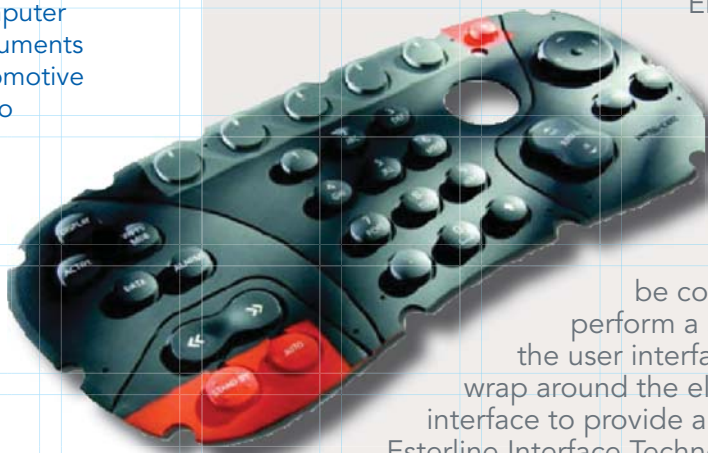


# Elastomeric Keypads

### Typical Applications

- Telephone
- Remote control
- Office machines
- Calculator
- Computer
- Instruments
- Automotive
- Radio



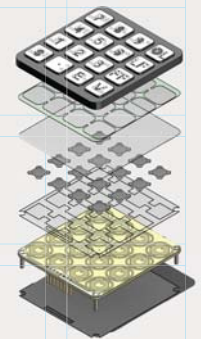
## Long operational life and excellent tactile feedback

Elastomers (or silicon rubber keypads) offer an alternative look and feel to traditional polyester or polycarbonate graphics. Relatively inexpensive and very reliable, elastomeric keypads from Esterline provide long operational life and excellent tactile feedback.

Elastomers, because they are silicone, can be co-molded to bond to plastic enclosures and perform a seamless bond between the enclosure and the user interface. Elastomers can also be designed to wrap around the electronic assembly of a user interface to provide a seamless sealed solution.

Esterline Interface Technologies molds elastomers by using the compression process and the liquid injection molding (LIM) process.

A number of enhancement and functionality opportunities exist - from legending and backlighting treatments to design shape, height, and texture options. Esterline Interface Technologies also provides a variety of abrasion resistant coatings and treatments to insure long life without noticeable wear.



### Features and Benefits

- In house engineering design
- Quick turn prototypes
- On and off shore tooling
- Internal molding for prototypes and low volume
- Environmental coatings for durability and chemical resistance
- Laser etching, silk screen and pad printing, insert molded, flow molded
- Backlighting
- Unique adhesion solutions

#### Description

**Elastomeric Silicone Rubber Keypads** easily interface with membrane switches, printed circuit boards and flex circuits utilizing polyester domes, stainless steel domes, carbon pills, or non-tactile constructions.

**Carbon Pill Elastomers** integrate the electrical contact circuit into the rubber keypad that interfaces directly with a polyester, polyimide, or printed circuit board lower circuit.

**Abrasion Resistant Coatings and Treatments** are available in many varieties and can be applied to the surface of elastomers to insure long life without noticeable wear.

**Design Shape, Height, and Texture** options are available with elastomeric keypads, offering the OEM customer several choices to enhance the look of the input device.







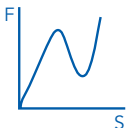
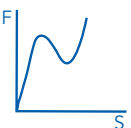
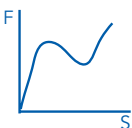
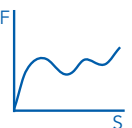
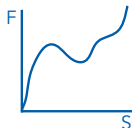

**Legending and Backlighting Techniques** in a variety of treatments are available, including screen printing and laser etching.

# SPECIFICATIONS

ELECTRICAL	
Contact resistance - Elastomer assemblies	<100Ω with silver shorting pads <200Ω to 300Ω with carbon pills
Insulation resistance @ 500 VDC	>100 Mohms
Contact rating (H depends on size and configuration of circuits)	30 mA @ 12V DC 0.5 sec
Contact bounce, milliseconds	<12 msec
MECHANICAL	
Actuation force	20-350 grams
Key stroke	0.25 - 5.0 mm
Operating life	1 million actuations (typical)
Durometer - typical 65 ± 5	40-80 ± 5
ENVIRONMENTAL	
Operating temperature	-30°C to +185°C
Storage temperature	-42°C to +250°C
Flammability	94HB
DURABILITY	
Dielectric strength	> 1 min. @ 500V RMS
Tensile strength (kg/cm <sup>2</sup> )	55-75 depending on durometer
Insulation breakdown	26k v/mm

Typical Dimensional Tolerances	
Dimension (mm)	Tolerance (+/-)
0.0 - 10.0	0.10 mm
10.1 - 20.0	0.15 mm
20.1 - 30.0	0.20 mm
30.1 - 40.0	0.25 mm
40.1 - 50.0	0.30 mm
50.1 - 100.0	0.35 mm
100.1 and larger	0.5%

Typical Actuation Tolerances	
Force (grams)	Tolerance (+/-)
50	15 grams
75	20 grams
100	25 grams
125	30 grams
150	35 grams
175	40 grams
200	50 grams
250 and higher	30%

BASIC CONSTRUCTION OF SILICONE RUBBER KEYPAD						
Type						
Force curve						
Force range	0-350g	30-250g	30-150g	30-80g	30-200g	20-80g
Stroke range	0.5-3.0 mm	0.7-1.5 mm	0.5-3.0 mm	2.0-4.0 mm	1.0-2.5 mm	0.2-1.0 mm
Life Cycle (x10)	500-2,000	500-2,000	1,000-3,000	5,000-20,000	500-3,000	500-10,000



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