
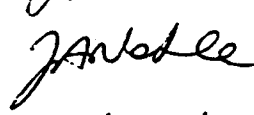


Test Report



Report No	EP003184
Client	Keymat Technology Ltd 14 Bentinck Court Bentinck Road West Drayton UB7 7RQ
Authority & date	Client's Purchase Order No. 003499 dated 5 April 1995
Items tested	Keyboards and Keypads
Specifications	Product evaluation
Results	See text
Prepared by	
Authorized by	 J A Noble
Issue date	9 November 1995
Conditions of issue	This Test Report is issued subject to the conditions stated in the current issue of <i>Test Leaflet 1</i> "General conditions relating to acceptance of testing". The results contained herein apply only to the particular samples tested and to the specific tests carried out, as detailed in this Test Report. The issuing of this Test Report does not indicate any measure of approval, certification, supervision, control or surveillance by BSI of any product. No extract, abridgement or abstraction from a Test Report may be published or used to advertise a product without the written consent of the Director, BSI Testing, who reserves the absolute right to agree or reject all or any of the details of any items of publicity for which consent may be sought.

TESTING, EXAMINATION AND ASSESSMENT OF KEYBOARDS AND KEYPADS SUBMITTED AS PRODUCT EVALUATION SAMPLES

INTRODUCTION

At the request of Keymat Technology Ltd the keyboards and keypads detailed below were subjected to Product Evaluation tests and assessments. Where applicable, the performance and conditioning requirements of relevant British Standards were used as a basis for assessment. This request was made by Purchase Order from the submittor No. 003499 dated 5 April 1995.

This Report only relates to the actual samples which have been tested and assessed. The results obtained do not necessarily relate to samples from the production line and in no way imply the performance or quality of the continuing production.

TEST ITEMS

5 off samples of Keymat Storm series 1100 Keyboard
 1 off sample of Keymat Storm series 1000 Keypad
 3 off samples of Keymat Storm series 2000 Keypad
 3 off samples of Keymat Storm series 3000 Keypad
 1 off sample of Keymat Storm series 4000 Keypad

SUMMARY OF RESULTS

The test samples met the performance requirements of those tests against which assessments were made.

Sample	Test Number						
	1	2	3	4	5	6	7
1100 Keyboard	√	√	√	√	√	√	√
1000 Keypad			√				
2000 Keypad	√	√	√	√	√	√	
3000 Keypad		√	√	√	√		
4000 Keypad				√			

EXAMINATION AND TEST**TEST****ASSESSMENT****1. RESISTANCE TO INGRESS OF DUST AND WATER**

The samples were tested in accordance with BS EN 60529:1992
Degrees of protection provided by enclosures (IP code).

Clause 5

Degrees of protection against access to hazardous parts and against
solid foreign objects indicated by the first characteristic numeral.

The samples were tested to first characteristic numeral 6 -
Dust tight (Table II)

Ingress of dust

Sample	Specified	Actual	
1100 Keyboard	None	None	Pass
2000 Keypad	None	None	Pass

Operation after exposure to dust

Sample	Specified	Actual	
1100 Keyboard	Correct	Correct	Pass
2000 Keypad	Correct	Correct	Pass

Clause 6

Degrees of protection against ingress of water indicated by the
second characteristic numeral.

The samples were tested to second characteristic numeral 5 -
Protected against water jets (Table III).

Ingress of water

Sample	Specified	Actual	
1100 Keyboard	None	None	Pass
2000 Keypad	None	None	Pass

Operation after exposure to water

Sample	Specified	Actual	
1100 Keyboard	Correct	Correct	Pass
2000 Keypad	Correct	Correct	Pass

EXAMINATION AND TEST (CONTINUED)**TEST****ASSESSMENT****2. OPERATIONAL LIFE TEST**

One key was selected at random and subjected to 10 million operations at the rate of 2 per second. The samples were assessed for circuit breakdown at regular intervals during the test and for full operation on completion of the test.

Operation after life test

Sample	Specified	Actual	
1100 Keyboard	Correct	Correct	Pass
2000 Keypad	Correct	Correct	Pass
3000 Keypad	Correct	Correct	Pass

3. RESISTANCE TO VIBRATION

The samples were tested in accordance with Mil Stan 8.10E, Ground Mobile, Wheeled Vehicles and Trailers, for a period of 2 hours in each axis. The samples were assessed for correct operation on completion of the test.

Operation after vibration test

Sample	Specified	Actual	
1100 Keyboard	Correct	Correct	Pass
1000 Keypad	Correct	Correct	Pass
2000 Keypad	Correct	Correct	Pass
3000 Keypad	Correct	Correct	Pass

EXAMINATION AND TEST (CONTINUED)**TEST****ASSESSMENT****4. ALTERNATING CURRENT FLASH TEST**

A variable AC voltage was applied at a current of 2mA between the connection pins and the body of the samples. The voltage was increased in stages first to 500V and then to 1000V, and held for 60 seconds at each stage. Finally the voltage was increased until breakdown of resistance occurred. The samples were assessed for correct operation on completion of the test.

