almaak international

automotive products

approvals
application examples
technical data

Edition 2023/24


brabender
TECHNOLOGIE
WERNER & PFLEIDERER

60 years of experience in the production of recycled materials

200 employees

approx. 15,000 t CO_2 reduction through almaak recycled materials

IATF 16949 / ISO 9001 / ISO 50001 / ISO 14001 / EcoVadis Silver Status

approx. € 95 mio turnover

18 production lines

2 production sites: Krefeld and Doberlug-Kirchhain
100,000 m² plot area with
35,000 m² production area

Production capacity 60,000 t/a

Laboratories at both sites

almaak international is an owner-managed company with many years of experience in the production, processing and development of engineering plastic compounds.

The plants in Krefeld and Doberlug-Kirchhain can produce around 60,000 metric tons of engineering thermoplastics (PC/ABS, PC, ABS, PA, PA/ABS, PBT/ASA, PBT, PP etc.) per year on 18 production lines with a flexible hourly output of 25 kg to 1,500 kg.

These products are mainly used in the automotive industry, in the electrical and household goods sector and in the construction industry.

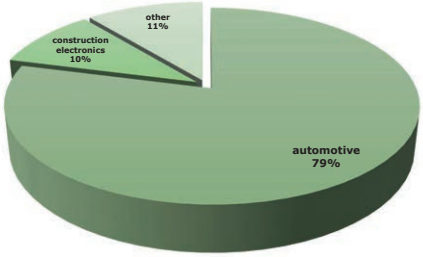
almaak has many years of experience in dealing with secondary raw materials and is one of the leading suppliers of sustainable product solutions in Europe. In addition to top-quality products – from medical applications to highly technical innovations of virgin material – the company has for years focused on the development of compounds from sustainable raw materials, for which there is extensive series experience in almost all relevant applications.

Due to the good availability as well as the high-quality and constant material sources, only post-industrial recyclates (PIR) have been used as raw materials for these products so far. By the end of 2023, the first products with a proportion of post-consumer recyclates (PCR) will be available.

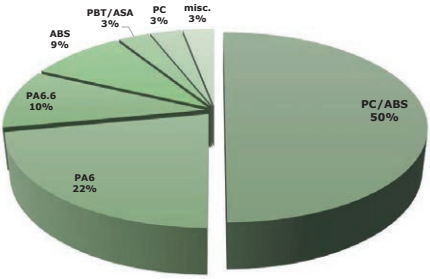
Our products with PCR content will be given their own nomenclature as well as their own data sheets so that they can be clearly distinguished from the well-known PIR-based Anja® compounds.

almaak international

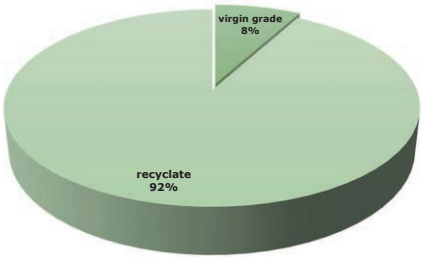
Industry distribution



Polymer distribution



Material class distribution



Release process and almaak products with component release

Component approvals are required for thermoplastics that are used.
For this purpose, the respective Group standards such as TL52231 and/or the respective specifications for the component must be taken into account and fulfilled.

The component release is usually carried out by the Audi supplier initiated together with the raw material supplier.

Material designation according to ISO 1043	almaak material designation
PC+ABS	Anjacom® PC/ABS R050/75S Anjacom® PC/ABS 050/75S
PC+ABS GF20	Anjacom® PC/ABS 055/80-GF20
PC+ABS-I GF20	Anjatech® PC/ABS 055/80-E/GF20
PC+ABS-(GF5+GK15)	Anjacom® PC/ABS 055/80-GFK5/15
PA6-I-(GF10+M20)	Anjatech® PA6 J255-H/TZ/M/GF20/10
PA6-I GF30	Anjatech® PA6 R250-DT2/GF30
PC GF50	Anjacom® PC 150-GF50
PC+ABS	Anjatech® PC/ABS 050/45GT

Material designation

- PC+ABS

almaak material designation

- Anjacom® PC/ABS R050/75S
- Anjacom® PC/ABS 050/75S

Material class

- Recycled material, virgin grade

Application examples

- Center console
- Armrest
- Trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS R050/75S	Anjacom® PC/ABS 050/75S
Minimum recycled content	DIN EN ISO 14021		%	77	0
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 0,96	3,44
Rheological properties					
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	27	25
Mechanical properties					
Train-E-Module	ISO 527-1	1 mm / min	MPa	2600	2500
Yield stress	ISO 527-1	50 mm / min	MPa	60	65
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	NB	NB
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	45	55
Thermal properties					
Vicat softening temperature	ISO 306	50K / h 50N	°C	128	128
Physical properties					
Density	ISO 1183	23°C	g / cm^3	1,14	1,14

Material designation

- PC+ABS GF20

almaak material designation

- Anjacom® PC/ABS 055/80-GF20

Material class

- Recycled material

Application examples

- Functional parts
- Back-injected trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS 055/80-GF20
Minimum recycled content	DIN EN ISO 14021		%	60
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,21
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	18
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	6500
Yield stress	ISO 527-1	5 mm / min	MPa	110
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	40
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	10
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	135
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,28

