tissue (or air dry) before re-use or storage.

SPECIFIC GRAVITY DETERMINATION

Auto-Chlor® SYSTEM

EQUIPMENT:

- 500cc Graduated Cylinder
- Thermometer
- Hydrometer

PROCEDURE:

1. Measure approximately 500cc of product to be tested in the 500cc graduated cylinder.
2. Adjust the product temperature to 70°F ± 2°F
3. Insert the appropriate range hydrometer into the flask/product pushing the hydrometer down the full length of the hydrometer scale.
4. Release the hydrometer allowing it to “float” or rise in the liquid. Allow sufficient time for stability before reading. NOTE: Thicker liquids require longer time for the hydrometer to stabilize (or stop rising to the final level)
5. Read the specific gravity from the scale on the hydrometer. Check the value against the product specification for product quality.

See attachments for product specification range for specific gravity.

PACKAGING

PURPOSE:

The purpose of this guide is to provide detailed and standardized best practices for the packaging, pouring, and bottling of products. This guide aims to ensure that all personnel involved in these processes adhere to consistent practices that maintain product quality, safety, and regulatory compliance. The document covers essential aspects such as filling techniques, labeling procedures, and adherence to Department of Transportation (DOT) requirements, along with practical tips and tricks to optimize efficiency and accuracy.

SCOPE:

This guide applies to all personnel involved in the packaging, pouring, and bottling processes within the company, including operators, supervisors, and quality control staff.

RECORDS:

- Pouring Report: Ensure that all pouring activities are accurately documented, including batch numbers, quantities, and any deviations from the standard procedure.

DOCUMENTS:

- Pouring Report: A standardized form for documenting all aspects of the pouring process.
- Line Clearance Form: A checklist to confirm that the filling line has been cleared and is ready for the next batch.

RESPONSIBILITY:

- Production Manager: Ensures that all packaging, pouring, and bottling processes are executed according to best practices and regulatory standards.
- Branch Manager: Oversees the overall packaging operations within the branch and ensures compliance with this guide.

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1 TIPS & TRICKS ON HOW TO FILL BOTTLES:

USING FILLING LINE:

Preparation: Ensure the filling line is thoroughly cleaned, properly calibrated, and free of any contaminants before use. Regular maintenance is essential to prevent cross-contamination and ensure accurate fills. Verify that the correct settings for fill volume and speed are applied for the product being processed.

During Operation: Continuously monitor the filling process to ensure bottles are filled to the correct level. Inconsistent fill levels can lead to quality issues and customer complaints. Adjust the filling speed and volume settings as necessary to maintain consistency, especially when switching between different bottle sizes or product viscosities.

Post Filling: Inspect filled bottles to ensure there are no leaks, spills, or other defects. Remove any bottles that do not meet quality standards.

BY HAND:

Preparation: Ensure that all hand-filling equipment is clean and in good working condition. Equipment such as funnels and hold tanks should be cleaned regularly.

Pouring Technique: Pour the product carefully, aiming for consistent fill levels across all bottles. Hold the bottle at an angle or use a filling tube inserted to the bottom of the bottle to minimize foam production.Avoid allowing foam to run over the bottle rim, as it can cause inaccurate fill levels, product waste, and contamination of the bottle exterior.

Post Filling: After filling, immediately cap and seal each bottle to prevent contamination. Inspect bottles for any excess foam or spills that may need to be cleaned before labeling. Also make sure to inspect leaks.

BEST BLENDING PRACTICES

2 LABELING

Preparation: Ensure labels are clean, dry, and free from defects before application. Store labels in a controlled environment to prevent damage from moisture or temperature fluctuations.

Application Process: Apply labels straight and centered on the designated area of the bottle. Consistent pressure is necessary to avoid wrinkles and air bubbles, which can compromise the label's appearance and adhesion. For large batches, consider using automated labeling machines to enhance efficiency and consistency.

Labeling Tools: Automated labeling machines are recommended for high-volume production to ensure precision and reduce the risk of human error.

