



# Recycling Process Overview

What  
makes  
something  
recyclable?



It can it be collected.



It can it be sorted.



It can it be sold.



It can be used to make  
something new.

1. Collection



# Types of recycling service

## Residential

- Open hauling or organized collection
- City-by-city basis
- 1-4 units



## Commercial

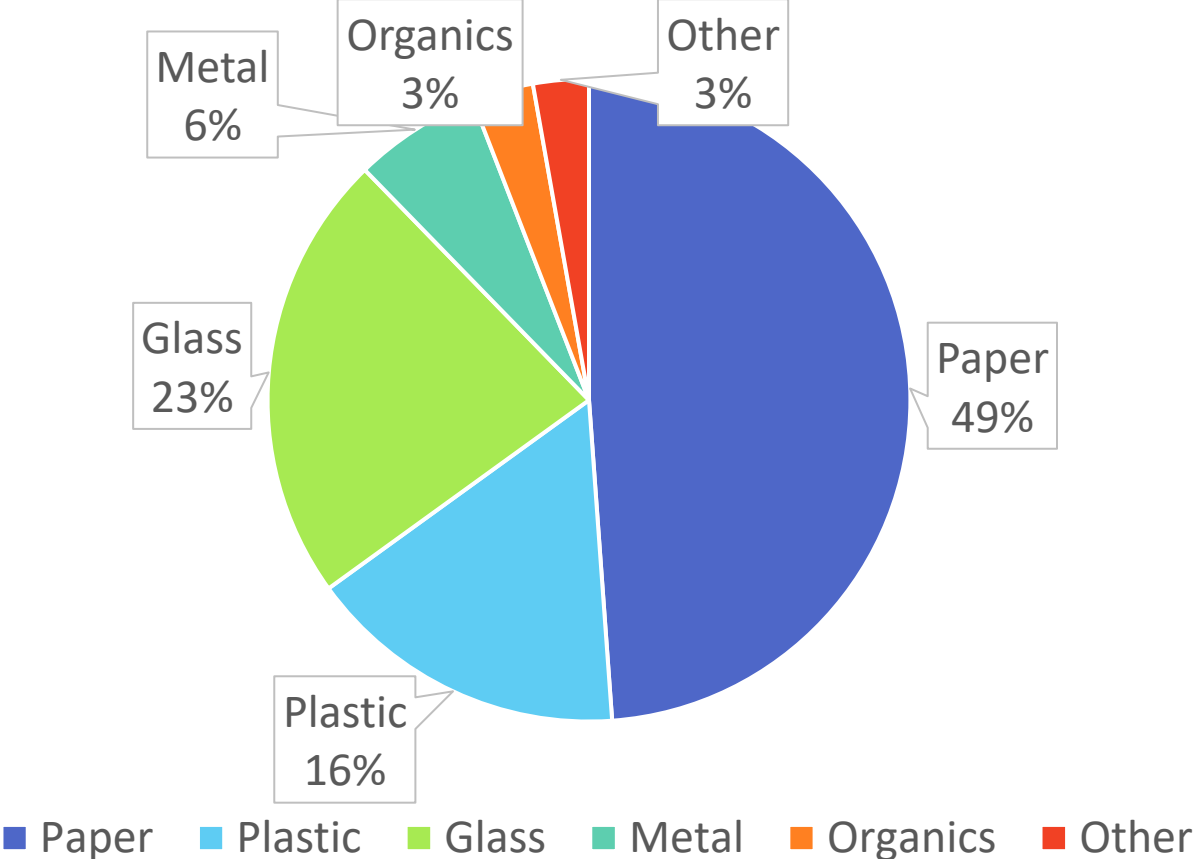
- Open hauling
- Businesses & multifamily (5+ units)



