Digital Materials Data Sheet

RIGID OPAQUE MATERIALS

PRIMARY MATERIAL: VEROWHITEPLUS™ RGD835
SECONDARY MATERIAL: VEROBLACKPLUS™ RGD875

PROPERTY	ASTM	UNITS	RGD8310-DM, RGD8320-DM, RGD8330-DM
Tensile strength	D-638-03	MPa	50-65
Elongation at break	D-638-05	%	10-25
Modulus of elasticity	D-638-04	MPa	2000-3000
Flexural strength	D-790-03	MPa	75-110
Flexural modulus	D-790-04	MPa	2200-3200
HDT, °C @ 0.45MPa	D-648-06	°C	45-50
Izod notched impact	D-256-06	J/m	20-30

PRIMARY MATERIAL: VEROWHITEPLUS RGD835
SECONDARY MATERIAL: TANGOBLACKPLUS™ FLX980 / TANGOPLUS™ FLX930

PROPERTY	ASTM	UNITS	RGD8505-DM RGD8510-DM RGD8515-DM RGD8520-DM	RGD8525-DM RGD8425-DM (ONLY OBJET TANGOPLUS FLX930)
Tensile strength	D-638-03	MPa	40-60	35-45
Elongation at break	D-638-05	%	15-25	20-30
Modulus of elasticity	D-638-04	MPa	1700-2300	1400-2000
Flexural strength	D-790-03	MPa	55-75	45-60
Flexural modulus	D-790-04	MPa	1500-2500	1400-1800
HDT, °C @ 0.45MPa	D-648-06	°C	40-45	40-43
Izod notched impact	D-256-06	J/m	22-35	22-35
Shore hardness (D)	D2240-05	Scale D	81.1-85.5	79.5-83.5

PRIMARY MATERIAL: HIGH TEMPERATURE RGD525
SECONDARY MATERIAL: TANGOBLACKPLUS FLX980

PROPERTY	ASTM	UNITS	RGD5205-DM RGD5210-DM RGD5215-DM RGD5220-DM RGD5225-DM	RGD5250-DM*
Tensile strength	D-638-03	MPa	43-55	50-56
Elongation at break	D-638-05	%	9-15	18-27
Modulus of elasticity	D-638-04	MPa	1600-2700	1700-2400
Flexural strength	D-790-03	MPa	50-100	47-70
Flexural modulus	D-790-04	MPa	1700-2700	1400-2000
HDT, °C @ 0.45MPa	D-648-06	°C	46-60	50-56
Izod notched impact	D-256-06	J/m	16-19	16-26

* Vero™-like DM with higher temperature resistance
Find material properties for color materials on the Color Digital Materials Data Sheet.

PRIMARY MATERIAL: VEROBLUE™ RGD840
SECONDARY MATERIAL: VEROBLACKPLUS RGD875

PROPERTY	ASTM	UNITS	RGD8210-DM
Tensile strength	D-638-03	MPa	50-60
Elongation at break	D-638-05	%	15-25
Modulus of elasticity	D-638-04	MPa	2000-3000
Flexural strength	D-790-03	MPa	60-70
Flexural modulus	D-790-04	MPa	1900-2500
HDT, °C @ 0.45MPa	D-648-06	°C	45-50
Izod notched impact	D-256-06	J/m	20-30

PRIMARY MATERIAL: VERO BLACKPLUS RGD875
SECONDARY MATERIAL: TANGOBLACKPLUS FLX980 / TANGOPLUS FLX930

PROPERTY	ASTM	UNITS	RGD8555-DM RGD8455-DM
Tensile strength	D-638-03	MPa	35-45
Elongation at break	D-638-05	%	20-30
Modulus of elasticity	D-638-04	MPa	1400-2000
Flexural strength	D-790-03	MPa	45-60
Flexural modulus	D-790-04	MPa	1400-1800
HDT, °C @ 0.45MPa	D-648-06	°C	40-43
Izod notched impact	D-256-06	J/m	25-35
Shore hardness (D)	D2240-05	Scale D	79.5-83.5