Recommending Lot Numbers on Labels: While not required, it is recommended to include lot numbers on all product labels to enhance traceability and quality control.Ensure that any included lot numbers are legible and prominently placed on the label. Use durable, smudge-resistant ink to prevent lot numbers from becoming illegible over time.

3 REUSING CONTAINERS

Reusing containers for chemical products can be an efficient and environmentally responsible practice, but it requires careful cleaning and inspection to ensure product integrity and safety. To clean a container for reuse, first empty it completely, rinsing out any remaining residue thoroughly with water or an appropriate solvent that does not react with the previous chemical. For particularly stubborn residues, a mild detergent solution may be used, followed by multiple rinses to ensure no cleaning agent remains. Be sure to also clean the container's lid or closure system to prevent cross-contamination. Allow the container to air dry fully in a well-ventilated area before refilling.

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For containers that previously held EPA-registered pesticide or chemical products, a triple rinse procedure is required to ensure proper decontamination before disposal or reuse. To perform a triple rinse:

1. First Rinse: Fill the empty container approximately 10-20% full with clean water. Secure the cap and shake the container vigorously, making sure to rinse all interior surfaces. If the container has held a viscous product, you may need to let the water coat and flow over the interior for better cleaning. Pour the rinse water into an application device or use it in a way that adheres to the product's label instructions.

2. Second Rinse: Repeat the same process as the first rinse, again using 10-20% of the container's volume in water. Shake the container well, ensuring that all surfaces are rinsed. Drain the rinse water into the application device or use it as specified on the product label.

3. Third Rinse: Perform the final rinse using clean water, shaking and draining the container thoroughly into the application equipment. Ensure no residual water remains inside after the final rinse by inverting the container and allowing it to drain completely.

Following the triple rinse, inspect the container for any remaining residue or damage, and let it dry thoroughly. The container can then be reused or recycled per EPA guidelines and local regulations, ensuring it does not pose a risk to the environment or contaminate new chemical products. Always follow the specific rinsing and disposal instructions provided on the product label, as they are legally binding and critical for compliance.

After cleaning, inspect the container carefully for any signs of damage or wear that could cause leaks. This includes checking for cracks, warping, or weakened areas, especially along seams and near the bottom, where the container experiences the most stress. To test for leaks, fill the container with water and gently press on the sides, looking for any drips or beads of moisture forming on the exterior. If the container passes this test and shows no signs of compromised structure, it should be

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safe to reuse. However, if any damage is detected, the container should be properly recycled or disposed of following local regulations, as compromised containers can pose significant safety and quality risks.

4 DOT REQUIREMENTS

Verify that the correct labels are used for each product as specified on the batch sheet. Use only Auto-Chlor approved packaging materials and containers that meet DOT standards for the specific type of product being shipped. Ensure all shipping documents and labels are accurate, complete, and comply with DOT regulations.

5 TIGHTENING CAPS TO THE PROPER TORQUE

Ensure caps are tightened to the specified torque for the different container sizes. Use a calibrated torque wrench to achieve consistent cap tightness and prevent leaks.

Line Clearance Form

This form is to be completed for each product run and attached to the production order packet

Finished Product: _____ Lot#: _____ Washout neutral? _____

Performed by _____ **Line Clearance for Start Up**

Verify that the entire previous run product has been removed from the line _____

Verify that the filler and all connecting lines have been flushed enough to remove previously run product. (Formula change) _____

Verify that all pkg. components from a previous run have been removed from the conveyors, unless they are generic components for this run. _____

Verify that all pkg. components from a previous run have been removed from the staging area, unless they are generic components for this run. _____

The Prep for Start Up (Attain Production Order (PO/Take Sheet)

Check lot # at ALL printers and print lot # on take sheet. _____

Verify that all pkg. components and part numbers match those listed on the P.O. including on PRINTERS. _____

Inspect materials for any obvious damage that may have occurred during handling or storage, place components in their proper line locations. _____

Verify that EPA information is present and accurate on case and bottle If needed. _____

Verify that the primary packaging LOT # is present and accurate. _____

Check tote for Manufacturing /Expiration date. (3 years for corrosive) _____

Record fill weights at the beginning of the run and two per pallet. (Refer to take sheet for fill weight range) For 15G, weigh at least every 4th container of product.

