

MCPP Products – For Medical Applications



mcpp™
Power to Perform

Performance Polymers Department
Mitsubishi Chemical Corporation
August, 2015

Portfolio for medical applications



Reactor made TPO



Film
– Infusion bags



SBC compound

Syringe gasket
Tube
Rubber closure
Resuscitator
Oxygen mask



Medical applications

Drip chamber
Port
Films



Tie resin
– Multilayer films

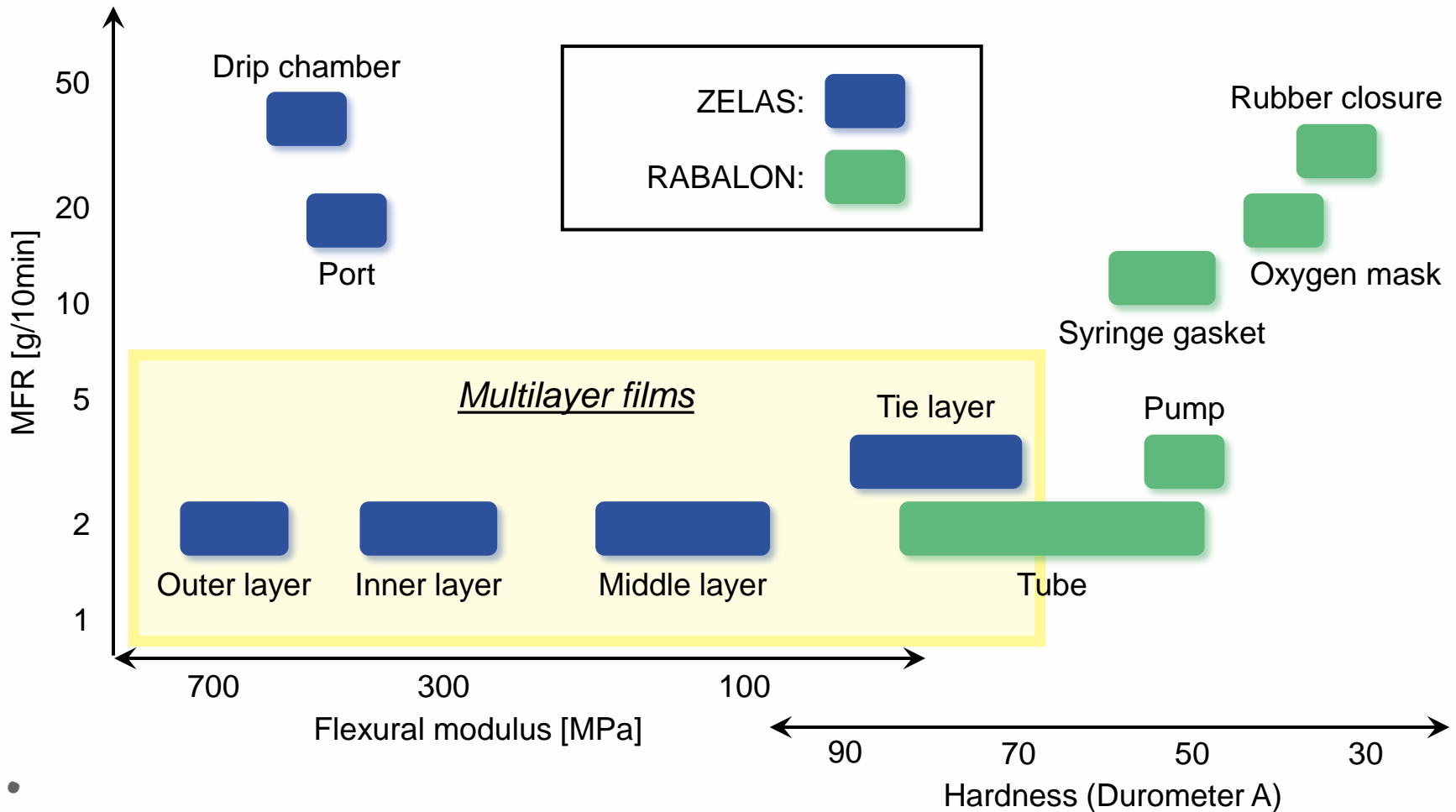


PP based specialty compounds



Adhesive polymer

Product range and applications



MCPP handles propylene derived products softer than Flexural Modulus of ~700 MPa

Commercial applications



- ✓ **Medical bag**
 - Parental nutrition
 - Hemodialysis
 - CAPD
 - Blood platelets
 - Fat emulsion preparations
 - Pyrazolone