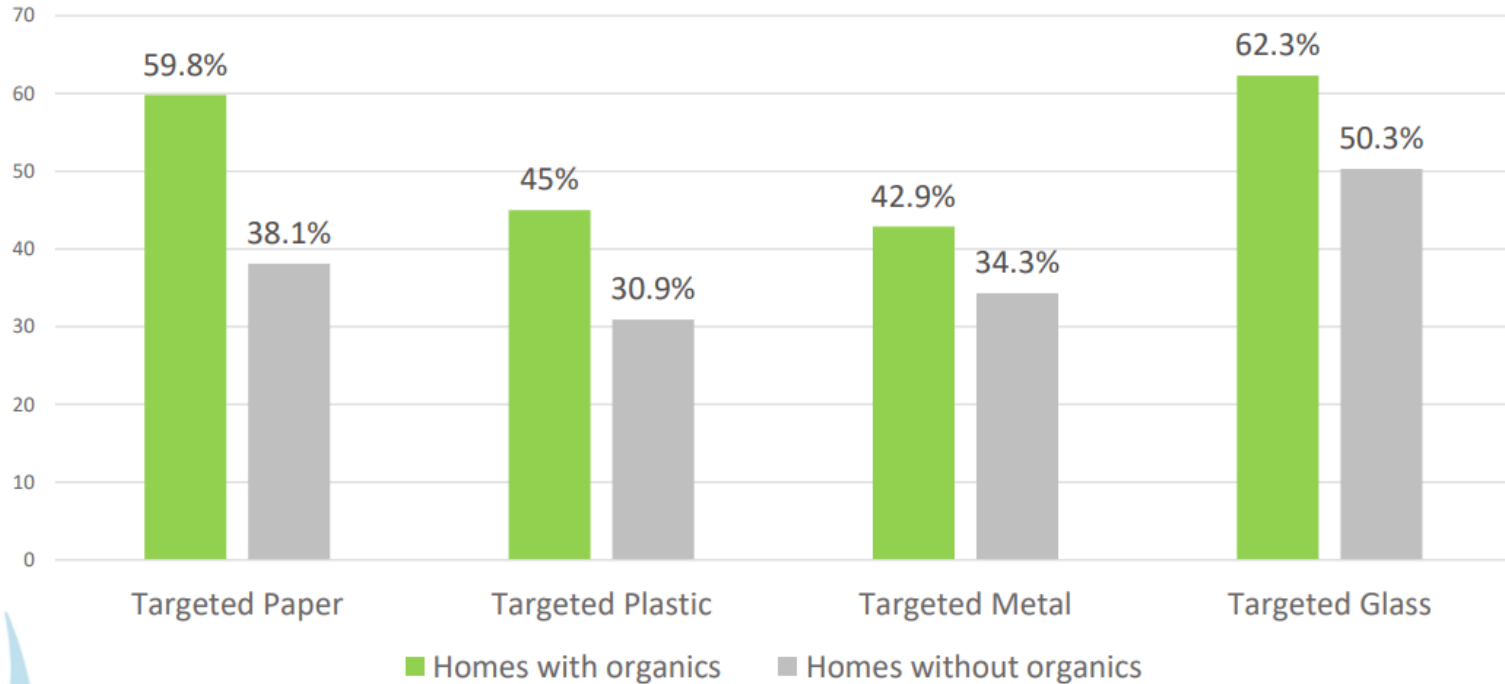
How many trucks do you need?



# Composition of materials in recycling carts by weight, Minneapolis 2022




# Capture rate of recyclable materials



# Common issues

- Food residue
- Shredded paper
- Plastic lined paper items
- Black plastic
- **Inconsistent messaging**



Dragons and unicorns  
may be myths, but

**Recycling exists.**

Your recycled items  
become new products.

Brought to you by Carver, Dakota,  
Hennepin, Ramsey, Scott and  
Washington counties.



