LX-10 PRESSING STUDIES

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DEVELOPMENT DIVISION

MASTER

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Normal Process Development
Endeavor No. 105

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ABSTRACT

The density of pressed LX-10-1 parts can reasonably exceed 1.860 Mg/m^3 when the part is formed by the wet-bag process and repressed in a captive-water assembly. A compacting pressure of 126 MPa is required during the captive-water phase for a dwell period of two to three hours.

DISCUSSION

The minimum acceptable density of WR quality LX-10-1 has been reduced from 1.865 Mg/m^3 to 1.860 Mg/m^3 . As previously reported(1) at least three repressing cycles via the captive-water mode will be required with normal dwell times to achieve 1.860 Mg/m^3 .

Several pressings have been made to determine the effect on density of extended dwell periods, using the captive-water process. A plot of density as a function of dwell time is given in Fig. 1.

Vacuum-pressing was investigated as a possible alternative process. Compressive forces of approximately 87 kPa (local atmospheric pressure) were generated by evacuating a wet-bag assembly against a prepressed billet of LX-10-1. The continuously evacuated assembly was heated to 74°C and held at pressure and temperature for 34 days.

The piece density at the start of the investigation was 1.855 Mg/m^3 , and decreased by 2 kg/m^3 at termination. Obviously, this low compacting pressure was not high enough to offset the deleterious effects of time at temperature. A decrease of 2 kg/m^3 may not be significant, but the direction of change will preclude further testing.

CONCLUSIONS

The captive-water dwell of three hours at 126 MPa will be required to assure attaining the minimum density of 1.860 Mg/m^3 . The selection of the best process; i.e., dwell for three hours or repress three times, will depend on production schedules and equipment. Equipment to supply the compaction pressure is worked harder when accomplishing the multiple repressing process but it requires less time than a three hour dwell.

The investigation of vacuum-pressing to increase density of a performed billet will not be continued.

(1) J. D. Harrell, *LX-10 Pressing Studies*, MHSMP-75-40C (July-September 1975).

Fig. 1. Density After Long Dwells via Captive-Water

FUTURE WORK

"Bartherm" is a post-pressing process that can be used to increase the density of preformed PBX parts by conditioning parts under pressure (1.72 MPa) and heat for five to eleven days.

The bartherm process should be investigated for applicability to LX-10-1; probably at pressures of 5 to 9 MPa and possibly with a shortened dwell period.