Material designation

- PC+ABS-I GF20

almaak material designation

- Anjatech® PC/ABS 055/80-E/GF20

Material class

- Recycled material

Application examples

- Functional parts
- Back-injected trim elements

Properties	Norm	Test conditions	Unit	Anjatech® PC/ABS 055/80-E/ GF20
Minimum recycled content	DIN EN ISO 14021		%	65
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,56
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	10
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	5600
Yield stress	ISO 527-1	5 mm / min	MPa	90
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	50
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	13
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	140
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,28

Material designation

- PC+ABS-(GF5+GK15)

almaak material designation

- Anjacom® PC/ABS 055/80-GFK5/15

Material class

- Virgin grade

Application examples

- Screen kinematics

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS 055/80-GFK5/15
Minimum recycled content	DIN EN ISO 14021		%	0
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	3,28
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10min	18
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	4300
Yield stress	ISO 527-1	5 mm / min	MPa	60
Charpy impact strength	ISO 179 / 1eU	23°C	kJ / m^2	40
Charpy notch impact strength	ISO 179 / 1eA	23°C	kJ/m^2	7
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	132
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,29

Material designation

- PA6-I-(GF10+M20)

almaak material designation

- Anjatech® PA6 J255-H/TZ/M/GF20/10

Material class

- Recycled material

Application examples

- Motordesign cover

Properties	Norm	Test conditions	Unit	Anjatech® PA6 J255-H/ TZ/M/ GF20/10
Minimum recycled content	DIN EN ISO 14021		%	59,8
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,67
Rheological properties				
MVR	ISO 1133	275°C / 5,00 kg	cm^3 / 10min	
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	5300
Yield stress	ISO 527-1	5 mm / min	MPa	80
Charpy impact strength	ISO 179 / 1eU	23°C	kJ / m^2	55
Charpy notch impact strength	ISO 179 / 1eA	23°C	kJ/m^2	6,5
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,35

Material designation

- PA6-I GF30

almaak material designation

- Anjatech® PA6 R250-DT2/GF30

Material class

- Recycled material

Application examples

- Control-unit holder

Properties	Norm	Test conditions	Unit	Anjatech® PA6 R250-DT2/GF30
Minimum recycled content	DIN EN ISO 14021		%	46,4
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,92
Rheological properties				
MVR	ISO 1133	275°C / 5,00 kg	cm^3 / 10min	
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	9000
Yield stress	ISO 527-1	5 mm / min	MPa	130
Charpy impact strength	ISO 179 / 1eU	23°C	kJ / m^2	75
Charpy notch impact strength	ISO 179 / 1eA	23°C	kJ/m^2	15
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	190
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,36

Material designation

- PC GF50

almaak material designation

- Anjacom® PC 150-GF50

Material class

- Virgin grade

Application examples

- Ventilation slats
- Cinematic parts
- Carrier components

Properties	Norm	Test conditions	Unit	Anjacom® PC 150-GF50
Minimum recycled content	DIN EN ISO 14021		%	0
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	3,09
Rheological properties				
MVR	ISO 1133	300°C / 1,20 kg	cm^3 / 10min	
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	15 000
Yield stress	ISO 527-1	5 mm / min	MPa	145
Charpy impact strength	ISO 179 / 1eU	23°C	kJ / m^2	45
Charpy notch impact strength	ISO 179 / 1eA	23°C	kJ/m^2	12
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	140
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,63

Material designation

- PC+ABS

almaak material designation

- Anjatech® PC/ABS 050/45GT

Material class

- Virgin grade

Application examples

- Galvanized/chrome-plated design elements

Properties	Norm	Test conditions	Unit	Anjatech® PC/ABS 050/45GT
Minimum recycled content	DIN EN ISO 14021		%	0
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	3,36
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10min	24
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	2500
Yield stress	ISO 527-1	50 mm / min	MPa	60
Charpy impact strength	ISO 179 / 1eU	23°C	kJ / m^2	NB
Charpy notch impact strength	ISO 179 / 1eA	23°C	kJ/m^2	55
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	110
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,10

Release process and released almaak products

GS 93016

BMW GS93016 is a group standard for thermoplastics within the BMW Group. This standard regulates the inclusion of material trade names and material certification.

In addition to a wide range of practical and theoretical requirements, raw material manufacturers and materials must undergo an approval test by a BMW-approved laboratory.

In order to achieve approval certification, tests specified by the BMW Materials Development Department are mandatory.

