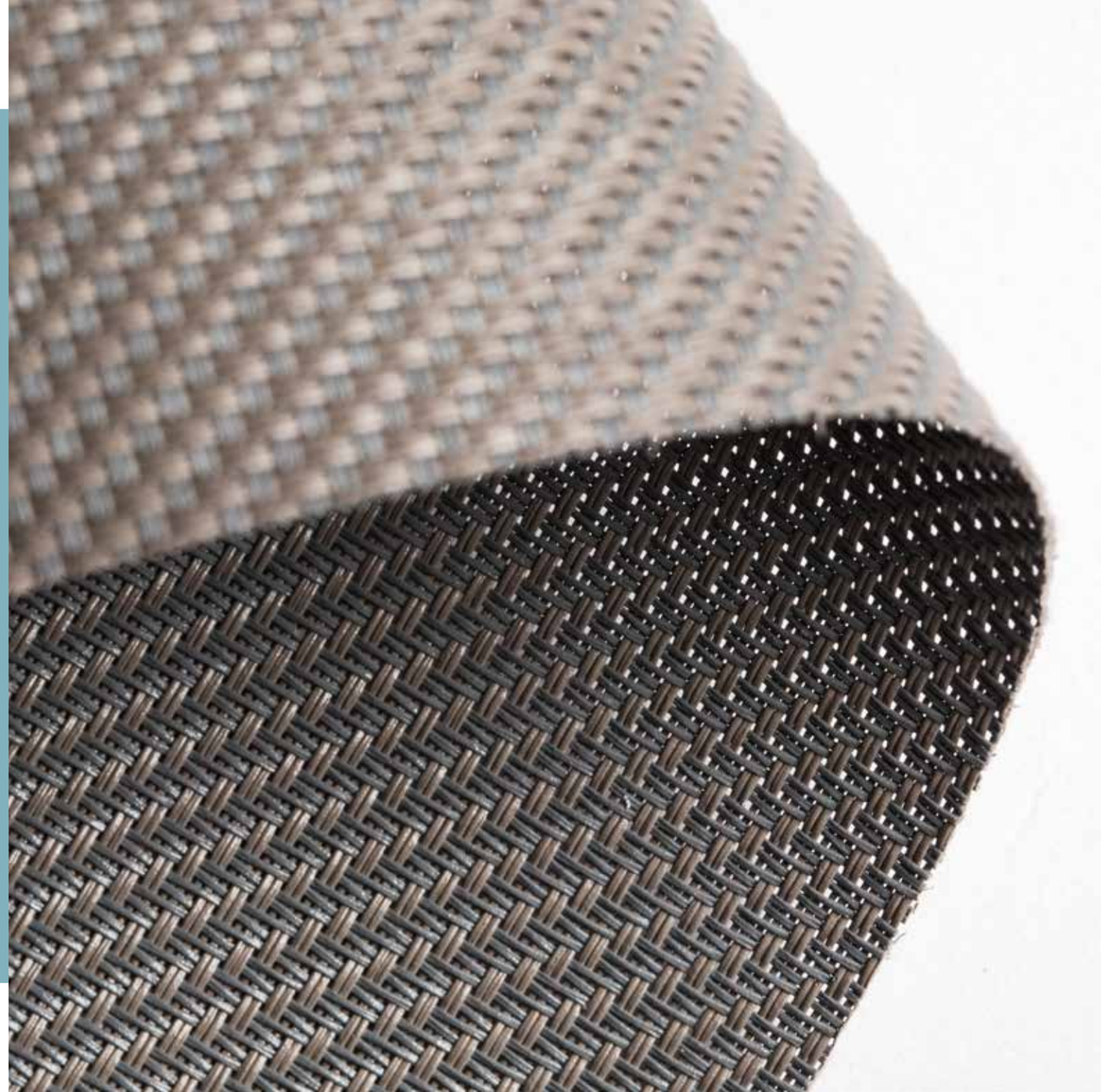
out

Serge 600

COLLECTION 2018-2021
REFLECTS SUNLIGHT OUTDOORS
GLASSFIBRE
OF = 5%

copaco®
screenweavers

Screens that reflect & absorb solar energy outside the house. Meet OUT.



Serge 600

GLASSFIBRE

OF = 5%

Technical specifications

TECHNICAL SPECIFICATION		UNITY		STANDARD	RESULT
composition				Glassfibre 42% - PVC 58%	
openness factor		%		NBN EN 410	5%
weight		g/m²		NF EN 12127	525
thickness		mm		ISO 2286-3	0,74
density		yarn/cm	warp	ISO 7211/2	18
			weft		14
colour fastness to artificial light				ISO 105 B02	>7
colour fastness to artificial weathering				ISO 105 B04	>7
tear strength	original	daN	warp	ISO 4674-1 method 2	8,5
			weft		7,5
elongation up to break	original	%	warp	ISO 1421	3,1
			weft		2,75
breaking strength	original	daN/5 cm	warp	ISO 1421	260
			weft		225
elongation up to break	after colour fastness to artificial weathering	%	warp	ISO 1421	3,5
			weft		2,8
breaking strength	after colour fastness to artificial weathering	%	warp	ISO 1421	240
			weft		225
elongation up to break	after colour fastness to artificial light	%	warp	ISO 1421	4
			weft		2,9
breaking strength	after colour fastness to artificial light	daN/5 cm	warp	ISO 1421	240
			weft		220
tear strength	after climatic chamber -30°C	daN	warp	ISO 4674-1 method 2	7,8
			weft		7,5
elongation up to break	after climatic chamber -30°C	%	warp	ISO 1421	3
			weft		2,5
breaking strength	after climatic chamber -30°C	daN/5 cm	warp	ISO 1421	225
			weft		200
tear strength	after climatic chamber +70°C	daN	warp	ISO 4674-1 method 2	8,2
			weft		7,2
elongation up to break	after climatic chamber +70°C	%	warp	ISO 1421	2,85
			weft		2,5
breaking strength	after climatic chamber +70°C	daN/5 cm	warp	ISO 1421	180
			weft		185
air permeability		l/m².s		ISO 9237	580
fire classification	Europe			UNE-EN 13501-1:2007	C-s3,d0
	France			NF P92-503	M1
	Italy			UNI 9177	Class 1
	Germany			DIN 4102	B1
	UK			BS 5867	C
	USA			NFPA 701	FR
roll length	**50 m / 30 m for all widths > 270 cm**				
cleaning	with soapy water				
confection	by heat, high frequency or ultrasonic welding				

