

# Silicone

## Elastic moulding materials – a comparison of our products

	Addition-crosslinked silicones								
	Alpa Sil Extra 10:1	Alpa Sil EH 10:1	Köraform A 42 10:1	Alpa Sil V 66 1:1	Köraform A 50 T 10:1		Alpa Megaplast 1:1	Neukasil RTV 29	Neukasil RTV 22
<b>Attributes of components/processing</b>									
Colour/Transparency A component	colourless, transluc.	colourless, transluc.	colourless, transp.	yellow, opaque	black, opaque		white, opaque	white, opaque	white, opaque
Colour/Transparency B component	blue, translucent	blue, translucent	colourless, transparent	blue, opaque	colourless, translucent		skin colour, opaque	reddish brown, translucent	orange, translucent
Fillers	w/o filler	w/o filler	w/o filler	with filler	with filler		with filler	w/o filler	w/o filler
Density A component (at RT <sup>5)</sup> )	app. 1.1 g/cm <sup>3</sup>	app. 1.1 g/cm <sup>3</sup>	app. 1.09 g/cm <sup>3</sup>	app. 1.07 g/cm <sup>3</sup>	app. 1.35 g/cm <sup>3</sup>		app. 1.5 g/cm <sup>3</sup>	app. 0.98 g/cm <sup>3</sup>	app. 1.1 g/cm <sup>3</sup>
Density B component (at RT <sup>5)</sup> )	app. 1.1 g/cm <sup>3</sup>	app. 1.1 g/cm <sup>3</sup>	app. 0.98 g/cm <sup>3</sup>	app. 1.07 g/cm <sup>3</sup>	app. 0.97 g/cm <sup>3</sup>		app. 1.5 g/cm <sup>3</sup>	app. 0.95 g/cm <sup>3</sup>	app. 1.1 g/cm <sup>3</sup>
Viscosity A component (at RT <sup>5)</sup> )	app. 4,000 mPa.s	app. 10,500 mPa.s	app. 62,000 mPa.s	app. 52,000 mPa.s	app. 33,530 mPa.s		pasty (kneadable)	app. 4,000 mPa.s	app. 2,000 mPa.s
Viscosity B component (at RT <sup>5)</sup> )	app. 2,700 mPa.s	app. 2,700 mPa.s	app. 650 mPa.s	app. 308,000 mPa.s	app. 1,200 mPa.s		pasty (kneadable)	app. 140 mPa.s	app. 2,450 mPa.s
Mixing ratio by weight (A comp.: B comp.)	10:1	10:1	10:1	1:1	10:1		1:1	100:5	1:1
Working life (at RT <sup>5)</sup> )	app. 25 min.	app. 25 min.	app. 90 min.	app. 5 min.	app. 45 min.		app. 2 min.	app. 4 hours	app. 5 min.
Linear shrinkage <sup>1)</sup>	app. 0.1 %	app. 0.1 %	app. 0.1 %	app. 0.1 %	app. 0.1 %		app. 0.1 %	app. 0.1 %	app. 0.1 %
De-moulding time (at RT <sup>5)</sup> )	app. 2 hours	app. 2 hours	12 hours	app. 15-20 min.	app. 12 hours		app. 5 min.	app. 12 hours	app. 30 min.
Shelf life minimum, A comp. (unopened 0-30 °C)	12 months	12 months	12 months	12 months	6 months		12 months	12 months	12 months
Shelf life minimum, B comp. (unopened 0-30 °C)	12 months	12 months	12 months	12 months	6 months		12 months	12 months	12 months
<b>Attributes of cured material</b>									