BMW material designation	almaak material designation
>ABS(REC80)<	Anjacom® ABS R050/7020
>PC+ABS(REC75)<	Anjacom® PC/ABS R050/75S Anjatech® PC/ABS R050/75S-GM
>PC+ABS(REC60)<	Anjacom® PC/ABS R050/65S
>PC+ABS-GF10(REC80)<	Anjacom® PC/ABS 055/80-GF10
>PC+ABS-GF20(REC80)<	Anjacom® PC/ABS 055/80-GF20
>PA6-(MX20+GF10)(REC80)<	Anjacom® PA6 J255-H/M/GF 20/10
>PA6-GF30(REC80)<	Anjatech® PA6 R250-DT2/GF30

BMW material designation

- >ABS(REC80)<

almaak material designation

- Anjacom® ABS R050/7020

Material class

- Recycled material

Application examples

- Bumper bracket
- Cover glove-box
- Loading sill

Properties	Norm	Test conditions	Unit	Anjacom® ABS R050/7020
Minimum recycled content	DIN EN ISO 14021		%	80
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 0,80
Rheological properties				
MVR	ISO 1133	220° / 10,00 kg	cm^3 / 10min	12
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	2500
Yield stress	ISO 527-1	50 mm / min	MPa	50
Charpy impact strength	ISO 179 / 1eU	23°C	kJ / m^2	NB
Charpy notch impact strength	ISO 179 / 1eA	23°C	kJ/m^2	35
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	107
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,09

BMW material designation

- >PC+ABS(REC75)<

almaak material designation

- Anjacom® PC/ABS R050/75S
- Anjatech® PC/ABS R050/75S-GM

Material class

- Recycled material

Application examples

- Center console
- Armrest
- Trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS R050/75S	Anjatech® PC/ABS R050/75S-GM
Minimum recycled content	DIN EN ISO 14021		%	77	75
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 0,96	< 1,2
Rheological properties					
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	27	28
Mechanical properties					
Train-E-Module	ISO 527-1	1 mm / min	MPa	2600	2400
Yield stress	ISO 527-1	50 mm / min	MPa	60	60
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	NB	999
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	45	40
Thermal properties					
Vicat softening temperature	ISO 306	50K / h 50N	°C	128	130
Physical properties					
Density	ISO 1183	23°C	g / cm^3	1,14	1,15

BMW material designation

- >PC+ABS(REC60)<

almaak material designation

- Anjacom® PC/ABS R050/65S

Material class

- Recycled material

Application examples

- Interieur
- Trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS R050/65S
Minimum recycled content	DIN EN ISO 14021		%	59
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,4
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	25
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	2200
Yield stress	ISO 527-1	50 mm / min	MPa	55
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	999
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	45
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	121
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,13

BMW material designation

- >PC+ABS-GF10(REC80)<

almaak material designation

- Anjacom® PC/ABS 055/80-GF10

Material class

- Recycled material

Application examples

- Functional parts
- Back-injected trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS 055/80-GF10
Minimum recycled content	DIN EN ISO 14021		%	69
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,02
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	18
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	4500
Yield stress	ISO 527-1	5 mm / min	MPa	85
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	50
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	10
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	135
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,23

BMW material designation

- >PC+ABS-GF20(REC80)<

almaak material designation

- Anjacom® PC/ABS 055/80-GF20

Material class

- Recycled material

Application examples

- Functional parts
- Back-injected trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS 055/80-GF20
Minimum recycled content	DIN EN ISO 14021		%	60
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,21
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	18
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	6500
Yield stress	ISO 527-1	5 mm / min	MPa	110
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	40
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	10
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	135
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,28

BMW material designation

- >PA6-(MX20+GF10)(REC80)<

almaak material designation

- Anjacom® PA6 J255-H/M/GF 20/10

Material class

- Recycled material

Application examples

- Motordesign cover

Properties	Norm	Test conditions	Unit	Anjacom® PA6 J255-H/M/GF 20/10
Minimum recycled content	DIN EN ISO 14021		%	70,5
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,06
Rheological properties				
MVR	ISO 1133	275°C / 5,00 kg	cm^3 / 10 min	60
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	6800
Yield stress	ISO 527-1	5 mm / min	MPa	100
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	47
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	4
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	205
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,36

BMW material designation

- >PA6-GF30(REC80)<

almaak material designation

- Anjatech® PA6 R250-DT2/GF30

Material class

- Recycled material

Application examples

- Control-unit holder

Properties	Norm	Test conditions	Unit	Anjatech® PA6 R250-DT2/GF30
Minimum recycled content	DIN EN ISO 14021		%	46,4
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,92
Rheological properties				
MVR	ISO 1133	275°C / 5,00 kg	cm^3 / 10 min	
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	9000
Yield stress	ISO 527-1	5 mm / min	MPa	130
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	75
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	15
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	190
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,36

Release process and released almaak products GM (Chevrolet, Buick, GMC and Cadillac)

The GMW 15702 factory standard for the automotive sector describes a classification system of plastic materials suitable for injection molding and extrusion.

For the material specification in GMW, the area of application, e.g. engine compartment, interior/exterior, must be described. Furthermore, the performance characteristics of the specified plastics are defined.

The specification according to GMW 15702 requires predetermined and defined tests.