These properties are given as indicative and don't have any contractual value

Serge 600 010010 charcoal | charcoal

Serge 600

GLASSFIBRE

OF = 5%

Colours & references

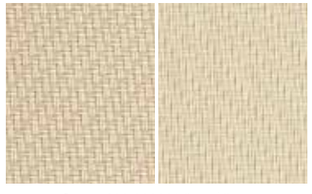
front back

Serge 600 002002 white | white

front back

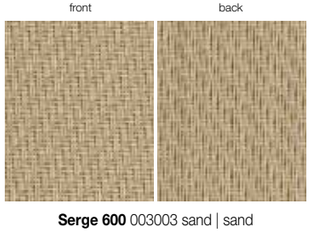
Serge 600 008002 linen | white

front back



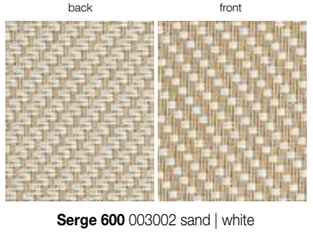
Serge 600 008008 linen | linen

front back



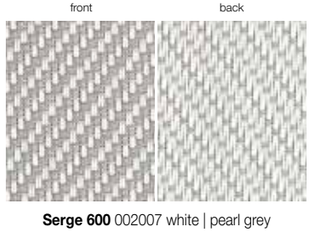
Serge 600 003003 sand | sand

back front



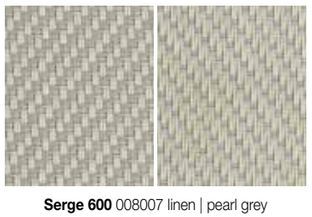
Serge 600 003002 sand | white

front back



Serge 600 002007 white | pearl grey

front back



Serge 600 008007 linen | pearl grey

front back

Serge 600 007082 pearl grey | white-sand

front back

Serge 600 008003 linen | sand

front back

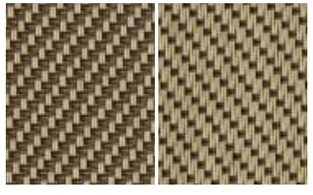
A' architects' selection

Serge 600 033033 sandstone

front back

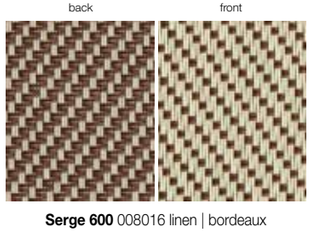
Serge 600 001003 grey | sand

front back



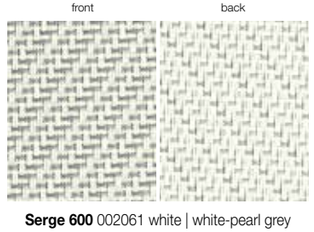
Serge 600 003011 sand | bronze

back front



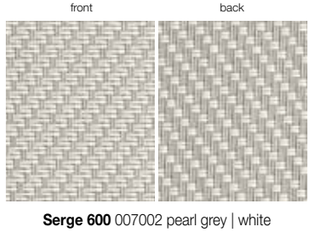
Serge 600 008016 linen | bordeaux

front back



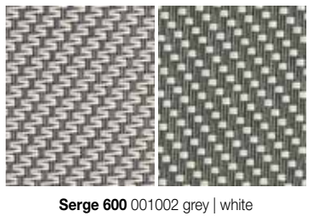
Serge 600 002061 white | white-pearl grey

