CONTROLS Technical Note - Gyratory Compactor - June 2012

5+1 fundamental reasons to prefer CONTROLS’ gyratory compactor.

1- Full conformity to ASTM, AASHTO and EN standards. Extremely rigid, thus lightweight, unitized body.

The exceptional performances of our Gyratory compactors have been tested and certified by some of the most important American Authorities as NECEPT (North East Centre of Excellence for Pavement Technology) of the Pennsylvania State University and North Central SUPERPAVE™ Center. Our models fully satisfy the above standards together with long term repeatability. These performances are due to the exceptional dynamic rigidity together with the unique and ingenious compaction system.

Controls’ Gyratory compactors fully comply, with large margin, to the standard requirement as specified in the following table:

<table>
<thead>
<tr>
<th>Specification</th>
<th>EN 12697-31 requirement</th>
<th>ASTM D6925 requirement</th>
<th>CONTROLS 76-B2522 Gyratory compactor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal angle (Stability factor)</td>
<td>0.82 ± 0.02°</td>
<td>1.16 ± 0.02</td>
<td>EN: 0.82 ± 0.01° ASTM: 1.16 ± 0.01°</td>
</tr>
<tr>
<td>Parallelism factor ( \delta_{TB} )</td>
<td>&lt;0.10°</td>
<td>Not req.</td>
<td>&lt;0.05°</td>
</tr>
<tr>
<td>Full rotation factor ( \delta_{max-min} )</td>
<td>&lt;0.05°</td>
<td>Not req.</td>
<td>&lt;0.02°</td>
</tr>
<tr>
<td>Deflection factor ( \delta_{lh=IEA_{240}-IEA_{325}} )</td>
<td>&lt;0.10°</td>
<td>Not req.</td>
<td>&lt;0.065</td>
</tr>
</tbody>
</table>
These values are verified with traceable calibration apparatus and certify the stability, the platen parallelism under load and the rotational/general stiffness of our Gyratory compactors which guarantee the REPEATABILITY of the system and the QUALITY of the machine. These excellent performances are basically due to the particular and unique design of the compaction mechanism. As prescribed by **EN 12697-31**, the shearing forces resulting from the motion of bituminous sample inside the mould generate a conical surface of revolution characterized by the gyratory angle.

The operating principle of 76-B2522 Gyratory compactor is shown in the following drawing.

### Representation of the gyratory motion of the Gyratory compactor 76-B2522

2- Adoption of the internal gyratory angle as unique calibration and verification reference.

The internal gyratory angle (and not the external) is the basic requirement for the compliance verification of the gyratory compactors. The standards clearly specify the internal angle and related tolerances: 0.82 ±0.02 for the EN 12697-31 and 1.16 ± 0.02 for the ASTM D6925. The internal angle cannot be simply deduced by the external angle. In addition ASTM D 6925 - (par. 4.1.1 Note 1) - outlines: "Research has shown external angle (measurement between the external mould and the frame of the compactor) to be different from the internal angle (measurement between internal mould wall and top and bottom plate) ... discrepancies has been resolved by use of the internal angle adjustment."

All Controls gyratory compactors are supplied complete with a calibration certificate which certify the real value of the internal angle. The calibration certificate also include charts and tables to obtain the parameter for the adjustment mechanism of the internal angle so, the operator, can set different internal gyratory angles to move, as example, from the EN to the ASTM angle and viceversa. The verification of the internal angle of our Gyratory compactors is extremely simple, quick and reliable, and can be performed by our ILS apparatus described below.
3 - The accurate measurement and calibration of the internal angle by the ILS apparatus.

This system fully satisfies EN 12697-31 Annex C and ASTM D7115. Compared to other systems as for example using reference hot mix asphalt, is enormously simple, easy, quick and reliable. This unique apparatus, featuring an electromechanical device, perfectly suits into any gyratory 150 mm dia. mould.

All our gyratory compactors are factory calibrated and supplied complete with calibration certificate.

4- Double control mode: by independent touch screen display or by PC. A "Custom" dedicated hardware and software.

Our gyratory compactors feature a "custom" dedicated hardware specifically designed for this application which result in a more flexible and simple use, considering, first of all the Standard requirement. The important investment involved has been possible by the adoption of our electronic technologies in continuous progress together with the large production. The PC control of the machine by a dedicated software, includes the data acquisition and processing of a single or multiple tests and the verification of different mixes for the elaboration of mix design. The same control, up to the storing of test data, can be done by the touch screen panel.
5- High handiness and flexibility: can be bench mounting, with manual or motor operated extruder. Also ideal for mobile laboratories.

CONTROLS' gyratory compactor is available in various versions: bench mounting, with integrated work top including electromechanical or manual specimen extruder. It does not need pavement anchor bolts as the mechanical stresses, due to the unitized body, are confined inside the structure. Compact, extremely rigid thus lightweight (100 kg only), is also ideal for mobile laboratories and to be moved from site to site.

...and, finally....+1

Excellent price/quality ratio: join the club of hundreds of satisfied clients using our Gyratory compactors all over the world.

For any additional info please reach the following web address