



Dolder Seminar

Resins for Sanitary Applications, part 2

Date: 26. September 2019
Toray Resins Europe GmbH
Mr. Ingo Maier

Agenda

- TORAY - Resins for Sanitary Applications

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Innovation by Chemistry

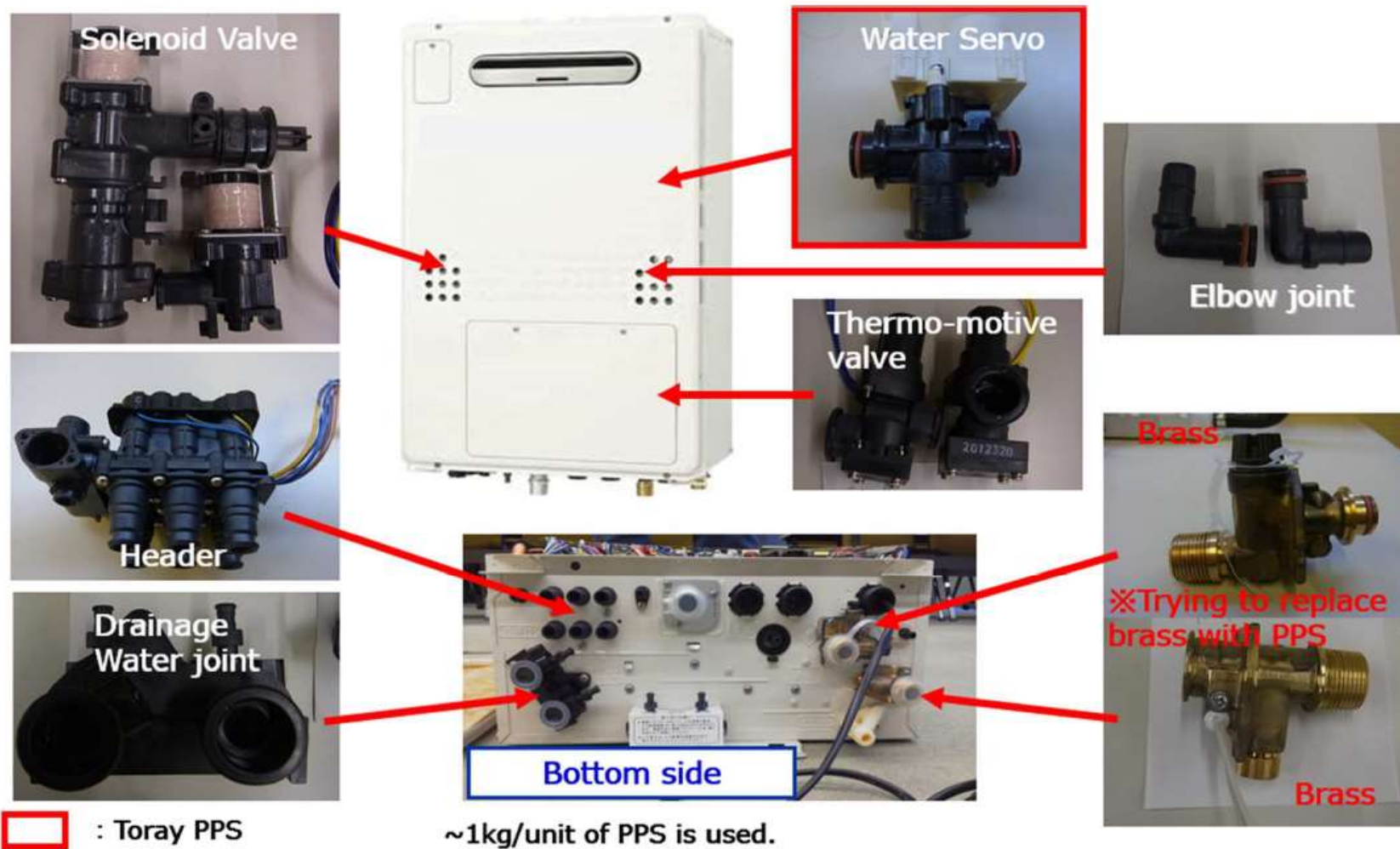


Sanitary

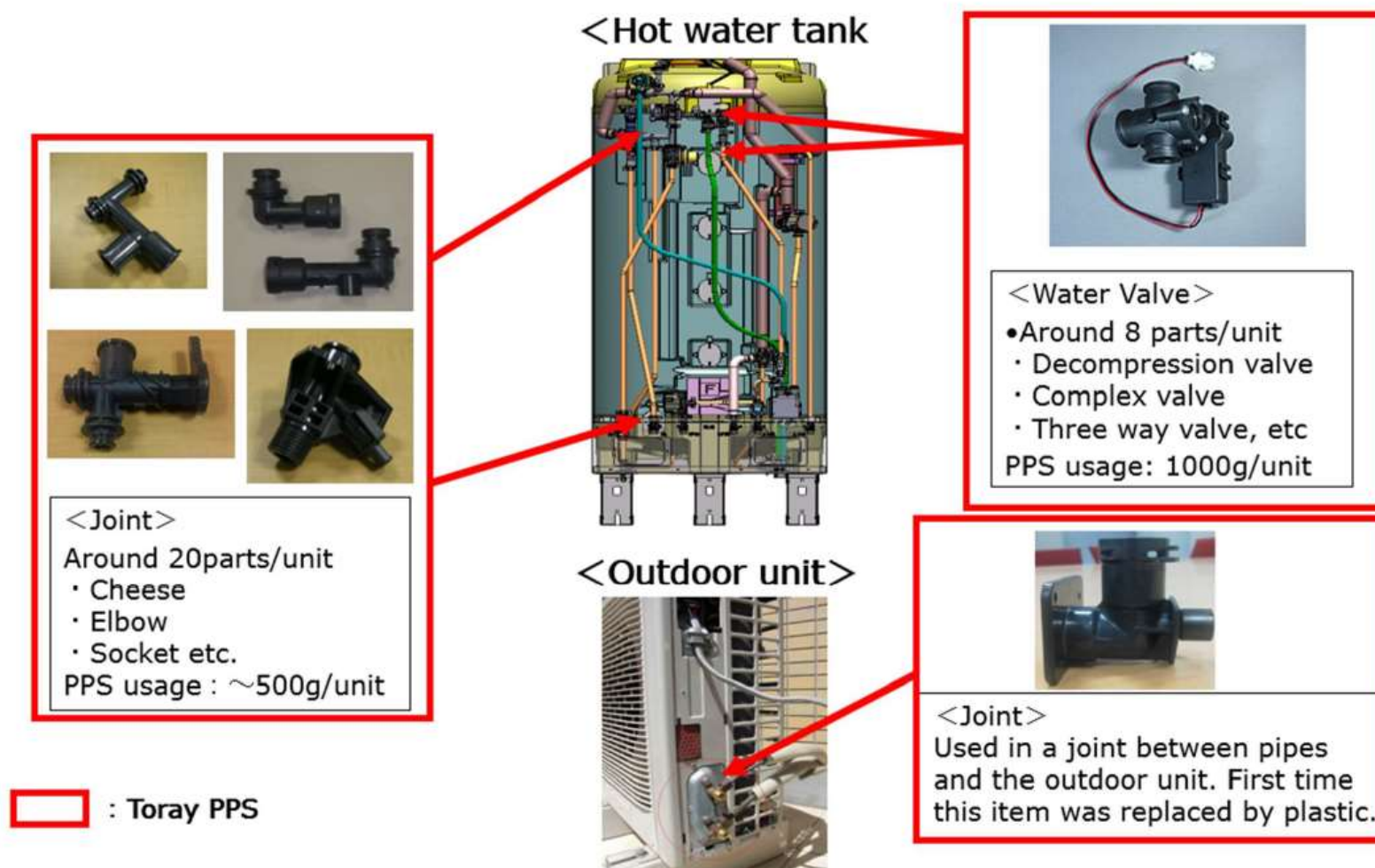


Confidential

Target Applications



Target Applications



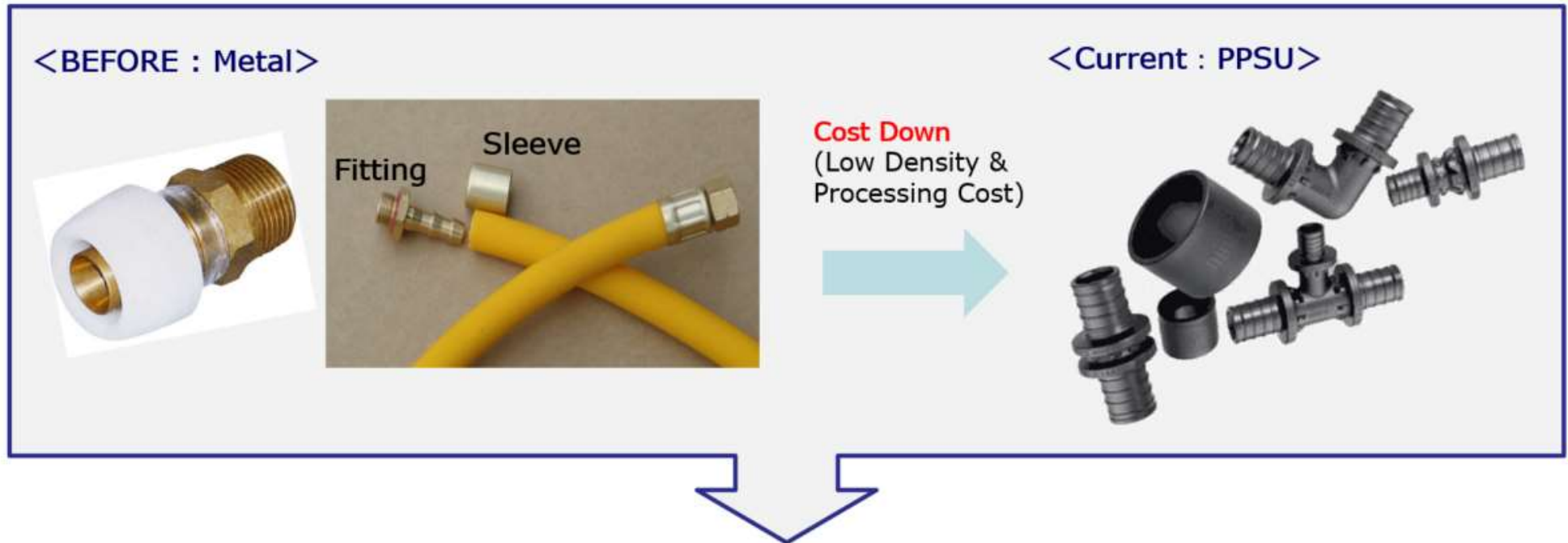
Toray Resins for sanitary applications - Grade lineup

Property		Test Method (ISO)	Unit	TORAY				PPSU
				No-GF Elastomer Improvement PPS		GF40%PPS	GF30%PPS +Elastomer	
				A670R63B	A670MT1B	A604WRB	A673MWRB	
ISO	Density	1183	Kg/m3	1300	1270	1660	1520	1290