front back



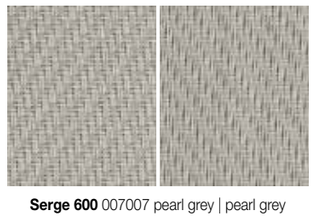
Serge 600 007002 pearl grey | white

front back



Serge 600 001002 grey | white

front back



Serge 600 007007 pearl grey | pearl grey

front back

A' architects' selection

Serge 600 033001 oyster shell

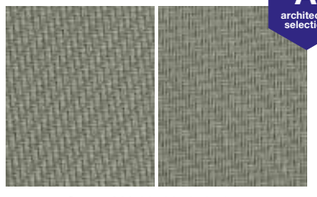
Serge 600

GLASSFIBRE

OF = 5%

Colours & references

front back



Serge 600 031031 jade river

front back

Serge 600 032031 duck egg

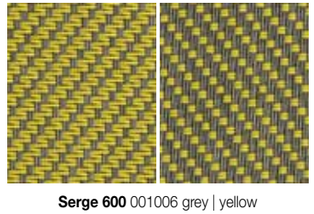
front back

Serge 600 032032 wet sand

back front

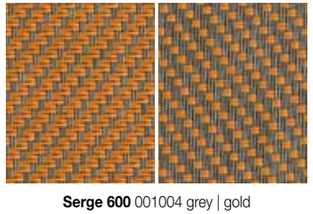
Serge 600 033032 soft clay

front back



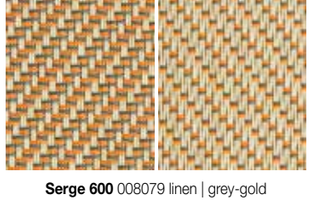
Serge 600 001006 grey | yellow

front back



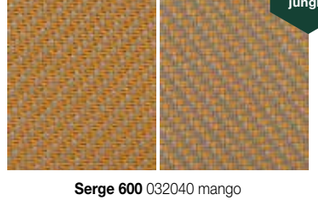
Serge 600 001004 grey | gold

back front



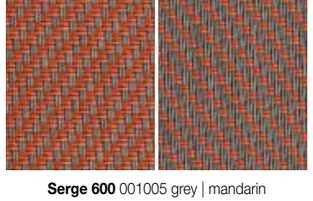
Serge 600 008079 linen | grey-gold

front back



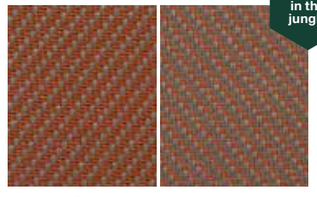
Serge 600 032040 mango

front back



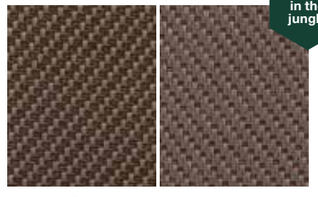
Serge 600 001005 grey | mandarin

front back



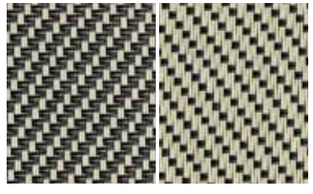
Serge 600 033041 maroon

front back



Serge 600 001045 coconut

front back

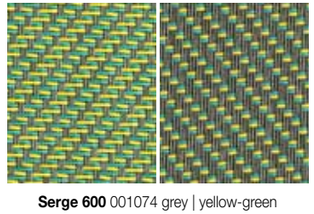


Serge 600 008015 linen | lichen

front back

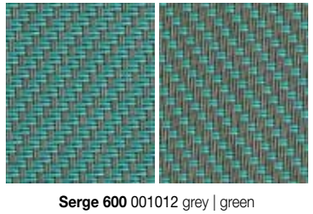
Serge 600 008001 safari

front back



Serge 600 001074 grey | yellow-green

front back



Serge 600 001012 grey | green

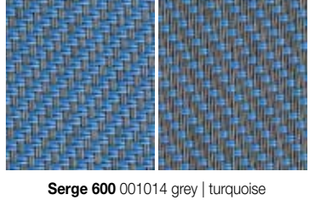
front back

Serge 600 033043 moss

front back

Serge 600 001044 palm

front back



Serge 600 001014 grey | turquoise

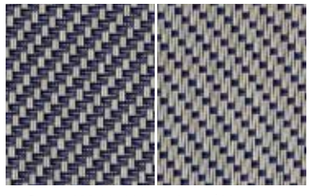
Serge 600

GLASSFIBRE

OF = 5%

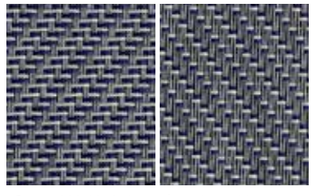
Colours & references

front back



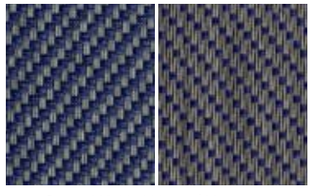
Serge 600 007009 pearl grey | blue azure

front back



Serge 600 001070 grey | pearl grey-blue azure

front back

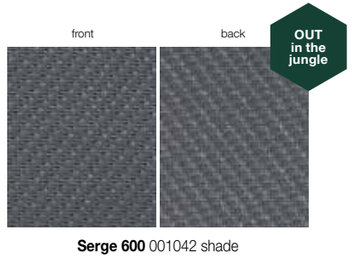


Serge 600 001009 grey | blue azure

front back OUT in the jungle

Serge 600 001094 lagoon

front back OUT in the jungle

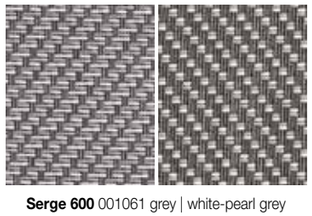


Serge 600 001042 shade

front back

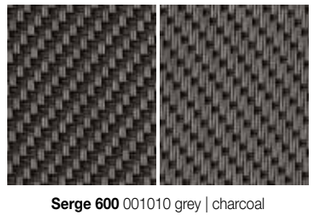
Serge 600 001001 grey | grey

front back



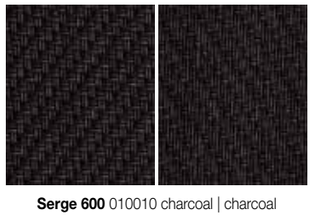
Serge 600 001061 grey | white-pearl grey

front back



Serge 600 001010 grey | charcoal

front back



Serge 600 010010 charcoal | charcoal

front back NEW

Serge 600 030030 pure black | pure black

front back

Serge 600 011011 bronze | bronze

front back

Serge 600 010011 charcoal | bronze

Serge 600		50 m roll					30 m roll	
colour	code	160 cm	190 cm	220 cm	250 cm	270 cm	320 cm	350 cm
grey / grey	001001	•	•	•	•	•	•	•
grey / white	001002	•	•	•	•	•	•	•
grey / sand	001003	•	•	•	•	•	•	
grey / gold	001004	•	•	•	•	•	•	
grey / mandarin	001005	•	•	•	•	•	•	
grey / yellow	001006	•	•	•	•	•	•	
grey / blue azure	001009	•	•	•	•	•	•	
grey / charcoal	001010	•	•	•	•	•	•	•
grey / green	001012	•	•	•	•	•	•	
grey / turquoise	001014	•	•	•	•	•	•	
shade	001042			•		•	•	
palm	001044			•		•	•	
coconut	001045			•		•	•	
grey / white-pearl grey	001061	•	•	•	•	•	•	
grey / pearl grey-blue azure	001070	•	•	•	•	•	•	
grey / yellow-green	001074	•	•	•	•	•	•	
lagoon	001094			•		•	•	
white / white	002002		•	•	•	•	•	•
white / pearl grey	002007		•	•	•	•	•	
white / white-pearl grey	002061				•	•	•	
sand / white	003002			•	•	•	•	
sand / sand	003003			•	•	•	•	