TARGET FILL WEIGHT:

_____

FILL WEIGHT					

REGULATORY

REGULATORY

PURPOSE:

The purpose of this document is to provide an overview for managing your branch's regulatory responsibilities. This specifically covers procedures for wastewater management, air permits, Tier II reporting, Environmental Protection Agency (EPA) compliance, and Department of Transportation (DOT) requirements.

SCOPE:

This document applies to all personnel responsible for regulatory compliance within the branch.

RECORDS:

- Wastewater Testing Log
- Production Log
- Pouring report
- QC testing report

DOCUMENTS:

- Wastewater Testing Log
- Production Log
- Pouring report
- QC testing report

RESPONSIBILITY:

- Production Manager: Ensures that all regulatory processes are followed and that records are maintained according to best practices.
- Branch Manager: Oversees branch-specific regulatory compliance and ensures alignment with these guidelines.

BEST BLENDING PRACTICES

1 WASTEWATER MANAGEMENT

Managing wastewater in a cleaning chemical production facility involves the systematic collection, treatment, and disposal of water used during manufacturing. Your facility must either treat wastewater on-site or arrange for it to be hauled to an appropriate treatment facility. Regular monitoring of water quality and equipment maintenance is essential to comply with environmental regulations and prevent contamination.

REQUIREMENTS:

- Comply with local, state, and federal regulations for wastewater discharge.
- Regularly monitor and document wastewater quality to ensure compliance with permitted limits.

PROCEDURES:

- Collect and test wastewater samples according to the specified schedule.
- Use company-approved methods and equipment for sampling and analysis.
- Record all results and report any deviations to the Environmental Compliance Manager immediately.

2 AIR PERMITS

Air permits legally authorize your facility to emit specific amounts of air pollutants. These permits ensure compliance with national and local air quality standards. Although most branches may not emit enough VOCs or HAPs to require a permit, it's crucial to verify this with a local expert.

REQUIREMENTS:

Obtain and maintain all necessary air permits. It is up to the branch manager to determine local permitting requirements.The Auto-Chlor regulatory department can help you figure out the VOC & HAP levels in each product/raw material you have in stock.

Monitor emissions to ensure they do not exceed permitted levels.

PROCEDURES:

Document all emissions data and maintenance activities for air control equipment (if applicable).

Keep reports ready for inspection.

3 TIER II REPORTING

Tier II reporting is an annual federal requirement for facilities that store hazardous materials. It's part of the Emergency Planning and Community Right-to-Know Act (EPCRA) and mandates the reporting of hazardous and toxic substances stored at your facility.

REQUIREMENTS:

Submit annual Tier II reports to local and state emergency response agencies, as well as the EPA.

Accurately report hazardous chemicals stored on-site, including quantities and storage locations.

PROCEDURES:

Review chemical inventory records and update them quarterly to ensure accuracy.

Auto-Chlor System Corporate regulatory department reviews quarterly inventory records and submits reports to necessary parties.

4 ENVIRONMENTAL PROTECTION AGENCY (EPA) COMPLIANCE

The EPA has strict regulations for manufacturers of sanitizers and disinfectants. Compliance involves product registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), maintaining good manufacturing practices, and submitting to regular inspections.

REQUIREMENTS:

Ensure compliance with all applicable EPA regulations. Maintain required records and documentation for EPA inspections and audits.

PROCEDURES:

Follow all procedures outlined in Auto-Chlor's EPA Compliance Program.

5 DEPARTMENT OF TRANSPORTATION (DOT) REQUIREMENTS

The Department of Transportation (DOT) regulations ensure the safe transport of hazardous materials. This includes proper classification, packaging, labeling, and documentation of chemicals to prevent leaks or spills during transportation.

REQUIREMENTS:

Ensure accurate and complete shipping documents.

Use the correct company-provided labels for all products as per the batch sheet, properly applying labels and tighten caps to the correct torque.

PROCEDURES:

Prepare shipping documents according to DOT regulations, ensuring all required information is included.

Apply labels straight and securely to each container and verify that the correct labels are used for each product, referring to the batch sheet for guidance.