Material designation according to ISO 1043	almaak material designation
ABS	Anjacom® ABS R050/7020
PC+ABS GF10	Anjacom® PC/ABS 055/80-GF10
PC+ABS GF20	Anjacom® PC/ABS 055/80-GF20
PA6 GF30	Anjacom® PA6 J250-H/GF30
PA6-(GF10+GK20)	Anjacom® PA6 J255-GFK10/20
PA6.6-I GF13	Anjatech® PA6.6 J355-E/GF13
PA6.6+PA6 GF30	Anjacom® PA6.6/6 R195-H/GF30
PBT GF20	Anjacom® PBT J450-GF20

Material designation

- ABS

almaak material designation

- Anjacom® ABS R050/7020

Material class

- Recycled material

Application examples

- Bumper bracket
- Cover glove-box
- Loading sill

Properties	Norm	Test conditions	Unit	Anjacom® ABS R050/7020
Minimum recycled content	DIN EN ISO 14021		%	80
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 0,80
Rheological properties				
MVR	ISO 1133	220°C / 10,00 kg	cm^3 / 10 min	12
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	2500
Yield stress	ISO 527-1	50 mm / min	MPa	50
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	NB
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	35
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	107
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,09

Material designation

- PC+ABS GF10

almaak material designation

- Anjacom® PC/ABS 055/80-GF10

Material class

- Recycled material

Application examples

- Functional parts
- Back-injected trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS 055/80-GF10
Minimum recycled content	DIN EN ISO 14021		%	69
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,02
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	18
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	4500
Yield stress	ISO 527-1	5 mm / min	MPa	85
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	50
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	10
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	135
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,23

Material designation

- PC+ABS GF20

almaak material designation

- Anjacom® PC/ABS 055/80-GF20

Material class

- Recycled material

Application examples

- Functional parts
- Back-injected trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS 055/80-GF20
Minimum recycled content	DIN EN ISO 14021		%	60
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,21
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	18
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	6500
Yield stress	ISO 527-1	5 mm / min	MPa	110
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	40
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	10
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	135
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,28

Material designation

- PA6 GF30

almaak material designation

- Anjacom® PA6 J250-H/GF30

Material class

- Recycled material

Application examples

- Motor-control unit

Properties	Norm	Test conditions	Unit	Anjacom® PA6 J250-H/ GF30
Minimum recycled content	DIN EN ISO 14021		%	52,4
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,87
Rheological properties				
MVR	ISO 1133	275°C / 5,00 kg	cm^3 / 10 min	
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	8500
Yield stress	ISO 527-1	5 mm / min	MPa	
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	50
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	6
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	203
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,36

Material designation

- PA6-(GF10+GK20)

almaak material designation

- Anjacom® PA6 J255-GFK10/20

Material class

- Virgin grade

Application examples

- Electronic box

Properties	Norm	Test conditions	Unit	Anjacom® PA6 J255-GFK10/20
Minimum recycled content	DIN EN ISO 14021		%	0
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	5,51
Rheological properties				
MVR	ISO 1133	275°C / 5,00 kg	cm^3 / 10 min	
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	6000
Yield stress	ISO 527-1	5 mm / min	MPa	115
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	43
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	3,5
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,35

Material designation

- PA6.6-I GF13

almaak material designation

- Anjatech® PA6.6 J355-E/GF13

Material class

- Recycled material

Application examples

- Plug connector
- Housing

Properties	Norm	Test conditions	Unit	Anjatech® PA6.6 J355-E/GF13
Minimum recycled content	DIN EN ISO 14021		%	62,7
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,63
Rheological properties				
MVR	ISO 1133	275°C / 5,00 kg	cm^3 / 10 min	
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	3500
Yield stress	ISO 527-1	5 mm / min	MPa	95
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	55
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	5,8
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,21

Material designation

- PA6.6/6 GF30

almaak material designation

- Anjacom® PA6.6/6 R195-H/GF30

Material class

- Recycled material

Application examples

- Fan shrouds

Properties	Norm	Test conditions	Unit	Anjacom® PA6.6/6 R195-H/GF30
Minimum recycled content	DIN EN ISO 14021		%	65,6
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,43
Rheological properties				
MVR	ISO 1133	275°C / 5,00 kg	cm^3 / 10 min	
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	9000
Yield stress	ISO 527-1	5 mm / min	MPa	135
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	55
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	6,5
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	230
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,36

Material designation

- PBT GF20

almaak material designation

- Anjacom® PBT J450-GF20

Material class

- Recycled material

Application examples

- Plug connector
- Electronic components
- Fuse box

Properties	Norm	Test conditions	Unit	Anjacom® PBT J450-GF20
Minimum recycled content	DIN EN ISO 14021		%	61,4
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,52
Rheological properties				
MVR	ISO 1133	260°C / 2,16 kg	cm^3 / 10 min	22
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	6800
Yield stress	ISO 527-1	5 mm / min	MPa	110
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	35
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	5
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	205
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,46

Release process and released almaak products

DBL1224

Mercedes-Benz factory standard DBL1224 describes the requirements for thermoplastics for use in vehicle interiors and replaces standards DBL5404, DBL5410 and DBL5490.
In order to achieve a release certification, specified tests are prescribed. The corresponding release list is ALD00002215.

DBL1232

The standard describes the requirements for thermoplastics for use in vehicle exteriors and replaces issues DBL5410, DBL5416, DBL5418 and DBL54090.