Serge 600

GLASSFIBRE

OF = 5%

Serge 600		50 m roll					30 m roll	
		160 cm	190 cm	220 cm	250 cm	270 cm	320 cm	350 cm
colour	code							
sand / bronze	003011			•	•	•	•	
pearl grey / white	007002			•	•	•	•	
pearl grey / pearl grey	007007		•	•	•	•	•	•
pearl grey / blue azure	007009			•	•	•	•	
pearl grey / white-sand	007082				•	•	•	
linen / white	008002		•	•	•	•	•	
linen / sand	008003				•	•		
linen / pearl grey	008007				•	•		
linen / linen	008008		•	•	•	•	•	
linen / lichen	008015				•	•		
linen / bordeaux	008016				•	•		
linen / grey-gold	008079				•	•		
safari	008001			•		•	•	
charcoal / charcoal	010010	•	•	•	•	•	•	•
pure black / pure black	030030					•		
charcoal / bronze	010011		•	•	•	•	•	
bronze / bronze	011011		•	•	•	•		
jade river	031031			•		•		
duck egg	032031			•		•	•	
wet sand	032032			•		•	•	
mango	032040			•		•	•	
oyster shell	033001			•		•	•	
soft clay	033032			•		•	•	
sandstone	033033			•		•	•	
maroon	033041			•		•	•	
moss	033043			•		•	•	

Solar energetic properties

Serge 600 European Standard EN 14501 Calculation G-value according to EN 13363-1 version 7.0					SOLAR ENERGETIC PROPERTIES												VISUAL PROPERTIES	
					FABRIC			FABRIC + GLAZING										
								EXTERIOR				INTERIOR						
								G-factor = total solar energy transmittance										
references	colours	front	back		As = Solar Absorptance %	Rs = Solar Reflectance %	Ts = Solar Transmittance %	Glazing A - Gv = 0,85 - U = 5,8	Glazing B - Gv = 0,76 - U = 2,9	Glazing C - Gv = 0,59 - U = 1,2	Glazing D - Gv = 0,32 - U = 1,1	Glazing A - Gv = 0,85 - U = 5,8	Glazing B - Gv = 0,76 - U = 2,9	Glazing C - Gv = 0,59 - U = 1,2	Glazing D - Gv = 0,32 - U = 1,1	Tv = Visible Light Transmittance %	Tuv = UV Transmittance %
002002	white | white			front	13,2	65,9	21,0	0,22	0,20	0,15	0,10	0,36	0,37	0,36	0,25	21,2	4,3
				back	12,7	66,3	21,0	0,22	0,19	0,15	0,10	0,35	0,37	0,36	0,25	21,2	4,3
008002	linen | white			front	26,4	58,2	15,5	0,20	0,17	0,13	0,09	0,39	0,41	0,38	0,26	13,7	5,3
				back	28,1	56,4	15,5	0,20	0,17	0,13	0,09	0,40	0,42	0,39	0,26	13,7	5,3
008008	linen | linen			front	32,5	52,5	14,9	0,21	0,17	0,13	0,09	0,43	0,43	0,40	0,26	12,9	5,8
				back	32,4	52,7	14,9	0,20	0,17	0,13	0,09	0,42	0,43	0,40	0,26	12,9	5,8
003003	sand | sand			front	54,1	36,5	9,4	0,20	0,16	0,11	0,09	0,51	0,51	0,45	0,28	7,7	4,9
				back	53,6	37,0	9,4	0,20	0,16	0,11	0,08	0,51	0,51	0,45	0,28	7,7	4,9
003002	sand | white			front	39,1	49,2	11,7	0,19	0,16	0,11	0,08	0,44	0,45	0,41	0,27	10,2	4,9
				back	43,6	44,6	11,7	0,20	0,17	0,12	0,09	0,47	0,47	0,42	0,27	10,2	4,9
002007	white | pearl grey			front	40,9	47,6	11,5	0,19	0,16	0,11	0,08	0,45	0,46	0,42	0,27	10,7	6,0
				back	33,2	55,3	11,5	0,18	0,15	0,11	0,08	0,40	0,42	0,39	0,26	10,7	6,0
008007	linen | pearl grey			front	45,7	43,5	10,8	0,20	0,16	0,11	0,08	0,47	0,48	0,43	0,27	9,1	5,0
				back	42,1	47,1	10,8	0,19	0,16	0,11	0,08	0,45	0,46	0,42	0,27	9,1	5,0
007082	pearl grey | white-sand			front	48,7	42,6	8,7	0,18	0,15	0,10	0,08	0,48	0,48	0,43	0,27	7,8	6,1
				back	52,4	38,9	8,7	0,19	0,15	0,10	0,08	0,50	0,50	0,44	0,27	7,8	6,1
008003	linen | sand			front	49,3	43,9	6,8	0,17	0,13	0,09	0,07	0,46	0,47	0,43	0,27	4,9	2,0
				back	44,9	48,3	6,8	0,16	0,13	0,08	0,07	0,44	0,45	0,41	0,27	4,9	2,0

GLAZING A = clear single glazing 4 mm	Gv = 0,85
GLAZING B = clear double glazing (4/12/4), space filled with air	Gv = 0,76
GLAZING C = double glazing (4/16/4), with a low emissivity coating in position 3, space filled with argon	Gv = 0,59
GLAZING D = reflective double glazing (4/16/4), with a low emissivity coating in position 2, space filled with argon	Gv = 0,32

