

## Materials Simulating Engineering Plastics

### Objet ABS-like Digital Material (RGD5160-DM) made of Objet RGD515 & Objet RGD535

	ASTM	Units	Metric	Units	Imperial
Zugfestigkeit	D-638-03	MPa	55-60	psi	8000-8700
Bruchdehnung	D-638-05	MPa	25-40	psi	25-40
Elastizitätsmodul	D-638-04	MPa	2600-3000	psi	375,000-435,000
Biegefestigkeit	D-790-03	MPa	65-75	psi	9,500-11,000
Biege E-Modul	D-790-04	MPa	1700-2200	psi	245,000-320,000
HDT, °C @ 0.45MPa	D-648-06	°C	58-68	°F	136-154
HDT, °C @ 0.45MPa after thermal post treatment procedure A	D-648-06	°C	82-90	°F	180-194
HDT, °C @ 0.45MPa after thermal post treatment procedure B	D-648-06	°C	92-95	°F	198-203
HDT, °C @ 1.82MPa	D-648-07	°C	51-55	°F	124-131
Izod Notched Impact	D-256-06	J/m	65-80	ft lb/inch	1.22-1.50
Tg	DMA, E <sub>s</sub>	°C	47-53	°F	117-127
Shore Hardness (D)	Scale D	Scale D	85-87	Scale D	85-87
Rockwell Hardness	Scale M	Scale M	67-69	Scale M	67-69

EU

### Objet High Temperature Material (RGD525)

	ASTM	Units	Metric	Units	Imperial
Zugfestigkeit	D-638-03	MPa	70-80	psi	10,000-11,500
Bruchdehnung	D-638-05	%	10-15	%	10-15
Elastizitätsmodul	D-638-04	MPa	3200-3500	psi	465,000-510,000
Biegefestigkeit	D-790-03	MPa	110-130	psi	16,000-19,000
Biege E-Modul	D-790-04	MPa	3100-3500	psi	450,000-510,000
HDT, °C @ 0.45MPa	D-648-06	°C	63-67	°F	145-163
HDT, °C @ 0.45MPa after thermal post treatment procedure A	D-648-06	°C	75-80	°F	167-176
HDT, °C @ 1.82MPa	D-648-07	°C	55-57	°F	131-135
Izod Notched Impact	D-256-06	J/m	14-16	ft lb/inch	0.262-0.300
Water Absorption, %	D-570-98 24hr	%	1.2-1.4	%	1.2-1.4
Tg	DMA, E <sub>s</sub>	°C	62-65	°F	144-149
Shore D	Scale D	Scale D	87-88	Scale D	87-88
Rockwell Hardness	Scale M	Scale M	78-83	Scale M	78-83
Polymerized density	ASTM D792	g/cm3	0.97-0.98		
Ash content	USP281	%	0.38-0.42	%	0.38-0.42

NEU

## Materials Simulating Standard Plastics

### Transparent Materials

#### Objet FullCure720

	ASTM	Units	Metric	Units	Imperial
Zugfestigkeit	D-638-03	MPa	50-65	psi	7250-9450
Bruchdehnung	D-638-05	%	15-25	%	15-25
Elastizitätsmodul	D-638-04	MPa	2000-3000	psi	290,000-435,000
Biegefestigkeit	D-790-03	MPa	80-110	psi	12000-16000
	D-790-04	MPa	2700-3300	psi	390,000-480,000
HDT, °C @ 0.45MPa	D-648-06	°C	45-50	°F	113-122
HDT, °C @ 1.82MPa	D-648-07	°C	45-50	°F	113-122
Izod Notched Impact	D-256-06	J/m	20-30	ft lb/inch	0.375-0.562
Water Absorption	D-570-98 24hr	%	1.5-2.2	%	1.5-2.2
Tg	DMA, E <sub>s</sub>	°C	48-50	°F	118-122
Shore Hardness (D)	Scale D	Scale D	83-86	Scale D	83-86
Rockwell Hardness	Scale M	Scale M	73-76	Scale M	73-76
Polymerized density	ASTM D792	g/cm3	1.18-1.19		
Ash content	USP281	%	0.01-0.02	%	0.01-0.02