Mercedes-Benz material designation	almaak material designation
ABS	Anjacom® ABS 500G Anjacom® ABS R500
ABS-T	Anjacom® ABS R050/7020 Anjacom® ABS 050/7020 Anjatech® ABS 050/7020-GM
ABS+PC	Anjacom® PC/ABS 050/45K Anjacom® PC/ABS R050/45K Anjatech® PC/ABS 050/45K-GM
PC+ABS	Anjacom® PC/ABS 050/65S Anjacom® PC/ABS R050/65S Anjatech® PC/ABS 050/65S-GM Anjacom® PC/ABS 050/75S Anjacom® PC/ABS R050/75S Anjatech® PC/ABS 050/75S-GM
(PC+ABS)-GF10	Anjacom® PC/ABS 055/80-GF10 Anjatech® PC/ABS 055/80-GM/GF10
(PC+ABS)-GF20	Anjacom® PC/ABS 055/80-GF20
PA6-GF15	Anjacom® PA6 255-H/GF15

Mercedes-Benz material designation

- ABS

almaak material designation

- Anjacom® ABS 500G
- Anjacom® ABS R500

Material class

- Virgin grade, recycled material

Application examples

- Interieur components

Properties	Norm	Test conditions	Unit	Anjacom® ABS R500	Anjacom® ABS 500G
Minimum recycled content	DIN EN ISO 14021		%	79	0
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 0,76	3,77
Rheological properties					
MVR	ISO 1133	220°C / 10,00 kg	cm^3 / 10 min	23	15
Mechanical properties					
Train-E-Module	ISO 527-1	1 mm / min	MPa	2000	2200
Yield stress	ISO 527-1	50 mm / min	MPa	40	41
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	70	NB
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	80	22
Thermal properties					
Vicat softening temperature	ISO 306	50K / h 50N	°C	95	97
Physical properties					
Density	ISO 1183	23°C	g / cm^3	1,04	1,04

Mercedes-Benz material designation

- ABS-T

almaak material designation

- Anjacom® ABS R050/7020
- Anjacom® ABS 050/7020
- also released as an anti squeak version (GM)

Material class

- Recycled material, virgin material

Application examples

- Bumper bracket
- Cover glove-box
- Loading sill

Properties	Norm	Test conditions	Unit	Anjacom® ABS R050/7020	Anjacom® ABS 050/7020
Minimum recycled content	DIN EN ISO 14021		%	80	0
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 0,80	3,30
Rheological properties					
MVR	ISO 1133	220°C / 10,00 kg	cm^3 / 10 min	12	13
Mechanical properties					
Train-E-Module	ISO 527-1	1 mm / min	MPa	2500	2500
Yield stress	ISO 527-1	50 mm / min	MPa	50	55
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	NB	NB
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	35	40
Thermal properties					
Vicat softening temperature	ISO 306	50K / h 50N	°C	107	105
Physical properties					
Density	ISO 1183	23°C	g / cm^3	1,09	1,08

Mercedes-Benz material designation

- ABS+PC

almaak material designation

- Anjacom® PC/ABS 050/45K
- Anjacom® PC/ABS R050/45K
- also released as an anti squeak version (GM)

Material class

- Recycled material, virgin material

Application examples

- Housing
- Panels
- Carrier door-sill

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS R050/45K	Anjacom® PC/ABS 050/45K
Minimum recycled content	DIN EN ISO 14021		%	40	0
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,91	3,36
Rheological properties					
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	17	17
Mechanical properties					
Train-E-Module	ISO 527-1	1 mm / min	MPa	2250	2300
Yield stress	ISO 527-1	50 mm / min	MPa	52	55
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	NB	NB
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	55	80
Thermal properties					
Vicat softening temperature	ISO 306	50K / h 50N	°C	109	109
Physical properties					
Density	ISO 1183	23°C	g / cm^3	1,09	1,09

Mercedes-Benz material designation

- PC+ABS

almaak material designation

- Anjacom® PC/ABS 050/65S
- Anjacom® PC/ABS R050/65S
- also released as an anti squeak version (GM)

Material class

- Recycled material, virgin material

Application examples

- Interieur components
- Trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS R050/65S	Anjacom® PC/ABS 050/65S
Minimum recycled content	DIN EN ISO 14021		%	59	0
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,4	3,41
Rheological properties					
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	25	22
Mechanical properties					
Train-E-Module	ISO 527-1	1 mm / min	MPa	2200	2300
Yield stress	ISO 527-1	50 mm / min	MPa	55	56
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	NB	NB
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	45	50
Thermal properties					
Vicat softening temperature	ISO 306	50K / h 50N	°C	121	122
Physical properties					
Density	ISO 1183	23°C	g / cm^3	1,13	1,13

Mercedes-Benz material designation

- PC+ABS

almaak material designation

- Anjacom® PC/ABS 050/75S
- Anjacom® PC/ABS R050/75S
- also released as an anti squeak version (GM)

Material class

- Recycled material, virgin material

Application examples

- Center console
- Armrest
- Trim components

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS R050/75S	Anjacom® PC/ABS 050/75S
Minimum recycled content	DIN EN ISO 14021		%	77	0
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 0,96	3,44
Rheological properties					
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	27	25
Mechanical properties					
Train-E-Module	ISO 527-1	1 mm / min	MPa	2600	2500
Yield stress	ISO 527-1	50 mm / min	MPa	60	63
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	NB	NB
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	45	55
Thermal properties					
Vicat softening temperature	ISO 306	50K / h 50N	°C	128	128
Physical properties					
Density	ISO 1183	23°C	g / cm^3	1,14	1,14