## 2. Sorting



# M a t e r i a l s R e c o v e r y F a c i l i t y

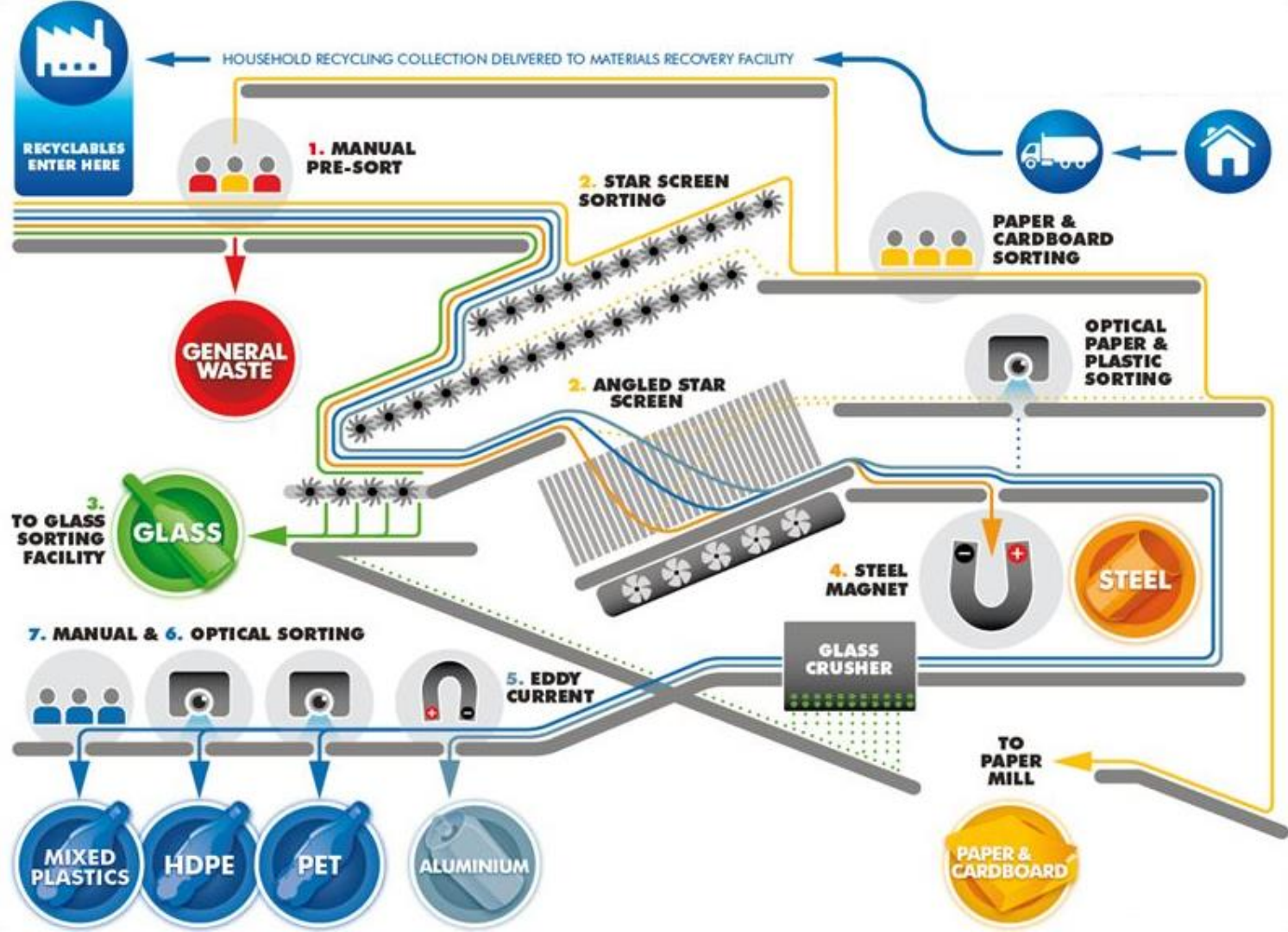




**TIP FLOOR**







### 3. Selling



Recyclable material	Percent by Weight	Value per Ton
Aluminum	1%	\$820
HDPE natural	1%	\$710
PET	4%	\$195
Tin	2%	\$100
HDPE pigmented	1%	\$85
Cardboard	20%	\$85
Aseptic packaging	<1%	\$23
Newspaper	10%	\$23
Mixed paper	32%	\$8
#3-7 plastics	1%	\$5
Mixed glass	23%	(\$15)
Residual garbage	5%	(\$63)