Serge 600

GLASSFIBRE

OF = 5%

Solar energetic properties

Serge 600 European Standard EN 14501 Calculation G-value according to EN 13363-1 version 7.0					SOLAR ENERGETIC PROPERTIES											VISUAL PROPERTIES	
					FABRIC			FABRIC + GLAZING									
								EXTERIOR				INTERIOR					
								G-factor = total solar energy transmittance									
references	colours	front	back		As = Solar Absorptance %	Rs = Solar Reflectance %	Ts = Solar Transmittance %	Glazing A - Gv = 0,85 - U = 5,8	Glazing B - Gv = 0,76 - U = 2,9	Glazing C - Gv = 0,59 - U = 1,2	Glazing D - Gv = 0,32 - U = 1,1	Glazing A - Gv = 0,85 - U = 5,8	Glazing B - Gv = 0,76 - U = 2,9	Glazing C - Gv = 0,59 - U = 1,2	Glazing D - Gv = 0,32 - U = 1,1	Tv = Visible Light Transmittance %	Tuv = UV Transmittance %
033033	sandstone			front	72,4	20,5	7,1	0,22	0,17	0,11	0,09	0,60	0,59	0,50	0,29	6,8	6,6
				back	72,5	20,4	7,1	0,22	0,17	0,11	0,09	0,60	0,59	0,50	0,29	6,8	6,6
001003	grey | sand			front	68,8	26,5	4,7	0,19	0,15	0,09	0,08	0,56	0,56	0,48	0,29	4,5	3,9
				back	73,8	21,5	4,7	0,20	0,15	0,10	0,08	0,59	0,59	0,50	0,29	4,5	3,9
003011	sand | bronze			front	73,2	21,1	5,7	0,21	0,16	0,10	0,09	0,60	0,59	0,50	0,29	5,0	4,0
				back	66,3	28,0	5,7	0,19	0,15	0,10	0,08	0,56	0,55	0,48	0,28	5,0	4,0
008016	linen | bordeaux			front	63,4	26,1	10,5	0,23	0,19	0,13	0,10	0,57	0,57	0,48	0,29	8,4	4,2
				back	54,3	35,3	10,5	0,21	0,17	0,12	0,09	0,52	0,52	0,45	0,28	8,4	4,2
002061	white | white-pearl grey			front	27,7	59,8	12,4	0,17	0,15	0,11	0,08	0,38	0,40	0,38	0,26	11,6	3,4
				back	23,4	64,2	12,4	0,16	0,14	0,10	0,07	0,35	0,37	0,36	0,25	11,6	3,4
007002	pearl grey | white			front	37,4	50,9	11,7	0,19	0,16	0,11	0,08	0,43	0,44	0,40	0,26	9,9	5,4
				back	41,4	46,9	11,7	0,19	0,16	0,11	0,08	0,45	0,46	0,42	0,27	9,9	5,4
001002	grey | white			front	56,2	37,2	6,7	0,18	0,14	0,09	0,08	0,50	0,51	0,45	0,28	6,6	5,5
				back	66,4	26,9	6,7	0,20	0,16	0,10	0,08	0,56	0,56	0,48	0,28	6,6	5,5
007007	pearl grey | pearl grey			front	51,7	38,3	10,1	0,20	0,16	0,11	0,09	0,50	0,50	0,44	0,27	8,4	6,0
				back	50,5	39,4	10,1	0,20	0,16	0,11	0,09	0,50	0,50	0,44	0,27	8,4	6,0
033001	oyster shell			front	74,7	17,0	8,3	0,23	0,19	0,12	0,10	0,62	0,61	0,51	0,29	8,0	7,9
				back	73,3	18,4	8,3	0,23	0,18	0,12	0,10	0,62	0,60	0,51	0,29	8,0	7,9
031031	jade river			front	75,0	17,9	7,1	0,22	0,18	0,11	0,09	0,62	0,61	0,51	0,29	7,0	6,8
				back	75,0	17,9	7,1	0,22	0,18	0,11	0,09	0,62	0,61	0,51	0,29	7,0	6,8

Solar energetic properties

Serge 600 European Standard EN 14501 Calculation G-value according to EN 13363-1+A1: 2007					SOLAR ENERGETIC PROPERTIES											VISUAL PROPERTIES	
					FABRIC			FABRIC + GLAZING									
								EXTERIOR				INTERIOR					
								G-factor = total solar energy transmittance									
references	colours	front	back		As = Solar Absorptance %	Rs = Solar Reflectance %	Ts = Solar Transmittance %	Glazing A - Gv = 0,85 - U = 5,8	Glazing B - Gv = 0,76 - U = 2,9	Glazing C - Gv = 0,59 - U = 1,2	Glazing D - Gv = 0,32 - U = 1,1	Glazing A - Gv = 0,85 - U = 5,8	Glazing B - Gv = 0,76 - U = 2,9	Glazing C - Gv = 0,59 - U = 1,2	Glazing D - Gv = 0,32 - U = 1,1	Tv = Visible Light Transmittance %	Tuv = UV Transmittance %
032031	duck egg			front	70,4	22,5	7,1	0,21	0,17	0,11	0,09	0,59	0,58	0,50	0,29	6,6	6,2
				back	67,6	25,3	7,1	0,21	0,16	0,11	0,09	0,57	0,57	0,49	0,29	6,6	6,2
032032	wet sand			front	63,8	27,9	8,3	0,21	0,17	0,11	0,09	0,56	0,56	0,48	0,28	7,4	6,9
				back	63,8	27,9	8,3	0,21	0,17	0,11	0,09	0,56	0,56	0,48	0,28	7,4	6,9
033032	soft clay			front	67,5	24,7	7,8	0,21	0,17	0,11	0,09	0,58	0,57	0,49	0,29	7,3	7,0
				back	69,7	22,5	7,8	0,22	0,17	0,11	0,09	0,59	0,58	0,50	0,29	7,3	7,0
001006	grey | yellow			front	64,6	29,0	6,4	0,20	0,15	0,10	0,08	0,55	0,55	0,47	0,28	6,2	4,4
				back	71,4	22,2	6,4	0,21	0,16	0,11	0,09	0,59	0,58	0,50	0,29	6,2	4,4
001004	grey | gold			front	65,5	29,5	4,9	0,18	0,14	0,09	0,08	0,55	0,55	0,47	0,28	4,3	3,7
				back	72,3	22,8	4,9	0,20	0,15	0,10	0,08	0,59	0,58	0,49	0,29	4,3	3,7
008079	linen | grey-gold			front	50,0	38,8	11,2	0,21	0,17	0,12	0,09	0,50	0,50	0,44	0,27	9,1	6,6
				back	45,6	43,2	11,2	0,20	0,16	0,11	0,09	0,48	0,48	0,43	0,27	9,1	6,6
032040	mango			front	56,8	34,2	9,0	0,20	0,16	0,11	0,09	0,52	0,52	0,46	0,28	6,8	5,9
				back	59,6	31,4	9,0	0,20	0,16	0,11	0,09	0,52	0,52	0,46	0,28	6,8	5,9
001005	grey | mandarine			front	65,6	27,7	6,8	0,20	0,16	0,10	0,08	0,56	0,56	0,48	0,28	5,7	5,1
				back	71,5	21,7	6,8	0,21	0,17	0,11	0,09	0,59	0,59	0,50	0,29	5,7	5,1
033041	maroon			front	66,5	25,9	7,6	0,21	0,17	0,11	0,09	0,57	0,57	0,48	0,29	6,4	6,2
				back	69,6	22,8	7,6	0,21	0,17	0,11	0,09	0,57	0,57	0,48	0,29	6,4	6,2

