



## Z-SCORES SUMMARY

### Concrete – April 2024 (122)

This proficiency program was conducted in April 2024 with participants throughout Australia. AS 1012 test methods were preferred, but other methods were allowed in this program. This summary provides the z-scores for the following tests.

- Compressive Strength
- Mass per Unit Volume

A z-score summary is provided to allow participants to gauge performance and address outliers as early as possible. It is recommended that any remedial action be undertaken cautiously until the final report for the program has been consulted.

Some participants supplied their Mass per Unit Volume in the wrong units of measurement; these have been corrected for this Z-score summary; more information about this matter will be found in the final report (once released)

Participants may forward the summary report to NATA as an indication of a participant's general performance.

The z-scores shown are unlikely to change significantly. Small changes, however, may become necessary during the preparation of the final report. The final report provides other information, apart from z-scores, that may be used to assess performance and interpret outliers' significance. The final report, once issued, supersedes the z-score summary.

**All participants need to assess their overall performance once the final report has been issued.**

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### Sample A - Compressive Strength: Z - Scores

Code	Test Result MPa	Z Score	Code	Test Result MPa	Z Score	Code	Test Result MPa	Z Score
A6	59.7	0.78	K7	58.4	0.30	Q2	48.6	<b>-3.35 #</b>
D8	60.0	0.89	P3	58.6	0.37	A7	51.9	-2.12
K6	58.1	0.19	V5	55.9	-0.63	P4	59.6	0.74
N8	48.1	<b>-3.54 #</b>	K8	58.3	0.26	P9	60.3	1.00
Q9	58.7	0.41	T3	58.4	0.30	T9	58.8	0.45
W8	57.8	0.07	V7	56.4	-0.45			
E6	56.7	-0.33	F4	57.8	0.07			
G2	59.0	0.52	J2	56.9	-0.26			
L5	57.0	-0.22	Y3	54.4	-1.19			
E8	60.3	1.00	X3	55.5	-0.78			
U3	57.7	0.04	F6	58.5	0.33			
A4	58.447	0.32	N2	36.5	<b>-7.85 #</b>			
S7	54.2	-1.27	R7	55.4	-0.82			
B4	62.1	1.67	J8	60.1	0.93			
W5	59.3	0.63	Q7	49.8	<b>-2.90</b>			
X9	57.0	-0.22	C7	51.8	-2.16			
J4	57.5	-0.04	U4	30.4	<b>-10.12 #</b>			
T7	58.1	0.19	L4	55.0	-0.97			
F2			C5	59.0	0.52			
U7			U2	60.2	0.97			
S4			Z4	58.5	0.33			
X8	55.3	-0.86	D4	56.0	-0.60			
M6	56.2	-0.52	A8	41.0	<b>-6.18 #</b>			
B9	54.7	-1.08	T5	62.1	1.67			
R6	55.1	-0.93	F7	59.4	0.67			
C8	54.4	-1.19	M4	56.0	-0.60			

Statistic	Value
Number of results	<b>54</b>
Median	<b>57.60</b>
Median MU	<b>0.46</b>
First Quartile	<b>55.15</b>
Third Quartile	<b>58.78</b>
IQR	<b>3.63</b>
Normalised IQR	<b>2.69</b>
CV (%)	<b>4.7</b>
Minimum	<b>49.8</b> (30.4)
Maximum	<b>62.1</b> (62.1)
Range	<b>12.3</b> (31.7)

**Note:** A # indicates an outlier where the z-score obtained is either greater than 3 or less than -3. Codes for all participants are shown. The results column shows a blank entry or 'NR' for those participants that did not submit a result for this test. Results in green have been calculated by the program coordinator. Minimum, Maximum and Range are calculated with outliers excluded, those in brackets include outliers.

### Sample A - Mass Per Unit Volume: Z - Scores

Code	Test Result	Z Score	Code	Test Result	Z Score	Code	Test Result	Z Score
	MPUV			MPUV			MPUV	
A6	2352	1.12	K7	2343	0.11	Q2	2293	-5.51 #
D8	2327	-1.69	P3	2350	0.90	A7		
K6	2338	-0.45	V5	2336	-0.67	P4	2356	1.57
N8	2332	-1.12	K8	5kg/m3	<b>R</b>	P9		
Q9			T3	2339	-0.34	T9	2343	0.11
W8	2345	0.34	V7	2339	-0.34			
E6	2343	0.11	F4	2344	0.22			
G2	2345	0.34	J2	2340	-0.22			
L5	2336	-0.67	Y3	2333	-1.01			
E8	2333	-1.01	X3	2339	-0.34			
U3	2353	1.24	F6	2316	-2.92			
A4			N2	2231	-12.48 #			
S7	2346	0.45	R7	2340	-0.22			
B4	2345	0.34	J8	2345	0.34			
W5	2350	0.90	Q7	2334	-0.90			
X9	2341	-0.11	C7	2344	0.22			
J4	2336	-0.67	U4	2320	-2.47			
T7	2350	0.90	L4	2340	-0.22			
F2			C5	2360	2.02			
U7			U2	2342	0.00			
S4			Z4	2360	2.02			
X8	2371	3.26 #	D4	2340	-0.22			
M6	2317	-2.81	A8	2260	-9.22 #			
B9	2326	-1.80	T5	2344	0.22			
R6	2354	1.35	F7	2352	1.12			
C8	2353	1.24	M4	2348	0.67			

