## Description

### Image



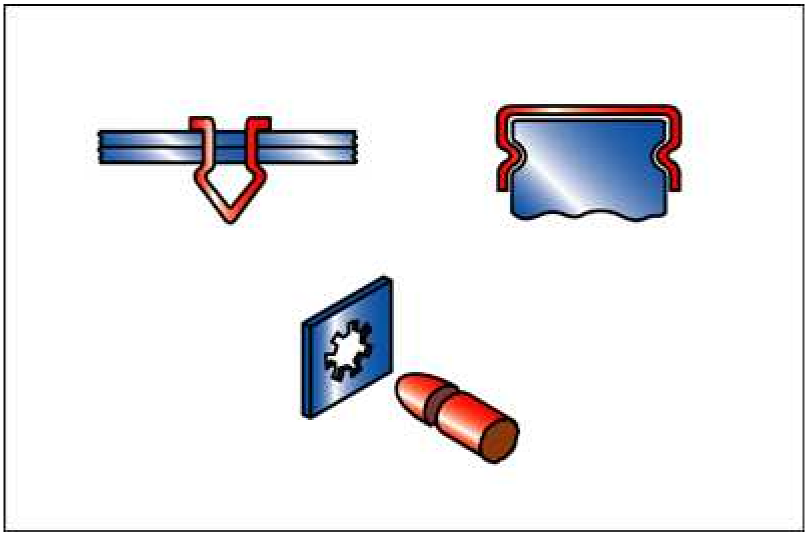
### Image caption

(1) Bag belt buckle © Frank C. Müller at Wikimedia Commons (CC BY-SA 4.0) (2) Plastic bottle lid © HebiFot at Pixabay [Public domain] (3) Tin recipient with snap fit seal © Pavel-Vacerek at pixabay [Public domain]

### The process

SNAP FITS, like other mechanical fastenings, involve no heat, they join dissimilar materials, they are fast and cheap and - if designed to do so - they can be disassembled. It is essential that the snap can tolerate the relatively large elastic deflection required for assembly or disassembly. Polymers,  particularly, meet this requirement, though springy metals, too, make good snap fits.

### Process schematic



### Figure caption

A snap fit

## Material compatibility

| | |
|---|---|
| Composites | ✔ |
| Foams | ✔ |
| Metals - ferrous | ✔ |

| | |
|---|---|
| Metals - non-ferrous | ✓ |
| Natural materials | ✓ |
| Polymers - thermoplastics | ✓ |
| Polymers - thermosets | ✓ |

## Function compatibility

| | |
|---|---|
| Electrically conductive | ✓ |
| Watertight/airtight | ✓ |
| Demountable | ✓ |

## Joint geometry compatibility

| | |
|---|---|
| Lap | ✓ |
| Sleeve | ✓ |
| Scarf | ✓ |

## Load compatibility

| | |
|---|---|
| Tension | ✓ |
| Compression | ✓ |
| Shear | ✓ |
| Bending | ✓ |
| Torsion | ✓ |
| Peeling | ✗ |

## Economic compatibility

| | |
|---|---|
| Relative tooling cost | low |
| Relative equipment cost | low |
| Labor intensity | low |

## Physical and quality attributes

| | | | | |
|---|---|---|---|---|
| Range of section thickness | 39.4 | - | 1.97e3 | mil |
| Unequal thicknesses | ✓ | | | |
| Processing temperature | 44.3 | - | 98.3 | °F |

## Process characteristics

| | |
|---|---|
| Discrete | ✓ |

## Supporting information

**Design guidelines**

Snap fits allow components of every different shape, material, color and texture to be locked together, or to be attached while allowing rotation in one or more direction (snap hinges). The snap fit can be permanent or allow disassembly, depending on the detailed shape of the mating components. The process allows great flexibility in design and aesthetic variety.

**Technical notes**

The best choices are materials with large yield strains (yield strain = yield strength, sy/elastic modulus, E) and with moduli that are high enough to ensure good registration and positive locking. The best materials for snap fits are those with large values of yield (or fatigue) strength/elastic modulus (sy/E), and a sufficiently large modulus to give a rigid attachment. Polymers (particularly SAN, nylons, polyethylenes and polypropylenes) have much larger values of sy/E than metals. Elastomers have the largest of all materials, but their low modulus means that the assembly will be too flexible and pop apart easily. Among metals, those used to make springs (spring steel, copper beryllium alloys and cold worked brass) are the best choices, for the same reasons.

**Typical uses**

Snap fits are increasingly used because of the freedom of material and shape that they allow. Typically they are used to join small or medium sized polymer parts, metal casings, sheet parts etc.

**The economics**

Snap fits are fast and cheap, they reduce assembly time and cost, both in production and in use. Hand assembly requires no special equipment. Automated assembly requires equipment that can be expensive, but it is very fast.

**The environment**

Snap fits disassemble easily, making recycling easier. In this and every other way they are environmentally benign.

## Links

MaterialUniverse

Reference