oryzite
a [re]defined material

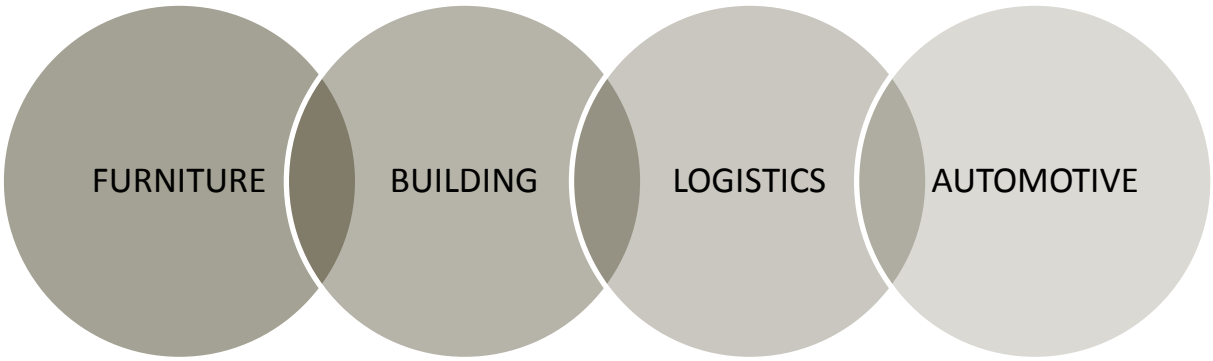
The first bio-filler based on rice husk with a very good dispersion capacity. APPLICATION FIELDS from packaging to engineering components, in a wide range of sectors (logistics, automotive, furniture, construction, etc ...).

the cycle...

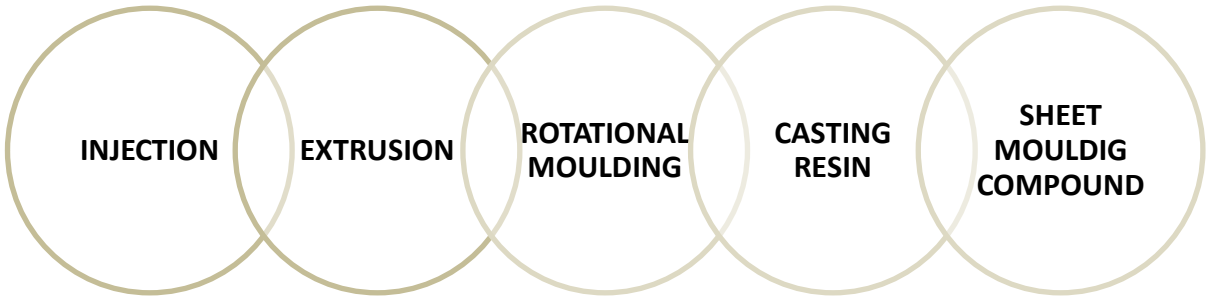
The Product

Two families of product are available; one for polymer melting points up to 220°C and the second up to 260°C, in powder or pellet form, to suit the customer's mixing processes.

Oryzite is applicable to making plastic components across a broad spectrum of applications.



Plastic Process



the cycle...

Advantages in the Supply chain

Oryzite offers a variety of benefits at every stage of the supply chain, from custom compounding elaboration to original equipment manufacturers and transportation. As these benefits accumulate, creating economic and environmental savings value

Throughout the production process, from design aesthetics to circular economy, compounds made with *Oryzite* add value at every step of the way.

Benefits on Alternative Materials

Compared to composites reinforced with short glass fibers

- Improves moulding cycle
- Density reduction
- Less abrasion, reducing wear on tools and equipment
- Comparable mechanical properties and impact improvements
- Lower energy requirements during moulding processes
- Improves surface finish
- Best surface appearance
- Regulator greenhouse emissions

Compared with filled and unfilled plastic compounds

- Superior mold flow in large components
- Improves bonding lines
- Fast mold filling to optimize production
- Better performance at high temperatures
- Better chemical resistance
- Lower wall thickness
- Reduces shrinkage
- Greenhouse gas emission reducer

Efficiency

The following tests illustrate how plastics combined with the Oryzite range of products reduce partial mass, reduce cycle time and save money.

the cycle...

Tests materials Thermoplastic

Pa66 15% mineral filled

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Automotion Pa66 15% mineral filled.
Compared to oryzite compound.

Production formulation

Pa66 15% mineral filled	2,35 €	100	0	0
Pa66	2,10 €	0	90	85
Oryzite -Ryz 256	1,92 €	0	10	15
Cost formulation EUR/Kg		2,35 €	2,08 €	2,07 €

Process Injection

Barrel temperatures	Temp	Temp	Temp
Zone 1	265	250	250
Zone 2	275	250	250
Zone 3	275	250	250
Zone 4	275	250	250
Zone 5	275	250	250
Zone 6	275	230	230
nozzle	265	197	197
Average	272,1	239,6	239,6
Clamp Tonnes	500	500	500
Installed power kW	136	136	136
Energy consumption %	52%	24,0%	19,0%
Power consumed Kw / h	70,72	32,64	25,84
Ejection temp/celsius	96	96	96
Cavities	1	1	1
Cycle time/sec	25,7	21,3	17,2
Parts / hour	140,08	169,01	209,30
Moulded part weight g	501	440,4	443,43

Productive cost

Material cost	1,177 €	0,917 €	0,919 €
Cost transformation	0,257 €	0,213 €	0,172 €
Energy cost	0,071 €	0,027 €	0,017 €
COMPONENT COST	1,505 €	1,157 €	1,109 €

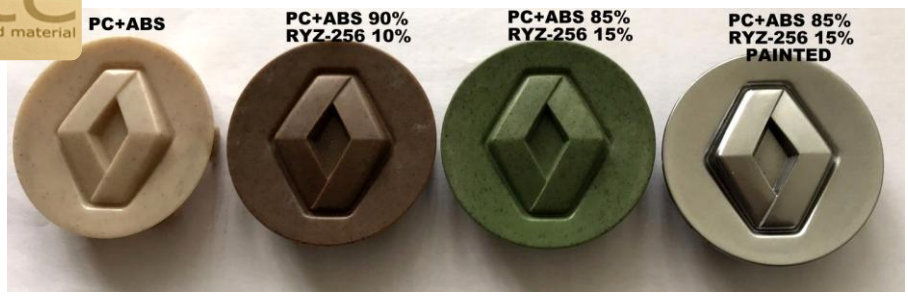
Efficiency gains

Barrel temperatures reduction	0,0%	12,0%	12,0%
Weight reduction	0,0%	12,1%	11,5%
Cycle reduction	0,0%	17,1%	33,1%
Energy reduction	0,0%	53,8%	63,5%
COMPONENT COST REDUCTION	0,0%	23,1%	26,3%

* *The values are reflected laboratory tests under controlled conditions. They are reference values and not contractual.*

the cycle...