Colour/Transparency	light blue, transluc.	light blue, transluc.	colourless, transparent	green, opaque	black, opaque		skin colour, opaque	white, opaque	beige-red, opaque
Shore hardness <sup>1)</sup>	app. 18-21 Sh-A	app. 26-28 Sh-A	app. 42 Sh-A	app. 25 Sh-A	app. 43 Sh-A		app. 35 Sh-A	app. 30 Sh-00	app. 22 Sh-A
Elongation at break <sup>1)</sup>	app. 261 %	app. 290 %	app. 330 %	app. 350 %	> 455 %		none given	none given <sup>6)</sup>	app. 1000 %
Tear resistance <sup>1)</sup>	app. 2.35 N/mm <sup>2</sup>	app. 3.7 N/mm <sup>2</sup>	> 5.0 N/mm <sup>2</sup>	app. 4.0 N/mm <sup>2</sup>	> 3.9 N/mm <sup>2</sup>		none given	none given <sup>6)</sup>	app. 3.5 N/mm <sup>2</sup>
Tear propagation strength <sup>1)</sup>	app. 4.6 N/mm	app. 9.4 N/mm	20.0 N/mm	app. 20.0 N/mm	> 7.0 N/mm		none given	none given <sup>6)</sup>	app. 15 N/mm
Heat resistance, short term	up to app. 220 °C	up to app. 220 °C	up to app. 220 °C	up to app. 250 °C	up to app. 250 °C		up to app. 220 °C	none given <sup>6)</sup>	up to app. 200 °C
Heat resistance, continuous/long term	up to app. 180 °C	up to app. 180 °C	up to app. 180 °C	up to app. 160-180 °C	up to app. 170 °C		up to app. 180 °C	up to app. 180 °C	none given
<b>Comments</b>									
Special features	- pours very well - de-aerates well	- pours well - de-aerates very well - high mechanical stability	- pourable - highly transparent - processes only with vacuum device (vacuum pouring device) - highly elastic - very high mechanical stability - good resistance to casting resin - good resistance to curing malfunctions	- thixotropic (pasty, spreadable) - high mechanical stability - very easy to mix (1:1)	- temperature resistant (heat dispersing) - use of vacuum device recommended - high mechanical stability		- kneadable, will not pour - developed for reproductions in paediatric labs (foot care) - tested and approved for skin contact - very easy to mix (1:1) - very short working life and de-moulding time	- gel-like material - de-aerates very well	- food-safe - skin compatible - pours very well - de-aerates very well - high mechanical stability - very easy to mix (1:1) - cures quickly
Intended use	- for basic moulds of small objects without undercuts	- standard silicone for moulding complicated master patterns	- for single piece solid moulds (cut open) - monitoring the pour is possible - rapid prototyping	- for making moulds of vertical or immovable models	- for reproduction of objects with low-melting metals (tin)		- for moulds of the human body	- good for electrical insulation - good for orthopaedic products	- standard silicone for moulds of master forms