Mercedes-Benz material designation

- (PC+ABS)-GF10

almaak material designation

- Anjacom® PC/ABS 055/80-GF10
- Anjatech® PC/ABS 055/80-GM/GF10

Material class

- Recycled material, virgin grade

application examples

- Trim
- Carrier elements
- Interieur Components

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS 055/80-GF10	Anjatech® PC/ABS 055/80-GM/GF10
Minimum recycled content	DIN EN ISO 14021		%	69	0
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,02	3,72
Rheological properties					
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	18	17
Mechanical properties					
Train-E-Module	ISO 527-1	1 mm / min	MPa	4500	4600
Yield stress	ISO 527-1	5 mm / min	MPa	85	85
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	50	55
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	10	11
Thermal properties					
Vicat softening temperature	ISO 306	50K / h 50N	°C	135	134
Physical properties					
Density	ISO 1183	23°C	g / cm^3	1,23	1,23

Mercedes-Benz material designation

- (PC+ABS)-GF20

almaak material designation

- Anjacom® PC/ABS 055/80-GF20

Material class

- Recycled material

Application examples

- Functional parts
- Back-injected trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS 055/80-GF20
Minimum recycled content	DIN EN ISO 14021		%	60
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,21
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	18
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	6500
Yield stress	ISO 527-1	5 mm / min	MPa	110
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	40
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	10
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	135
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,28

Mercedes-Benz material designation

- PA6-GF15

almaak material designation

- Anjacom® PA6 255-H/GF15

Material class

- Recycled material

Application examples

- Exterieur components

Properties	Norm	Test conditions	Unit	Anjacom® PA6 255-H/ GF15
Minimum recycled content	DIN EN ISO 14021		%	64
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,67
Rheological properties				
MVR	ISO 1133	275°C / 5,00 kg	cm^3 / 10 min	
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	6200
Yield stress	ISO 527-1	5 mm / min	MPa	120
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	43
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	5
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	205
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,23

PORSCHE

Release process and almaak products with component release

Component approvals are required for thermoplastics that are used.
For this purpose, the respective Group standards such as TL52231 and/or the respective specifications for the component must be taken into account and fulfilled.

The component release is usually carried out by the Porsche-supplier initiated together with the raw material supplier.

Material designation according to ISO 1043	almaak material designation
PBT+ASA GF15	Anjacom® PBT/ASA 468-GF15
PC+ABS	Anjacom® PC/ABS R050/75S

PORSCHE

Material designation

- PBT+ASA GF15

almaak material designation

- Anjacom® PBT/ASA 468-GF15

Material class

- Virgin grade

Application examples

- Diffuse panels
- Centerfills
- Electronic box

Properties	Norm	Test conditions	Unit	Anjacom® PBT/ASA 468-GF15
Minimum recycled content	DIN EN ISO 14021		%	0
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	4,25
Rheological properties				
MVR	ISO 1133	260°C / 2,16 kg	cm^3 / 10 min	7
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	5000
Yield stress	ISO 527-1	5 mm / min	MPa	65
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	35
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	3,5
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	120
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,3

PORSCHE

Material designation

- PC+ABS

almaak material designation

- Anjacom® PC/ABS R050/75S

Material class

- Recycled material

Application examples

- Center console
- Armrest
- Trim element

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS R050/75S
Minimum recycled content	DIN EN ISO 14021		%	77
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 0,96
Rheological properties				
MVR	ISO 1133	260°C / 2,16 kg	cm^3 / 10 min	27
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	2600
Yield stress	ISO 527-1	5 mm / min	MPa	60
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	NB
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	45
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	128
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,14

Release process and specified almaak products Stellantis (Opel, PSA and Chrysler)

For the material specification in GMW, the area of application, e.g. engine compartment, interior/exterior, must be described. Furthermore, the performance characteristics of the specified plastics are defined.

The specification according to GMW 15702 requires prescribed and defined tests. The transfer of the OEMs Opel and PSA to Stellantis meant that the release specifications were transferred.

Material designation according to ISO 1043	almaak material designation
ABS	Anjacom® ABS R050/7020
PC+ABS	Anjacom® PC/ABS R050/75S
PC+ABS GF10	Anjacom® PC/ABS 055/80-GF10
PC+ABS GF20	Anjacom® PC/ABS 055/80-GF20
PC+ABS-I GF20	Anjatech® PC/ABS 055/80-E/GF20
PA6.6-I GF13	Anjatech® PA6.6 J355-E/GF13
PA6.6+PA6 GF30	Anjacom® PA6.6/6 R195-H/GF30
PBT GF20	Anjacom® PBT J450-GF20

Material designation

- ABS

almaak material designation

- Anjacom® ABS R050/7020

Material class

- Recycled material

Application examples

- Bumper bracket
- Cover glove-box
- Loading sill

Properties	Norm	Test conditions	Unit	Anjacom® ABS R050/7020
Minimum recycled content	DIN EN ISO 14021		%	80
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 0,80
Rheological properties				
MVR	ISO 1133	220°C / 10,00 kg	cm^3 / 10 min	12
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	2500
Yield stress	ISO 527-1	50 mm / min	MPa	50
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	NB
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	35
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	107
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,09