Tests materials Thermoplastic — BAYBLEND-T45PG



Automotion PC+ABS Compared to oryzite compound

Production formulation

BAYBLEND-T45PG	4,20 €	100	0	0
BAYBLEND-T45PG	4,20 €	0	90	85
Oryzite -Ryz 256	1,92 €	0	10	15
Cost formulation EUR/Kg		4,20 €	3,97 €	3,86 €

Process Injection

Barrel temperatures	Temp	Temp	Temp
Zone 1	265	238	238
Zone 2	270	244	244
Zone 3	270	245	245
Zone 4	270	242	242
Zone 5	0	0	0
Zone 6	0	0	0
nozzle	270	238	238
Average	269,0	241,4	241,4
Clamp Tonnes	50	50	50
Installed power kW	20,5	20,5	20,5
Energy consumption %	54%	24,9%	19,7%
Power consumed Kw / h	11,1315	5,1045	4,04465
Ejection temp/celsius	106	100	99
Cavities	1	1	1
Cycle time/sec	21,3	17,2	16,1
Parts / hour	169,01	209,30	223,60
Moulded part weight g	9,00	9,05	9,07

Productive cost

Material cost	0,038 €	0,036 €	0,035 €
Cost transformation	0,112 €	0,091 €	0,085 €
Energy cost	0,009 €	0,003 €	0,003 €
COMPONENT COST	0,159 €	0,130 €	0,122 €

Efficiency gains

Barrel temperatures reduction	0,0%	10,3%	10,3%
Weight reduction	0,0%	-0,6%	-0,8%
Cycle reduction	0,0%	19,2%	24,4%
Energy reduction	0,0%	54,1%	63,7%
COMPONENT COST REDUCTION	0,0%	18,4%	23,2%

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the cycle...

Tests materials Thermoplastic

30% glass fiber reinforced PP homopolymer

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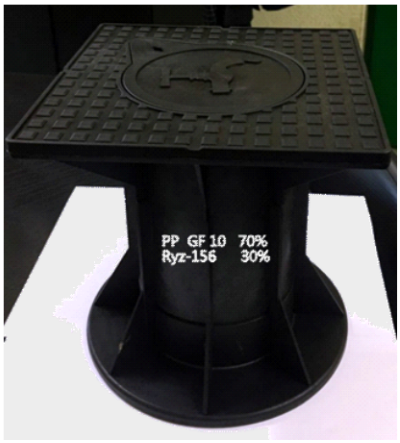
Public work

Water register



Production formulation

30% glass fiber reinforced PP homopolymer	2,15 €	100	28	24
PP homopolymer	1,46 €	0	57	46
Oryzite -Ryz 156	0,93 €	0	15	30
Cost formulation EUR/Kg		2,15 €	1,58 €	1,48 €

Process Injection

Barrel temperatures	Temp	Temp	Temp
Zone 1	235	210	210
Zone 2	235	210	210
Zone 3	235	210	210
Zone 4	235	210	210
Zone 5	0	0	0
Zone 6	0	0	0
nozzle	235	210	210
Average	235,0	210,0	210,0
Clamp Tonnes	220	220	220
Installed power kW	66	66	66
Energy consumption %	58%	26,7%	21,2%
Power consumed Kw / h	38,28	17,622	13,9854
Ejection temp/celsius	65	65	65
Cavities	1	1	1
Cycle time/sec	59	47	44
Parts / hour	61,02	76,60	81,82
Moulded part weight g	358	336	340

Productive cost

Material cost	0,770 €	0,531 €	0,504 €
Cost transformation	0,393 €	0,313 €	0,293 €
Energy cost	0,088 €	0,032 €	0,024 €
COMPONENT COST	1,251 €	0,877 €	0,821 €

Efficiency gains

Barrel temperatures reduction	0,0%	10,6%	10,6%
Weight reduction	0,0%	6,1%	5,0%
Cycle reduction	0,0%	20,3%	25,4%
Energy reduction	0,0%	54,0%	63,5%
COMPONENT COST REDUCTION	0,0%	29,9%	34,4%

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the cycle...

Tests materials Thermoplastic — Ps polyestyrene

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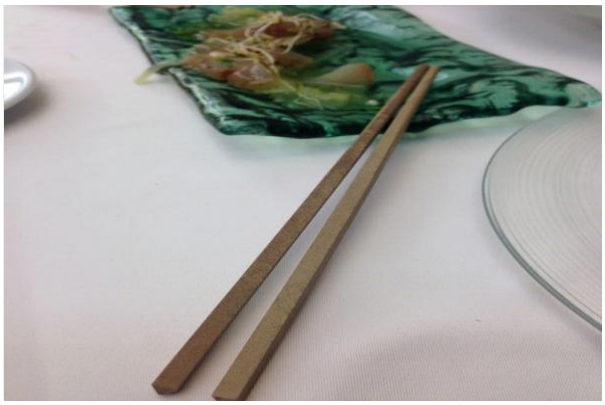
Chopsticks



Production formulation

Ps polyestyrene	1,65 €	100	0	0
Ps polyestyrene	1,65 €	0	80	70
Oryzite -Ryz 156	0,98 €	0	20	30
Cost formulation EUR/Kg		1,65 €	1,52 €	1,45 €

Process Injection

Barrel temperatures	Temp	Temp	Temp
Zone 1	225	200	200
Zone 2	225	200	200
Zone 3	225	200	200
Zone 4	225	200	200
Zone 5	0	0	0
Zone 6	0	0	0
nozzle	225	200	200
Average	225,0	200,0	200,0
Clamp Tonnes	50	50	50
Installed power kW	20,5	20,5	20,5
Energy consumption %	45%	28,0%	22,0%
Power consumed Kw / h	9,225	5,74	4,51
Ejection temp/celsius	70	70	70
Cavities	10	10	10
Cycle time/sec	49	24	21,6
Parts / hour	734,69	1500,00	1666,67
Moulded part weight g	14,6	14,1	14

Productive cost

Material cost	0,024 €	0,021 €	0,020 €
Cost transformation	0,030 €	0,015 €	0,013 €
Energy cost	0,002 €	0,001 €	0,000 €
COMPONENT COST	0,056 €	0,037 €	0,034 €

Efficiency gains

Barrel temperatures reduction	0,0%	11,1%	11,1%
Weight reduction	0,0%	3,4%	4,1%
Cycle reduction	0,0%	51,0%	55,9%
Energy reduction	0,0%	37,8%	51,1%
COMPONENT COST REDUCTION	0,0%	34,4%	39,3%

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the cycle...

