CERTIFICATE OF CALIBRATION

ISSUED BY: ZwickRoell Ltd.
UKAS ACCREDITED CALIBRATION LABORATORY
CERTIFICATE NUMBER: 2506-1983
DATE OF ISSUE: 10 June 2025

0167

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Approved Signatories
Dr N.S.Wrigley
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Issued To:	**LCM Systems Ltd**		
Address:	**Unit 15, Newport Business Park, Barry Way, Newport, Isle of Wight**		
Machine Description:	Compression Tester	**Serial Number:**	13004
Manufacturer / Type:	LCM C1500T	**Force Capacity:**	15,000kN
Display System:	Single Range Digital Display	**Software:**	LCM Systems
Force Transducer:	Strain Gauge Columns	**Serial Number:**	13004
Associated Equipment:	Mantracourt Amplifier	**Serial Number:**	16987752
Associated Equipment:	Asus Computer System	**Serial Number:**	D6PTBX005294

Date of Calibration:	**09 June 2025**	**Ambient Temperature:**	**20.3°C**
Zwick reference numbers:	SC147785 F116455	**Location:**	Shop floor
Previous certificate number:	2412-5170	Issued on:	11 December 2024

Method:
The testing machine identified above has been calibrated in accordance with the requirements of **BS EN ISO 7500-1:2018** over the ranges given below for increasing forces only. The calibration was performed using force proving devices and / or masses which meet the requirements of BS EN ISO 7500-1 and equipment which is calibrated in accordance with BS EN ISO 376:2011
The machine complied with the requirements of the standard for the following ranges and classifications with regard to the relative error, repeatability, resolution and zero return to which table 2 of the standard refers:

Range	Mode	Display	Status	Classification of range(s)
15000kN	Compression	Display 1	As found	15000kN Class 0.5 down to 4500kN Class 1 down to 300kN

Detailed tabulated results are shown on the following pages.

Calibrated by: Alan Wilkins

Certified by: S Pearce

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to the units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with prior written approval of the issuing laboratory.

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The following traceable force proving equipment was used for the calibration:

Description	Capacity	Class	Serial Number	Certificate Number	Date Calibrated
DC Ratio meter	N/A	N/A	08-5097	2024050346-1	06 June 2024
Load Cell	3000kN	1.0	3000/7C	2023030163-1	30 June 2023
Load Cell	16500kN	0.5	17000/1C	PTB1.21Kö-23074-01	10 October 2023

With reference to clause 6 of BS EN ISO 7500-1 the proving equipment used have been calibrated to BS EN ISO 376 and the class of the proving device(s) was equal to or exceeded the class to which the machine has been verified.

The expiry date of the certificates of calibration for the elastic proving devices used is 26 months and for masses 5 years from the dates given above.

Where masses are used, the value for gravity (g) used to calculate the forces exerted by the masses was 9.815m/s^2

When using elastic proving devices the constant indicated force method was used to effect the verification. When masses are used the constant true force method was used to effect the verification. Three verification runs were made on each range

The ZwickRoell Calibration Laboratory is accredited by UKAS to BS EN ISO/IEC 17025 (General requirements for the competence of testing and calibration laboratories) to perform the calibration which is reported on this certificate.

Prior to verification the machine was inspected for good working order and was found to satisfy the guidelines given in section 5 of BS EN ISO 7500-1

The calculation of the accuracy and repeatability errors and the classification of the testing machines performance was made in accordance with the method specified in BS EN ISO 7500-1:2018

Where there are adjacent results at the same force increment, these are at the overlap point from the two proving devices used.

The results only relate to the item calibrated, described above.

The decision rule of the classification does not take into account the uncertainty as described in Section 7 of BS EN ISO 7500-1

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.
The uncertainty stated above refer to values obtained during calibration and make no allowances for factors such as long term drift, and alignment effects, the influences of these factors should be taken into account by the user.

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Results:

Range 1 15000kN Compression Display 1		
These results are:	As found - no adjustments were made	
Nominal Force	Relative Error	Relative Uncertainty
kN	%	%
300.0	-0.57	0.66
600.0	-0.12	0.68
1000.0	0.50	0.50
1500.0	-0.50	0.52
3000.0	-0.49	0.48
3000.0	-0.10	0.49
4500.0	-0.25	0.29
6000.0	-0.14	0.27
7500.0	-0.15	0.24
9000.0	-0.11	0.24
10500.0	-0.05	0.24
12000.0	-0.14	0.24
13500.0	-0.14	0.24
15000.0	-0.11	0.24

End of Certificate

In the result table(s) above a negative relative error indicates that the machine indicator lags the true applied force.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.
The uncertainty stated above refer to values obtained during calibration and make no allowances for factors such as long term drift, and alignment effects, the influences of these factors should be taken into account by the user.