	Tensile Strength	527-1,2	MPa	70	58	188	147	75
	Tensile Strain		%	10	26	1.8	2.0	48
	Flexural Strength	178	MPa	110	94	270	222	105
	Flexural Modulus		GPa	2.8	2.5	14.1	9.8	2.2
	Charpy Impact Strength (Notched)	179-1	kJ/m2	7.3	30	9.0	10.6	3~20
	Charpy Impact Strength (Unnotched)		kJ/m2	NB	NB	—	—	NB
	Heat Deflection Temperature (1.8MPa)	75	°C	100	100	>260	—	—
Food regulation		FDA		—	—	○	—	○
		NSF ANSI51		—	—	—	—	○
		EU10/2011		—	—	○	—	?
Drink water regulation		NSF ANSI61		—	—	○	○	○
		WRAS		—	—	○	○	○
		KTW		—	—	○	Dec-17	○
		W270		—	—	○	Dec-17	?
		ACS		—	—	○	○	○
Long- term durability		ISO9080		Under consideration	Under consideration	Under testing	-	?

Toray Resins for sanitary applications - Grade lineup // approval status

Type			GF40			GF30				Unreinforced		
						Elastomer improvement						
Features			Toughness			High Toughness moist and heat resistance				High impact strength		
Grade /color			A604 B/G	A604WR B/G/NC		A673MT B			A673MWR B/NC		A670R63 B2/G2/N2	
Country of origin			Japan	Japan	China	Japan	Korea	Thailand	Japan	Thailand	Japan	
W A T E R	NSF ANSI61	USA	✓	✓	✓	✓	✓	-	✓	-	✓	
	KTW	DEU	✓	✓	✓	-	-	-	✓	✓	Oct, 2019	
	W270		✓	✓	✓	-	-	-	✓	✓	✓	
	WRAS	GBR	✓	✓	✓	✓	-	✓	✓	Oct, 2019	✓	
	ACS	FRA	-	✓	✓	-	-	-	✓	✓	✓	
	AS	AUS	-	✓	✓	-	-	-	✓	-	-	
F O O D	FDA	USA	-	✓		-	-	-	-	-	-	
	EU10/2011	EU	-	✓		-	-	-	-	-	✓	
ISO 9080 (LTHS DATA)			-	✓		-			-		Under testing	