Tests materials Thermoplastic

Polyester-TPU Hardness 80 shore A

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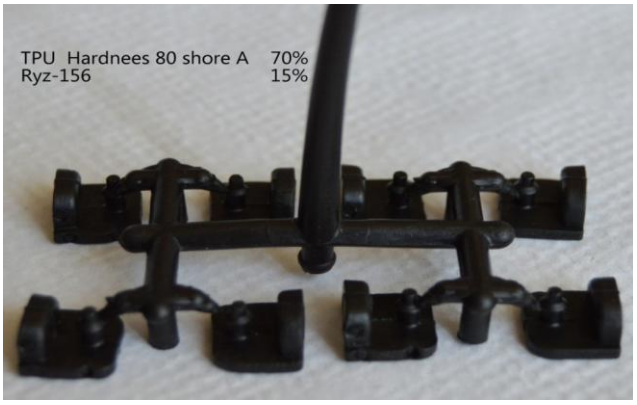
Automotive parts



Production formulation

Polyester-TPU Hardness 80 shore A	6,81 €	100	0	0
Polyester-TPU Hardness 80 shore A	6,81 €	0	85	70
Oryzite -Ryz 156	0,98 €	0	15	30
Cost formulation EUR/Kg		6,81 €	5,94 €	5,06 €

Process Injection

Barrel temperatures	Temp	Temp	Temp
Zone 1	215	190	190
Zone 2	225	205	205
Zone 3	225	205	205
Zone 4	225	205	205
Zone 5	0	0	0
Zone 6	0	0	0
nozzle	225	190	190
Average	223,0	199,0	199,0
Clamp Tonnes	40	40	40
Installed power kW	15	15	15
Energy consumption %	45%	28,0%	22,0%
Power consumed Kw / h	6,75	4,2	3,3
Ejection temp/celsius	40	40	40
Cavities	8	8	8
Cycle time/sec	28	20	16
Parts / hour	1028,57	1440,00	1800,00
Moulded part weight g	0,469	0,432	0,450

Productive cost

Material cost	0,003 €	0,003 €	0,002 €
Cost transformation	0,016 €	0,011 €	0,009 €
Energy cost	0,0009 €	0,0004 €	0,0003 €
COMPONENT COST	0,020 €	0,014 €	0,011 €

Efficiency gains

Barrel temperatures reduction	0,0%	10,8%	10,8%
Weight reduction	0,0%	7,9%	4,1%
Cycle reduction	0,0%	28,6%	42,9%
Energy reduction	0,0%	37,8%	51,1%
COMPONENT COST REDUCTION	0,0%	28,4%	41,9%

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the cycle...

Tests materials Thermoplastic — PP homopolymer

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Consumer Packaged Goods

Production formulation

PP homopolymer	1,40 €	100	0	0
PP homopolymer	1,40 €	0	90	80
Oryzite -Ryz 156	0,98 €	0	10	20
Cost formulation EUR/Kg		1,40 €	1,36 €	1,32 €

Process Injection

Barrel temperatures	Temp	Temp	Temp
Zone 1	215	185	185
Zone 2	215	190	190
Zone 3	215	190	190
Zone 4	215	190	190
Zone 5	0	0	0
Zone 6	0	0	0
nozzle	200	180	180
Average	212,0	187,0	187,0
Clamp Tonnes	50	50	50
Installed power kW	20,5	20,5	20,5
Energy consumption %	56%	32,0%	27,0%
Power consumed Kw / h	11,48	6,56	5,535
Ejection temp/celsius	60	60	60
Cavities	1	1	1
Cycle time/sec	6,5	5,2	4,8
Parts / hour	553,85	692,31	750,00
Moulded part weight g	13,100	13,900	14,300

Productive cost

Material cost	0,0183 €	0,0189 €	0,0188 €
Cost transformation	0,040 €	0,032 €	0,029 €
Energy cost	0,0029 €	0,0013 €	0,0010 €
COMPONENT COST	0,061 €	0,052 €	0,049 €

Efficiency gains

Barrel temperatures reduction	0,0%	11,8%	11,8%
Weight reduction	0,0%	-6,1%	-9,2%
Cycle reduction	0,0%	20,0%	26,2%
Energy reduction	0,0%	42,9%	51,8%
COMPONENT COST REDUCTION	0,0%	14,7%	19,3%

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the cycle...

Tests materials Thermoplastic

Polyvinylchloride S-PVC K67

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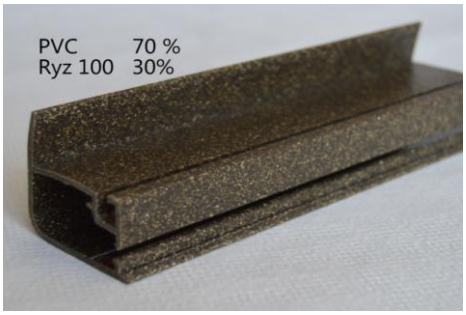
Machine building



Production formulation

Polyvinylchloride S-PVC K67	1,08 €	100	0	0
Polyvinylchloride S-PVC K67	1,08 €	0	90	70
Oryzite -Ryz 100	0,79 €	0	10	30
Cost formulation EUR/Kg		1,08 €	1,05 €	0,99 €

Process Extruder

Barrel temperatures	Temp	Temp	Temp
Zone 1	160	160	140
Zone 2	165	165	145
Zone 3	166	166	145
Zone 4	170	170	145
Zone 5	159	159	140
Zone 6	165	165	145
Zone 7			
Zone 8	175	175	170
Zone 9	195	195	190
Zone 10			
Zone 11			
Zone 12			
Mass temperature	186,2	178,6	166,7
Pressure bar	272	214	203
Installed power kW	130	130	130
Energy consumption %	74%	51,9%	59,0%
Power consumed Kw / h	96,72	67,47	76,7
m/min	3,5	3,7	3,78
m/hour	210	222	227
m/l weight g	598,000	561,000	548,000

Productive cost

Material cost	0,6458 €	0,5896 €	0,5442 €
Cost transformation	0,381 €	0,360 €	0,353 €
Energy cost	0,0645 €	0,0425 €	0,0473 €
COMPONENT COST	1,091 €	0,993 €	0,944 €

Efficiency gains

Mass temperature	0,0%	-4,1%	-10,5%
Weight reduction	0,0%	6,2%	8,4%
m/hour	0,0%	5,4%	7,4%
Energy reduction	0,0%	30,2%	20,7%
COMPONENT COST REDUCTION	0,0%	9,0%	13,5%

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the cycle...