STELLANTIS

Material designation

- PC+ABS

almaak material designation

- Anjacom® PC/ABS R050/75S

Material class

- Recycled material

Application examples

- Center console
- Armrest
- Trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS R050/75S
Minimum recycled content	DIN EN ISO 14021		%	77
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 0,96
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	27
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	2600
Yield stress	ISO 527-1	50 mm / min	MPa	60
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	NB
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	45
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	128
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,14

Material designation

- PA6.6-I GF13

almaak material designation

- Anjatech® PA6.6 J355-E/GF13

Material class

- Recycled material

Application examples

- Plug connector
- Housing

Properties	Norm	Test conditions	Unit	Anjatech® PA6.6 J355-E/GF13
Minimum recycled content	DIN EN ISO 14021		%	62,7
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,63
Rheological properties				
MVR	ISO 1133	275°C / 5,00 kg	cm^3 / 10 min	
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	3500
Yield stress	ISO 527-1	5 mm / min	MPa	95
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	55
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	5,8
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,21

Material designation

- PA6.6+PA6 GF30

almaak material designation

- Anjacom® PA6.6/6 R195-H/GF30

Material class

- Recycled material

Application examples

- Fan shroud

Properties	Norm	Test conditions	Unit	Anjacom® PA6.6/6 R195-H/GF30
Minimum recycled content	DIN EN ISO 14021		%	65,6
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,43
Rheological properties				
MVR	ISO 1133	275°C / 5,00 kg	cm^3 / 10 min	
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	9000
Yield stress	ISO 527-1	5 mm / min	MPa	135
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	55
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	6,5
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	230
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,36

Material designation

- PBT GF20

almaak material designation

- Anjacom® PBT J450-GF20

Material class

- Recycled material

Application examples

- Plug connector
- Electronic components
- Fuse boxes

Properties	Norm	Test conditions	Unit	Anjacom® PBT J450-GF20
Minimum recycled content	DIN EN ISO 14021		%	61,4
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,52
Rheological properties				
MVR	ISO 1133	260°C / 2,16 kg	cm^3 / 10 min	22
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	6800
Yield stress	ISO 527-1	5 mm / min	MPa	110
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	35
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	5
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	205
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,46

Material designation

- PC+ABS GF10

almaak material designation

- Anjacom® PC/ABS 055/80-GF10

Material class

- Recycled material

Application examples

- Functional parts
- Back-injected trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS 055/80-GF10
Minimum recycled content	DIN EN ISO 14021		%	69
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,02
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	18
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	4500
Yield stress	ISO 527-1	5 mm / min	MPa	85
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	50
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	10
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	135
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,23

Material designation

- PC+ABS GF20

almaak material designation

- Anjacom® PC/ABS 055/80-GF20

Material class

- Recycled material

Application examples

- Functional parts
- Back-injected trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS 055/80-GF20
Minimum recycled content	DIN EN ISO 14021		%	60
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,21
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	18
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	6500
Yield stress	ISO 527-1	5 mm / min	MPa	110
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	40
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	10
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	135
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,28

Material designation

- PC+ABS-I GF20

almaak material designation

- Anjatech® PC/ABS 055/80-E/GF20

Material class

- Recycled material

Application examples

- Functional parts
- Back-injected trim elements

Properties	Norm	Test conditions	Unit	Anjatech® PC/ABS 055/80-E/ GF20
Minimum recycled content	DIN EN ISO 14021		%	65
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,56
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	10
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	5600
Yield stress	ISO 527-1	5 mm / min	MPa	90
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	50
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	13
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	140
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,28

Release process and almaak products with component release

Component approvals are required for thermoplastics that are used.
For this purpose, the respective Group standards such as TL52231 and/or the respective specifications for the component must be taken into account and fulfilled.

The component release is usually carried out by the VW-supplier initiated together with the raw material supplier.

Material designation according to ISO 1043	almaak material designation
PC+ABS	Anjacom® PC/ABS R050/75S Anjacom® PC/ABS 050/75S
PC+ABS GF30	Anjacom® PC/ABS 055/80-GF30
PA6-(GF20+M10)	Anjacom® PA6 J255-H/M/GF 20/10

Material designation

- PC+ABS

almaak material designation

- Anjacom® PC/ABS R050/75S

Material class

- Recycled material

Application examples

- Center console
- Armrest
- Trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS R050/75S
Minimum recycled content	DIN EN ISO 14021		%	77
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 0,96
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	27
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	2600
Yield stress	ISO 527-1	50 mm / min	MPa	60
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	NB
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	45
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	128
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,14

Material designation

- PC+ABS GF30

almaak material designation

- Anjacom® PC/ABS 055/80-GF30

Material class

- Recycled material

Application examples

- Functional parts
- Back-injected trim elements

Properties	Norm	Test conditions	Unit	Anjacom® PC/ABS 055/80-GF30
Minimum recycled content	DIN EN ISO 14021		%	53
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	< 1,4
Rheological properties				
MVR	ISO 1133	260°C / 5,00 kg	cm^3 / 10 min	15
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	10000
Yield stress	ISO 527-1	5 mm / min	MPa	120
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	35
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	9
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	135
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,385