- ✓ **Drip chamber**

- ✓ **Port**

- ✓ **Soft bottle**



- ✓ **Disposal / pre-filled syringe gasket**
 - Low compression set
 - As rubber replacement
 - Low sticktion performance

- ✓ **Stopper for infusion bags**
 - Low compression set
 - As rubber replacement
 - Leak resistance

- ✓ **Tube**
 - Low migration => oil-free types
 - High transparency, low haze

- ✓ **Respiratory care applications**

RABALON – For Tube

Item	Method	Unit	MP5306C	T3781C	MP7201C	MP8201C
MFR (230°C, 21N)	ISO 1133	g/10min	3	1	2	2
Density	ISO 1183	g/cm ³	0.89	0.89	0.89	0.89
Hardness (Durometer A)	ISO 7619	–	54	74	68	78
Tensile Strength at Break	ISO 37	MPa	8	10	18	15
Elongation at Break	ISO 37	%	810	730	830	760
Haze (2mmt)	ISO 14782	%	18	40	10	18
US Pharmacopoeia Class VI			Not tested	Pass	Pass	Not tested
FDA Drug Master File			Not listed	Listed #27013	Listed #27013	Not listed
Sterilization			Autoclave ETO	Autoclave ETO	Autoclave ETO	Autoclave ETO
Special Characteristics					Without plasticizer	Without plasticizer

Above figures are typical values and not specifications.

RABALON – For Syringe Gasket

Item	Method	Unit	PJ5302B	PJ6302B
MFR (230°C, 49N)	ISO 1133	g/10min	12	12
Density	ISO 1183	g/cm ³	0.89	0.89
Hardness (Durometer A)	ISO 7619	–	50	55
Tensile Strength at Break	ISO 37	MPa	13	17
Elongation at Break	ISO 37	%	880	880
Compression Set (70°C, 22h)	ISO 815	%	36	42
US Pharmacopoeia Class VI			Pass	Pass
FDA Drug Master File			Listed #27013	Listed #27013
Sterilization			Autoclave ETO Radiation	Autoclave ETO Radiation

Above figures are typical values and not specifications.

RABALON – For Rubber Closure

Item	Method	Unit	T3348G	T3352G
MFR (230°C, 49N)	ISO 1133	g/10min	15	36
Density	ISO 1183	g/cm ³	0.89	0.89
Hardness (Durometer A)	ISO 7619	–	33	33
Tensile Strength at Break	ISO 37	MPa	6	5
Elongation at Break	ISO 37	%	780	730
Compression Set (70°C, 22h)	ISO 815	%	40	47
US Pharmacopoeia Class VI			Not tested	Pass
FDA Drug Master File			Not listed	Listed #27013
Sterilization			Autoclave ETO Radiation	Autoclave ETO Radiation
Special Characteristics			For metal needles only	For metal and plastic needles

Above figures are typical values and not specifications.

RABALON – For Respiratory Care

Item	Method	Unit	PJ4301C	T35033C
MFR (230°C, 49N)	ISO 1133	g/10min	20	3
Density	ISO 1183	g/cm ³	0.89	0.89
Hardness (Durometer A)	ISO 7619	–	40	51
Tensile Strength at Break	ISO 37	MPa	6	7
Elongation at Break	ISO 37	%	760	750
Compression Set (70°C, 22h)	ISO 815	%	46	47
US Pharmacopoeia Class VI			Pass	Not tested
FDA Drug Master File			Not listed	Not listed
Sterilization			Autoclave ETO	Autoclave ETO
Special Characteristics			For oxygen mask	For resuscitator

Above figures are typical values and not specifications.