Tests materials Thermoset

Production formulation

Oryzite compound		
	gr	%
Resin G102	57,53	57,53%
Catalyst	0,69	0,69%
CO 6%	0,12	0,12%
CaCO3	0,00	0,00%
Oryzite RYZ 100	41,66	41,66%
TOTAL	100,00	100,00%

Values		
Mixing ratio:	Resin	Oryzite
Weight	58,34%	41,66%
Volume	49,86%	50,14%

Polymerization		
Gel-Time	10	minutes
Demoulding time	25	minutes
Maximum temperature	86	°C
Contraction	0,43	%
Shore D hardness 1 hour	90,00	gr/cm3
Density	1,02	gr/cm3

Production formulation

Polymer concrete		
	gr	%
Resin G102	28,82	28,82%
Catalyst	0,58	0,58%
CO 6%	0,06	0,06%
CaCO3	70,55	70,55%
Oryzite RYZ 100	0,00	0,00%
TOTAL	100,00	100,00%

Values		
Mixing ratio:	Resina	CaCo3
Weight	29,45%	70,55%
Volume	49,45%	50,55%

Polymerization		
Tiempo gel	10	minutes
Demoulding time	36	minutes
Maximum temperature	48	°C
Contraction	2,00	%
Shore D hardness 1 hour	60,00	gr/cm3
Density	2,01	gr/cm3

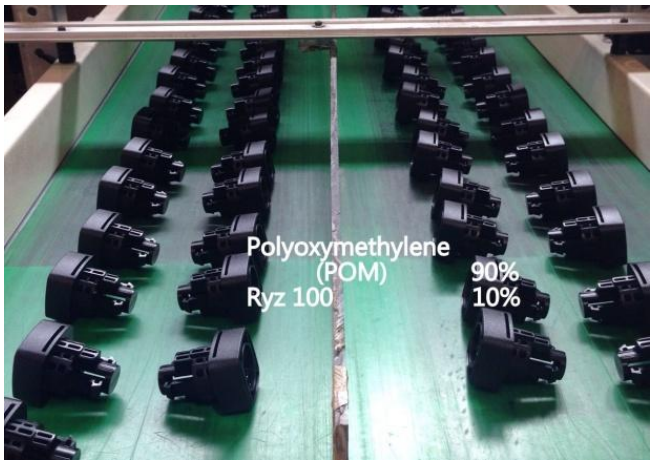
Summary of Environmental Impact

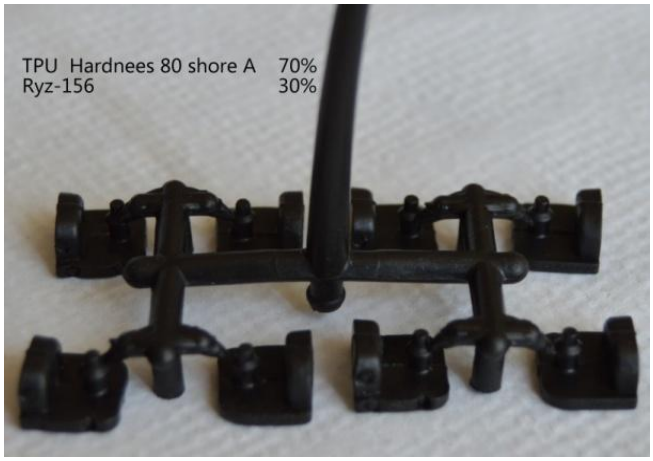
		Oryzite compound	Polymer concrete	Reduction
Volumen	cc	4539	4539	0,00%
Weight	gr/cm3	4630	9123	-49,25%
Carbon Footprint	kg CO_2	29,54	58,10	-49,16%
Water eutrophication	kg PO_4	0,01	0,02	-50,00%
Air acidification	kg SO_2	0,06	0,13	-53,85%
Total energy consumed	MJ	369,96	730,15	-49,33%

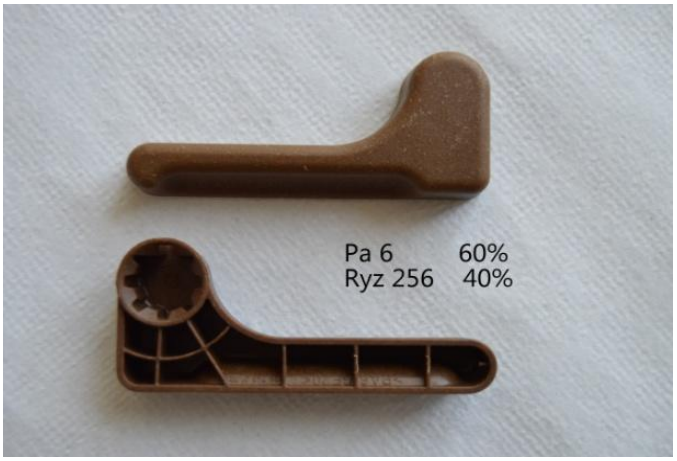
The current design will contribute 29,544 kg CO_2 towards Carbon Footprint. The baseline design will contribute 58,219 kg CO_2. The current design will reduce 49% of the impact, which is saving the equivalent of producing 67,749kg of corn grain in the US.

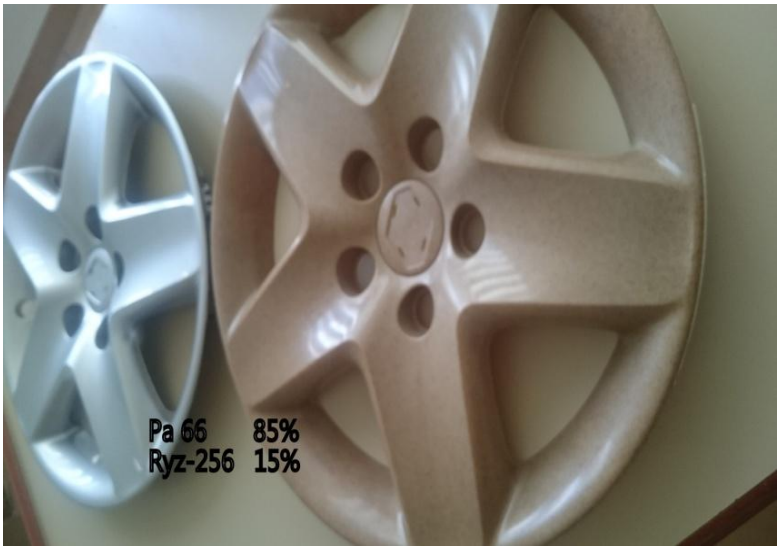
the cycle...