GLAZING A = clear single glazing 4 mm	Gv = 0,85
GLAZING B = clear double glazing (4/12/4), space filled with air	Gv = 0,76
GLAZING C = double glazing (4/16/4), with a low emissivity coating in position 3, space filled with argon	Gv = 0,59
GLAZING D = reflective double glazing (4/16/4), with a low emissivity coating in position 2, space filled with argon	Gv = 0,32

Serge 600

GLASSFIBRE

OF = 5%

Solar energetic properties

Serge 600 European Standard EN 14501 Calculation G-value according to EN 13363-1+A1: 2007					SOLAR ENERGETIC PROPERTIES											VISUAL PROPERTIES	
					FABRIC			FABRIC + GLAZING									
								EXTERIOR				INTERIOR					
								G-factor = total solar energy transmittance									
references	colours	front	back		As = Solar Absorptance %	Rs = Solar Reflectance %	Ts = Solar Transmittance %	Glazing A - Gv = 0,85 - U = 5,8	Glazing B - Gv = 0,76 - U = 2,9	Glazing C - Gv = 0,59 - U = 1,2	Glazing D - Gv = 0,32 - U = 1,1	Glazing A - Gv = 0,85 - U = 5,8	Glazing B - Gv = 0,76 - U = 2,9	Glazing C - Gv = 0,59 - U = 1,2	Glazing D - Gv = 0,32 - U = 1,1	Tv = Visible Light Transmittance %	Tuv = UV Transmittance %
001045	coconut			front	78,3	14,4	7,3	0,23	0,18	0,12	0,10	0,64	0,62	0,52	0,30	7,1	7,0
				back	77,5	15,2	7,3	0,23	0,18	0,12	0,10	0,64	0,62	0,52	0,30	7,1	7,0
008015	linen | lichen			front	70,6	21,1	8,3	0,23	0,18	0,12	0,09	0,60	0,59	0,50	0,29	7,8	3,9
				back	59,7	32,0	8,3	0,20	0,16	0,11	0,09	0,54	0,54	0,47	0,28	7,8	3,9
008001	safari			front	61,5	29,8	8,7	0,21	0,17	0,11	0,09	0,55	0,55	0,47	0,28	7,9	6,4
				back	53,0	38,3	8,7	0,21	0,17	0,11	0,09	0,55	0,55	0,47	0,28	7,9	6,4
001074	grey | yellow-green			front	67,8	29,2	3,0	0,17	0,13	0,08	0,07	0,55	0,55	0,47	0,28	2,7	2,3
				back	74,4	22,6	3,0	0,18	0,14	0,09	0,07	0,58	0,58	0,49	0,29	2,7	2,3
001012	grey | green			front	70,1	23,5	6,5	0,21	0,16	0,10	0,09	0,58	0,58	0,49	0,29	6,0	5,4
				back	73,7	19,9	6,5	0,22	0,17	0,11	0,09	0,60	0,60	0,50	0,29	6,0	5,4
033043	moss			front	75,4	18,2	6,4	0,22	0,17	0,11	0,09	0,61	0,60	0,51	0,29	6,0	5,8
				back	75,2	18,4	6,4	0,22	0,17	0,11	0,09	0,61	0,60	0,51	0,29	6,0	5,8
001044	palm			front	80,3	12,6	7,1	0,23	0,18	0,12	0,10	0,65	0,63	0,53	0,30	7,0	6,9
				back	78,5	14,4	7,1	0,23	0,18	0,12	0,10	0,65	0,63	0,53	0,30	7,0	6,9
001014	grey | turquoise			front	63,8	28,9	7,3	0,20	0,16	0,10	0,08	0,55	0,55	0,47	0,28	6,3	6,0
				back	68,8	23,8	7,3	0,21	0,17	0,11	0,09	0,58	0,58	0,49	0,29	6,3	6,0
007009	pearl grey | blue azure			front	61,5	31,0	7,5	0,20	0,16	0,10	0,08	0,54	0,54	0,47	0,28	4,4	3,4
				back	57,3	35,2	7,5	0,19	0,15	0,10	0,08	0,52	0,52	0,45	0,28	4,4	3,4
001070	grey | pearl grey-blue azure			front	73,4	23,0	3,6	0,19	0,14	0,09	0,08	0,58	0,58	0,49	0,29	3,0	2,9
				back	76,5	19,8	3,6	0,20	0,15	0,09	0,08	0,60	0,59	0,50	0,29	3,0	2,9