RABALON – For General Purpose (1)

Item	Method	Unit	PJ4300C	PJ5300C	PJ6300C
MFR (230°C, 21N)	ISO 1133	g/10min	0.4	4	6
Density	ISO 1183	g/cm ³	0.89	0.89	0.89
Hardness (Durometer A)	ISO 7619	–	33	45	57
Tensile Strength at Break	ISO 37	MPa	9	10	13
Elongation at Break	ISO 37	%	1000	950	900
Compression Set (70°C, 22h)	ISO 815	%	35	40	42
US Pharmacopoeia Class VI			Not tested	Not tested	Not tested
FDA Drug Master File			Not listed	Not listed	Not listed
Sterilization			Autoclave ETO	Autoclave ETO	Autoclave ETO

Above figures are typical values and not specifications.

RABALON – For General Purpose (2)

Item	Method	Unit	PJ7300C	PJ8300C	PJ9300C
MFR (230°C, 21N)	ISO 1133	g/10min	8	16	12
Density	ISO 1183	g/cm ³	0.89	0.89	0.89
Hardness (Durometer A)	ISO 7619	–	67	78	90
Tensile Strength at Break	ISO 37	MPa	16	16	21
Elongation at Break	ISO 37	%	900	850	750
Compression Set (70°C, 22h)	ISO 815	%	47	50	56
US Pharmacopoeia Class VI			Not tested	Not tested	Not tested
FDA Drug Master File			Not listed	Not listed	Not listed
Sterilization			Autoclave ETO	Autoclave ETO	Autoclave ETO

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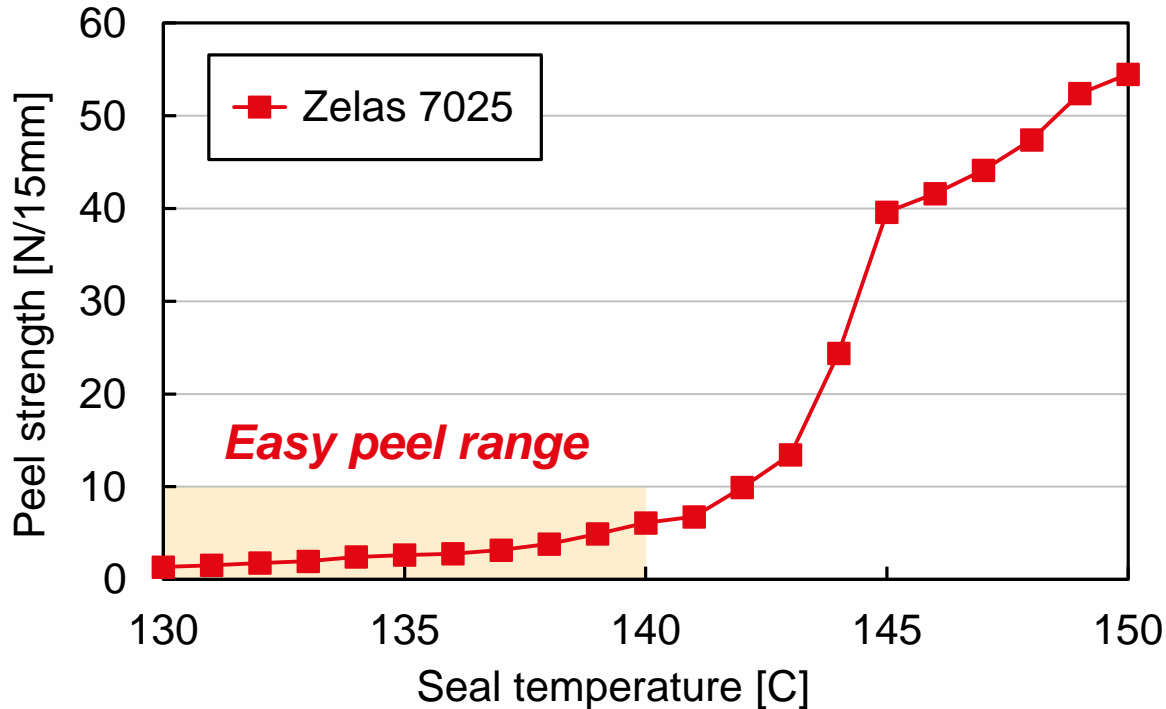
ZELAS – For IV-bag Film

