

## COMPRESSION DATA REGISTRATION AND MANIPULATION BY MICROPROCESSOR

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Whilst the use of on-line computers for dealing with compaction data is well known, (see for example, De Blaey and Polderman, 1971), the computing facilities needed have been elaborate and expensive. This contribution shows how recent microprocessor developments can be utilised to carry out such tasks more economically.

The computational device consists of an A/D converter (Burr-Brown, model 7216, a 16 channel single ended system, 12 bit resolution capability) and a microcomputer (Motorola MEK 6800D2 Evaluation Kit II, based on the MC 6800 microprocessing unit and its family of associated memory and input/output devices) linked to a teletype terminal. The system allows the user 32K of RAM and the system software is stored in 8K of ROM.

As the apparatus is currently arranged, upper and lower punch forces and punch displacement are registered using strain gauges and displacement transducer respectively. The conditioned and amplified signals are sampled sequentially every 600 sec and stored in the allocated memory space. For a single stroke tablet press, working at 60 tablets per minute, about 250 sets of data can be recorded during the compaction stage which lasts about 0.15 sec, though the sampling rate can be slowed down if needed.

Once the data have been registered, it can be manipulated by the microprocessor in a variety of ways.

- (a) Presentation of a complete printout of the compaction process, either in computer units (bits) or in force and distance units using previously fed-in calibration factors.
- (b) Scanning the memory for the maximum values registered by a particular transducer, followed if required by further manipulation. e.g. calculation of the ratio of maximum lower punch force to maximum upper punch force, a ratio frequently used in lubrication studies.
- (c) Calculation of the area under the force-displacement curve, giving the work used in compaction. The apparatus can also deal with multicompression data, in which the same tablet is compressed a number of times. Up to 13 sequential compressions can be registered on a continuously running machine.
- (d) From displacement measurements, the tablet density can be calculated, and hence data to fit pressure-density relationships, e.g. the Heckel equation, can be derived.

De Blaey, C.J. and Polderman, J. (1971) Pharm.Weekblad 105: 57-65.