

CAF 33

Description	<p>CAF 33 is a room temperature curing silicone elastomer:</p> <ul style="list-style-type: none"> • ACETIC. • Non FLOWING. • BLACK, WHITE, TRANSLUCENT.
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Examples of applications	<p>This product is more specifically intended for industrial customers who use it for bonding/sealing in various applications:</p> <ul style="list-style-type: none"> • Automotive: <ul style="list-style-type: none"> - sealing on engines, - bonding/sealing of sunroofs. • Domestic appliances: <ul style="list-style-type: none"> - bonding of oven door brackets, - sealing of washing machine tanks. • Aeronautic: <ul style="list-style-type: none"> - miscellaneous bonding applications. • Industry: <ul style="list-style-type: none"> - sealing of molding compartments, - bonding of HCR silicones, - sealing of industrial rotary machines (pumps, turbines, compressors).
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Key benefits	<ul style="list-style-type: none"> • Resists very high temperatures. • Good dielectric properties. • Adhesion to many surfaces. • High resistance to chemical agents. • Resistance to water and humidity.
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Typical properties	<p>1. Processing/Curing</p> <p>Processing is particularly easy since the product is delivered ready to use. Application can be carried out manually or using robotize application equipment.</p> <p>The CAF 33 bead is applied onto one of the two joint surfaces. Assembly must be carried out before the product has formed a skin.</p> <p>It is recommended not to exert an immediate strain on the assembly.</p>
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Curing

Curing of **CAF 33** starts as soon as the product comes into contact with atmospheric humidity.

- Skin formation time*, min..... 6
- Cure rate of 2 mm thickness*, h..... 6
- Cured thickness after 24 h*, mm..... 4,3
- *Temperature 23 °C - relative humidity 50 %

The cure rate increases with temperature and hygrometry.

Comment: it is recommended to apply the product to clean, dry surfaces.

Examples: curing time for 2 mm thickness, according to temperature and hygrometry:

Temperature	25 °C			50 °C			90 °C		110 °C	103 °C
	25	50	70	25	50	70	25	50	70	20
Relative humidity in %	25	50	70	25	50	70	25	50	70	20
2 mm cured thickness	14 h	6 h	4 h	4 h	2 h	2 h	50 min	30 min	17 min	16 min

2. Properties before curing

Appearance	non flowing paste
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Colors	black, white, translucent
Cure type	acetic
Flowability, in mm <small>(Standard BOEING S 7502, NMRPS 459)</small>	≤ 2
Extrusion, g/min <small>(Standard NMRPS 495 A, 3 mm / 3 bars)</small>	50
Specific gravity at 25 °C <small>(Standards ISO R 1183, DIN 53479, NMRPS703)</small>	1.04

3. Properties after curing

3.1. Specific gravity at 25 °C..... 1.05

(Standards ISO 2781, ASTM D 297, BS 903 Part A1)

3.2. Mechanical properties after 7 days

• **Shore A hardness..... 25**

(Standards ISO R 868, DIN 53505, ASTM D 2240 BS 903 Part A7, NFT 46003, NMRPS 471)

• **Modulus at 100 % elongation, MPa..... 0.6**

(Standard ISO R 37 (H2), DIN 53504, ASTM D 412 BS 903 Part A2, NFT 46002 (H2), NMRPS 470)

• **Tensile strength, MPa..... 2.5**

(Standards ISO R 37 (H2), DIN 53504, ASTM D 412 BS 903 Part A2, NFT 46002 (H2), NMRPS 470)

• **Elongation at break, % 500**

(Standards ISO R 37 (H2), DIN 53504, ASTM D 412 BS 903 Part A2, NFT 46002 (H2), NMRPS 470)

• **Tear strength, kN/m..... 5.4**

(Standards ASTM D 624 specimen 1, NMRPS 492)

3.3. Thermal properties or heat stability

Tests carried out on **CAF 33 Black**

Lower temperature limits: Brittle point temperature <small>(Measured using differential calorimetric analysis)</small>	- 65 °C
Upper limit in use Maximum recommended temperature in use:	
continuous <small>(on 2 mm thick film, 1000 h)</small>	+ 250 °C
peak <small>(on 2 mm thick film, 72 h)</small>	+ 300 °C

N.B.: These thermal values are not absolute limits. They represent the range within which initial mechanical properties are not modified by more than 50 %.

Furthermore, for peak uses, exposure for periods less than 72 h, allow higher maximum temperatures.