#### Objet VeroClear FullCure810

	ASTM	Units	Metric	Units	Imperial
Zugfestigkeit	D-638-03	MPa	50-65	psi	7250-9450
Bruchdehnung	D-638-05	%	10-25	%	10-25
Elastizitätsmodul	D-638-04	MPa	2000-3000	psi	290,000-435,000
Biegefestigkeit	D-790-03	MPa	75-110	psi	11000-16000
Biege E-Modul	D-790-04	MPa	2200-3200	psi	320,000-465,000
HDT, °C @ 0.45MPa	D-648-06	°C	45-50	°F	113-122
HDT, °C @ 1.82MPa	D-648-07	°C	45-50	°F	113-122
	D-256-06	J/m	20-30	ft lb/inch	0.375-0.562
Water Absorption	D-570-98 24hr	%	1.1-1.5	%	1.1-1.5
Tg	DMA, E <sub>s</sub>	°C	52-54	°F	126-129
Shore Hardness (D)	Scale D	Scale D	83-86	Scale D	83-86
Rockwell Hardness	Scale M	Scale M	73-76	Scale M	73-76
Polymerized density	ASTM D792	g/cm3	1.04-1.05		
Ash content	USP281	%	0.02-0.06	%	0.02-0.06

NEU

## Rigid Opaque Materials

### Objet VeroGray FullCure850, VeroBlack FullCure870, VeroWhitePlus FullCure835

	ASTM	Units	Metric	Units	Imperial
Zugfestigkeit	D-638-03	MPa	50-65	psi	7250-9450
Bruchdehnung	D-638-05	%	10-25	%	10-25
Elastizitätsmodul	D-638-04	MPa	2000-3000	psi	290,000-435,000
Biegefestigkeit	D-790-03	MPa	75-110	psi	11000-16000
Biege E-Modul	D-790-04	MPa	2200-3200	psi	320,000-465,000
HDT, °C @ 0.45MPa	D-648-06	°C	45-50	°F	113-122
HDT, °C @ 1.82MPa	D-648-07	°C	45-50	°F	113-122
Izod Notched Impact	D-256-06	J/m	20-30	ft lb/inch	0.375-0.562
Water Absorption	D-570-98 24hr	%	1.1-1.5	%	1.1-1.5
Tg	DMA, E»	°C	52-54	°F	126-129
Shore Hardness (D)	Scale D	Scale D	83-86	Scale D	83-86
Rockwell Hardness	Scale M	Scale M	73-76	Scale M	73-76
Polymerized density	ASTM D792	g/cm3	1.17-1.18		
Ash content VeroGray, VeroWhitePlus	USP281	%	0.23-0.26	%	0.23-0.26
Ash content VeriBlack	USP281	%	0.01-0.02	%	0.01-0.02

### Objet VeroBlue FullCure840

	ASTM	Units	Metric	Units	Imperial
Zugfestigkeit	D-638-03	MPa	50-60	psi	7250-8700
Bruchdehnung	D-638-05	%	15-25	%	15-25
Elastizitätsmodul	D-638-04	MPa	2000-3000	psi	290,000-435,000
Biegefestigkeit	D-790-03	MPa	60-70	psi	8700-10200
Biege E-Modul	D-790-04	MPa	1900-2500	psi	265,000-365,000
HDT, °C @ 0.45MPa	D-648-06	°C	45-50	°F	113-122
HDT, °C @ 1.82MPa	D-648-07	°C	45-50	°F	113-122
Izod Notched Impact	D-256-06	J/m	20-30	ft lb/inch	0.375-0.562
Water Absorption	D-570-98 24hr	%	1.5-2.2	%	1.5-2.2
Tg	DMA, E»	°C	48-50	°F	118-122
Shore Hardness (D)	Scale D	Scale D	83-86	Scale D	83-86
Rockwell Hardness	Scale M	Scale M	73-76	Scale M	73-76
Polymerized density	ASTM D792	g/cm3	1.18-1.19		
Ash content Vblack	USP281	%	0.21-0.22	%	0.21-0.22