# Regional Markets

## Glass



Anchor Glass Container Corporation



Strategic Materials

## Paper/OCC



WestRock



Rock-Tenn Recycling

## Metal



Bay Side Recycling Corporation



Beltrami Recycling Inc

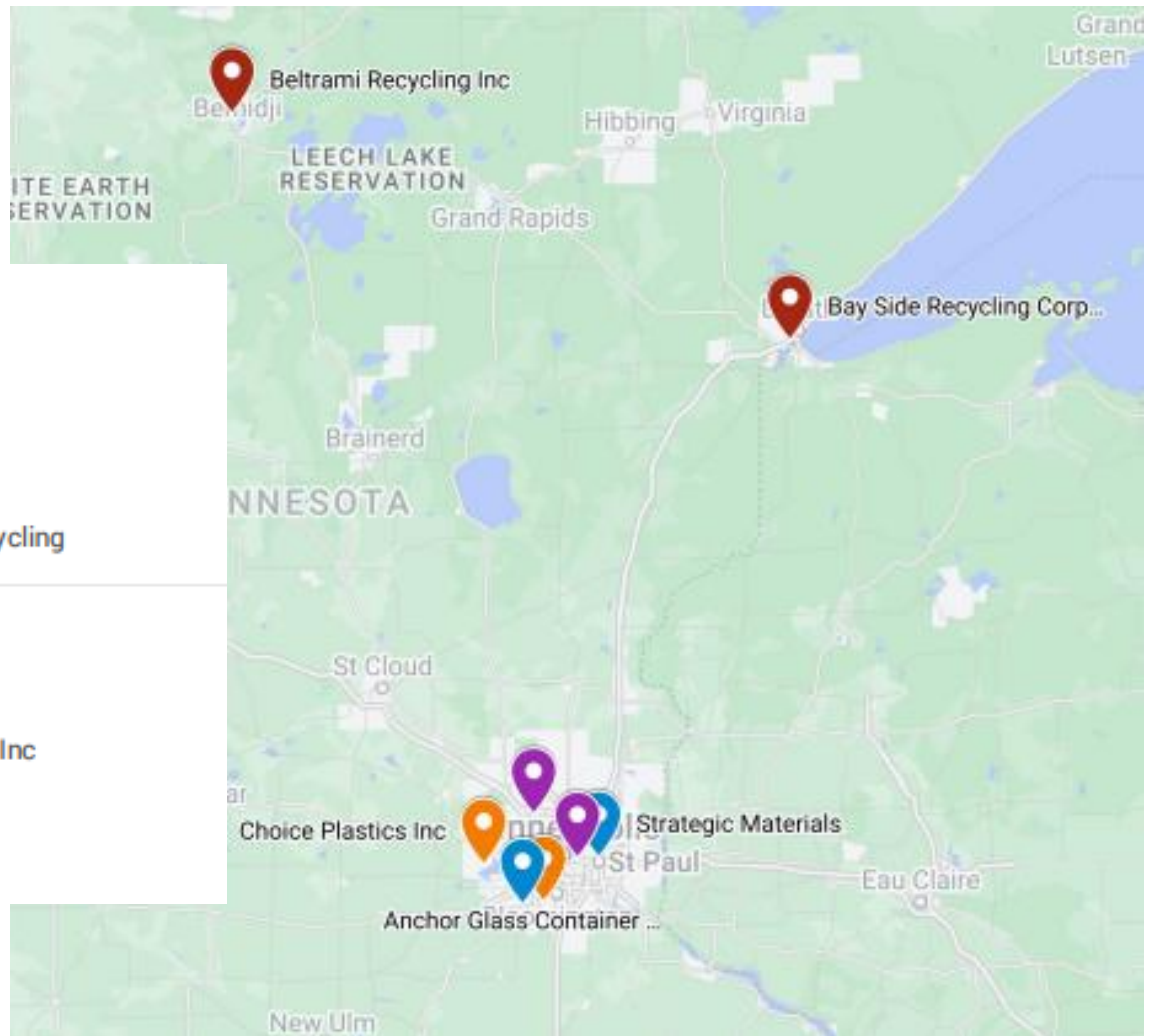
## Plastics



Choice Plastics Inc



Rohn Industries



4.  
Something  
New







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# Recycling beyond the cart

- Special item drop offs
  - Plastic film
  - Ridwell, Terracycle
  - City events
- Hennepin County drop offs
  - Appliances, electronics, scrap metal, batteries, paint, mattresses, etc.