AUTOMOTIVE



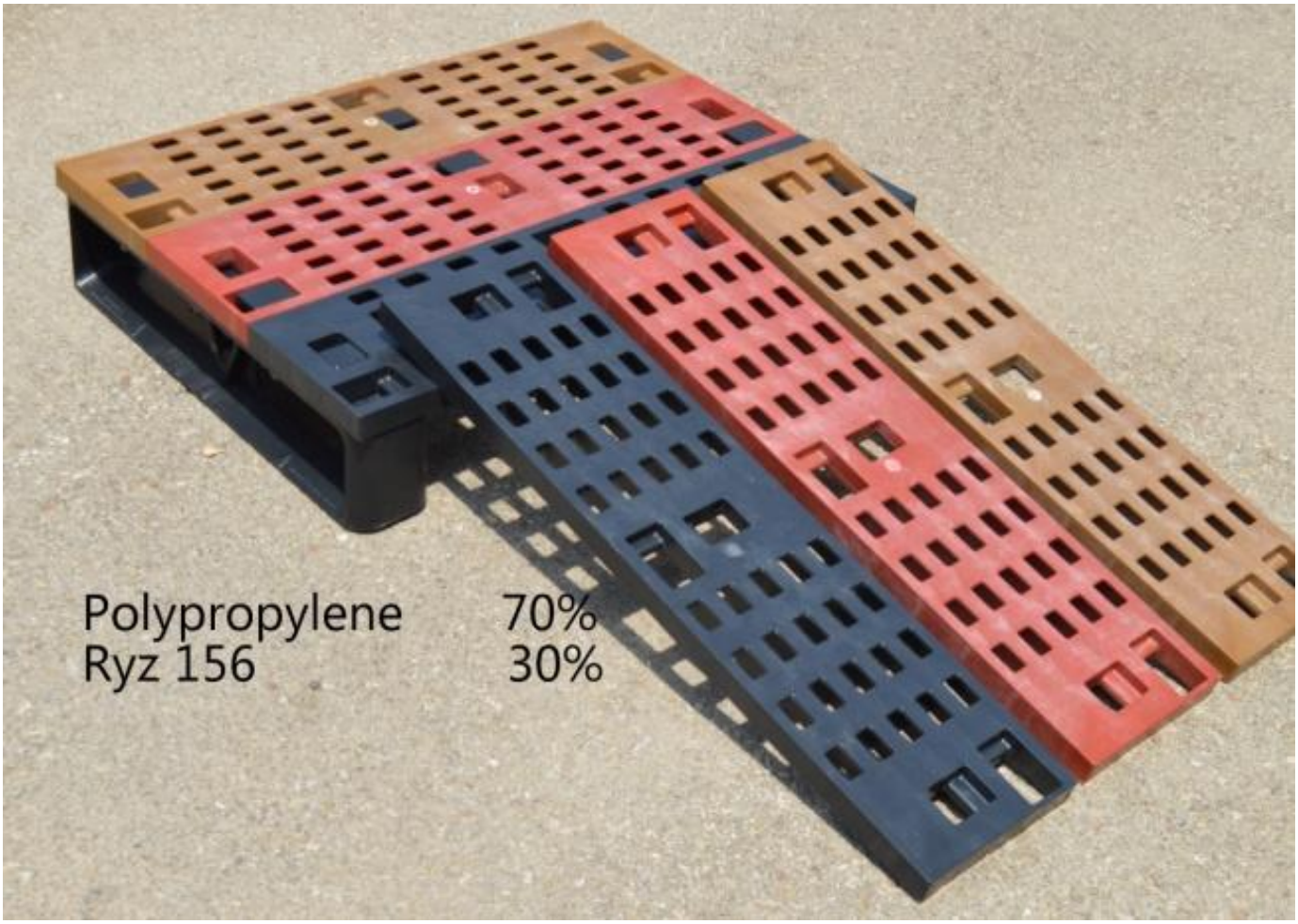


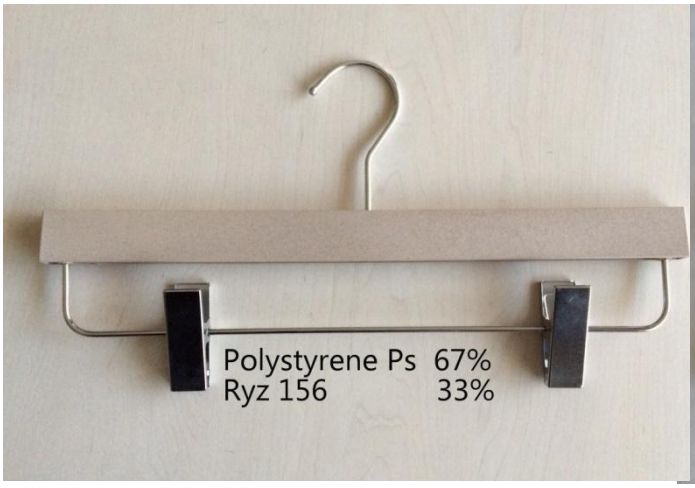




the cycle...

