Typical properties of biodegradable M·VERA® injection moulding compounds

	Unit	M·VERA® GP1005 (B0001)[a]	M·VERA® GP1012 (B0254)[a]	M·VERA® GP1015 (B0071)	M·VERA® GP1025 (B0147)[a]	M·VERA® GP1041 (B0210)	M·VERA® GP1045 (B0217)
Food contact approval EU 10/2011	-	√[kc]	√[kc]	√[c]	√[c]	√[c]	√[kc]
Certificates	-	-	OK biodegrad-able SOIL; OK compost HOME	OK compost INDUSTRIAL	OK compost INDUSTRIAL	OK compost INDUSTRIAL	OK biodegrad-able SOIL; OK compost HOME
Renewable content in the polymer	%	>48	>98	>68	>98	>98	>98
Density	g/cm³	1.44	1.22	1.44	1.49	1.26	1.20
MVR (190 °C/2.16 kg)	cm³/10 min	12	9[e]	10	11	30	9[e]
Tensile modulus[f]	MPa	1,190	1,750	4,100	8,480	3,500	1.500
Tensile strength[f]	MPa	26	25	40	65	61	26
Yield strength[f]	MPa	26	25	41	n.d.	61	26
Elongation at yield[f]	%	7	3.7	2	n.d.	2.3	3
Elongation at break[f]	%	20	4	4.7	1.3	3.8	5.5
Charpy notched impact strength[g]	kJ/m²	3.2	2.2	3.5	2	1.8	2
Charpy impact strength[l]	kJ/m²	46	12	50	19	18	14
HDT/B (ISO 75/B)	°C	95	104	50–115[h]	50–115[h]	50–115[h]	98

[a] product in development, preliminary data [b] certfication in progress [c] available on request [e] (160/5) [f] according ISO 527-1/-2 [g] ISO 179-1/1eA [l] ISO 179-1/1eU [h] depending on mould temperature and annealing process afterwards
[k] food contact limitations, for more informations please contact BIO-FED

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05/2024

Typical properties of biomass-balanced M·BIOBASE® polypropylene compounds

	Unit	M·BIOBASE® PPH 032 nat	M·BIOBASE® PPC 035 nat	M·BIOBASE® PPH 120 nat	M·BIOBASE® PPH 500 nat
Food contact approval EU 10/2011	-	√[d]	√[d]	√[d]	√[d]
Certificates	-	ISCC PLUS	ISCC PLUS	ISCC PLUS	ISCC PLUS
Mass-balanced content/Allocation factor[a]	%	100	90	100	100
Density	g/cm³	0.905	0.905	0.905	0.905
MFR (230 °C/2.16 kg)	g/10 min	3.2	3.5	12	50
Tensile modulus[b]	MPa	1,700	1,350	1,550	1,650
Tensile strength at yield[b]	MPa	33	25	34	35
Elongation at yield[b]	%	7	6	9	9
Elongation at break[b]	%	27	110	330	47
Charpy notched impact strength +23 °C[c]	kJ/m²	6	15	3.5	2
Charpy notched impact strength -20 °C[c]	kJ/m²	n.a.	6.5	n.a.	n.a.
Suitable for	-	Extrusion, BOPP films	Injection moulding (e.g. luggage, bins, crates, technical parts)	Injection moulding (e.g. thin wall packaging)	Injection moulding (e.g. thin wall packaging and containers with excellent transparency)

[a] The allocation factor is the percentage of biomass allocated to the product (max. value: 100%) = percentage of replaced fossil based resources in the value chain. The allocation factor does not indicate how much biomass is actually in the product. It refers to the organic content (e.g. polymers) in the product. [b] ISO 527-1/-2 [c] ISO 179-1/1eA [d] available on request n.a. = not applicable