PRIMARY MATERIAL: HIGH TEMPERATURE RGD525
SECONDARY MATERIAL: TANGOPLUS FLX930

PROPERTY	ASTM	UNITS	RGD5150-DM
Tensile strength	D-638-03	MPa	45-60
Elongation at break	D-638-05	%	18-27
Modulus of elasticity	D-638-04	MPa	1700-2400
Flexural strength	D-790-03	MPa	47-70
Flexural modulus	D-790-04	MPa	1400-2000
HDT, °C @ 0.45MPa	D-648-06	°C	50-56
Izod notched impact	D-256-06	J/m	16-26

RIGID OPAQUE MATERIALS

PRIMARY MATERIAL: VEROWHITEPLUS RGD835
SECONDARY MATERIAL: TANGOBLACK™ FLX973

PROPERTY	ASTM	UNITS	RGD8110 - DM	RGD8120 - DM	RGD8130 - DM
Tensile strength	D-638-03	MPa	45-65	46-65	27-33
Elongation at break	D-638-05	%	10-30	10-30	25-35
Modulus of elasticity	D-638-04	MPa	2000-3000	2000-3000	1500-2100
Flexural strength	D-790-03	MPa	70-100	70-100	40-50
Flexural modulus	D-790-04	MPa	2000-3000	2000-3000	1400-1800
HDT, °C @ 0.45MPa	D-648-06	°C	43-50	43-50	40-45
Izod notched impact	D-256-06	J/m	20-35	20-35	30-40

TRANSPARENT MATERIALS

PRIMARY MATERIAL: RGD720
SECONDARY MATERIAL: VEROBLACKPLUS RGD875

PROPERTY	ASTM	UNITS	RGD7513-DM (DOTS) RGD7523-DM (GRID)
Tensile strength	D-638-03	MPa	50-65
Elongation at break	D-638-05	%	15-25
Modulus of elasticity	D-638-04	MPa	2000-3000
Flexural strength	D-790-03	MPa	80-110
Flexural modulus	D-790-04	MPa	2700-3300
HDT, °C @ 0.45MPa	D-648-06	°C	45-50
Izod notched impact	D-256-06	J/m	20-30

PRIMARY MATERIAL: RGD720
SECONDARY MATERIAL: TANGOBLACK FLX973

PROPERTY	ASTM	UNITS	RGD7210-DM	RGD7220-DM	RGD7230-DM
Tensile strength	D-638-03	MPa	50-55	50-55	45-50
Elongation at break	D-638-05	%	15-25	15-25	15-25
Modulus of elasticity	D-638-04	MPa	2200-2500	2000-2300	1700-2000
Flexural strength	D-790-03	MPa	80-90	75-85	70-80
Flexural modulus	D-790-04	MPa	2300-2700	2200-2600	2100-2400
HDT, °C @ 0.45MPa	D-648-06	°C	45-50	45-50	45-50
Izod notched impact	D-256-06	J/m	20-30	20-30	20-30

PRIMARY MATERIAL: VEROCLEAR™ RGD810
SECONDARY MATERIAL: TANGOPLUS FLX930 / TANGOBLACKPLUS FLX980

PROPERTY	ASTM	UNITS	RGD8705-DM RGD8710-DM RGD8715-DM RGD8720-DM	RGD8625-DM RGD8725-DM
Tensile strength	D-638-03	MPa	40-60	35-45
Elongation at break	D-638-05	%	15-25	20-30
Modulus of elasticity	D-638-04	MPa	1,700-2,300	1,400-2,000
Flexural strength	D-790-03	MPa	55-75	45-60
Flexural modulus	D-790-04	MPa	1,500-2,500	1,400-1,800
HDT, °C @ 0.45MPa	D-648-06	°C	40-45	40-43
Izod notched impact	D-256-06	J/m	22-35	25-35
Shore hardness (D)	D2240-05	Scale D	81.1-85.5	79.5-83.5

SIMULATED POLYPROPYLENE MATERIALS

PRIMARY MATERIAL: DURUSWHITE™ RGD430
SECONDARY MATERIAL: VEROWHITEPLUS RGD835, VEROBLUE RGD840, VEROBLACKPLUS RGD875 OR RGD720