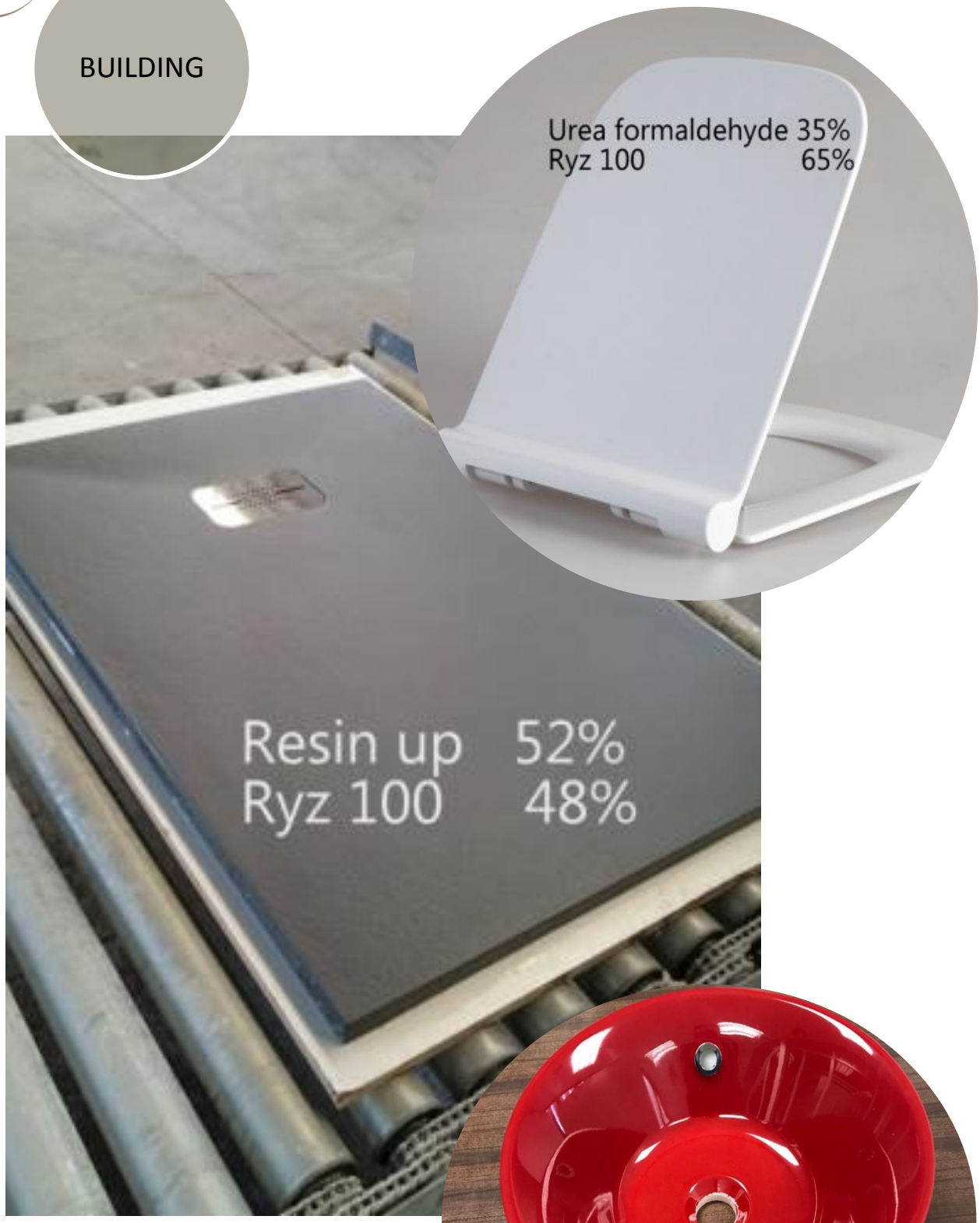
LOGISTICS





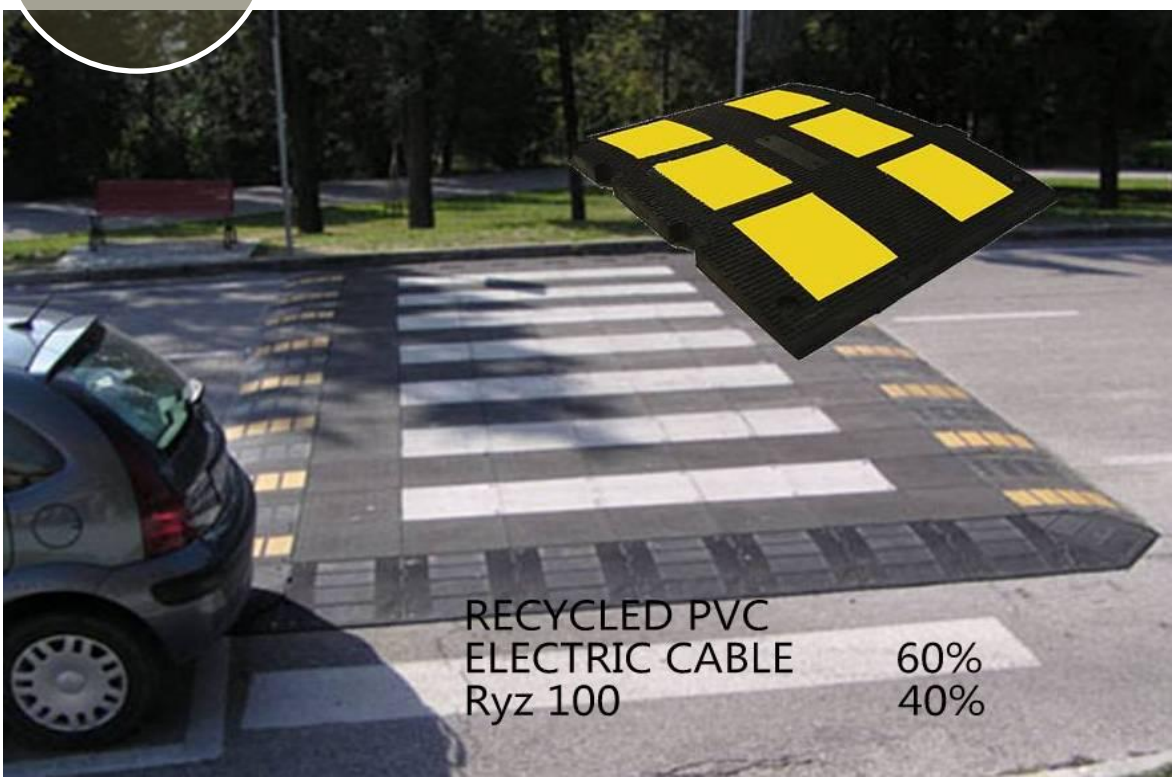
the cycle...

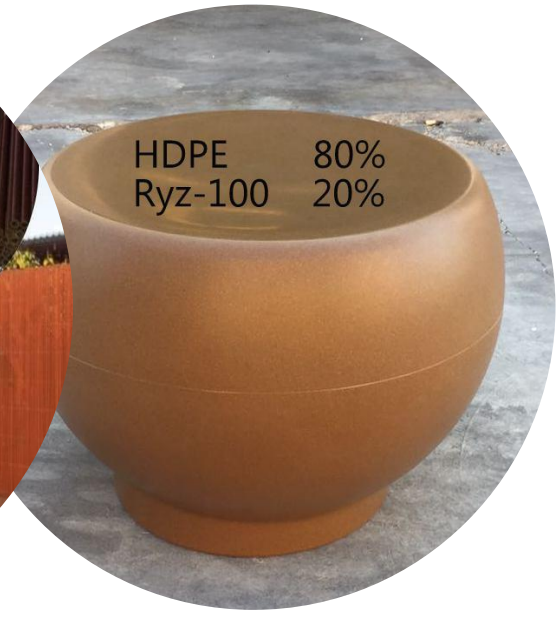
BUILDING



the cycle...