Voltage subjected to without breakdown

Sample	Specified	Actual	
1100 Keyboard	500	500	Pass
	1000	1000	Pass
2000 Keypad	500	500	Pass
	1000	1000	Pass
3000 Keyboard	500	500	Pass
	1000	1000	Pass
4000 Keypad	500	500	Pass
	1000	1000	Pass

Final breakdown voltage

Sample	Voltage
1100 Keyboard	1850
2000 Keypad	1020
3000 Keypad	2410
4000 Keypad	2420

Operation after breakdown

Sample	Operation
1100 Keyboard	Correct
2000 Keypad	Correct
3000 Keypad	Correct
4000 Keypad	Correct

EXAMINATION AND TEST (CONTINUED)**TEST****ASSESSMENT****5. RESISTANCE TO EXTREMES OF TEMPERATURE**

The samples were tested in accordance with BS 2011:Part 2.1A:1990 (IEC 68-2-1:1990) and BS EN 60068-2-2:1993 (IEC 68-2-2:1974) to assess resistance to cold and dry heat respectively.

Resistance to cold

After conditioning at $23 \pm 2^\circ\text{C}/50 \pm 5\%$ RH for 24 hours the samples were exposed to -40°C for 2 hours. After a recovery period of 90 minutes the samples were assessed for correct operation.

Operation after exposure to -40°C

Sample	Specified	Actual	
1100 Keyboard	Correct	Correct	Pass
2000 Keypad	Correct	Correct	Pass
3000 Keypad	Correct	Correct	Pass

Resistance to dry heat

After conditioning at $23 \pm 2^\circ\text{C}/50 \pm 5\%$ RH for 24 hours the Keypad samples were exposed to 125°C for 2 hours. After a recovery period of 90 minutes the samples were assessed for correct operation.

Operation after exposure to 125°C

Sample	Specified	Actual	
2000 Keypad	Correct	Correct	Pass
3000 Keypad	Correct	Correct	Pass

After conditioning at $23 \pm 2^\circ\text{C}/50 \pm 5\%$ RH for 24 hours the Keyboard sample was exposed to 85°C for 2 hours. After a recovery period of 90 minutes the samples were assessed for correct operation.

Operation after exposure to 85°C

Sample	Specified	Actual	
1100 Keyboard	Correct	Correct	Pass

EXAMINATION AND TEST (CONTINUED)**TEST****ASSESSMENT****6. RESISTANCE TO IMPACT**

A 50mm diameter steel impactor of mass 2.00 kg was dropped onto the operating faces of the samples from a height of 1 metre thereby imparting an impact energy of 19.62J to the samples. The samples were assessed for correct operation after completion of the test.

Operation after impact

Sample	Specified	Actual	
1100 Keyboard	Correct	Correct	Pass
2000 Keypad	Correct	Correct	Pass

7. DROP TEST

The 1100 Keyboard was dropped from a height of 1 metre onto a flat concrete surface, striking first on the lower right hand corner of the Keyboard 'edge-on' to the concrete surface. The Keyboard was assessed for condition and correct operation on completion of the test.

Condition after drop test.

The Keyboard sustained minor distortion and damage to the plastic surface in the immediate area of the initial impact only.

Operation after drop test

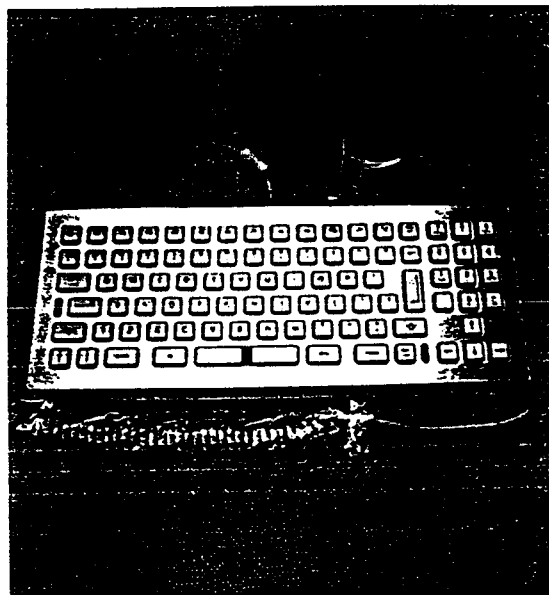
Sample	Specified	Actual	
1100 Keyboard	Correct	Correct	Pass

EXAMINATION AND TEST (CONTINUED)

