

Technical Bulletin



Silicone Rubber Dies

Silicone rubber dies are commonly used for application of thermal graphics onto flat, contoured or cylindrical-shaped products. Silicone rubber conforms to surface variations and delivers a consistent, high-quality impression. We offer standard rubber formulations designed with excellent thermal conductivity and physical properties to ensure the success of your applications. United Silicone's standard die sizes offer improved setup efficiency and repeatable artwork position from die to die. Die changes become routine, as re-drilling the die mounting block is unnecessary.



Silicone Rubber

Formulation

- **Supersil™** (Red): General purpose
- **Ultrasil™** (Red): High heat endurance
- **Thermosil™** (Brown): High thermal conductivity

Hardness

Measured using a Shore A scale

- 60 - 90 durometer available in all formulations
- Dual durometer (90/60) is also available

Character Height (A)

- .035" and .065" relief, standard
- Custom reliefs available

Rubber Thickness (B)

- 3/32" is used for .035" relief dies
- 1/8" is used for .065" relief dies
- Custom thickness available upon request

Aluminum Thickness (C)

- 1/8" is standard
- 1/32", 1/16", 1/4" available
- Deadsoft- Aluminum, easily formed to a set contour
- 22" L x 25" W maximum size

Standard Dies

Increased Productivity and Reduced Cost

- Consistent Die-to-Die artwork placement
- Precision machined holes
- Reduced set-up time
- Improved set-up efficiency

Die Sizes Available

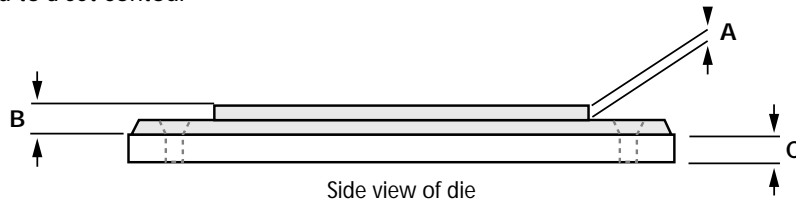
- 2" x 4" with mounting holes
- 2 3/8" x 3 1/4" with mounting holes
- 4" x 5" with mounting holes
- Custom die sizes and holes available per your drawing or sketch

Magnesium Dies

- 16 gauge material (.064") .035" relief
- 11 point material (.153") .065" relief
- 1/4" material (.250") .065" relief

Die Mounting Blocks

- Standard die mounting blocks available for immediate delivery
- Custom die mounting blocks available
- Magnetic Quick-Change



ITW United Silicone

DESIGNERS AND MANUFACTURERS OF HOT STAMP AND HEAT TRANSFER DECORATING SYSTEMS AND SUPPLIES

Vertical, Roll-on and Peripheral Machines

Automated Systems • Close Tolerance Machines • In-Mold Feed Systems
Metal Dies • Custom Tooling • Silicone Rubber Sheets, Dies and Rollers
Contract Manufacturing • R & D • Custom Engineering & Design

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Properties of Silicone Rubber Formulations

| Formulation | Duro (Shore A) | Tensile Strength (PSI) | Elongation (%) | Compression Set (%) | Heat Resistance | Specific Gravity |
|-------------------|----------------|------------------------|----------------|---------------------|-----------------|------------------|
| Supersil (red) | 90 | 800 | 95 | 13.8 | 500 | 1.77 |
| | 80 | 880 | 125 | 8.2 | 500 | 1.73 |
| | 70 | 830 | 250 | 9.7 | 500 | 1.59 |
| | 60 | 835 | 360 | 9.5 | 500 | 1.49 |
| | 50 | 910 | 490 | 9.8 | 500 | 1.38 |
| | 40 | 1010 | 660 | 10.1 | 500 | 1.20 |
| Ultrasil (red) | 90 | 1110 | 60 | 30 | 600 | 1.75 |
| | 80 | 1100 | 125 | 24 | 600 | 1.72 |
| | 70 | 1030 | 185 | 20 | 600 | 1.60 |
| | 60 | 1050 | 270 | 18 | 600 | 1.45 |
| | 50 | 940 | 365 | 17 | 600 | 1.35 |
| | 40 | 890 | 535 | 15 | 600 | 1.11 |
| Thermosil (brown) | 90 | 1075 | 100 | 14 | 600 | 2.10 |
| | 80 | 1050 | 120 | 12 | 600 | 2.09 |
| | 70 | 1030 | 175 | 7 | 600 | 1.80 |
| | 60 | 980 | 215 | 6 | 600 | 1.63 |

*Properties listed are typical and subject to change

Durometer - The hardness of a material as measured on the Shore A scale. (90 durometer = hardest)

Tensile Strength - The pulling stress just before the material breaks into two pieces. (1080psi = strongest)

Elongation - The fractional increase in length of a material, stressed in tension, just before it breaks into two pieces. (585% = most elastic)

Compression Set - The measure of material resiliency after being subjected to compression and heat. (10% = most resilient)

Heat Resistance - Ability of a material to remain bonded to metal during exposure to extreme temperature. (600°F at bond surface = most resistant)

Specific Gravity - The density of a material divided by that of water. (2.11 = best thermal conductivity)

| | | |
|-----------|--|--|
| Supersil | Excellent general purpose material specifically formulated for expedited leadtimes | Conventional vertical and peripheral decorating operations requiring moderate heat and cycle times – typically manually fed |
| Ultrasil | Premium, high performance material with outstanding rubber to metal bondability | Demanding vertical and peripheral decorating operations requiring high temperatures and/or high pressures – usually manually fed |
| Thermosil | Advanced high performance material with enhanced heat recovery properties | Semi-automatic and automatic vertical and peripheral decorating requiring very stable high temperatures and very rapid recovery |

United Silicone offers a complete line of Hot Stamp/Heat Transfer Equipment & Supplies.

Silicone Rubber Rollers

- Flat, Stepped & Contoured
- Heat Transfer & Hot Stamping
- Extruded Product
- Heat Sealing
- Edge Banding
- Laminating
- Feed & Guide Rollers

Silicone Rubber Sheets:

- Heat Sealing
- Heat Transfer
- Automated Applications
- Hot Stamp Tipping

Tooling:

- Precision Part Holding Fixtures



Equipment:

- Standard Machines
- Automated Systems