<sup>1)</sup> measured at room temperature, for addition-crosslinked silicone after 24 hours (after 7 days for Köraform A 50 T), for condensation-crosslinked silicone after 4 days

<sup>2)</sup> In order to be able to match the attributes of the silicone rubber to the various intended uses, the A components of Con Sil 12 and 25 can be mixed with one another.

<sup>3)</sup> Elastic PUR casting resins can be found in the „Casting Resin“ section because this material can be used to both make moulds and to produce flexible shaped parts.

<sup>4)</sup> The U1404 PUR moulding/casting resin is available with two different hardeners. By changing the mixing ratio between resin and hardener(s) a large range of attributes can be achieved. Please consult the corresponding table found at the product.

<sup>5)</sup> RT = room temperature

<sup>6)</sup> Mechanical strength cannot be determined.

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	Condensation-crosslinked silicones			Elastic polyurethanes	Latex
	Con Sil 12 100:5 <sup>2)</sup>	Köraform K 18 100:2	Con Sil 25 100:5 <sup>2)</sup>	PUR casting/moulding resin U1404	Latex milk
<b>Attributes of components/processing</b>					
Colour/Transparency A component	white, opaque	white, opaque	white, opaque	colourless, transparent	white, opaque
Colour/Transparency B component	yellowish, transparent	colourless, transparent	colourless, transparent	reddish, transparent (both hardeners)	-
Fillers	with filler	with filler	with filler	with filler	w/o filler
Density A component (at RT <sup>5)</sup> )	app. 1.20 g/cm <sup>3</sup>	app. 1.09 g/cm <sup>3</sup>	app. 1.20 g/cm <sup>3</sup>	app. 1.05 g/cm <sup>3</sup>	app. 1.0 g/cm <sup>3</sup>
Density B component (at RT <sup>5)</sup> )	app. 0.95 g/cm <sup>3</sup>	app. 1.04 g/cm <sup>3</sup>	app. 1.20 g/cm <sup>3</sup>	app. 1.03 g/cm <sup>3</sup> (hardener U1404)	-
Viscosity A component (at RT <sup>5)</sup> )	app. 15,000 mPa.s	app. 25,000 mPa.s	app. 35,000 mPa.s	app. 6,500 mPa.s	180 mPa.s
Viscosity B component (at RT <sup>5)</sup> )	very low viscosity	very low viscosity	very low viscosity	app. 300 mPa.s (both hardeners)	-
Mixing ratio by weight (A comp.: B comp.)	100:5	100:2	100:5	varies <sup>4)</sup>	-
Working life (at RT <sup>5)</sup> )	app. 120 min.	80 min.	90 - 150 min.	25 - 100 min. <sup>4)</sup>	-
Linear shrinkage <sup>1)</sup>	app. 1 %	app. 0.5 %	app. 0.7 %	< 0.1 %	app. 6 %
De-moulding time (at RT <sup>5)</sup> )	app. 24 hours	app. 18 hours	app. 24 hours	app. 24 hours	> 12 hours
Shelf life minimum, A comp. (unopened 0-30 °C)	12 months	9 months	12 months	12 months (unopened 15-25 °C)	app. 24 months
Shelf life minimum, B comp. (unopened 0-30 °C)	12 months	6 months	12 months	12 months (unopened 15-25 °C)	-
<b>Attributes of cured material</b>					
Colour/Transparency	white, opaque	white, opaque	white, opaque	reddish, transparent	beige, translucent
Shore hardness <sup>1)</sup>	app. 12 Sh-A	app. 18 Sh-A	app. 25 Sh-A	40 - 80 Sh-A <sup>4)</sup>	none given
Elongation at break <sup>1)</sup>	app. 400 %	app. 350 %	app. 450 %	600 - 1,000 % <sup>4)</sup>	900 - 920 %
Tear resistance <sup>1)</sup>	app. 2.2 N/mm <sup>2</sup>	app. 3.5 N/mm <sup>2</sup>	app. 4.0 N/mm <sup>2</sup>	3 - 16 N/mm <sup>2</sup> <sup>4)</sup>	24 - 28 N/mm <sup>2</sup>
Tear propagation strength <sup>1)</sup>	app. 8 N/mm	app. 17 N/mm	app. 20 N/mm	7 - 40 N/mm <sup>4)</sup>	16 N/mm
Heat resistance, short term	up to app. 70 °C	up to app. 80 °C	up to app. 70 °C	none given	none given
Heat resistance, continuous/long term	none given	none given	none given	up to app. 70 °C	none given
<b>Comments</b>					
Special features	- very soft - pours well - de-aerates very well - highly elastic - long working life and de-moulding times - especially resistant to polyester and polyurethane - good tear-growth resistance	- very highly elastic - high mechanical stability - long working life and de-moulding times - de-aerates very well - especially resistant to polyester and polyurethane - good tear-growth resistance	- highly elastic - very high mechanical stability - long working life and de-moulding times - de-aerates very well - especially resistant to polyester and polyurethane - good tear-growth resistance	- hazardous label required - varying Shore hardnesses, working lives and mechanical stabilities <sup>4)</sup> - very little shrinkage - pours very well (compare silicone) - de-aerates very well (compare silicone) - very highly elastic (compare silicone) - high mechanical stability (compare silicone) - long service life (compare silicone) - takes colouring very well - not self-releasing - relatively hard - exothermic curing - especially resistant to polyester, polyurethane and epoxy resin	- very good value - extremely elastic - material not very durable when cured - smells like ammonia - relatively involved and time-consuming moulding process
Intended use	- for moulds of small objects with significant undercuts and for reproductions made with polyurethane	- for moulds of objects with significant undercuts and on vertical areas as well as for reproductions made with polyurethane	- for moulds of large objects with undercuts	- for moulds of complicated master patterns (alternative to silicone) - casting material for making flexible shaped parts	- for very thin seamless flexible moulds

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