Solar energetic properties

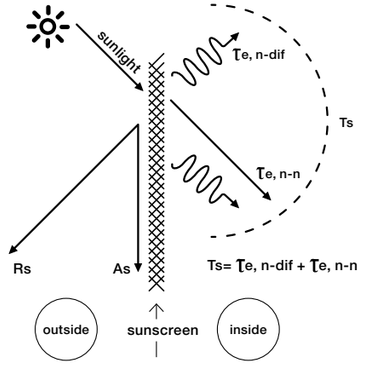
Serge 600 European Standard EN 14501 Calculation G-value according to EN 13363-1+A1: 2007					SOLAR ENERGETIC PROPERTIES											VISUAL PROPERTIES	
					FABRIC			FABRIC + GLAZING									
								EXTERIOR				INTERIOR					
								G-factor = total solar energy transmittance									
references	colours	front	back		As = Solar Absorptance %	Rs = Solar Reflectance %	Ts = Solar Transmittance %	Glazing A - Gv = 0,85 - U = 5,8	Glazing B - Gv = 0,76 - U = 2,9	Glazing C - Gv = 0,59 - U = 1,2	Glazing D - Gv = 0,32 - U = 1,1	Glazing A - Gv = 0,85 - U = 5,8	Glazing B - Gv = 0,76 - U = 2,9	Glazing C - Gv = 0,59 - U = 1,2	Glazing D - Gv = 0,32 - U = 1,1	Tv = Visible Light Transmittance %	Tuv = UV Transmittance %
001009	grey | blue azure			front	76,0	18,4	5,6	0,21	0,16	0,10	0,09	0,61	0,60	0,51	0,29	4,7	4,6
				back	77,6	16,8	5,6	0,22	0,17	0,11	0,09	0,62	0,61	0,51	0,29	4,7	4,6
001094	lagoon			front	78,0	15,2	6,8	0,23	0,18	0,11	0,09	0,63	0,62	0,52	0,30	6,6	6,5
				back	77,4	15,8	6,8	0,23	0,18	0,11	0,09	0,63	0,62	052	0,30	6,6	6,5
001042	shade			front	75,8	16,7	7,5	0,23	0,18	0,12	0,10	0,62	0,61	0,51	0,29	7,4	7,2
				back	76,0	16,5	7,5	0,23	0,18	0,12	0,10	0,62	0,61	0,51	0,29	7,4	7,2
001001	grey | grey			front	81,3	15,1	3,5	0,20	0,16	0,10	0,08	0,63	0,62	0,52	0,30	3,6	3,5
				back	81,4	15,1	3,5	0,20	0,16	0,10	0,08	0,63	0,62	0,50	0,30	3,6	3,5
001061	grey | white-pearl grey			front	63,0	33,2	3,9	0,17	0,13	0,08	0,07	0,52	0,53	0,46	0,28	3,6	3,0
				back	70,9	25,2	3,9	0,19	0,14	0,09	0,08	0,57	0,57	0,49	0,29	3,6	3,0
001010	grey | charcoal			front	86,5	9,9	3,6	0,22	0,16	0,10	0,09	0,66	0,64	0,54	0,30	3,6	3,4
				back	83,8	12,6	3,6	0,21	0,16	0,10	0,08	0,64	0,63	0,53	0,30	3,6	3,4
010010	charcoal | charcoal			front	91,4	5,0	3,6	0,23	0,17	0,10	0,09	0,69	0,67	0,55	0,30	3,6	3,6
				back	91,6	4,8	3,6	0,23	0,17	0,10	0,09	0,69	0,67	0,55	0,30	3,6	3,6
030030	pure black | pure black			front	90,4	3,7	5,9	0,18	0,14	0,09	0,07	0,64	0,64	0,54	0,30	5,9	5,9
				back	90,4	3,7	5,9	0,18	0,14	0,09	0,07	0,64	0,64	0,54	0,30	5,9	5,9
011011	bronze | bronze			front	88,0	8,1	3,9	0,22	0,17	0,10	0,09	0,67	0,65	0,54	0,30	3,8	3,8
				back	87,7	8,4	3,9	0,22	0,17	0,10	0,09	0,67	0,65	0,54	0,30	3,8	3,8
010011	charcoal | bronze			front	87,4	6,5	6,1	0,18	0,14	0,09	0,07	0,62	0,63	0,54	0,30	6,1	6,2
				back	87,9	6,0	6,1	0,18	0,14	0,09	0,07	0,62	0,63	0,54	0,30	6,1	6,2

GLAZING A = clear single glazing 4 mm	Gv = 0,85
GLAZING B = clear double glazing (4/12/4), space filled with air	Gv = 0,76
GLAZING C = double glazing (4/16/4), with a low emissivity coating in position 3, space filled with argon	Gv = 0,59
GLAZING D = reflective double glazing (4/16/4), with a low emissivity coating in position 2, space filled with argon	Gv = 0,32

Working of a sunscreen

Sunscreen = protection against sunrays

Sunscreen means protection against the sunrays, so the function is the protection against light and heat, which is expressed in several properties.



Rs	Solar reflectance
As	Solar absorptance
Ts	Solar transmittance
τe,n-dif	Diffuse solar transmittance
τe,n-n	Normal solar transmittance

Classes indicate effect of a sunscreen

Based on certain properties, the screen can be split up in classes, from 0 to 4. Those classes are used, starting from the norm EN 14501, to indicate the effect of a certain sunscreen.

influence on thermal and visual comfort	
Class 0	very little effect
Class 1	little effect
Class 2	moderate effect
Class 3	good effect
Class 4	very good effect

Visual properties

Openness factor

The openness of a screen is indicated by the openness factor **= OF.** The openness coefficient is the relative area of the openings in the fabric seen under a given incidence. The openness factor is seen under a normal incidence.

The sunrays are subdivided in: **Visible light, UV-light** and **IR-light.**

Visible light (55% of the sun-energy) is that part for which our eyes are most sensitive. How larger the light intensity, how more detrimental for our eyes.

The factor Visible Light Transmittance = **Tv,** is the ratio of visible light that will be transmitted. How lower this factor can be kept, how better for the eyes.

UV-light (3% of the sun-energy) is the part of radiation which is detrimental for our health. This factor is indicated by the UV Transmittance = **Tuv.** This is the quantity UV-light transmitted by the sunscreen.

IR-light is invisible. This is however 42% of the sun-energy. These rays care for the reheating of solid substances and gases.

Influence of colours

The choice of the colour has direct influence on the criteria which justify the use of sunscreen protection:

- Protection against visible light, expressed by the factor **Tv.**
- Protection against sun-energy, expressed by the **G** value.
- Protection against secondary heat, expressed by the factor **Qi.**
- Protection against UV-light, expressed by the factor **Tuv.**

Visual properties: classes

Glare control

The capacity of the solar protection device to control the luminance level of openings and to reduce the luminance contrasts between different zones within the field.

τv,n-n	τv,n-dif			
	τv,n-dif < 0,02	0,02 ≤ τv,n-dif < 0,04	0,04 ≤ τv,n-dif < 0,08	τv,n-dif ≥ 0,08
τv,n-n > 0,10	0	0	0	0
0,05 < τv,n-n ≤ 0,10	1	1	0	0
τv,n-n ≤ 0,05	3	2	1	1
τv,n-n = 0,00	4	3	2	2

Privacy at night

Night privacy is the capacity of an internal or external blind or a shutter in the fully extended position or fully extended and closed position to protect persons, at night in normal light conditions from external view. External views means the ability of an external observer located 5m from the fully extended and closed product, to distinguish a person or object standing 1m behind the protection device in the room.

τv,n-n	τv,n-dif		
	0 < τv,n-dif ≤ 0,04	0,04 < τv,n-dif ≤ 0,15	τv,n-dif > 0,15
τv,n-n > 0,10	0	0	0
0,05 < τv,n-n ≤ 0,10	1	1	1
τv,n-n ≤ 0,05	2	2	2
τv,n-n = 0,00	4	3	2

Visual contact with the outside

Visual contact with the outside is the capacity of the solar protection device to allow an exterior view when it is fully extended. This function is affected by different light conditions during the day.