Tighten caps to the required torque values. Use a calibrated torque wrench to ensure consistency and prevent leaks.

PLANT MAINTENANCE

PLANT MAINTENANCE

Auto-Chlor SYSTEM

PURPOSE:

- The purpose of this document is to provide an overview for performing maintenance tasks within the branch. This ensures that all personnel involved in plant maintenance follow consistent practices to maintain optimal operational efficiency, minimize downtime, and ensure a safe working environment.

SCOPE:

- This document applies to all personnel responsible for plant maintenance activities. It covers the following areas:
- Routine Maintenance
- Preventive Maintenance
- Corrective Maintenance
- Inventory Management for Maintenance Supplies
- Training and Safety
- Cleaning
- Additional Best Practices
- By adhering to this document, personnel will be able to effectively perform maintenance tasks, ensuring the plant operates efficiently, minimizing downtime, and maintaining a safe working environment. This standardized approach helps optimize maintenance activities, prolong equipment life, and enhance overall operational productivity.

RECORDS & DOCUMENTS:

- To ensure comprehensive tracking and accountability of maintenance activities, the following records and documents should be maintained:
- Daily Inspection Logs
  - Content: Details of daily inspections, including the date, equipment inspected, issues identified, and actions taken.
  - Purpose: To track routine inspections and identify recurring issues or patterns.
- Weekly Maintenance Logs
  - Content: Records of weekly maintenance tasks, such as lubrication, bolt tightening, and fluid level checks.
  - Purpose: To ensure weekly maintenance activities are performed consistently and on schedule.

PLANT MAINTENANCE

- Monthly Inspection Reports
  - Content: Detailed reports of monthly inspections and maintenance tasks, including findings and corrective actions.
  - Purpose: To provide a comprehensive overview of equipment condition and maintenance needs.
- Preventive Maintenance Schedule
  - Content: A calendar or list outlining the preventive maintenance tasks and their scheduled dates.
  - Purpose: To plan and track preventive maintenance activities, ensuring they are performed timely.
- Preventive Maintenance Records
  - Content: Documentation of preventive maintenance tasks performed, including parts replaced, adjustments made, and any issues encountered.
  - Purpose: To verify that preventive maintenance tasks are completed as scheduled and identify any deviations.
- Corrective Maintenance Logs
  - Content: Records of corrective maintenance activities, including the issue identified, actions taken, and testing results.
  - Purpose: To document equipment repairs and ensure issues are resolved effectively.
- Inventory Logs
  - Content: Records of maintenance supply inventory levels, usage, and reorder points.
  - Purpose: To manage maintenance supply inventory and prevent shortages.
- Training Records
  - Content: Documentation of training programs attended by maintenance personnel, including dates, topics covered, and attendees.
  - Purpose: To ensure maintenance personnel are properly trained and up-to-date with the latest maintenance techniques and safety protocols.
- Safety Checklists
  - Content: Checklists used during maintenance tasks to ensure all safety protocols are followed.
  - Purpose: To enhance safety and ensure compliance with established safety procedures.

RESPONSIBILITY:

- Production Manager
- Branch Manager
- Maintenance Personnel

BEST BLENDING PRACTICES

1 ROUTINE MAINTENANCE

DAILY CHECKS:

Conduct daily inspections of key equipment and machinery to identify any immediate issues.

WEEKLY TASKS:

Perform weekly maintenance tasks such as lubrication, tightening of bolts, and checking fluid levels.

MONTHLY INSPECTIONS:

Carry out detailed monthly inspections and maintenance tasks to prevent equipment failure.

DOCUMENTATION:

Record all maintenance activities in a manual log or spreadsheet, noting the date, tasks performed, and any issues identified.

2 PREVENTATIVE MAINTENANCE

SCHEDULE CREATION:

Develop a preventive maintenance schedule based on manufacturer recommendations and equipment usage.

TASK ASSIGNMENT:

Assign specific preventive maintenance tasks to trained personnel, ensuring they understand the importance of these tasks.

BEST BLENDING PRACTICES

EXECUTION:

Execute preventive maintenance tasks as per the schedule, including cleaning, calibration, and parts replacement.