## Polypropylene-like Materials

### Objet DurusWhite FullCure430

	ASTM	Units	Metric	Units	Imperial
Zugfestigkeit	D-638-03	MPa	20-30	psi	2900-4350
Bruchdehnung	D-638-05	%	40-50	%	40-50
Elastizitätsmodul	D-638-04	MPa	1000-1200	psi	145,000-175,000
Biegefestigkeit	D-790-03	MPa	30-40	psi	4350-5800
Biege E-Modul	D-790-04	MPa	1200-1600	psi	175,000-230,000
HDT, °C @ 0.45MPa	D-648-06	°C	37-42	°F	99-108
HDT, °C @ 1.82MPa	D-648-07	°C	32-34	°F	90-93
Izod Notched Impact	D-256-06	J/m	40-50	ft lb/inch	0.749-0.937
Water Absorption	D-570-98 24hr	%	1.5-1.9	%	1.5-1.9
Tg	DMA, E»	°C	35-37	°F	95-99
Shore Hardness (D)	Scale D	Scale D	74-78	Scale D	74-78
Rockwell Hardness	Scale M	Scale M	no data	Scale M	no data
Polymerized density	ASTM D792	g/cm3	1.15-1.17		
Ash content	USP281	%	0.10-0.12	%	0.1-0.12

## Rubber-like Materials

### Objet TangoBlackPlus FullCure980 and TangoPlus FullCure930

	ASTM	Units	Metric	Units	Imperial
Zugfestigkeit	D-412	MPa	0.8-1.5	psi	115-220
Bruchdehnung	D-412	%	170-220	%	170-220
Druckverformungsrest	D-395	%	4-5	%	4-5
Shore Hardness (A)	D-2240	Scale A	26-28	Scale A	26-28
Tensile Tear resistance	D-624	Kg/cm	2-4	Lb/in	18-22
Polymerized density	ASTM D792	g/cm3	1.12-1.13		

### Objet TangoBlack FullCure970

	ASTM	Units	Metric	Units	Imperial
Zugfestigkeit	D-412	MPa	1.8-2.4	psi	115-350
Bruchdehnung	D-412	%	45-55	%	45-55
Druckverformungsrest	D-395	%	0.5-1.5	%	0.5-1.5
Shore Hardness (A)	D-2240	Scale A	60-62	Scale A	60-62
Tensile Tear resistance	D-624	Kg/cm	3-5	Lb/in	18-24
Polymerized density	ASTM D792	g/cm3	1.12-1.13		

### Objet TangoGray FullCure950

	ASTM	Units	Metric	Units	Imperial
Zugfestigkeit	D-412	MPa	3-5	psi	435-725
Bruchdehnung	D-412	%	45-55	%	45-55
Druckverformungsrest	D-395	%	0.5-1.5	%	0.5-1.5
Shore Hardness (A)	D-2240	Scale A	73-77	Scale A	73-77
Tensile Tear resistance	D-624	Kg/cm	8-12	Lb/in	50-60
Polymerized density	ASTM D792	g/cm3	1.16-1.17		



## Simulating Standard Plastics

### Transparent Materials

**Primary material:** FullCure720 **Secondary material:** VeroBlack

Property	ASTM	Units	DM_Dots_7513/ DM_Grid_7523
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:** FullCure720 **Secondary material:** TangoBlack

Property	ASTM	Units	DM_7210	DM_7220	DM_7230
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

