

7-16(67)
M.300

27th June, 1962.

Mr. D.M. Carroll,
Chef de la Mission Australienne,
S.N.E.C.M.A.,
70 Boulevard Kellerman,
PARIS 13,
FRANCE.

Cadmium Plating.

Dear Sir,

On examination of documentation received from S.N.E.C.M.A., we have noted some variations between various documents in respect to baking temperatures and time after cadmium plating, and we would be pleased if you could clarify the actual practice used at S.N.E.C.M.A.

No doubt Mr. Brooks will recall that a considerable amount of investigation has been carried out in both Britain and the United States, on the required baking temperatures after cadmium plate for steel having a tensile strength of 65 tons per sq. in. or greater (300 Brinell), where it has been found that cadmium plate produces a barrier effect to the dissipation of hydrogen incurred during the plating process, and unless a baking temperature of 200°C is used very little hydrogen is dissipated.

On the basis of this work, a baking temperature of 200-210°C was included in our specification, an extract of which is given below.

"Carbon and low alloy steel components having a hardness of 30 Rock "C" or over, or carburized components where the minimum case hardness is 55 Rock "C" or lower, shall be stress relieved in air at a temperature of 200-210°C for a minimum period of 5 hours.

Carburized components, where the minimum case hardness is above 55 Rock "C" shall be stress relieved in air at a temperature of 130-140°C for a minimum period of 5 hours.

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Non ferrous alloys, stainless steels and carbon and low alloy steels having a hardness below 30 Rock "C", require no stress release".

It will be noted from above that we do in fact bake carburized components having a hardness above 55 Rock "C" below 200°C, i.e. 130-140°C.

This is due, as you are fully aware, to the fact that the 200°C bake could possibly lower the case hardness. However, we feel that the 130-140°C bake is a safety factor even though we appreciate the possibility of it having very little effect in respect to the removal of hydrogen.

Considering the French documentation we find the following references.

AIR NORME 9056 Clause 2.32 bake at 200°C $\pm$ 10°C for 3 hours.

Note (1) States. The baking treatment is carried out at a temperature lower than the tempering temperature for the material DTM.130-42 quotes baking at 150°C $\pm$ 10°C for 2-3 hours.

Some operation sheets call for baking at 150°C for 2 hours, while others e.g. 501,700.078.0, 501,200.069.0 calls for baking at 120-140°C for 1 hour.

The materials concerned with the examples given are, 25 CD4, 35 NC6, 30 NC11, XC 38f, and it would be thought that particularly with XC 38f that baking would be unnecessary.

It has also been noted on other operation sheets that baking at 150°C is listed where cadmium plating is carried out on copper base alloys.

We would be pleased if you would take up the subject of the baking temperature with S.N.E.C.M.A. and ascertain actual shop practice and also obtain comments on our normal procedure to bake where possible at 200°C, and whether any objections would be forthcoming if C.A.C. used 200°C bake on ATAR components.

Yours faithfully,
H.H. KNIGHT
Manager


EH/IG

Per:


C. BELLWARD