RECORD KEEPING:

Document all preventive maintenance activities, including any parts replaced and adjustments made.

3 CORRECTIVE MAINTENANCE

1. **ISSUE IDENTIFICATION:** Identify equipment issues through routine inspections, reports from operators, or system alerts.
2. **ASSESSMENT:** Assess the severity of the issue and determine the appropriate corrective action.
3. **REPAIRS:** Perform necessary repairs or replacements to resolve the issue, using approved tools and parts.
4. **TESTING:** Test the equipment post-repair to ensure it is functioning correctly.
5. **DOCUMENTATION:** Record the corrective maintenance activities, including the issue identified, actions taken, and results of the testing.

BEST BLENDING PRACTICES

4 INVENTORY MANAGEMENT FOR MAINTENANCE SUPPLIES

INVENTORY TRACKING:

Maintain an inventory of essential maintenance supplies, including spare parts, tools, and lubricants.

REORDERING:

Monitor stock levels and reorder supplies when they reach the reorder point to avoid shortages.

STORAGE:

Store maintenance supplies in an organized manner, clearly labeling each item for easy access.

DOCUMENTATION:

Keep a log of inventory levels, usage, and reorder points to ensure accurate tracking.

5 TRAINING & SAFETY

TRAINING PROGRAMS:

Conduct regular training programs for maintenance personnel on proper maintenance techniques and safety procedures.

SAFETY PROTOCOLS:

Ensure all maintenance activities adhere to established safety protocols to prevent accidents and injuries.

PPE USAGE:

Require the use of personal protective equipment (PPE) during maintenance tasks, such as gloves, safety glasses, and hard hats.

EMERGENCY PROCEDURES:

Train personnel on emergency procedures, including how to handle equipment failures and safety incidents.

BEST BLENDING PRACTICES

6 CLEANING

ESTABLISH CLEANING PROCEDURES:

Cleaning procedures should be established for all areas of the manufacturing facility, including the production and storage areas.

TRAIN PERSONNEL:

Personnel responsible for cleaning should be trained on the cleaning procedures and the importance of maintaining a clean environment. They should also be trained on the proper use of cleaning agents and equipment.

CONDUCT REGULAR CLEANING:

Regular cleaning should be conducted to maintain a clean environment.

IMPLEMENT CONTAMINATION CONTROLS:

Contamination controls should be implemented to prevent contamination from entering the manufacturing process.

VALIDATE CLEANING PROCEDURES:

Cleaning procedures should be validated to ensure that they are effective in removing contaminants. The results of the validation should be used to modify the cleaning procedures if necessary.

7 ADDITIONAL BEST PRACTICES

CONTINUOUS IMPROVEMENT:

Regularly review maintenance procedures and update them based on feedback and technological advancements. Implement a continuous improvement process to enhance maintenance efficiency and effectiveness.

BEST BLENDING PRACTICES

COMMUNICATION:

Establish clear communication channels between maintenance personnel, operators, and management to ensure timely reporting of issues and coordination of maintenance activities. Hold regular meetings to review maintenance status, discuss any ongoing issues, and plan upcoming maintenance tasks.

PURCHASING

PURCHASING

PURPOSE:

The purpose of this guide is to provide “best practices” for personnel involved in purchasing concentrates, finished goods from Atlanta, and chemicals from outside vendors. It ensures that all purchasing activities are conducted efficiently, cost-effectively, and in compliance with organizational and regulatory requirements.

SCOPE:

This guide covers the best practices when ordering raw materials and finished goods from Atlanta, as well as from outside suppliers.

DOCUMENTS:

- Atlanta Order Guide

RESPONSIBILITY:

- Production Manager: Ensures adherence to best practices for purchasing and maintains proper inventory levels.
- Branch Manager: Oversees purchasing activities, ensuring compliance with these guidelines.

BEST BLENDING PRACTICES

1 ORDERING CONCENTRATES & FINISHED GOODS FROM ATLANTA

PLACING AN ORDER WITH RA3:

1. Access RA3: Log in to the portal and access the RA3 software to initiate an order.
2. Order Guide: Refer to the Atlanta order guide for available products and their specifications.
3. Order Form: Complete the order form within RA3 with the required quantities and product codes.