Item	Method	Unit	7025	7055	MC743	MC638
MFR (230°C, 21N)	ISO 1133	g/10min	1.6	7	1.7	2.4
Density	ISO 1183	g/cm ³	0.89	0.89	0.89	0.89
Flexural Modulus	ISO 178	MPa	620	550	110	600
Tensile Stress at Break	ISO 527-1	MPa	43	40	18	38
Tensile Strain at Break	ISO 527-1	%	680	650	750	650
The Peak Melting Temp	ISO 11357-3	°C	162	162	161	135
US Pharmacopoeia Class VI			Pass	Not tested	Not tested	Not tested
FDA Drug Master File			Listed #27126	Not listed	Not listed	Not listed
Sterilization			Autoclave ETO	Autoclave ETO	Autoclave ETO	Autoclave ETO
Special Characteristics			For blown molding Outer layer	For cast molding Outer layer	For blown molding Middle layer	For blown molding Inner layer

Above figures are typical values and not specifications.

Sealability for multi-chamber bags

Comparison of peel strength vs. seal temperature
(Pre-sterilization)



Seal conditions

Thickness: 200mic

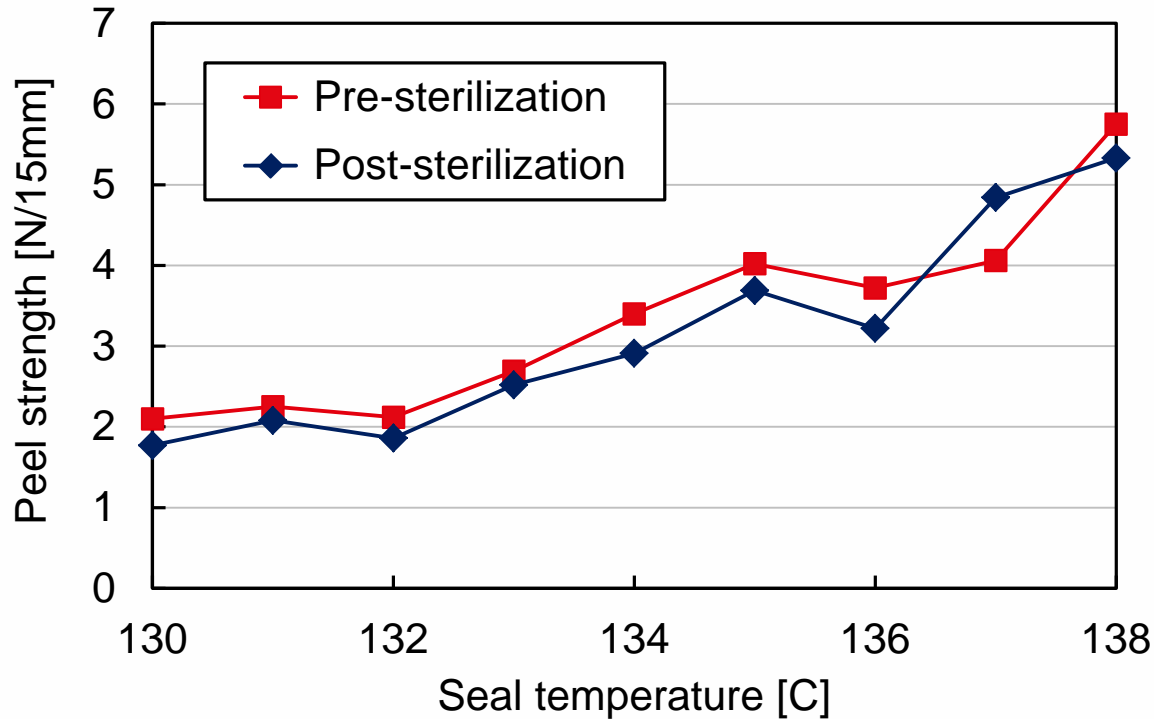
Seal time: 3s

Pressure: 0.3MPa

Zelas 7025 has stable low peel strength
between 130°C and 140°C

Peel strength after sterilization

Comparison of peel strength vs. seal temperature
(After sterilization)



Seal conditions
Thickness: 200mic
Seal time: 3s
Pressure: 0.3MPa

Zelas 7025 shows stable peel strength
even after sterilization

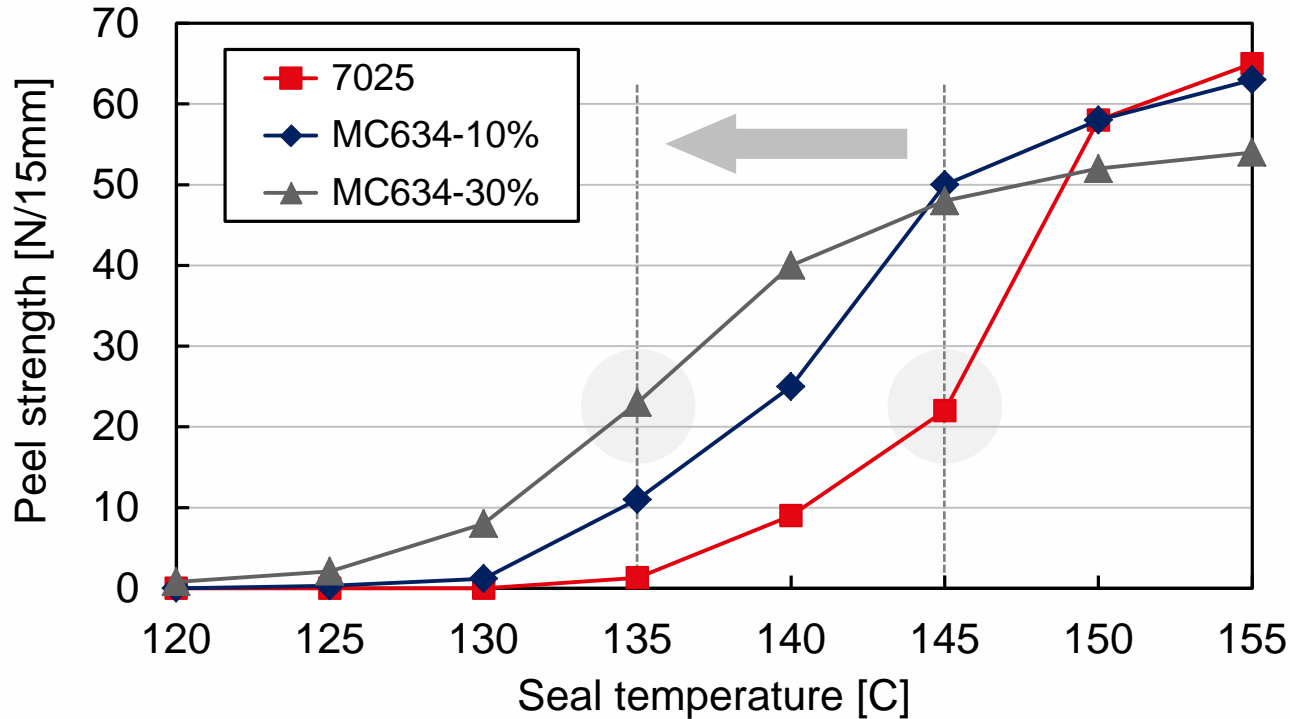
ZELAS – Film Modifier

Item	Method	Unit	MC634
MFR (230°C, 21N)	ISO 1133	g/10min	4.5
Density	ISO 1183	g/cm ³	0.89
Flexural Modulus	ISO 178	MPa	200
Tensile Stress at Break	ISO 527-1	MPa	20
Tensile Strain at Break	ISO 527-1	%	650
The Peak Melting Temp	ISO 11357-3	°C	135
US Pharmacopoeia Approval			Not tested
FDA Drug Master File			Not listed
Sterilization			Autoclave ETO
Special Characteristics			Seal temp modifier