τv,n-n	τv,n-dif		
	0 < τv,n-dif ≤ 0,04	0,04 < τv,n-dif ≤ 0,15	τv,n-dif > 0,15
τv,n-n > 0,10	4	3	2
0,05 < τv,n-n ≤ 0,10	3	2	1
τv,n-n ≤ 0,05	2	1	0
τv,n-n = 0,00	0	0	0

Daylight utilisation

Daylight utilisation is characterised by:

- the capacity of the solar protection device to reduce the time period during the artificial light is required.
- the capacity of the solar protection device to optimise the daylight which is available.

CLASS	0	1	2	3	4
τv,dif-h	τv,dif-h < 0,02	0,02 ≤ τv,dif-h < 0,10	0,10 ≤ τv,dif-h < 0,25	0,25 ≤ τv,dif-h < 0,40	τv,dif-h ≥ 0,40

Working of a sunscreen

Thermal comfort

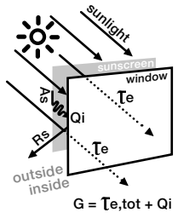
Fabric

Energy radiated by the sun, will be split up in 3 factors:

factor 1:	factor 2:	factor 3:
As = **Solar absorptance** is the ratio of the absorbed flux to the incident flux.	**Rs =** **Solar reflectance** is the fraction of the incident solar radiation that is directly reflected by the component.	**Ts =** **Solar transmittance** is the sum of the (normal) direct solar transmittance and the diffuse solar transmittance. This is the fraction of the total transmitted energy to the total incident solar radiation.
These 3 factors together are always 100%		

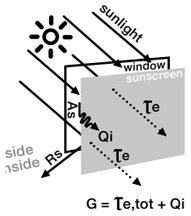
The G-factor

exterior sunscreen



G = Te,tot + Qi

interior sunscreen



G = Te,tot + Qi

Rs	Solar reflectance
As	Solar absorptance
Te	Direct solar transmittance
Qi	Secondary heat transfer factor
G	G-factor = total solar energy transmittance

Sunscreens are always used in combination with a glazing. These together will prevent a large quantity of energy, sent by the sun to the earth, which is indicated by the: Total Solar Energy Transmittance, or **G-factor.**

The **G** value is the ratio between the total solar energy transmitted into a room through a window and the incident solar energy on the window. The **Gtot** is the solar factor of the combination of glazing and solar protection device.
The **Gv** is the solar factor of the glazing alone.
The shading coefficient is defined as the ratio of the solar factor of the combined glazing and solar protection device **Gtot** to that of the glazing alone **Gv.**

The total solar energy transmitted through a window consists of two parts:
1) Radiation: measured by the solar transmittance: **Te,tot**
2) Heat: measured by the secondary heat transfer: **Qi**

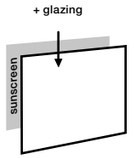
G = Te,tot + Qi

The factor **Te,tot,** is the quantity of energy, which will pass the combination solar protection device and window.
The factor **Qi** is the quantity of heat which is released by the absorption of energy in the sunscreen protection system = combination sunscreen + glazing.

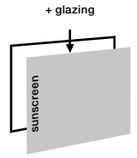
The **G-factor** is the most important factor to explain the efficiency of a combination sunscreen + glazing, as protection against the energy of the sun. The **G-factor** divided into his components explains the difference in efficiency between exterior and interior sunscreen.

G = Te,tot + Qi

exterior sunscreen



interior sunscreen



The direct solar transmittance **Te,tot** is the same for interior and exterior use of sunscreens.
The secondary heat factor **Qi** for interior sunscreen is bigger then for exterior sunscreen. For interior use, the heat, produced by the absorption of energy, will be transmitted to the room inside. By exterior use, the heat will be transmitted to the outside, without any inconvenience at the inside.

Also the colour of the sunscreen has an influence on the **G-factor.** Dark colours will absorb a lot of sun energy and will transmit this to heat. If the screen is used for exterior, heat will have no influence inside the room, contrary to a screen used for interior. This is why a darker screen is ideal for exterior use and a lighter screen for interior use.

Thermal comfort: classes

Total Solar energy Transmittance = G-factor

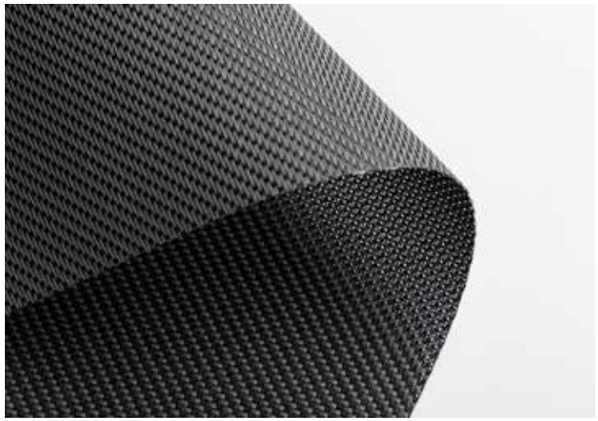
CLASS	0	1	2	3	4
Gtot	Gtot ≥ 0,50	0,35 ≤ Gtot < 0,50	0,15 ≤ Gtot < 0,35	0,10 ≤ Gtot < 0,15	Gtot < 0,10

Secondary Heat transfer = Qi

CLASS	0	1	2	3	4
Qi	Qi ≥ 0,30	0,20 ≤ Qi < 0,30	0,10 ≤ Qi < 0,20	0,03 ≤ Qi < 0,10	Qi < 0,03

Normal Solar transmittance = protection against direct transmission
The ability of a solar protection device to protect persons and surroundings from direct irradiation is measured by the direct/direct solar transmittance of the device in combination with the glazing. Te,n-n is used as measure for this property.

reflects sunlight outdoors



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Rijksweg 125, 8531 Bavikhove - Belgium · T +32 (0)56 35 35 33 · F +32 (0)56 35 80 48 · **www.copaco.be**