FURNITURE



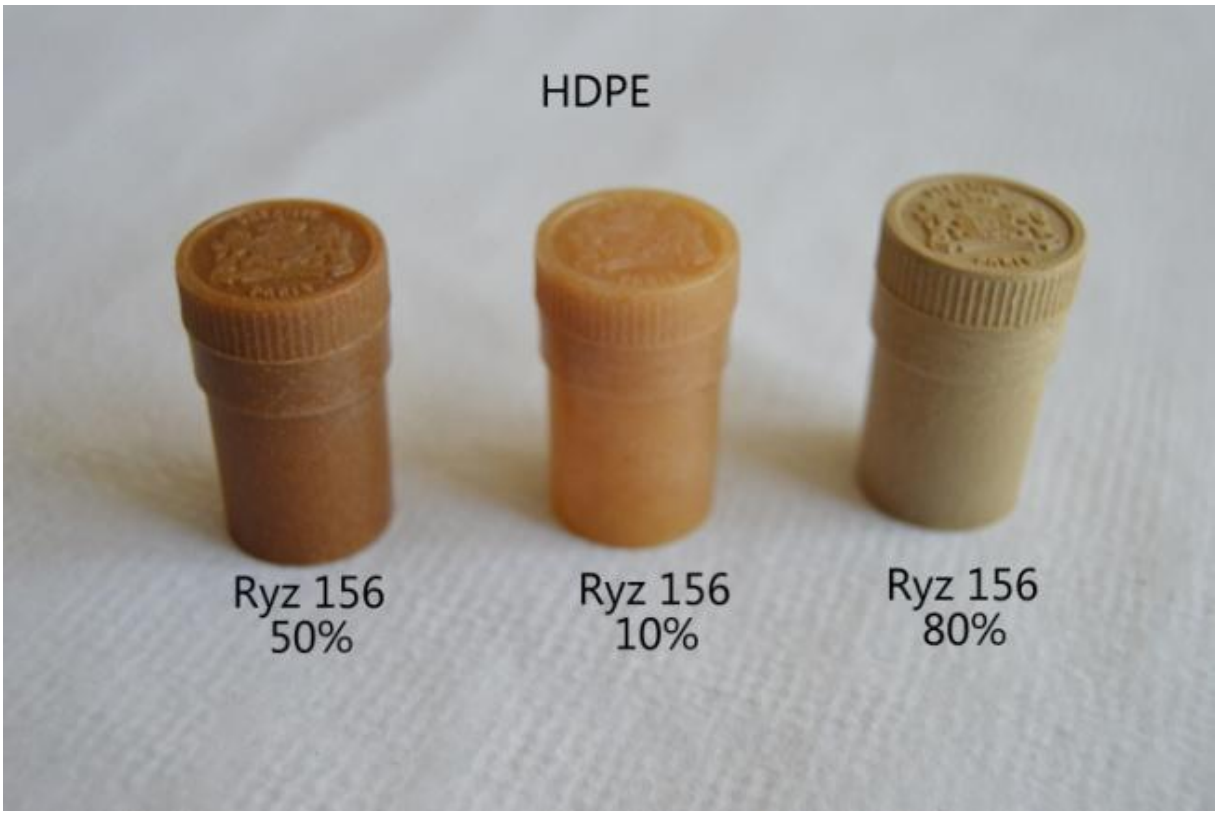


the cycle...