SHIPPING:

1. Semi Truck Load: To maximize shipping efficiency, place orders that weigh between 38,000 and 42,000 pounds. This is the maximum weight allowed in a semi-truck per DOT regulations.
2. LTL Orders: Note that orders weighing less than 20,000 pounds will be shipped as Less Than Truckload (LTL). Consider coordinating a combo drop with another branch to meet the full truckload requirements and reduce shipping costs.

COMMUNICATION:

1. Order Confirmation: Confirm the order details within RA3 and ensure all information is accurate.
2. Shipment Tracking: If you want to know your order's estimated ship time, please call customer service in Memphis.

MAINTAINING PAR LEVELS:

1. Define Par Levels: Establish and document par levels for all concentrates and finished goods to ensure adequate inventory without overstocking.
2. Inventory Checks: Regularly check inventory levels against par levels to identify reorder points.

3. Order Planning: Use par level data to plan and schedule orders, ensuring inventory is replenished before reaching critical levels.

2 PURCHASING CHEMICALS FROM OUTSIDE VENDORS

VENDOR VETTING PROCESS:

Identify Potential Vendors Through:

- Research: Conduct thorough research to identify potential vendors that supply the required commodity chemicals.
- References: Seek references and reviews from other branch managers or local industry contacts.
- Certifications: Verify that the vendor holds necessary certifications and complies with industry standards.

EVALUATING RAW MATERIALS:

If you are unsure if the material you are purchasing is correct, you can always reach out to the Chemical R&D team in Memphis. They can let you know if the material you are asking about has been tested. If the material has not received testing, then request a sample from the vendor to be sent to Memphis Chemical R&D.
The following tests are run to ensure nothing will go wrong.

- Specification Match: Ensures that the raw material matches the specs of currently approved ones.
- Quality Assurance: Conduct quality assurance tests to confirm that when the material is used in a finished good, all the QC specs are met.
- Stability: Product is kept at room temperature, 120° oven, 34°F refrigerator for one month and run through 5 freeze/thaw cycles to make sure product remains stable.

VENDOR SELECTION CRITERIA:

1. Quality: Evaluate the quality of the materials based on test results.
2. Cost: Compare prices from different vendors to ensure cost-effectiveness.

3. Reliability: Assess the vendor's reliability in terms of delivery times and consistency.

4. Support: Consider the level of customer support and responsiveness provided by the vendor.

SUPPLIER RELATIONSHIPS:

1. Building Long-Term Relationships:
   - Strategic Partnerships: Focus on cultivating strong, long-term relationships with suppliers who consistently deliver quality materials. These partnerships can lead to benefits such as better pricing, priority in shipments, and enhanced support, especially during periods of shortage or high demand.
   - Open Communication: Maintain open and regular communication with suppliers to build trust and ensure they understand your needs and expectations.

2. Supplier Audits: Periodically audit suppliers to ensure they continue to meet quality and compliance standards.

CONTINGENCY PLANNING:

1. Backup Suppliers: Identify and vet secondary suppliers to mitigate risks associated with supply chain disruptions, ensuring continuity in case of issues with primary vendors.

2. Emergency Procedures: Outline procedures for managing urgent orders or supply shortages, including who to contact and how to expedite orders.

PLACING AN ORDER:

1. When placing an order, it is good to have the following information:
   - Specify Quantities: Clearly specify the quantities of each commodity chemical required.
   - Delivery Instructions: Provide detailed delivery instructions, including preferred delivery dates and times.

Payment Terms: Agree on payment terms and conditions with the vendor.

