IMPROVED ULTRASONIC EVALUATION OF GREEN-STATE CERAMICS WITH THE USE OF A SURFACE BONDED ADHESIVE TAPE *

K. Yamanaka, C.K. Jen+, C. Neron+ and J.F. Bussiere+
Mechanical Engineering Laboratory,
Namiki 1-2, Tsukuba, Ibaraki, 305 JAPAN
+Industrial Materials Research Institute,
75 Mortagne, Boucherville, Quebec, J4B6Y4 CANADA

Performance of the piezoelectric and the laser ultrasonic methods have been extensively examined in testing green-state ceramics, and a new practical method is developed by covering specimens with an adhesive tape. The tape serves to protect sample from contamination by ultrasonic coupler and the adhesive serves to couple ultrasonic wave into the specimen. This tape can be removed without any damage on the surface. If the specimen is sealed by the tape, water immersion C- scan imaging can be applied. Furthermore, if a water bag is placed onto the taped specimen and a transducer is scanned in the water, complete sealing is not necessary and practical industrial testing of large or curved products is possible. These ideas has been proved in large and thick (70 mm dia and 19 mm thick) green-state alumina with 4 % PVA binder. A 2 mm dia paper sheet inclusion at 8 mm depth was detected and velocity and attenuation variation within and among specimens have been mapped by using 0.5 MHz, 4" focused transducer. After sintering, extensive nondestructive and destructive evaluation are applied and correlated to the green-state test results.
---Acknowledgement--: Alumina specimens have been supplied by Almax Industries Ltd., CANADA

*Reference:
K.Yamanaka, C.K.Jen, C.Neron and J.F.Bussiere, Materials Evaluation, 47, pp 828-834 (1989).