

Drawing / Metal Forming Procedures (Trouble Shooting and Correction Procedures)

TROUBLE SHOOTING CHECKLIST: ALTHOUGH METALFORMING COMPOUNDS CONSIST OF MANY TYPES OF PRODUCTS (EMULSIONS, SEMI-SYNTHETIC, SYNTHETIC AND OILS) MANY OF THEIR CHARACTERISTICS AND PROBLEMS ARE COMMON TO ALL PRODUCTS. THE FOLLOWING MATREX IS DESIGNED TO AID IN TROUBLE SHOOTING PROBLEMS ASSOCIATED WITH METAL FORMING.

CONDITION	PROBABLE CAUSE	CORRECTIVE ACTION
Lubrication Problems	Compound not available and/or applied properly.	Check to insure product is available and properly mixed.
	Low concentration	Check concentration and adjust.
	Drawing compound feed mechanism problem.	Correct feed problem and monitor results.
	Application problem.	Adjust the amount of compound being applied and add additional applicators if necessary.
	Contaminated solution.	Dump, clean and recharge.
Rusty/stained parts	Chemical attack	Insure that the drawing compound selected does not attack (stain) the metal/alloy and is capable of providing in process rust protection.
	Cleaning problem	Drawing compounds should be easily removed with mild alkaline cleaner.
	Material problem (from mill)	Staining/rust exists prior to the forming operation due to a quality problem at the mill, e.g. pickling, oiling, etc.
	Rust prior to forming	Storage and/or mill related problem.
	Rust/staining after forming	Cleaning, packaging and /or storage problem.
Common drawing/forming problems	Roll Pickup	Polish die(s)
	Cross or Coil Breaks	Go to a harder temper or material that has been given a skin pass.
Common drawing/forming problems (continuation)	Off Center	Improve the locating method or correct the tooling, e.g. burr on a badly sharpened punch.
	Puckers	Insufficient pressure on the draw pad or area to hold

Drawing / Metal Forming Procedures

(Trouble Shooting and Correction Procedures)

CONDITION	PROBABLE CAUSE	CORRECTIVE ACTION
		pressure.
	Dished Top	Omission of air holes (or too small) on compound dies. Air holes or knockout will cure the problem.
	Dome Top (double action presses)	The reverse of "Dish Top" same solution, add air holes and/or knockouts.
	Lamination	Material problem, return material to the mill.
	Burnishing	Several causes, material is too thick, die problem (too tight), radius is excessive. Solution, correct the tooling
	Wall Wrinkles	Insufficient pressure at the start of the draw. Increase pad pressure.
	Scratches (Non-directional)	Faulty handling and/or ejection. Check lubrication and improve part-handling procedures.
	Gauling	Too tight a fit between punch and die. Check material thickness, lubrication and tooling.
	Flange Wrinkles	Insufficient pressure. Increase pad pressure, use a heavier pad or more pin support.
	Nicks and Dents	Caused by loose slugs and chips. Better housekeeping at the press will eliminate most nicks and dents.
	Draw Lines	Lubrication problem and/or radius is too small.

INSPECTION OF PROCESSED WORK

- Periodic inspection of parts emerging from the washer after phosphating should find them to be completely water-break free. Special note should be made of welded or crimped edges where oil may have been trapped and difficult to reach.
- After drying, the phosphate coating appearance should be generally even overall with no streaks or spots. Although the coating color will vary with different steels, it will most often exhibit a blue or iridescent color when it is proper.

Note: Variations in color can still be satisfactory as long as one color shades into the other with no sharply defined edges between.

CORRECTION PROCEDURES

- **WATER BREAKING**

If water-breaking is observed, it usually indicates unremoved soil or residual oil film and the washer should be inspected to determine if discrepancies in operating concentration, temperature, nozzle pressure, or spray pattern exists.

The next step is to increase cleaning by adding **SURF AID** (detergent additive) either to the point of foam, or in 1/4% increments until an additional one-half percent has been added. If this doesn't correct the problem, then the temperature should be raised in ten degree increments (not to exceed 160 degrees maximum). In more extreme cases, it may be necessary to add still more detergent.

- **STREAKING, SPOTTING, OR LOOSE WHITE POWDER**

Streaking, spotting, or loose white powder could represent any one of a number of inefficiencies. For instance, mill oil that has sufficiently oxidized may etch and stain the metal in a worm-track pattern that will produce sharply defined edges.

Under certain conditions, condensation of chemical vapors can occur on the conveyor or ceiling of the washer and then run down the work to form streaks. Depending on the efficiency of the exhaust system, this can happen in any area where no sprays are operating. Streaks caused by conveyor drippings are especially prevalent during stoppages when parts stand motionless between stages.

Powdery streaks are also frequently caused by the ricocheting of sprays hitting each other, parts, or the spray chamber walls and then splattering on the work just outside the entrances or exits of the spray stages.

Note: Even though final results show that all oil has been removed, it is sometimes possible to eliminate streaking and powdering by adding more detergent into the phosphate bath.

- **FLASH RUSTING**

Occasionally, parts may emerge from the washer with superficial, loose rust. Its color can vary from light tan to deep orange and the pattern it takes may be in wavy lines following the design of water draining from the metal surface, or streaks and spots. Frequently, this 'flash rusting' is mistaken for a light coating when it is light tan with a blotchy appearance, but its presence can be confirmed by wiping with a white cloth and looking for tell-tale reddish residues.

Drawing / Metal Forming Procedures (Trouble Shooting and Correction Procedures)

Most of the time, the cause of flash rusting is the lack of sufficient phosphate coating to protect the metal surface until it dries. However, if the exhausts are not functioning properly, the acidic humidity from the acid phosphate spray may become trapped and cause even a well phosphated area to rust.