Statistic	Value
Number of results	49
Median	2342
Median MU	1.59
First Quartile	2336
Third Quartile	2348
IQR	12.00
Normalised IQR	8.90
CV (%)	0.4
Minimum	2316 (2231)
Maximum	2371 (2371)
Range	55.0 (140.0)

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### Sample B - Compressive Strength: Z - Scores

Code	Test Result MPa	Z Score	Code	Test Result MPa	Z Score	Code	Test Result MPa	Z Score
A6	39.0	0.03	K7	41.1	0.69	Q2	37.4	-0.47
D8	42.9	1.25	P3	37.5	-0.44	A7	39.1	0.06
K6	39.1	0.06	V5	33.6	-1.66	P4	39.5	0.19
N8	32.5	-2.01	K8	36.1	-0.88	P9	39.0	0.03
Q9	42.4	1.10	T3	38.5	-0.13	T9	39.2	0.09
W8	37.5	-0.44	V7	41.9	0.94			
E6	38.8	-0.03	F4	39.9	0.31			
G2	35.5	-1.07	J2	38.3	-0.19			
L5	40.7	0.56	Y3	38.0	-0.28			
E8	38.7	-0.06	X3	41.4	0.78			
U3	35.9	-0.94	F6	41.0	0.66			
A4	40.134	0.39	N2	58.5	<b>6.15 #</b>			
S7	33.2	-1.79	R7	38.4	-0.16			
B4	40.6	0.53	J8	37.9	-0.31			
W5	40.4	0.47	Q7	30.9	-2.51			
X9	41.2	0.72	C7	36.7	-0.69			
J4	39.4	0.16	U4	53.3	<b>4.52 #</b>			
T7	40.0	0.35	L4	38.0	-0.28			
F2			C5	39.0	0.03			
U7			U2	39.8	0.28			
S4			Z4	41.5	0.82			
X8	31.3	-2.38	D4	37.0	-0.60			
M6	27.1	<b>-3.70 #</b>	A8	58.5	<b>6.15 #</b>			
B9	34.3	-1.44	T5	41.5	0.82			
R6	35.7	-1.00	F7	31.3	-2.38			
C8	34.4	-1.41	M4	35.0	-1.22			

Statistic	Value
Number of results	<b>54</b>
Median	<b>38.90</b>
Median MU	<b>0.54</b>
First Quartile	<b>36.25</b>
Third Quartile	<b>40.55</b>
IQR	<b>4.30</b>
Normalised IQR	<b>3.19</b>
CV (%)	<b>8.2</b>
Minimum	<b>30.9</b> (27.1)
Maximum	<b>42.9</b> (58.5)
Range	<b>12.0</b> (31.4)

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### Sample B - Mass Per Unit Volume: Z - Scores

Code	Test Result	Z Score	Code	Test Result	Z Score	Code	Test Result	Z Score
	MPUV			MPUV			MPUV	
A6	2269	0.58	K7	2273	0.84	Q2	2231	-1.86
D8	2286	1.67	P3	2255	-0.32	A7		
K6	2251	-0.58	V5	2255	-0.32	P4	2268	0.51
N8	2246	-0.90	K8	6kg/m3	<b>R</b>	P9		
Q9			T3	2278	1.16	T9	2270	0.64
W8	2250	-0.64	V7	2272	0.77			
E6	2251	-0.58	F4	2277	1.09			
G2	2250	-0.64	J2	2240	-1.28			
L5	2270	0.64	Y3	2278	1.16			
E8	2251	-0.58	X3	2287	1.73			
U3	2255	-0.32	F6	2247	-0.84			
A4			N2	2325	<b>4.18 #</b>			
S7	2245	-0.96	R7	2240	-1.28			
B4	2258	-0.13	J8	2237	-1.48			
W5	2270	0.64	Q7	2270	0.64			
X9	2284	1.54	C7	2265	0.32			
J4	2263	0.19	U4	2220	-2.57			
T7	2270	0.64	L4	2260	0.00			
F2			C5	2300	2.57			
U7			U2	2265	0.32			
S4			Z4	2260	0.00			
X8	2242	-1.16	D4	2260	0.00			
M6	2227	-2.12	A8	2320	<b>3.85 #</b>			
B9	2225	-2.25	T5	2252	-0.51			
R6	2275	0.96	F7	2263	0.19			
C8	2271	0.71	M4	2248	-0.77			

Statistic	Value
Number of results	<b>49</b>
Median	<b>2260</b>
Median MU	<b>2.78</b>
First Quartile	<b>2250</b>
Third Quartile	<b>2271</b>
IQR	<b>21.00</b>
Normalised IQR	<b>15.57</b>
CV (%)	<b>0.7</b>
Minimum	<b>2220</b> (2220)
Maximum	<b>2300</b> (2325)
Range	<b>80.0</b> (105.0)

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