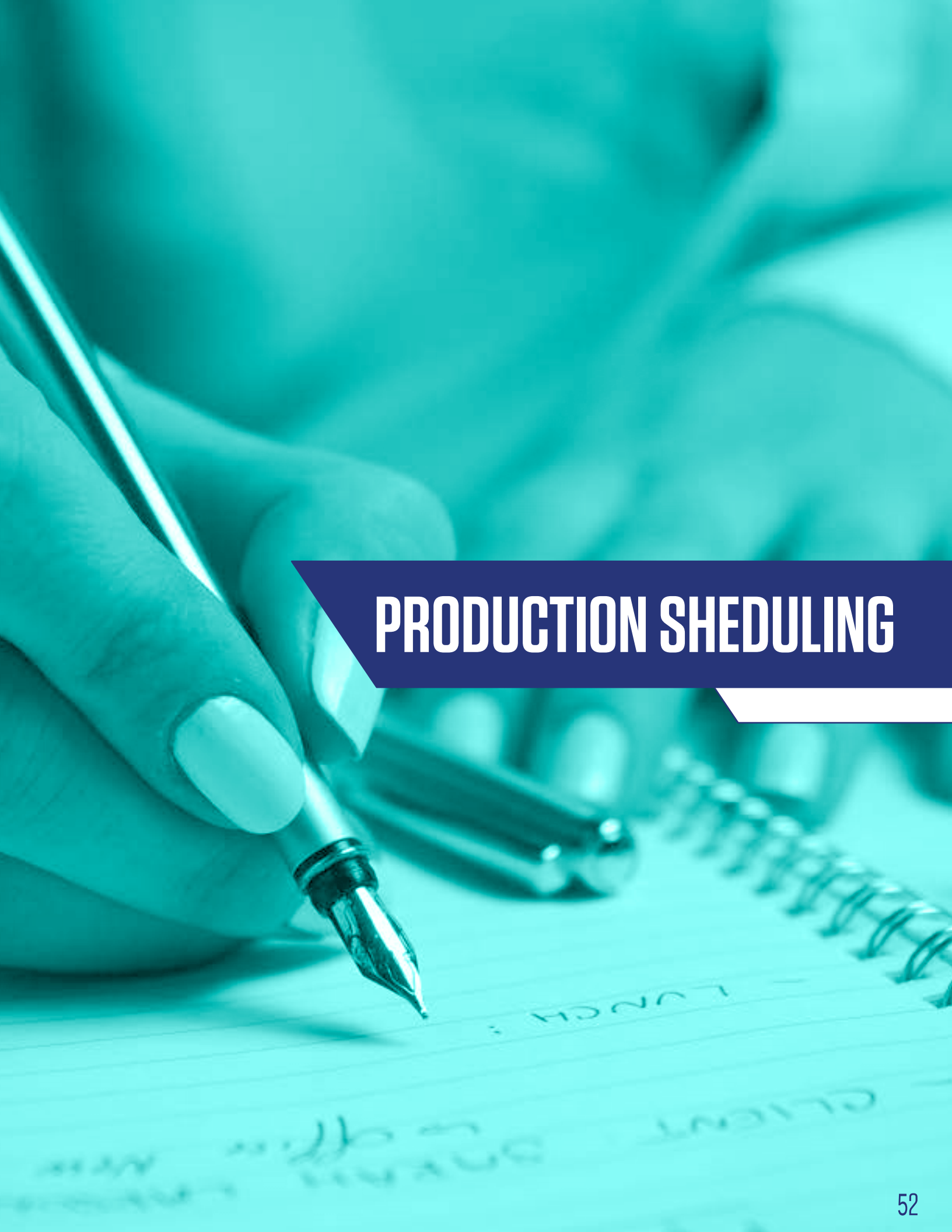
POST-PURCHASE EVALUATION:

It is a good practice to perform a yearly performance review on all of your suppliers. The metrics to qualify their performance can include but are not limited to:

Timeliness: Evaluate the timeliness of the delivery.

Quality: Review the quality of the delivered materials.

Documentation: Ensure all necessary documentation, such as invoices and quality certificates, are received and correctly filed.



PRODUCTION SHEDULING

PRODUCTION SCHEDULING

PURPOSE:

This document provides best practice guidelines for branch managers and production supervisors to effectively create and manage production schedules. It covers determining batch times, best practices in scheduling, maintaining par levels, and balancing orders with inventory levels.

SCOPE:

This guide applies to all personnel involved in the production scheduling process, including branch managers, production supervisors, and production teams.