Above figures are typical values and not specifications.

Adjustable heat-seal strength

Comparison of peel strength vs. seal temperature
(Pre-sterilization)



Seal conditions
Thickness: 200mic
Seal time: 3s
Pressure: 0.3MPa

The heat-seal temperature may be reduced
with the addition of MC634 (7025 @ max 30wt%)

ZELAS – For Tie Layer

Item	Method	Unit	MC719	MC721AP
MFR (230°C, 21N)	ISO 1133	g/10min	3	3
Density	ISO 1183	g/cm ³	0.89	0.89
Hardness (Durometer A)	ISO 7619-1	–	75	75
Tensile Strength at Break	ISO 527-1	MPa	10	10
Elongation at Break	ISO 527-1	%	880	880
Haze (2mmt)	ISO 2813	%	14	14
The Peak Melting Temp	ISO 11357-3	°C	155	157
US Pharmacopoeia Approval			USP 35 <661> Containers- plastics	USP 35 <661> Containers- plastics
FDA Drug Master File			Not listed	Not listed
Sterilization			Autoclave ETO	Autoclave ETO
Special Characteristics			Adhesive to COP and COC	Adhesive to PA and EVOH

Above figures are typical values and not specifications.

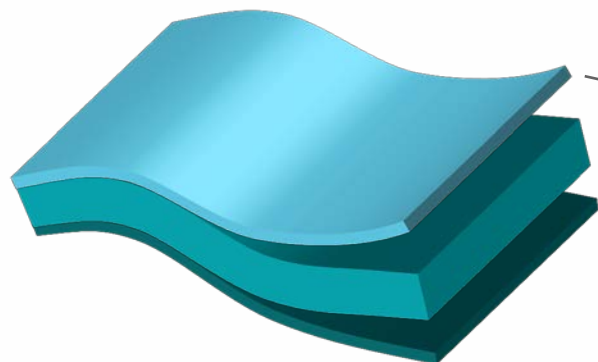
ZELAS – COP-based Grades For Film Power to Perform

Item	Method	Unit	MC903	MC906
MFR (230°C, 21N)	ISO 1133	g/10min	2	1.2
Density	ISO 1183	g/cm ³	1.00	1.00
Flexural Modulus	ISO 178	MPa	1700	1600
Tensile Stress at Break	ISO 527-1	MPa	37	37
Tensile Strain at Break	ISO 527-1	%	140	80
Haze (2mmt)	ISO 2813	%	8	34
Izod Impact @23°C	ISO 11357-3	kJ/m ²	5	62
US Pharmacopoeia Class VI			Not tested	Pass
FDA Drug Master File			Not listed	Not listed
Sterilization			Autoclave ETO	Autoclave ETO
Special Characteristics			High performance vapor barrier	High performance vapor barrier

Above figures are typical values and not specifications.

Possible film structure (1)

EX1) Single chamber bag

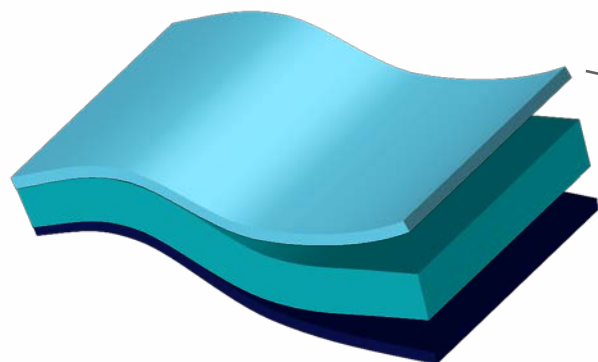


Outer layer: Zelas 7025
For high heat seal resistance
w/o stickiness, but + softness