  - [hennepin.us/green-disposal-guide](https://hennepin.us/green-disposal-guide)

Search items

## Green Disposal Guide

Find information on the best way to recycle, reuse or dispose of items from your home.

Get answers about common items

- › Appliances
- › Batteries
- › Carpet
- › Electronics
- › Fluorescent light bulbs

Get rid of it

Find the specific item you need to get rid of.

[Find items ›](#)

Yard waste disposal options



Ask your hauler about pick-up service

Bring to a yard waste drop-off facility

Questions?

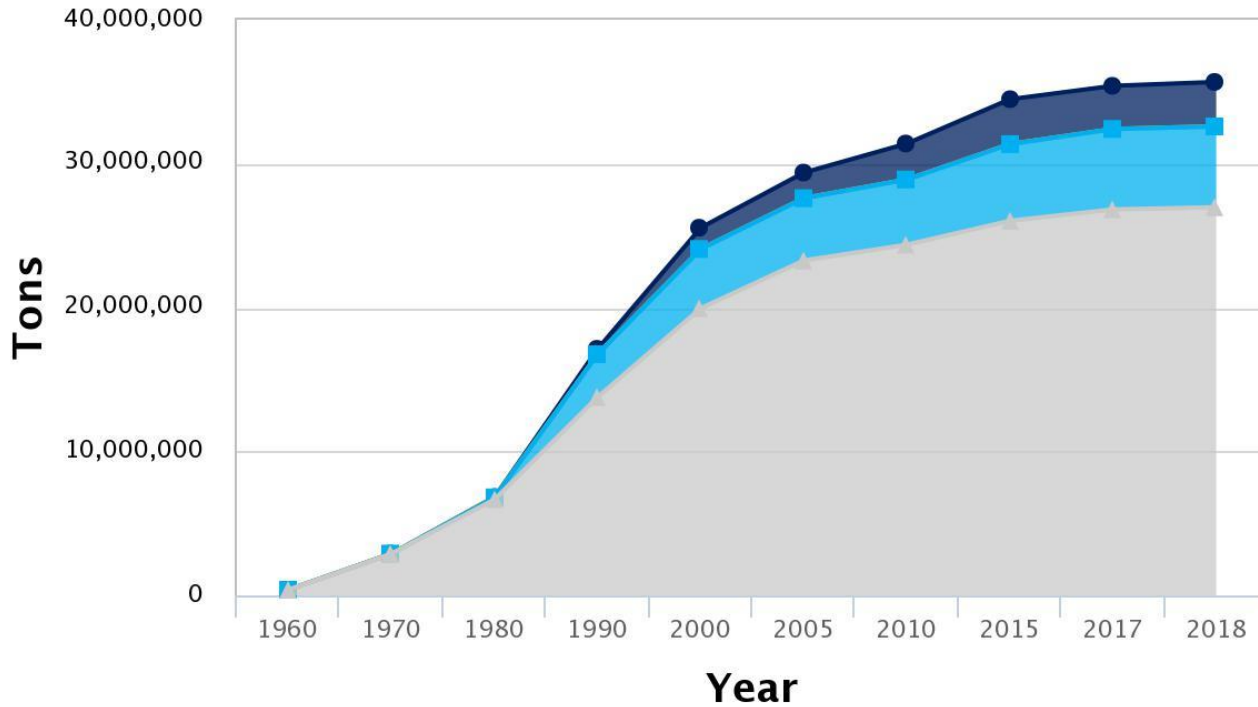
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# Deep Dive: Plastics