PROPERTY	ASTM	UNITS	RGD4310-DM RGD4410-DM RGD4510-DM RGD4710-DM
Tensile strength	D-638-03	MPa	30-40
Elongation at break	D-638-05	%	40-50
Modulus of elasticity	D-638-04	MPa	1200-1600
Flexural strength	D-790-03	MPa	40-50
Flexural modulus	D-790-04	MPa	1300-1700
HDT, °C @ 0.45MPa	D-648-06	°C	40-45
Izod notched impact	D-256-06	J/m	35-45

PRIMARY MATERIAL: VEROWHITEPLUS RGD835
SECONDARY MATERIAL: TANGOPLUS FLX930 / TANGOBLACKPLUS FLX980

PROPERTY	ASTM	UNITS	RGD8430-DM RGD8530-DM
Tensile strength	D-638-03	MPa	29-38
Elongation at break	D-638-05	%	25-35
Modulus of elasticity	D-638-04	MPa	1100-1700
Flexural strength	D-790-03	MPa	35-45
Flexural modulus	D-790-04	MPa	1200-1500
HDT, °C @ 0.45MPa	D-648-06	°C	38-41
Izod notched impact	D-256-06	J/m	21-40
Shore hardness (D)	D2240-05	Scale D	76.1-81.7

SIMULATED POLYPROPYLENE MATERIALS

PRIMARY MATERIAL: VEROBLACKPLUS RGD875
SECONDARY MATERIAL: TANGOPLUS FLX930 / TANGOBLACKPLUS FLX980

PROPERTY	ASTM	UNITS	RGD8460-DM RGD8560-DM
Tensile strength	D-638-03	MPa	29-38
Elongation at break	D-638-05	%	25-35
Modulus of elasticity	D-638-04	MPa	1100-1700
Flexural strength	D-790-03	MPa	35-45
Flexural modulus	D-790-04	MPa	1200-1500
HDT, °C @ 0.45MPa	D-648-06	°C	38-41
Izod notched impact	D-256-06	J/m	21-40
Shore hardness (D)	D2240-05	Scale D	76.1-81.7

PRIMARY MATERIAL: VEROCLEAR RGD810
SECONDARY MATERIAL: TANGOPLUS FLX930 / TANGOBLACKPLUS FLX980

PROPERTY	ASTM	UNITS	RGD8630-DM RGD8730-DM
Tensile strength	D-638-03	MPa	29-38
Elongation at break	D-638-05	%	25-35
Modulus of elasticity	D-638-04	MPa	1100-1700
Flexural strength	D-790-03	MPa	35-45
Flexural modulus	D-790-04	MPa	1200-1500
HDT, °C @ 0.45MPa	D-648-06	°C	38-41
Izod notched impact	D-256-06	J/m	21-40
Shore hardness (D)	D2240-05	Scale D	76.1-81.7

PRIMARY MATERIAL: RIGUR™
SECONDARY MATERIAL: TANGOBLACKPLUS FLX980

PROPERTY	ASTM	UNITS	RGD4805-DM RGD4810-DM RGD4815-DM RGD4820-DM
Tensile strength	D-638-03	MPa	25-45
Elongation at break	D-638-05	%	35-45
Modulus of elasticity	D-638-04	MPa	1200-1800
Flexural strength	D-790-03	MPa	30-40
Flexural modulus	D-790-04	MPa	1000-1400
HDT, °C @ 0.45MPa	D-648-06	°C	43-48
Izod notched impact	D-256-06	J/m	50-70
Shore hardness (D)	D2240-05	Scale D	81.1-85.5

PRIMARY MATERIAL: RIGUR
SECONDARY MATERIAL: TANGOPLUS FLX930 / TANGOBLACKPLUS FLX980

PROPERTY	ASTM	UNITS	RGD4825-DM RGD4830-DM RGD4625-DM RGD4630-DM
Tensile strength	D-638-03	MPa	25-35
Elongation at break	D-638-05	%	35-45
Modulus of elasticity	D-638-04	MPa	900-1500
Flexural strength	D-790-03	MPa	20-35
Flexural modulus	D-790-04	MPa	800-1200
HDT, °C @ 0.45MPa	D-648-06	°C	43-46
Izod notched impact	D-256-06	J/m	50-70
Shore hardness (D)	D2240-05	Scale D	79.5-83.5