PHOTOGRAPHS OF SAMPLES UNDER TEST

Storm series 1100 Keyboard

Keyboard

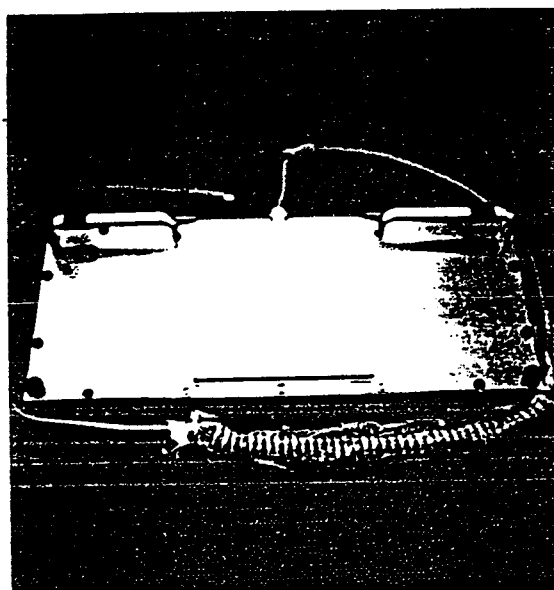


EXAMINATION AND TEST (CONTINUED)

PHOTOGRAPHS OF SAMPLES UNDER TEST (CONTINUED)

Storm series 1100 Keyboard (continued)

Underside



EXAMINATION AND TEST (CONTINUED)

PHOTOGRAPHS OF SAMPLES UNDER TEST (CONTINUED)

Storm series 1000 Keypad (continued)

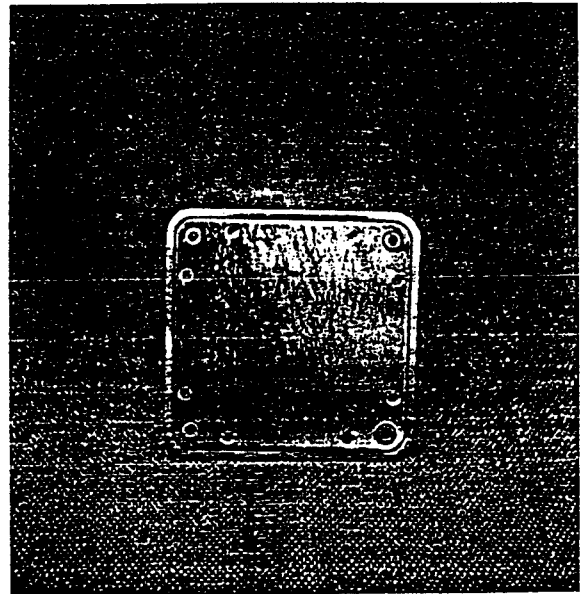
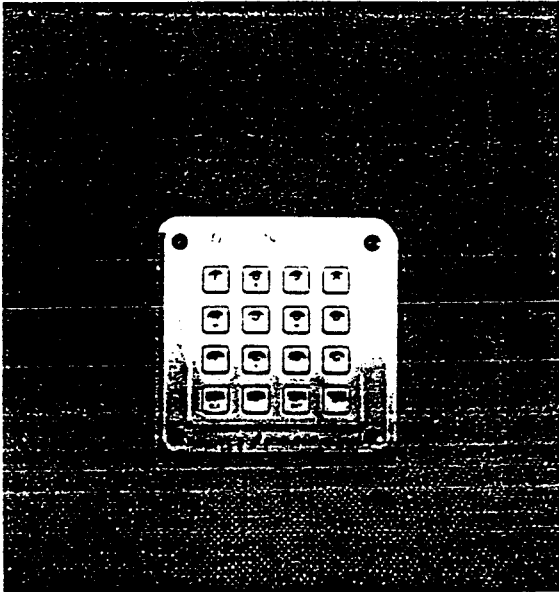
Underside

EXAMINATION AND TEST (CONTINUED)

PHOTOGRAPHS OF SAMPLES UNDER TEST (CONTINUED)

Storm series 1000 Keypad

Keyboard



EXAMINATION AND TEST (CONTINUED)

PHOTOGRAPHS OF SAMPLES UNDER TEST (CONTINUED)

Storm series 2000 Keypad (continued)