### Rigid Opaque Materials

**Primary material:** VeroWhitePlus **Secondary material:** Veroblack

Property	ASTM	Units	DM_8310, DM_8320, DM_8330
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:** VeroBlue **Secondary material:** VeroBlack

Property	ASTM	Units	DM_8210
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:** VeroWhitePlus **Secondary material:** TangoBlackPlus

Property	ASTM	Units	DM_8505Gray20 DM_8510_Gray25 DM_8515_Gray35 DM_8520_Gray40	DM_8525_Gray50
HDT at 0.45 MPa	D-648-06	°C	40-45	40-43
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
Izod Notched Impact	D-256-06	J/m	22-35	25-35
Flexural Strength	D-790-03	MPa	55-75	45-60
Flexural Modulus	D-790-04	MPa	1500-2500	1400-1800

**Primary material:** VeroWhitePlus **Secondary material:** TangoPlus

Property	ASTM	Units	DM_8425
HDT at 0.45 MPa	D-648-06	°C	40-43
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
Izod Notched Impact	D-256-06	J/m	25-35
Flexural Strength	D-790-03	MPa	45-60
Flexural Modulus	D-790-04	MPa	1400-1800

## Polypropylene-like Materials

**Primary material:** DurusWhite **Secondary material:** VeroWhitePlus, VeroBule, VeroBlack or FullCure720

Property	ASTM	Units	DM_4310	DM_4410	DM_4510	DM_4710
Tensile strength	D-638-03	MPa	30-40	30-40	30-40	30-40
Elongation at break	D-638-05	%	40-50	40-50	40-50	40-50
Modulus of elasticity	D-638-04	MPa	1200-1600	1200-1600	1200-1600	1200-1600
Flexural Strength	D-790-03	MPa	40-50	40-50	40-50	40-50
Flexural Modulus	D-790-04	MPa	1300-1700	1300-1700	1300-1700	1300-1700
HDT, °C @ 0.45MPa	D-648-06	°C	40-45	40-45	40-45	40-45
Izod Notched Impact	D-256-06	J/m	35-45	35-45	35-45	35-45

**Primary material:** VeroWhitePlus **Secondary material:** TangoBlackPlus

Property	ASTM	Units	DM_8530_Gray60
HDT at 0.45 MPa	D-648-06	°C	38-41
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
Izod Notched Impact	D-256-06	J/m	21-40
Flexural Strength	D-790-03	MPa	35-45
Flexural Modulus	D-790-04	MPa	1200-1500

**Primary material:** VeroWhitePlus **Secondary material:** TangoPlus

Property	ASTM	Units	DM_8430
HDT at 0.45 MPa	D-648-06	°C	38-41
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
Izod Notched Impact	D-256-06	J/m	21-40
Flexural Strength	D-790-03	MPa	35-45
Flexural Modulus	D-790-04	MPa	1200-1500

## Rubber- like Materials

**Primary material:** TangoBlackPlus/TangoPlus **Secondary material:** VeroWhitePlus

Property	ASTM	Units	DM_9840/ 9740	DM_9850/ 9750	DM_9860/ 9760	DM_9870/ 9770	DM_9885/ 9785	DM_9895/ 9795
Tensile strength	D-412	MPa	0.5-1.5	0.5-1.5	2-4	2-4	4-8	15-25
Elongation at break	D-412	%	150-170	130-150	80-100	50-70	50-60	25-35
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	4-6	5-7	7-9	12-14	25-27	45-47

**Primary material:** TangoBlack **Secondary material:** VeroWhitePlus, VeroBlue, VeroBlack, FullCure720

Property	ASTM	Units	DM_9110/9410 9210/9310	DM_9120/9420 9220/9320	DM_9130/9430 9230/9330
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:** TangoGray **Secondary material:** TangoBlack

Property	ASTM	Units	DM_9510
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	5-7

**Primary material:** TangoGray **Secondary material:** VeroBlack

Property	ASTM	Units	DM_9610
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