RUBBER-LIKE MATERIALS

PRIMARY MATERIAL: TANGOBLACKPLUS FLX980 / TANGOPLUS FLX930
SECONDARY MATERIAL: VEROWHITEPLUS RGD835

PROPERTY	ASTM	UNITS	FLX9840-DM FLX9740-DM	FLX9850-DM FLX9750-DM	FLX9860-DM FLX9760-DM	FLX9870-DM FLX9770-DM	FLX9885-DM FLX9785-DM	FLX9895-DM FLX9795-DM
Tensile strength	D-412	MPa	1.3-1.8	1.9-3.0	2.5-4.0	3.5-5.0	5.0-7.0	8.5-10.0
Elongation at break	D-412	%	110-130	95-110	75-85	65-80	55-65	35-45
Shore hardness (A)	D-2240	Scale A	35-40	45-50	57-63	68-72	80-85	92-95
Tensile tear resistance	D-624	Kg/cm	5.5-7.5	7.5-9.5	11-13	15.5-17.5	23-25	41-44

PRIMARY MATERIAL: TANGOBLACKPLUS FLX980 / TANGOPLUS FLX930
SECONDARY MATERIAL: VEROCLEAR RGD810

PROPERTY	ASTM	UNITS	FLX9040-DM FLX9940-DM	FLX9050-DM FLX9950-DM	FLX9060-DM FLX9960-DM	FLX9070-DM FLX9970-DM	FLX9085-DM FLX9985-DM	FLX9095-DM FLX9995-DM
Tensile strength	D-412	MPa	1.3-1.8	1.9-3.0	2.5-4.0	3.5-5.0	5.0-7.0	8.5-10.0
Elongation at break	D-412	%	110-130	95-110	75-85	65-80	55-65	35-45
Shore hardness (A)	D-2240	Scale A	35-40	45-50	57-63	68-72	80-85	92-95
Tensile tear resistance	D-624	Kg/cm	5.5-7.5	7.5-9.5	11-13	15.5-17.5	23-25	41-44

RUBBER-LIKE MATERIALS (CONT.)

PRIMARY MATERIAL: TANGOGRAY™ FLX950
SECONDARY MATERIAL: VEROBLACKPLUS RGD875

PROPERTY	ASTM	UNITS	FLX9610-DM
Tensile strength	D-412	MPa	9-13
Elongation at break	D-412	%	45-55
Shore hardness (A)	D-2240	Scale A	75-85
Tensile tear resistance	D-624	Kg/cm	45-50

PRIMARY MATERIAL: TANGOGRAY FLX950
SECONDARY MATERIAL: TANGOBLACK FLX973

PROPERTY	ASTM	UNITS	FLX9510-DM
Tensile strength	D-412	MPa	1-3
Elongation at break	D-412	%	35-45
Shore hardness (A)	D-2240	Scale A	60-70
Tensile tear resistance	D-624	Kg/cm	5.0-7.0

PRIMARY MATERIAL: TANGOPLUS FLX930 / TANGOBLACKPLUS FLX980
SECONDARY MATERIAL: HIGH TEMPERATURE RGD525

PROPERTY	ASTM	UNITS	FLX9540-DM FLX9640-DM	FLX9550-DM FLX9650-DM	FLX9560-DM FLX9660-DM	FLX9570-DM FLX9670-DM	FLX9585-DM FLX9685-DM	FLX9595-DM FLX9695-DM
Tensile strength	D-412	MPa	1.3-1.8	2.0-2.8	2.8-4.0	3.8-4.9	6.0-7.3	9.0-12
Elongation at break	D-412	%	100-130	80-100	60-80	50-70	35-50	27-40
Shore hardness (A)	D-2240	Scale A	39-41	52-55	60-67	70-78	85-87	95-96
Tensile tear resistance	D-624	Kg/cm	5.0-7.0	8.0-10.0	10.5-12.5	13-15	22.5-24.5	45-47