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03/2024

M·BIOBASE® product portfolio
Biomass-balanced polypropylene

Typical properties of biomass-balanced filled M·BIOBASE® polypropylene compounds

	Unit	M·BIOBASE® PPH 050 GF30 nat	M·BIOBASE® PPH 080 WF20 nat	M·BIOBASE® PPH 130 WF30 nat	M·BIOBASE® PPH 230 WF20 nat
Food contact approval EU 10/2011	-	√[d]	-	-	-
Certificates	-	ISCC PLUS; REDcert²	ISCC PLUS; REDcert²	ISCC PLUS; REDcert²	ISCC PLUS; REDcert²
Mass-balanced content/Allocation factor[a]	%	96	80[e]	70[e]	80[e]
Filler	%	30 % glass fibre	20 % wood fibre	30 % wood fibre	20 % wood fibre
Bio-based content	%	0	20	30	20
Appearence	-	-	brownish, fibres visible	brownish, fibres visible	brownish, fibres visible
Density	g/cm³	1.12	0.968	1.006	0.956
MFR (230 °C/2.16 kg)	g/10 min	5	8	13	23
Tensile modulus[b]	MPa	7,350	3,040	3,570	2,670
Tensile strength at break[b]	MPa	95	39	39	28
Elongation at break[b]	%	3.2	4.3	3.2	5.2
Charpy notched impact strength +23 °C[c]	kJ/m²	14.5	2.7	2.5	2.2
Charpy unnotched impact strength +23 °C[c]	kJ/m²	58.5	17.4	13.9	13.6
Suitable for	-	Injection moulding (e.g. technical parts)	Injection moulding (e.g. consumer goods)	Injection moulding (e.g. consumer goods)	Injection moulding (e.g. consumer goods)

[a] The allocation factor is the percentage of biomass allocated to the product (max. value: 100%) = percentage of replaced fossil based resources in the value chain. The allocation factor does not indicate how much biomass is actually in the product. It refers to the organic content (e.g. polymers) in the product. [b] ISO 527-1/-2 [c] ISO 179-1/1eA [d] available on request [e] estimated value; exact value on request

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03/2024

M·BIOBASE® product portfolio
Biomass-balanced polypropylene

Typical properties of M·VERA® biocompounds for extrusion and thermoforming

	Unit	M·VERA® GP4001 (B0148)[a]	M·VERA® GP4003 (B0219)[a]	M·VERA® GP4004 (B0165)	M·VERA® GP4005 (B0242)[a]	M·VERA® GP4006 (B0241)[a]
Food contact approval EU 10/2011	-	√[f]	√[f]	√[f]	√[f]	√[f]
Certificates	-	OK compost INDUSTRIAL	OK compost INDUSTRIAL	OK compost INDUSTRIAL[i]	OK compost INDUSTRIAL	OK compost INDUSTRIAL[i]
Renewable content in the polymer	%	~70	~50	n.a.	~100	~80
Density	g/cm³	1.44	1.32	1.41	1.25	1.25
MVR (190 °C/2.16 kg)	cm³/10 min	2–5	2–5	2–5	2–8	2–5
Tensile modulus[f]	MPa	2,650	1,850	370/185[e]	2,150	1,800
Tensile strength[f]	MPa	34	25	27/28[e]	34	32
Yield strength[f]	MPa	34	25	-	32	32
Elongation at yield[f]	%	3.1	2.5	-	2.8	3.4
Elongation at break[f]	%	30	25	400/460[e]	9	40
Dart-drop Impact Test[d] Force$_{max}$ @ 23 °C	N	1,030	1,080	-	72	840
Dart-drop Impact Test[d] Energy$_{max}$ @ 23 °C	J	3.7	6.3	-	0.15	2.2
Dart-drop Impact Test[d] Deformation$_{max}$ @ 23 °C	mm	7.6	10.9	-	4.5	6.2
Dart-drop Impact Test[d] Force$_{max}$ @ 4 °C	N	1,070	1,560	-	65	1,223
Dart-drop Impact Test[d] Energy$_{max}$ @ 4 °C	J	2.7	8.4	-	0.11	3.2
Dart-drop Impact Test[d] Deformation$_{max}$ @ 4 °C	mm	5.7	8.4	-	0.9	6.3