RECORDS:

- Batch Time Log: A record of actual batch production times for analysis and future reference.
- Production Schedule: A detailed schedule outlining daily and weekly production activities.
- Inventory Logs: Records of raw material and finished goods inventory levels.

DOCUMENTS:

- Batch Sheets: Provide estimated blending times and other production details.
- Production Planning Sheets: Used to outline and plan production activities.
- Inventory Tracking Sheets: Used for monitoring raw material and finished goods levels.

RESPONSIBILITY:

- Branch Manager: Ensures overall production scheduling aligns with business goals and customer needs.
- Production Manager: Oversees the daily execution of the production schedule and manages resources accordingly.

BEST BLENDING PRACTICES

1 DETERMINING BATCH TIMES

ASSESSING PRODUCTION CAPACITY

1. Equipment Capabilities: Familiarize yourself with the capacity and limitations of your production equipment, including any recent upgrades or changes.
2. Historical Data: Use historical data to identify average processing times for different products and batches.

BATCH TIME CALCULATION

1. Batch Sheet: Start with the estimated blending times provided on batch sheets.
2. Adjust for Variations: Make necessary adjustments based on any changes in production processes, equipment, or material properties.

MONITORING & RECORDING

1. Continuous Monitoring: Regularly monitor batch production times to ensure they align with estimates.
2. Documentation: Record actual batch times in a log for future reference and to identify any discrepancies or areas for improvement.

2 BEST PRACTICES IN SCHEDULING

SCHEDULE PLANNING:

Develop Daily & Weekly Schedules: Create detailed daily and weekly production schedules to meet demand, accounting for all products and shifts.

Include Buffer Time: Schedule buffer periods for equipment maintenance, cleaning, and potential delays to avoid disruptions.

BEST BLENDING PRACTICES

RESOURCE ALLOCATION:

Manage Workforce Effectively:
Ensure the right number of staff is allocated to each shift based on the production schedule and workload.

Maintain Equipment:
Regularly service and maintain equipment to minimize downtime and ensure smooth production runs.

COMMUNICATION:

Hold Regular Briefings:
Conduct regular team briefings to review the production schedule and address any concerns or questions.

Provide Timely Updates:
Keep the production team informed of any changes to the schedule as soon as they arise.

3 MAINTAINING PAR LEVELS

DEFINING PAR LEVELS:

ASSESS INVENTORY NEEDS: Regularly review inventory levels to establish par levels for both raw materials and finished goods.

USE HISTORICAL DATA: Analyze past sales and production data to set accurate and realistic par levels.

MONITORING INVENTORY:

CONDUCT REGULAR CHECKS: Frequently check inventory levels to ensure they remain within the defined par range.

BEST BLENDING PRACTICES

SAFETY STOCK: Maintain safety stock levels to trigger new production runs before inventory falls below critical levels.

MAKING ADJUSTMENTS:

ACCOUNT FOR SEASONAL VARIATIONS: Adjust par levels based on seasonal trends, special promotions, or changes in customer demand.

4 SHARING THE PRODUCTION SCHEDULE

USING VISUAL TOOLS:

Display on Whiteboards: Use a whiteboard in a central location to display the daily and weekly production schedules, updating it as needed to reflect any changes.

CONDUCTING MEETINGS:

Weekly Production Meetings: Hold weekly meetings with the production team, production manager, and branch manager to review production progress, discuss challenges, and adjust schedules as necessary.

Daily Huddles: Start each shift with a brief daily huddle to review the day's schedule, priorities, and any potential issues.

5 STAFF FLEXIBILITY

IMPORTANCE OF CROSS-TRAINING:

Enhanced Flexibility: Cross-training staff to handle multiple roles within the production process ensures that your team can adapt to various tasks and responsibilities.

Minimized Disruptions: By equipping employees with skills across different functions, you reduce the risk of production delays caused by the absence of a single team member or unexpected surges in demand.

BEST BLENDING PRACTICES

IMPLEMENTATION STRATEGIES:

Identifying Key Roles: Determine the critical roles and tasks within your production process that would benefit from cross-training.

Rotational Shifts: Implement rotational shifts or job rotation schedules to provide staff with experience in different roles.