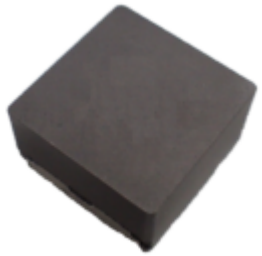
Core Materials: Differences in Metal Coils

Metal-based coils may appear similar, but their performance can differ greatly depending on the molding method.
Here's a look at how different molding techniques impact the performance of metal coils in Sagami Elec's lineup.



XRK-B Series

XRK-D Series

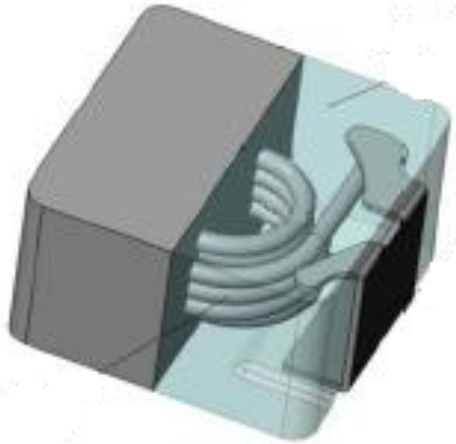
XRJ Series

The three types in Sagami Elec's lineup each use a different molding method, but it is difficult to distinguish them by appearance alone.

Metal core molding methods are mainly divided into three types.
Cold pressing generally shows the most basic characteristics, while T-cores tend to deliver the best performance.

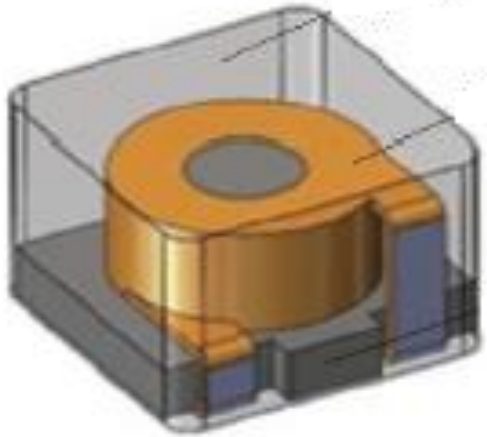
Molding Method	Performance	Sagami Line up
Cold Pressing	Standard characteristics	XRK-B
Hot Pressing	Enhanced DC superposition	XRK-D
T-core	Optimized performance with low DCR	XRJ

Depending on the molding method, the structure of the coil differs, resulting in the following structures:



- cold-formed and hot-formed products

In both cold and hot forming, metal powder is filled into an air-core coil and then compression-molded. Lower temperatures are used for cold forming, and higher temperatures for hot forming. 。



- T-core

A T-core is combined with an air-core coil, and the area around the air-core coil is then pressed with metal powder to form the final shape.

As an example of how molding methods affect performance, the characteristics of XRK0730B, XRK0754D, and XRJ0754 are compared below.
*Note: Since XRK0730B differs in size, adjustments were made: the increase in the low-area portion was applied to the core diameter, and the increase in product height was reflected in the DCR.

	DCR	Volume	Isat-30%	Irat40
XRK0730B-100M	65	138.6	4.4	3.3
XRK0730B Adjustement	36.1	291.6	5.1	5.3
XRK0754D-100M	37.4	291.6	11.5	5.2
XRJ0754-100M	22	291.6	10	6.8

XRK-D shows more than double the DC superposition compared to B, while XRJ has lower DC superposition than D. However, its DCR is much smaller, making it the best overall in performance.