Thermal conductivity:

Tests carried out on the **CAF 33 Translucent**

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- **Thermal conductivity at 30 °C, W/m.K**..... 0.20
(Standard NF X 10021)

- **Thermal conductivity at 150 °C, W/m.K**..... 0.16
(Standard NF X 10021)

3.4. Resistance to chemicals

Tests carried out on 2 mm thick films, cured for 7 days at room temperature

Resistance to oils after 70 h immersion in the oil at 150 °C

(Standards ISO R 1817, D 471, NMRPS 525)

Oil type	Bulk Swelling (%)	Shore A hardness (points)	Modulus at 100% elongation (MPa)	Tensile strength (MPa)	Elongation at break (%)
Without oil	/	26	0.56	2.4	435
ELF Prestigrade 15 W 40	20	10	0.25	1.4	550
TEXACO 10 W 30	25	7	0.3	1.5	580
ELF Compet. SX 5 W 30	30	7	0.2	1.0	460

Resistance to anti-freeze

Tests carried out after 7 days in boiling RVI anti-freeze

Immersion in boiling RVI anti-freeze	Bulk Swelling (%)	Shore A hardness (points)	Modulus at 100% elongation (MPa)	Tensile strength (MPa)	Elongation at break (%)
Before immersion	0	26	0.58	2,2	435
After 7 days immersion	2.8	23	0.54	2.2	450

Resistance to chemicals

Tests carried out after 5 000 h immersion at room temperature

Product	Bulk Swelling (%)	Variation in tensile strength (%)	Variation in elongation at break (%)
12 % Citric acid		- 0.3	0
12 % Lactic acid	+ 0.3	+ 4	+ 10

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2 % Hydrochloric acid	- 0.1	- 8	- 8
12 °Cl Bleach	- 1	- 20	- 15
25 % Caustic soda	- 7	- 15	- 15
25 % Sodium carbonate	- 0.2	- 12	- 10
25 % Sodium chloride	- 0.1	0	0

3.5. Compression set

Testing to measure the ability of the product to recover its initial state after compression.

(0 % = integral recovery

100 % = no elastic recovery of the product)

(Standards ASTM D 395 (specimen 1, method B), ISO R 815, NF T 46011, NMRPS 523)

Curing time of films at room temperature	Test temperature on stack compressed to 25 % for 3 days	Compression set
3 days	150 °C	54 %

3.6. Adhesion properties

- **Shear strength, MPa**..... 1.4
(Aluminum specimens AG3, joint 1 mm thick,NPRPS 748)
- **Type of cohesive failure, %**..... 100
- **Primerless self-adhesion on**..... glass, enamel,ceramics, epoxy paint,polyester
- **Adhesion with primer**
 - Stainless steel, aluminum primer PM 820
 - ABS primer PP 878
 - Polymethyl methacrylate..... primer 131
 - Composites filled to 30 % with glass fiber primer PP 878 (polyamide, polyester, polypropylene)
- **Adhesion to glass with immersion in various chemicals** (4 months immersion)
 - in isopropyl alcohol 100 % cohesive failure
 - in ammonia solution at 20 % ditto
 - in triethanol amine ditto
 - in sodium chloride at 20 % ditto
 - in concentrated acetic acid ditto
 - in hydrochloric acid at 20 % ditto
 - in nitric acid at 20 % ditto

3.7. Dielectric properties

- **Dielectric strength, KV/mm**..... 19
(Standards NF C 26225, ASTM D 419), IEC 243)
- **Dielectric constant at 1MHz**..... 2.8
(Standards NF C 26230, ASTM D 150, IEC 250)
- **Dielectric dissipation factor at 1MHz**..... 2×10^{-3}

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(Standards NF C 26250, ASTM D 150, IEC 250)

- **Volume resistivity, W.cm**..... 1 x 10¹⁴
(Standards NF C 26215, ASTM D 257, IEC 93)

Please note: The typical properties are not intended for use in preparing specifications. Please contact our local Sales Department for assistance in writing specifications.

Instruction of use	Please consult your local ELKEM SILICONES sales office.
Regulation	Please consult your local ELKEM SILICONES sales office.
Limitations	Please consult your local ELKEM SILICONES sales office.
Packaging	<ul style="list-style-type: none"> • CAF 33 BLACK is available in <ul style="list-style-type: none"> ○ Drum of 210 KG (463.05 LB) ○ Drum of 25 KG (55.13 LB) ○ Pallet of 250 KG (551.25 LB) ○ Piece of 0.322 KG (0.71 LB) ○ Piece of 0.1 KG (0.22 LB) • CAF 33 TRANSLUCENT is available in <ul style="list-style-type: none"> ○ Drum of 210 KG (463.05 LB) ○ Carton • CAF 33 WHITE is available in <ul style="list-style-type: none"> ○ Carton ○ Piece of 0.1 KG (0.22 LB) ○ Drum
Storage and shelf life	When stored in its original packaging: CAF 33 BLACK may be stored at temperatures between 2°C / 36°F and 30°C / 86°F for up to 24 months from its date of manufacturing. CAF 33 TRANSLUCENT may be stored at temperatures between 2°C / 36°F and 30°C / 86°F for up to 24 months from its date of manufacturing. CAF 33 WHITE may be stored at temperatures between 2°C / 36°F and 30°C / 86°F for up to 24 months from its date of manufacturing. Comply with the storage instructions and expiration date marked on the packaging. Beyond this date, Elkem Silicones no longer guarantees that the product meets the sales specifications.
Safety	Please consult the Safety Data Sheet of: CAF 33 BLACK, CAF 33 TRANSLUCENT and CAF 33 WHITE

Visit our website www.elkem.com/silicones/

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