# Plastics Waste Management: 1960–2018



2018  
3 million tons recycled  
5.6 million tons incinerated  
Almost 28 million tons landfilled

*Click on legend items below to customize items displayed in the chart*

Recycled Composted Combustion with Energy Recovery Landfilled

Why is plastic recycling so tricky?



# Resin codes

- 1-7 in United States

Figure 2: Main Plastic Resin Types and Their Applications in Packaging

 <p>PET</p>		Water and soft drink bottles, salad domes, biscuit trays, salad dressing and peanut butter containers
 <p>HDPE</p>		Milk bottles, freezer bags, dip tubs, crinkly shopping bags, ice cream containers, juice bottles, shampoo, chemical and detergent bottles
 <p>PVC</p>		Cosmetic containers, commercial cling wrap
 <p>LDPE</p>		Squeeze bottles, cling wrap, shrink wrap, rubbish bags
 <p>PP</p>		Microwave dishes, ice cream tubs, potato chip bags, and dip tubs
 <p>PS</p>		CD cases, water station cups, plastic cutlery, imitation "crystal glassware", video cases
 <p>EPS</p>		Foamed polystyrene hot drink cups, hamburger take-away clamshells, foamed meat trays, protective packaging for fragile items
 <p>OTHERS</p>		Water cooler bottles, flexible films, multi-material packaging

# Thousands of types of plastics

材料术语	缩写语	代号
聚对苯二甲酸乙二酯 poly(ethylene terephthalate)	PET	01
高密度聚乙烯 polyethylene, high density	PE-HD	02
聚乙烯 poly(vinyl chloride)	PVC	03
低密度聚乙烯 polyethylene, low density	PE-LD	04
聚丙烯 polypropylene	PP	05
聚苯乙烯 polystyrene	PS	06
丙烯酸丁二酯塑料 acrylonitrile-butadiene plastic	AB	07
丙烯酸丁二酯-丙烯酸酯塑料 acrylonitrile-butadiene-acrylate plastic	ABAK	08
丙烯酸丁二酯-苯乙烯塑料 acrylonitrile-butadiene-styrene plastic	ABS	09
丙烯酸-氯化聚乙烯-苯乙烯塑料 acrylonitrile-chlorinated polyethylene styrene	ACS	10
丙烯酸(乙烯-丙烯-二烯)-苯乙烯塑料 acrylonitrile-cethylene-propylene-diene-styrene plastic	AEPDS	11
丙烯酸-甲基丙烯酸甲酯塑料 acrylonitrile-methyl methacrylate plastic	AMMA	12
丙烯酸-苯乙烯-丙烯酸酯塑料 acrylonitrile-styrene-acrylate plastic	ASA	13
乙酰胺 cellulose acetate	CA	14
乙腈丙烯酰胺 cellulose acetate butyrate	CAB	15
乙腈丙酸纤维素 cellulose acetate propionate	CAP	16
甲酸纤维素 cellulose formaldehyde	CEF	17
甲酸-甲酰胺脲 urea-formaldehyde resin	CF	18
甲酸纤维素脲 carbonylmethyl cellulose	CMC	19
硝酸纤维素 cellulose nitrate	CN	20
环状头聚脲 cyclotetra cyclopolymer	COC	21
丙酸纤维素 cellulose propionate	CP	22
三醋酸纤维素 cellulose triacetate	C/T	23
乙烯-丙烯酸酯 ethylene-acrylate plastic	EAA	24
乙烯-丙烯酸酯共聚物 ethylene-acrylate copolymer	EAAK	25
乙烯-丙烯酸乙酯 ethylene-acrylate plastic	EBA	26
乙烯-丙烯酸乙酯共聚物 ethylene-acrylate copolymer	EBAK	27
乙烯-丙烯酸乙酯塑料 ethylene-acrylate plastic	EBAK	28
乙烯-甲基丙烯酸酯 ethylene-methyl methacrylate plastic	EMA	29

