c. Spray rinsing may be utilized provided the same end-product quality is maintained.

d. Immediately following the water rinse, all items (except class 4) shall be treated in a chromic acid rinse (see 3.2.5).

3.2.5 Chromic acid rinse. (Classes 1, 2 and 3). The chromic acid rinse of classes 1, 2, and 3 shall be performed in accordance with the following:

a. The final rinse shall be hot 63 to 93°C (150 to 200°F) chromic acid or chromic phosphoric acid solution: approximately 300 grams chromic acid flake in 1000 liters (L) of water.

b. The final rinse shall be maintained at a pH of 2 to 4 by the addition of flake chromic acid or mixtures of chromic and phosphoric acids. The pH of the final rinse shall be checked at least every 8 hours.

c. The final rinse shall be checked by a standard free and total acid titration or pH reading as often as is necessary to assure that the bath remains within the limits set at all times during which it is in operation.

d. All rinses should be discarded whenever they become contaminated. The final rinse shall be checked at least every 8 hours and shall be discarded when the total acid reading rises to more than 7 times the free acid reading.

e. The item should remain in each rinse for a minimum of 60 seconds.

f. Following the chromic acid rinse, the item shall be thoroughly dried before application of a supplementary treatment, as applicable.

3.3 Stress Relief. Unless otherwise specified (see 6.2), parts with a surface or through hardness of Rockwell C 39 or greater shall be given a stress relief treatment. This includes carburized, induction hardened, flame hardened, etc. treatments. Also, any part that is ground, cold formed, cold straightened, etc., that may induce residual tensile stresses after machining or heat treatment shall be given a stress relief treatment. The stress relief treatment shall consist of a heat treatment at 177 to 204°C (350 to 400°F) for a minimum of one hour for every inch of thickness but not less than one half hour for thicknesses less than one-half inch. Optional heat treatment for carburized parts is 104 to 155°C (225 to 275° F) for 8 hours.

3.4 Hydrogen embrittlment relief heat treatment.

3.4.1 After coating. Unless otherwise specified (see 6.2), parts (including carburized parts) having the hardness values shown in Table I shall be given a hydrogen embrittlement relief heat treatment after coating per Table I without any parts developing cracks.

3.4.2 After baking. Unless otherwise specified (see 6.2), all lots of parts or materials for which baking is required shall be tested for hydrogen embrittlement.

TABLE I. Hydrogen embrittlement heat treatment.

Coating Type	Material	Hardness Rockwell C (minimum)	Heat treatment	Stage of operation
Z	Alloy steel Carbon steel	39 39	98 to 107°C (210 to 225°F) for 8 hours or room temperature for 120 hours	Heat treatment for both types of coatings and material is conducted after coating but before any stressing operation
M	Alloy steel Carbon steel	39 39	98 to 107°C (210 to 225°F) for 8 hours or room temperature for 120 hours	

3.5 Weight of phosphate coatings. The weight of phosphate coatings, prior to application of any supplementary treatment, shall conform to the following:

a. Type M shall be a minimum of 16 grams per square meter (g/m^2) (11 g/m^2 when specified (see 6.2))

b. Type Z shall be a minimum of 11 g/m^2

3.6 Accelerated corrosion resistance. The phosphate coated item, free of supplementary treatment, shall be subjected to a salt spray (fog) test. It shall show no evidence of corrosion for the period of time shown in Table II.

3.7 Supplementary treatments. Supplementary treatments shall be applied after completion of the phosphating process. Items receiving supplementary treatment shall be either centrifuged or permitted to drain sufficiently to remove all surplus from the surfaces. Unless otherwise specified (see 6.2), the supplemental oil coating weight shall be sufficient to meet the salt spray requirements of 3.7.2 and 3.7.4.

3.7.1 Types M and Z, class 1. The supplementary treatment for class 1 of types M and Z shall be as specified (see 6.2). Unless otherwise specified, weight of oil per unit area does not apply.