[a] product in development, preliminary data [b] certfication in progress [c] ISO 527-3; determined in MD on 0.8 mm thick test specimens [d] ISO 6603-2 (4,4 m/s) [e] in MD/TD; (MD) = Machine direction; (TD) = Transversal direction [f] available on request [i] certification possible
n.a. = not applicable

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10/2022

M·VERA® product portfolio
Extrusion and thermoforming

Typical properties of biodegradable M·VERA® film compounds

	Unit	M·VERA® B5019 (B0041)	M·VERA® B5029 (B0155)	M·VERA® B5033 (B0267)	M·VERA® B5037 (B0183)	M·VERA® B5039 (B0186)
Food contact approval EU 10/2011	-	√ [f]	√ [f]	√ [f]	√ [f]	√ [f]
Certificates	-	OK compost INDUSTRIAL	OK compost INDUSTRIAL	OK compost HOME	OK compost INDUSTRIAL	OK compost INDUSTRIAL
Biobased carbon content [c]	%	n.a.	n.a.	>50	n.a.	n.a.
Transparency	-	translucent	opaque	opaque	opaque	opaque
Density	g/cm³	1.23	1.41	1.30	1.51	1.45
MVR (190 °C/2.16 kg)	cm³/10 min	2–5	2–5	1–5	1–5	1–5
Tensile modulus [d]	MPa	1,150/470	380/175	250/150	175/160	150/145
Tensile strength [d]	MPa	21/30	25/30	19/20	22/22	30/31
Elongation at break [d]	%	210/350	410/480	350/550	505/510	525/550
Tear strength (ISO 6383)	N/mm	12/20	105/48	200/250	150/170	105/145

[a] product in development, preliminary data [b] certfication in progress [c] ISO 16620; TC [d] according ISO 527-3; values were determined on 25 µm blown film samples (BUR 1:3) and given in MD/TD; MD = machine direction; TD = transversal direction [e] certification possible
[f] available on request n.a. = not applicable

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05/2024

M·VERA® product portfolio
Film extrusion

Typical properties of biodegradable M·VERA® film compounds

	Unit	M·VERA® A5001 (B0090)	M·VERA® A5002 (B0281)[a]	M·VERA® A5003 (B0162)
Food contact approval EU 10/2011	-	√[f]	√[f]	√[f]
Certificates	-	OK compost INDUSTRIAL	Biodegradable in Soil	OK compost INDUSTRIAL[e]
Biobased carbon content[c]	%	n.a.	n.a.	n.a.
Transparency	-	opaque	opaque	opaque
Density	g/cm³	1.40	1.26	1.33
MVR (190 °C/2.16 kg)	cm³/10 min	2–5	2–5	2–5
Tensile modulus[d]	MPa	380/170	300/190	320/155
Tensile strength[d]	MPa	25/30	23/23	30/40
Elongation at break[d]	%	410/470	420/470	450/455
Tear strength (ISO 6383)	N/mm	100/50	100/120	105/33

[a] product in development, preliminary data [c] ISO 16620; TC [d] according ISO 527-3 [e] certification possible [f] available on request n.a. = not applicable

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M·VERA® product portfolio
Film extrusion

Typical properties of biodegradable M·VERA® filament compounds

	Unit	M·VERA® F4001 (B0088)[a]	M·VERA® F4002 (B0221)[a]	M·VERA® F4003 (B0270)[a]
Food contact approval EU 10/2011	-	√[f]	√[f]	√[f]
Certificates	-	OK compost INDUSTRIAL[e]	OK compost INDUSTRIAL[e]	OK compost INDUSTRIAL[e]
Biobased carbon content[c]	%	~80	~100	~70
Transparency	-	white	transparent	grey
Density	g/cm³	1.26	1.26	1.43
MVR (190 °C/2.16 kg)	cm³/10 min	2–5	2–5	2–5
Tensile modulus[d]	MPa	2,450	3,500	2,600
Tensile strength[d]	MPa	44	45	30
Elongation at break[d]	%	43	<5	30

[a] product in development, preliminary data [c] calculated according ISO 16620; TC [d] according ISO 527 -1/-2 [e] certification possible [f] available on request n.a. = not applicable

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