

DIFFERENCES IN ICE CONDENSER BASKET SCREWS REPORT NO. 97-1021
E13 950602 302 (1st Report - NOT SUBMITTED) and E13 950619 303 (2nd Report- RIMSED)

1. First report states that the screws were ^{reported to be} zinc plated, while second report states that screws ^{were reported to have been} ~~had a coating of~~ zinc plated, cadmium plated, or zinc phosphate.
2. Wording on description of screws state that one was new (1st report) versus one had not been in service (2nd report).
3. First report contains statements from the customer (cyclically cooled between 15°F and room temperature) and the screws were probably over-torqued when installed. Second report does not state this.
4. Both reports list the chemical results that were found on a representative/typical screw, but second report states from which screw (Screw "A") the data was reported. The second report states that the screws were probably zinc phosphate coated, but the data is listed on both reports.
5. The first report does not have microhardness traverse graphs included to indicate carburization, but both reports talk about the higher carbon values than those for AISI 1022 steel and Table III, which shows a difference in case to core hardness which would indicate carburization.
6. In the fractography section, both reports discussed the examination of screw "A" (failed) and a screw from "G". A different micrograph is shown in Figure 7 for new screw "A" (1st report) versus whole screw "A" (2nd report). The second report does not mention set "B" (Figure 7), and the first report does not mention set "H" (Figure 7). Figure 7 is different in each report.
7. The 1st report does not mention the particular screw in which the ^{presence} ~~presence~~ of zinc was found, but both talk about pre-existing cracks, laps at the tip, face and roots of every screw. But there is no mention in second report of fatigue.
8. More explanation was given in the second report concerning the other screws in which no photographic documentation was shown. But the information concerning the screws is given by saying that "similar cracks were found both in the new and used screws". *← see note*
9. The specific screws that were broken in the laboratory are not mentioned by name in the first report. Additional screws were broken at 15°F and reported in the second report. (Possibly additional info from customer). First report used the word "ductile" and "brittle" while the second report refers to it as "void coalescence" and "cleavage", respectively – both words indicating the same type of failure. The second report discussed "quasi-cleavage", here again, the first report states "more ductile" and "more brittle", both stating a mixed mode of failure.
10. Because of the additional time to do testing on set "H", "G", and "B", metallography was performed and reported in the second report. A different microstructure was discovered showing slack quenching.
11. Possible conclusions were not bulleted in the second report as in the first, but the lower ductility of the screws were mentioned in the second report when cleavage or brittle fractures were discussed. No mention of high stress appears in the second report, nor design limits.
12. The presence of stress concentrators is mentioned in both reports in the discussion of (laps found at the tips, face, and roots). *← see checking condition*
13. Corrosion is not mentioned in second report as a possible failure mechanism, but is mentioned at the beginning of the second report as being present in the threaded region.
14. Carbon content, and the higher values of for some samples is mentioned in both reports, but no tie back to lower ductility expected in second report.
15. Pre-existing cracks (quench cracks) were mentioned in the second report when the intergranular cracks were discovered in the transverse section of the whole screw from set "A".
16. The second report does not mention thermal changes acting on the material, but tests were performed in the second report to indicate that this was a concern (Testing at 15°F).
17. NOTE: There is an endorsement to this report (E13 950612 303) to list which samples had a slack quench microstructure.

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