Middle layer: MC743
For flexibility, transparency,
toughness & heat resistance

Inner layer: MC638
For easy heat seal process

EX2) Multi-chamber bag



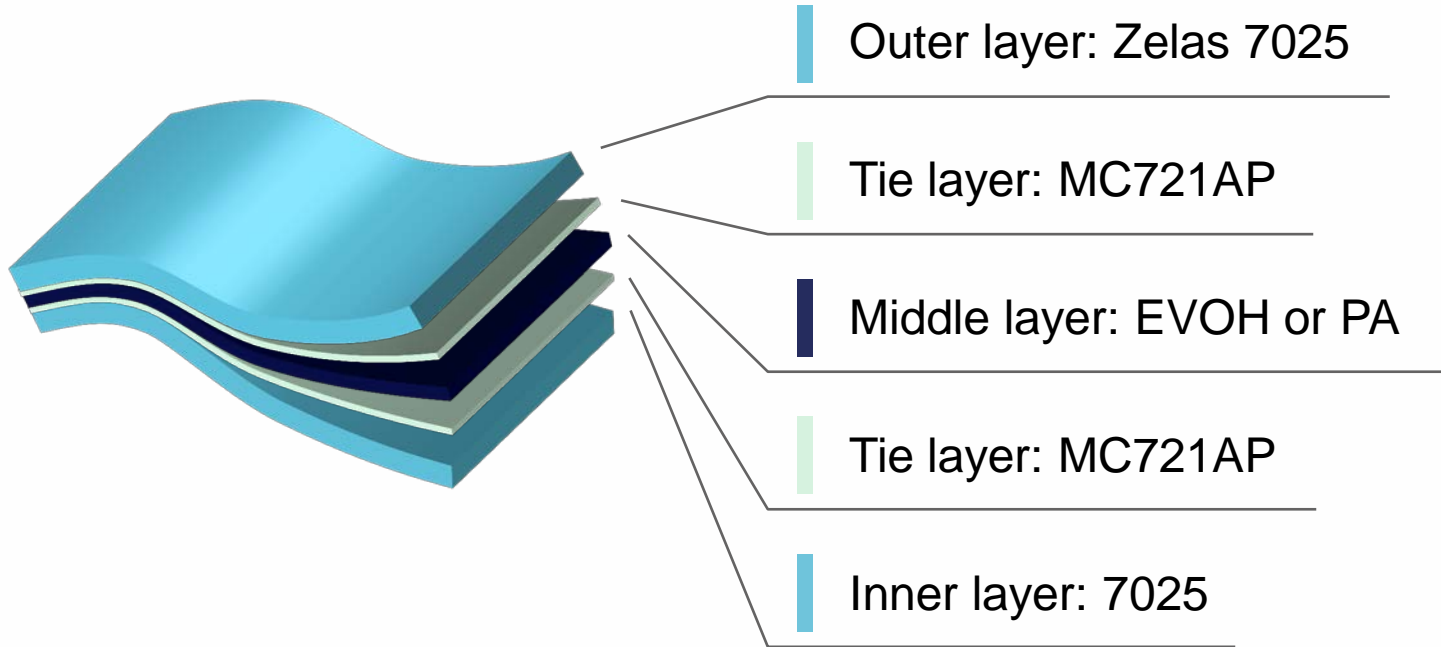
Outer layer: Zelas 7025
For high heat seal resistance
w/o stickiness, but + softness

Middle layer: MC743
For flexibility, transparency,
toughness & heat resistance

Inner layer: 7025
For easy heat seal process

Possible film structure (2)