材料术语	缩写语	代号
环氧-环氧树脂或塑料 epoxy-resin or plastic	EP	30
乙烯-四氯乙烯塑料 ethylene-tetrafluoroethylene plastic	ETFE	31
乙烯-醋酸乙烯酯塑料 ethylene-vinyl acetate plastic	EVAC	32
乙烯-乙醇塑料 ethylene-vinyl alcohol plastic	EVOH	33
全氟(乙烯-丙烯)塑料 perfluoro(ethylene-propylene) plastic	PEP	34
缩醛-甲醛树脂 formaldehyde resin	FF	35
液体合金液 liquid-crystal polymer	LCP	36
甲基丙烯酸甲酯-丙烯酸酯塑料 methyl methacrylate-acrylate plastic	MASS	37
甲基丙烯酸甲酯-丙烯酸酯-丙烯酸酯塑料 methyl methacrylate-acrylate-acrylate plastic	MASS	38
甲基丙烯酸甲酯-丙烯酸酯-丙烯酸酯-丙烯酸酯塑料 methyl methacrylate-acrylate-acrylate-acrylate plastic	MASS	39
甲基丙烯酸甲酯-丙烯酸酯-丙烯酸酯-丙烯酸酯-丙烯酸酯塑料 methyl methacrylate-acrylate-acrylate-acrylate-acrylate plastic	MASS	40
三聚氰胺-甲醛树脂 melamine-formaldehyde resin	MF	41
三聚氰胺-磷酸树脂 melamine-phosphoric resin	MP	42
二甲基丙烯酸甲酯塑料 dimethyl methacrylate plastic	MDAN	43
聚丙烯 polypropylene	PP	44
聚丙烯(乙二酸) polypropylene (ethylene dicarboxylate)	PPA	45
聚丙烯(丙二酸) polypropylene (malonic dicarboxylate)	PPM	46
聚丙烯(丁二酸) polypropylene (succinic dicarboxylate)	PPS	47
聚丙烯(戊二酸) polypropylene (glutaric dicarboxylate)	PPS	48
聚丙烯(己二酸) polypropylene (adipic dicarboxylate)	PPS	49
聚丙烯(庚二酸) polypropylene (sebacic dicarboxylate)	PPS	50
聚丁烯 polybutene	PB	51
聚丙烯丁二烯 poly(butyl diene)	PBAK	52
聚丙烯(二亚乙基)二丁二烯 poly(butylene diene-terephthalate)	PBAT	53
1,2-亚乙基二丁二烯 1,2-polybutadiene	PBD	54
聚丁二烯二丁二烯 poly(butylene maleichalate)	PBN	55
聚丁二烯二丁二烯 poly(butylene maleichalate)	PBN	56
聚对苯二甲酸丁二酯 poly(butylene terephthalate)	PBT	57
有机硅塑料 silicone plastic	PC	58
亚环己基-二亚甲基-环己烷二胺塑料 poly(cyclohexylene dimethylene cyclohexanamine hexylene)	PCCE	59
聚己内酯 polyε-caprolactone	PCL	60
聚(对苯二甲酸亚苯基二亚甲基)塑料 poly(cyclohexylene dimethylene terephthalate)	PCT	61