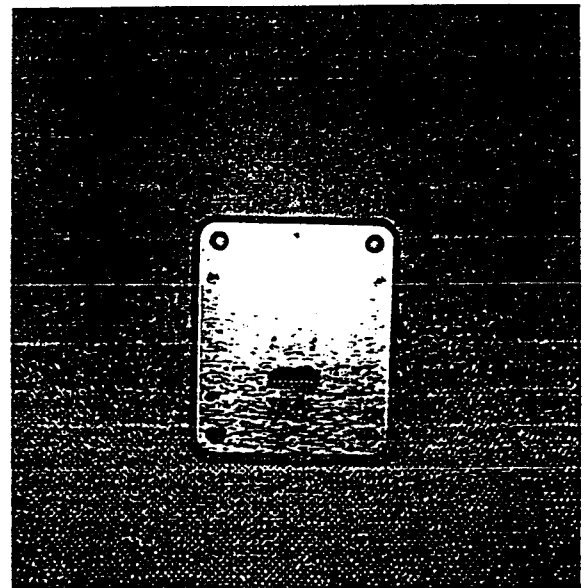
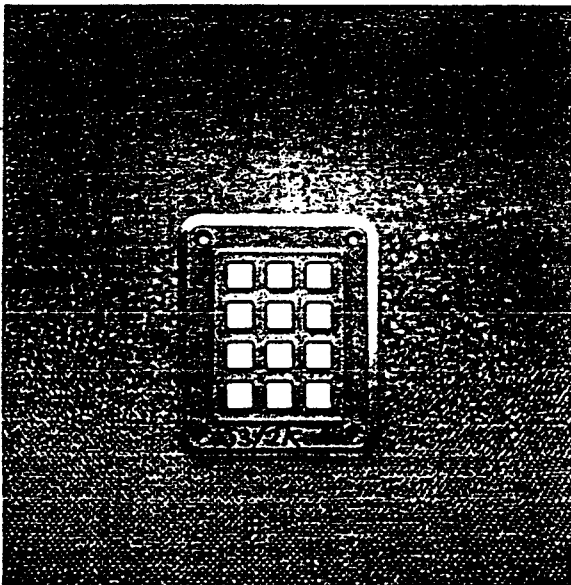
Underside

EXAMINATION AND TEST (CONTINUED)

PHOTOGRAPHS OF SAMPLES UNDER TEST (CONTINUED)

Storm series 2000 Keypad

Keyboard



EXAMINATION AND TEST (CONTINUED)

EXAMINATION AND TEST (CONTINUED)

PHOTOGRAPHS OF SAMPLES UNDER TEST (CONTINUED)

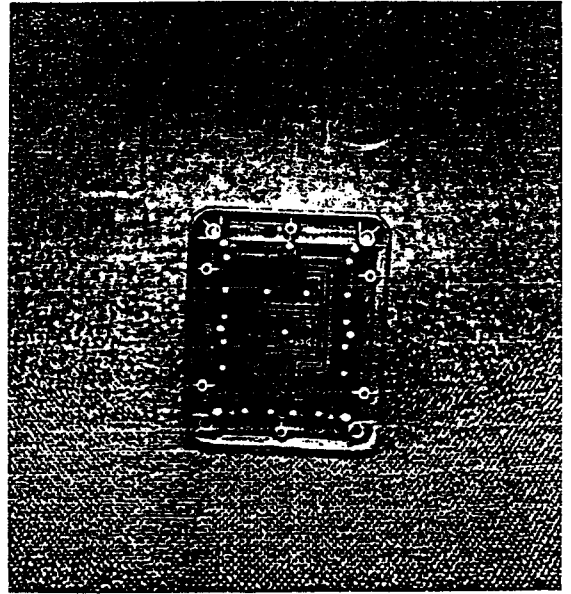
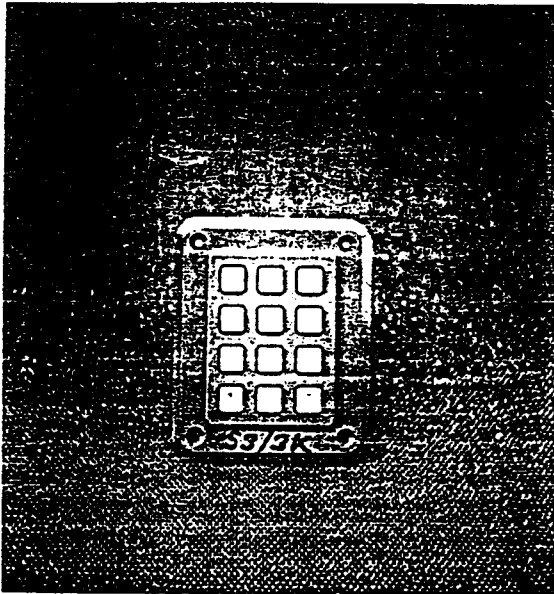
PHOTOGRAPHS OF SAMPLES UNDER TEST (CONTINUED)

Storm series 3000 Keypad

Storm series 3000 Keypad (continued)

Keyboard

Underside



EXAMINATION AND TEST (CONTINUED)

EXAMINATION AND TEST (CONTINUED)

PHOTOGRAPHS OF SAMPLES UNDER TEST (CONTINUED)

PHOTOGRAPHS OF SAMPLES UNDER TEST (CONTINUED)

Storm series 4000 Keypad

Storm series 4000 Keypad (continued)

Keyboard

Underside