Material designation

- PA6-(GF20+M10)

almaak material designation

- Anjacom® PA6 J255-H/M/GF 20/10

Material class

- Recycled material

Application examples

- Motordesign cover

Properties	Norm	Test conditions	Unit	Anjacom® PA6 J255-H/M/GF 20/10
Minimum recycled content	DIN EN ISO 14021		%	70,5
Product Carbon Footprint	DIN EN ISO 14067*		[kg CO^2 eq / kg]	1,06
Rheological properties				
MVR	ISO 1133	275°C/ 5,00 kg	cm^3 / 10 min	60
Mechanical properties				
Train-E-Module	ISO 527-1	1 mm / min	MPa	6800
Yield stress	ISO 527-1	5 mm / min	MPa	100
Charpy impact strength	ISO 179/1eU	23°C	kJ / m^2	47
Charpy notch impact strength	ISO 179/1eA	23°C	kJ / m^2	4
Thermal properties				
Vicat softening temperature	ISO 306	50K / h 50N	°C	205
Physical properties				
Density	ISO 1183	23°C	g / cm^3	1,36

Material designation / OEM	Audi	BMW	GM	Mercedes-Benz
Anjacom® ABS 500G				X
Anjacom® ABS R500				X
Anjacom® ABS R050/7020		X	X	X
Anjacom® ABS 050/7020				X
Anjatech® ABS 050/7020-GM				X
Anjacom® PC/ABS R050/45K				X
Anjacom® PC/ABS 050/45K				X
Anjatech® PC/ABS 050/45K-GM				X
Anjacom® PC/ABS R050/65S		X		X
Anjacom® PC/ABS 050/65S				X
Anjatech® PC/ABS 050/65S-GM				X
Anjacom® PC/ABS R050/75S	X	X		X
Anjacom® PC/ABS 050/75S	X			X
Anjatech® PC/ABS 050/75S-GM				X
Anjatech® PC/ABS R050/75S-GM		X		
Anjacom® PC/ABS 050/45GT	X			
Anjacom® PC/ABS 055/80-GF10		X	X	X
Anjacom® PC/ABS 055/80-GF20	X	X	X	X
Anjacom® PC/ABS 055/80-GF30				
Anjatech® PC/ABS 055/80-GM/GF10				X
Anjatech® PC/ABS 055/80-E/GF20	X			
Anjacom® PC/ABS 055/80-GFK 5/15	X			
Anjacom® PA6 255-H/GF15				X
Anjacom® PA6 J255-GFK10/20			X	
Anjacom® PA6 J255 H/M/GF 20/10		X		
Anjatech® PA6 J255-H/TZ/M/GF20/10	X			
Anjatech® PA6 R250-DT2/GF30	X	X		
Anjacom® PA6 J250-H/GF30			X	
Anjatech® PA6.6 J355-E/GF13			X	
Anjacom® PA6.6/6 R195-H/GF30			X	
Anjacom® PBT J450-GF20			X	
Anjacom® PBT/ASA 468-GF15				
Anjacom® PC 150-GF50	X			

Material designation / OEM	Porsche	Stellantis	Tesla	VW
Anjacom® ABS 500G				
Anjacom® ABS R500				
Anjacom® ABS R050/7020		X		
Anjacom® ABS 050/7020				
Anjatech® ABS 050/7020-GM				
Anjacom® PC/ABS R050/45K				
Anjacom® PC/ABS 050/45K				
Anjatech® PC/ABS 050/45K-GM				
Anjacom® PC/ABS R050/65S				
Anjacom® PC/ABS 050/65S				
Anjatech® PC/ABS 050/65S-GM				
Anjacom® PC/ABS R050/75S	X	X		X
Anjacom® PC/ABS 050/75S				
Anjatech® PC/ABS 050/75S-GM				
Anjatech® PC/ABS R050/75S-GM				
Anjacom® PC/ABS 050/45GT				
Anjacom® PC/ABS 055/80-GF10		X		
Anjacom® PC/ABS 055/80-GF20		X	X	
Anjacom® PC/ABS 055/80-GF30				X
Anjatech® PC/ABS 055/80-GM/GF10				
Anjatech® PC/ABS 055/80-E/GF20		X		
Anjacom® PC/ABS 055/80-GFK 5/15				
Anjacom® PA6 255-H/GF15				
Anjacom® PA6 J255-GFK10/20		X		
Anjacom® PA6 J255 H/M/GF 20/10				X
Anjatech® PA6 J255-H/TZ/M/GF20/10				
Anjatech® PA6 R250-DT2/GF30				
Anjacom® PA6 J250-H/GF30		X		
Anjatech® PA6.6 J355-E/GF13		X		
Anjacom® PA6.6/6 R195-H/GF30		X		
Anjacom® PBT J450-GF20		X		
Anjacom® PBT/ASA 468-GF15	X			
Anjacom® PC 150-GF50				

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Footnote:
* The calculation of the Product Carbon Footprint (PCF) is an internal calculation based on the DIN EN ISO 14067 standard. Information on the calculation basis (scope 1-3 emissions included, system boundaries, accounting basis, data basis) can be provided on request.

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