材料术语	缩写语	代号
聚-甲基丙烯酸酯 poly-methylacrylate	PMS	97
聚(甲基丙烯酸甲酯)-聚(丙烯酸甲酯)-聚(丙烯酸乙酯) poly(methyl methacrylate-polyacrylate-polyacrylate)	POM	98
二氯化亚砶-丙酮共聚物 carbon dioxide and propylene copolymer	PPC	99
聚对二氧环己酮	PPDO	100
聚苯醚 poly(phenylene ether)	PPE	101
可发性聚丙烯 polypropylene, expandable	PP-E	102
高抗冲聚丙烯 polypropylene, high impact	PP-HI	103
聚氧化丙烯 poly(propylene oxide)	PPOX	104
聚苯砜 poly(phenylene sulfide)	PPS	105
聚苯醚 poly(phenylene sulfone)	PPSU	106
可发性聚苯乙烯 polystyrene, expandable	PS-E	107
高抗冲聚苯乙烯 polystyrene, high impact	PS-HI	108
聚砜 polysulfone	PSU	109
聚四氯乙烯 poly tetrafluoroethylene	PTFE	110
聚(四氯乙烯-邻苯二甲酸) poly(tetrafluoroethylene adipate/terephthalate)	PTMAT	111
聚对苯二甲酸丙二烯 poly(tetramethylene terephthalate)	PTT	112
聚脲 polyurethane	PUR	113
聚乙烯-醋酸酯 poly(vinyl acetate)	PVAC	114
聚乙烯醇 poly(vinyl alcohol)	PVAL	115
聚乙烯醇丁二烯 poly(vinyl butyral)	PVB	116
氯化聚氯乙烯 poly(vinyl chloride), chlorinated	PVC-C	117
未氯化聚氯乙烯 poly(vinyl chloride), unchlorinated	PVC-U	118
聚二氯乙烯 poly(vinylidene chloride)	PVDC	119
聚(二氯乙烯-乙二酸) poly(vinylidene fluorinate)	PVF	120
聚(二氯乙烯-丙二酸) poly(vinylidene fluoride)	PVF	121
聚(二氯乙烯-丁二酸) poly(vinylidene fumarate)	PVFM	122
聚(二氯乙烯-戊二酸) poly-N-vinylcarbazole	PVK	123
聚(二氯乙烯-己二酸) poly-N-vinylpyrrolidone	PVP	124
聚-N-乙基马来酰亚胺 styrene-acrylonitrile plastic	SAN	125
聚-N-乙基马来酰亚胺 styrene-butadiene plastic	SB	126
有机硅塑料 silicone plastic	SI	127
聚(二-丁二亚甲基)二胺塑料 styrene-maleic anhydride plastic	SMAH	128
聚-N-甲基马来酰亚胺 styrene-methylacrylate plastic	SMAS	129
聚-甲酰胺脲 urea-formaldehyde resin	UF	130
不饱和聚酯树脂 unsaturated polyester resin	UP	131

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有机硅塑料 silicone plastic	SI	127
聚(二-丁二亚甲基)二胺塑料 styrene-maleic anhydride plastic	SMAH	128
聚-N-甲基马来酰亚胺 styrene-methylacrylate plastic	SMAS	129
聚-甲酰胺脲 urea-formaldehyde resin	UF	130
不饱和聚酯树脂 unsaturated polyester resin	UP	131





# Plastic recycling: what's accepted?



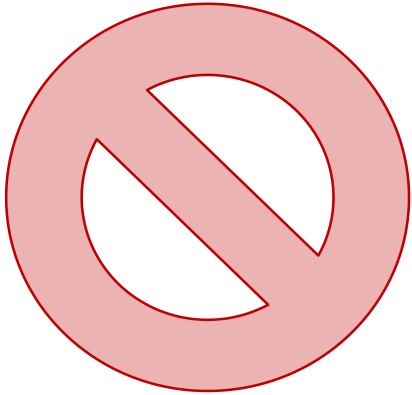
#1, #2, #5

# Recycling prep





# Plastic recycling: what's NOT accepted?



# Plastic film recycling

- **NOT mixed recycling**
- Clean
- Dry



# Plastic prevention



Legislation



Manufacturing  
and  
businesses



Personal  
consumption

Questions/Break