PRIMARY MATERIAL: TANGOBLACKPLUS FLX980 / TANGOPLUS FLX930
SECONDARY MATERIAL: VEROBLACKPLUS RGD875

PROPERTY	ASTM	UNITS	FLX2140-DM FLX2040-DM	FLX2150-DM FLX2050-DM	FLX2160-DM FLX2060-DM	FLX2170-DM FLX2070-DM	FLX2185-DM FLX2085-DM	FLX2195-DM FLX2095-DM
Tensile strength	D-412	MPa	1.3-1.8	1.9-3.0	2.5-4.0	3.5-5	5.5-7.0	8.5-10
Elongation at break	D-412	%	110-130	95-110	75-85	65-80	55-65	35-45
Shore hardness (A)	D-2240	Scale A	35-40	45-50	57-63	68-72	80-85	92-95
Tensile tear resistance	D-624	Kg/cm	5.5-7.5	7.5-9.5	11.0-13.0	15.5-17.5	23-25	41-44

PRIMARY MATERIAL: TANGOBLACK FLX973
SECONDARY MATERIAL: VEROWHITEPLUS RGD835(I),
VEROBLUE RGD840(III), VEROBLACKPLUS RGD875(IIII), RGD720(II)

PROPERTY	ASTM	UNITS	FLX9110-DM(I) FLX9410-DM (II) FLX9210-DM (III) FLX9310-DM (IIII)	FLX9120-DM (I) FLX9420-DM (II) FLX9220-DM (III) FLX9320-DM (IIII)	FLX9130-DM (I) FLX9430-DM (II) FLX9230-DM (III) FLX9330-DM (IIII)
Tensile strength	D-412	MPa	2-4.	3-5	7-11
Elongation at break	D-412	%	45-55	35-45	35-45
Shore hardness (A)	D-2240	Scale A	75-85	80-90	90-100
Tensile tear resistance	D-624	Kg/cm	7-9	13-17	45-50

PRIMARY MATERIAL: TANGOBLACKPLUS FLX930 / TANGOPLUS FLX980
SECONDARY MATERIAL: DIGITAL ABS™ IVORY

PROPERTY	ASTM	UNITS	FLX95540-DM FLX95040-DM	FLX95550-DM FLX95050-DM	FLX95560-DM FLX95060-DM	FLX95570-DM FLX95070-DM	FLX95585-DM FLX95085-DM	FLX2195-DM FLX2095-DM
Tensile strength	D-412	MPa	2.3-2.5	3.2-3.5	3.8-4.3	4.7-5.0	7.0-7.7	9.8-10.6
Elongation at break	D-412	%	145-155	125-135	95-110	80-90	50-65	40-50
Shore hardness (A)	D-2240	Scale A	35-45	45-55	55-65	65-75	80-90	90-100
Tensile tear resistance	D-624	Kg/cm	5.5-6.5	8.5-10.5	10.0-12.0	13-15	22-26	42-52

RUBBER-LIKE MATERIALS (CONT.)

PRIMARY MATERIAL: TANGOPLUS FLX930 / TANGOBLACKPLUS FLX980
SECONDARY MATERIAL: RIGUR

PROPERTY	ASTM	UNIT	FLX4640-DM FLX4840-DM	FLX4650-DM FLX4850-DM	FLX4660-DM FLX4860-DM	FLX4670-DM FLX4870-DM	FLX4685-DM FLX4885-DM	FLX4695-DM FLX4895-DM
Tensile strength	D-412	MPa	1.3-1.8	1.9-3.0	2.5-4.0	3.5-5.0	5.0-7.0	8.5-10.0
Elongation at break	D-412	%	110-130	95-110	75-85	65-80	55-65	35-45
Shore hardness (A)	D-2240	Scale A	35-40	45-50	57-63	68-72	80-85	92-95
Tensile tear resistance	D-624	Kg/cm	5.5-7.5	7.5-9.5	11-13	15.5-17.5	23-25	41-44