EX3) For O₂ barrier bag



ZELAS – For Injection Parts

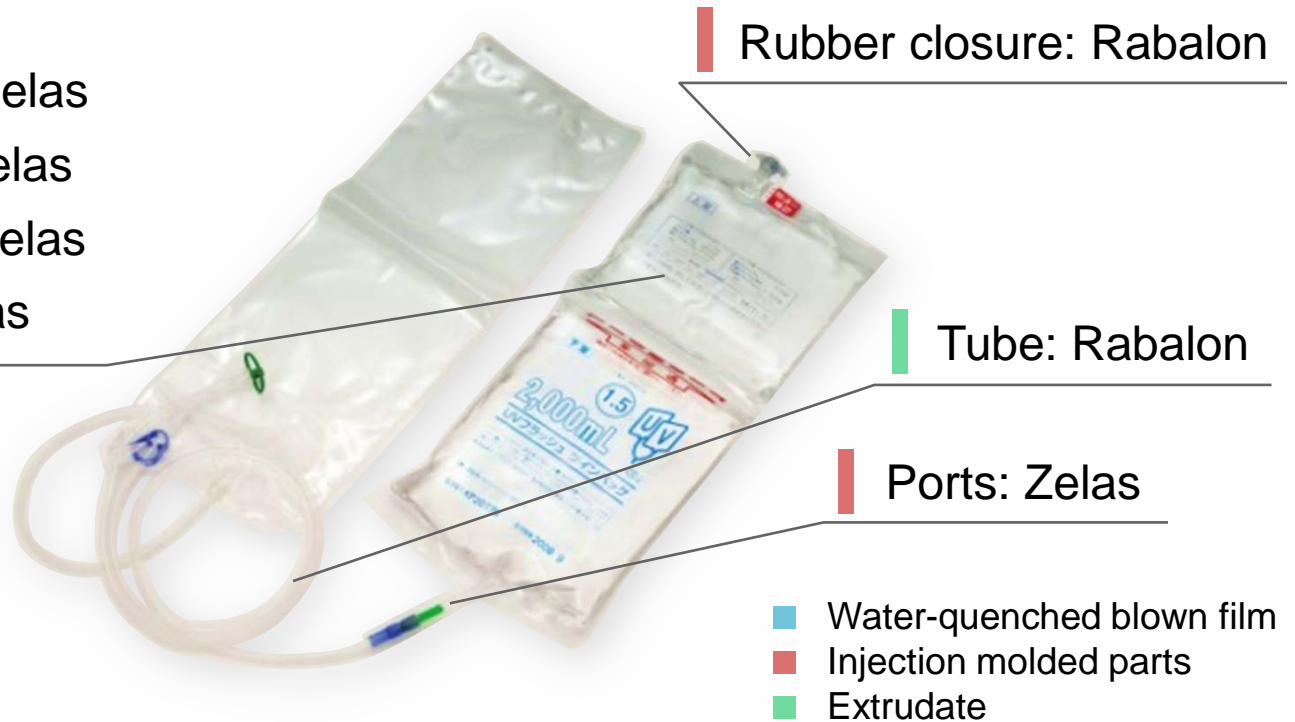
Item	Method	Unit	MC639	MC642
MFR (230°C, 21N)	ISO 1133	g/10min	40	20
Density	ISO 1183	g/cm ³	0.89	0.89
Flexural Modulus	ISO 178	MPa	560	560
Tensile Stress at Break	ISO 527-1	MPa	28	29
Tensile Strain at Break	ISO 527-1	%	560	680
Haze (2mmt)	ISO 2813	%	20	25
The Peak Melting Temp	ISO 11357-3	°C	134	134
US Pharmacopoeia Class VI			Pass	Not tested
FDA Drug Master File			Listed #27126	Listed #27126
Sterilization			Autoclave ETO	Autoclave ETO
Special Characteristics			For drip chamber	For port

Above figures are typical values and not specifications.

Total material solutions – for medical bags

Multilayer bags

- outer layer: Zelas
- core layer: Zelas
- inner layer: Zelas
- tie layer: Zelas



We can be your one-stop solution
for non-PVC bag assembly materials