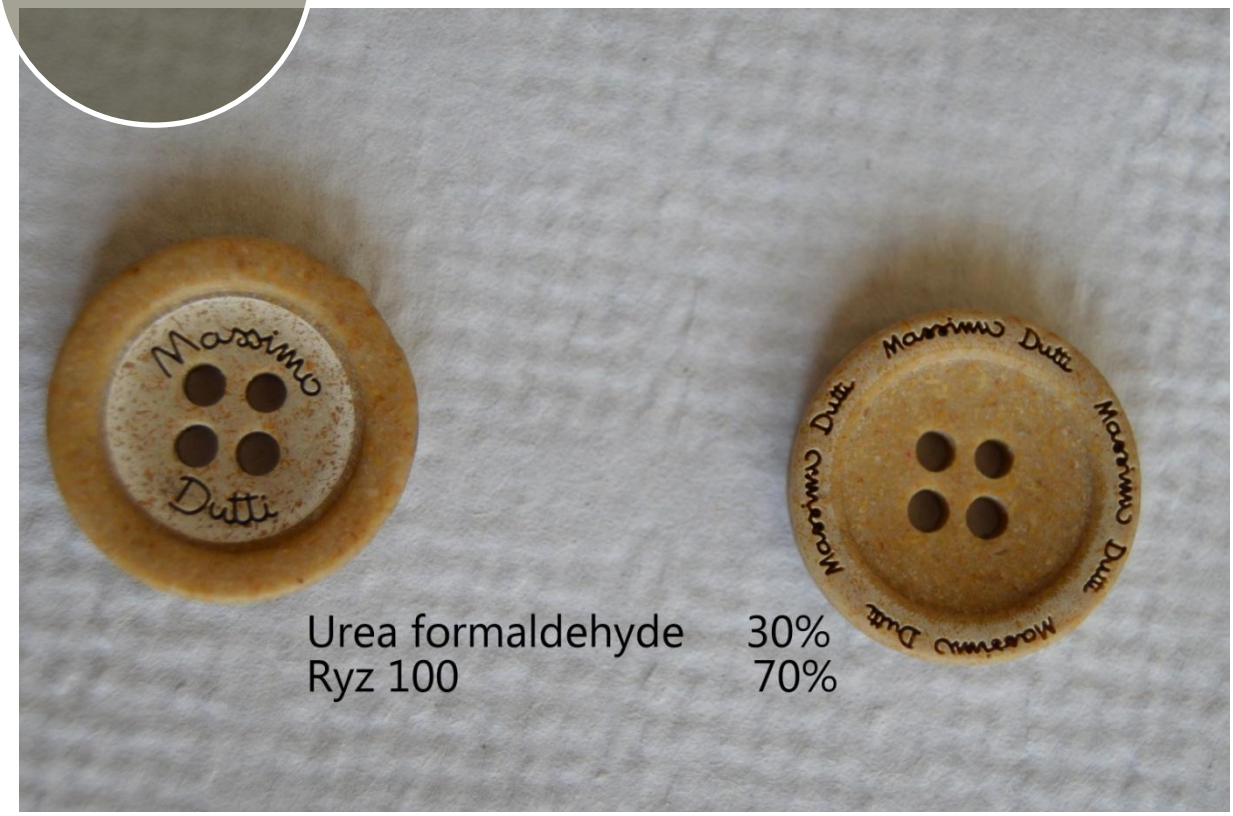
FARMING

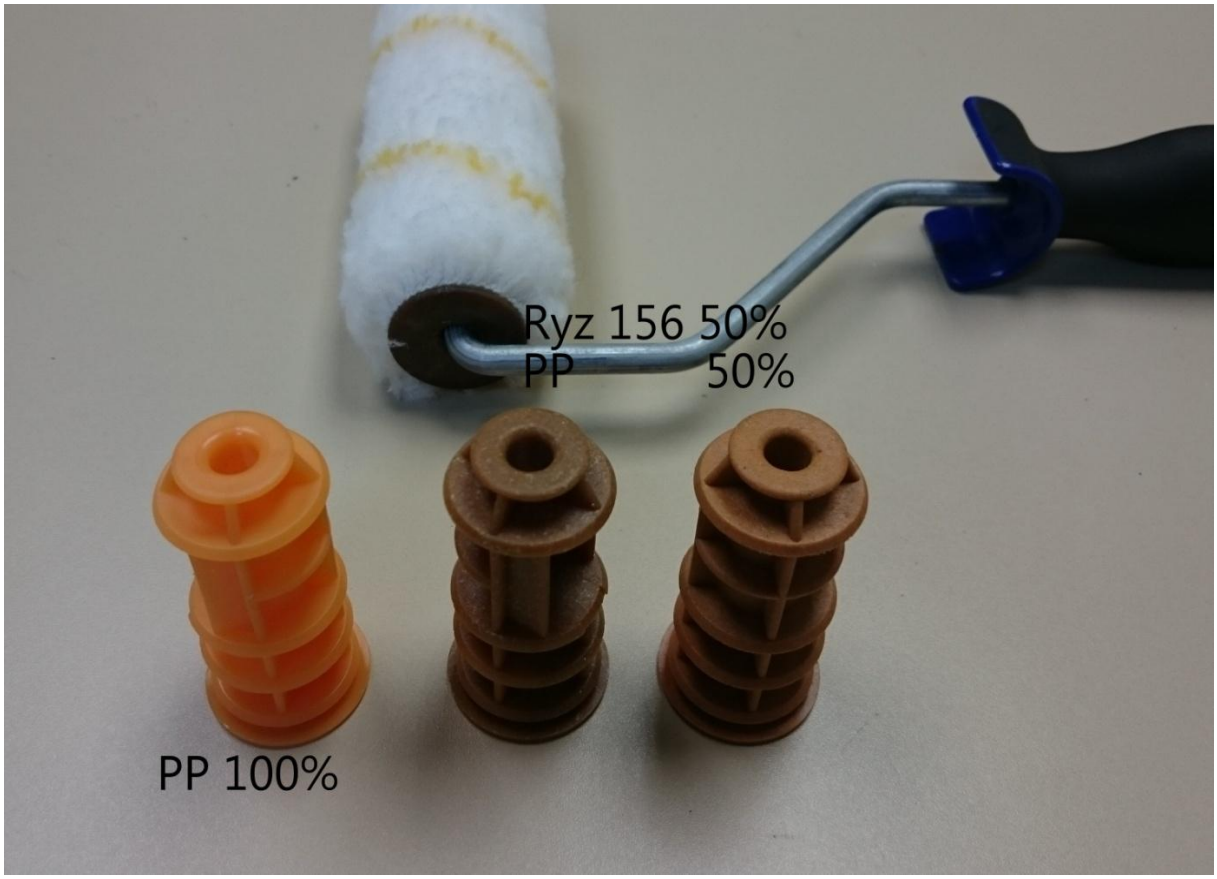
the cycle...

PACKAGING



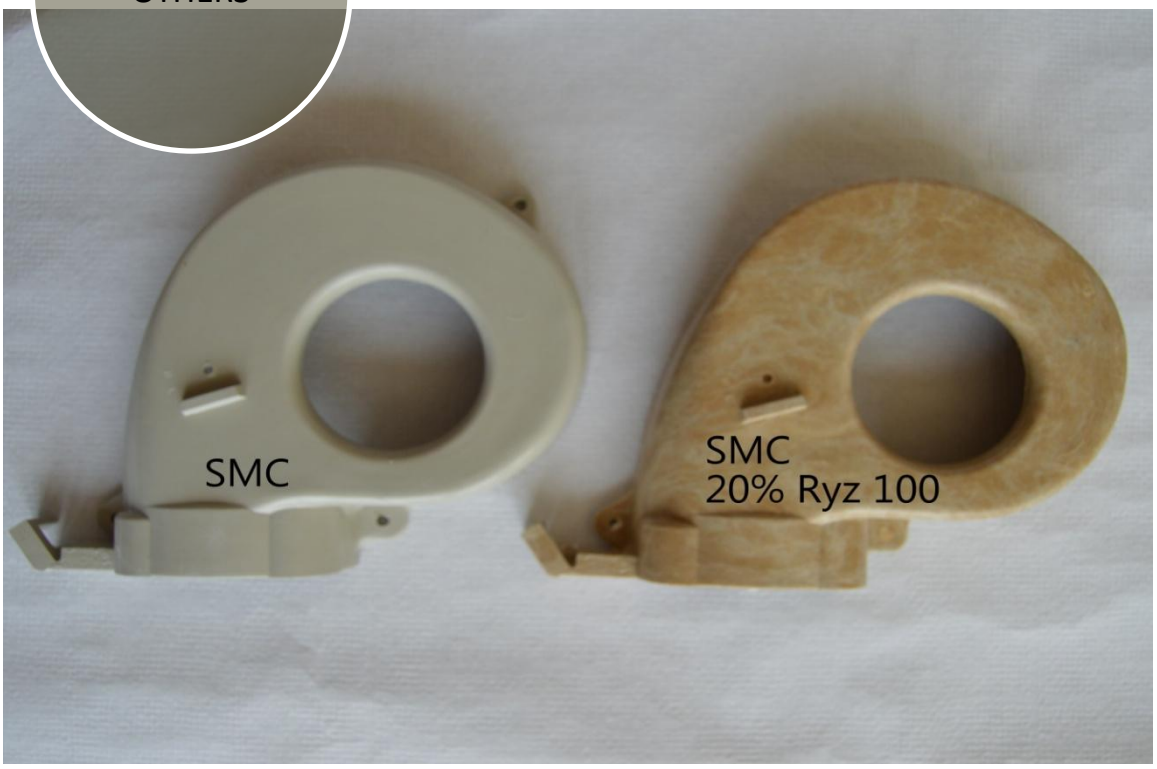
OTHERS


Massimo Dutti
Massimo Dutti
Urea formaldehyde 30%
Ryz 100 70%


Ryz 156 50%
PP 50%
PP 100%

the cycle...

OTHERS




oryzite
the planet can't wait...
#goodfortheplanet
#reducereuserecycle
#sustainability