

ANALYTICAL PROCEDURE FOR MONITORING AND MAINTAINING THE CONTENT OF COPPER FROM HN505.4 KICK START II™ IN THE HN505 ACCELERATOR BATH

Method:

For uniform results and long solution life, the HN505 Accelerator operating solution should be maintained based on regular analysis using the following analytical procedures. It is recommended that this analysis be performed daily in large volume facilities and weekly for medium or small volume facilities for optimum performance and adjustments made (if necessary) before beginning production.

NOTE: This analytic procedure applies only if the operation tank is filled to its capacity at the time the sample is taken.

Caution: The following procedures involve the use of potentially hazardous chemicals: manufacturer's operating instructions should be consulted and the appropriate safety precautions followed.

I. Reagents Required:

10 ml sample of HN505 Accelerator bath
20% v/v sulfuric acid
20% w/v potassium iodide solution
20% w/v potassium thiocyanate solution
1% starch indicator
0.01N sodium thiosulfate solution

II. Apparatus Required:

10 ml measuring pipette
50 ml burette
250 ml Erlenmeyer flask

III. Procedure:

1. Pipette a 10 ml sample into a 250 ml Erlenmeyer flask.
2. Add 20 ml of deionized water to the sample.
3. **SLOWLY** add 15 - 20 ml of 20% v/v sulfuric acid to the sample. **Make this addition a few mils at a time. There are carbonates in the sample that will evolve CO₂ when the sulfuric acid is added.**

4. **SLOWLY** add 10 ml of 20% w/v potassium iodide solution to the sample.
5. Add 10 ml of 20% w/v potassium thiocyanate solution to the sample.
6. Add 1 ml of 1% starch indicator to the sample.
7. Titrate with 0.01 N sodium thiosulfate to a water-white endpoint.

Calculation:

$$\text{PPM Cu in the tank} = \text{ml sod. thiosulfate} \times 63.6$$

Add Calculation:

$$\text{Milliliters HN505.4} = (1 - (\text{ppm copper}/300)) \times 56.775 \times \text{tank volume (gal)}$$

IV. Maintenance Requirement

This addition can be made to either a cooled operating bath or a bath at operating temperature. It should not be made concurrently with the HN505.1 Accelerator (powder). Wait at least one hour after adding the accelerator powder before making the addition of the KICK START product.

For HN505.4™ KICK START II™ the copper level should be maintained between 270 and 300 PPM with 300 PPM as the optimum.

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