Toray Resins for sanitary applications - Fittings



Replacing from PPSU to PPS can be more cost down

- *Estimated Market Price of PPSU: over 20€/kg > PPS unfilled
- *Mechanical Properties: PPSU \approx PPS

Toray Resins for sanitary applications – Fittings / A670R63



Item

Water Joint (For household pipeline)

Grade

A670R63B2
(Quench (Unfilled) and Elastomer)

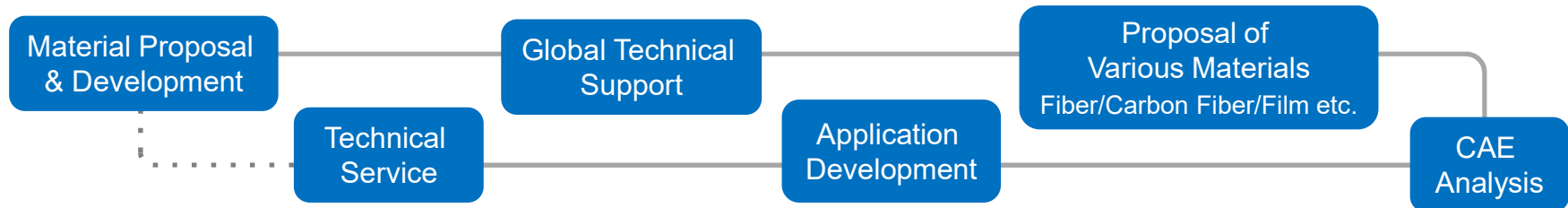
Requirement properties

- 1) High toughness
- 2) High impact resistance
- 3) Chemical resistance
→ **replaced from PPSU**

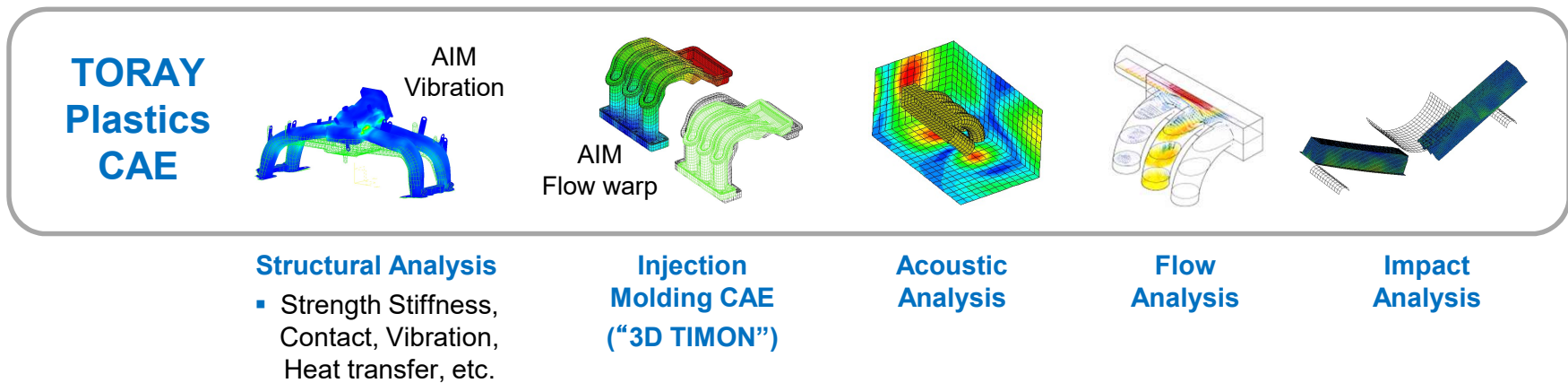
Toray Resins for sanitary applications – Fittings / Torelina A670R63

Property		Test Method	Unit	TORAY		SOLVAY
				PPS Unfilled + Elastomer		PPSU Unfilled
				A670R63B2	A670MT1B	R-5100
ISO	Density	1183	Kg/m3	1300	1270	1290
	Tensile Strength	527-1,2	MPa	70	58	75
	Tensile Elongation		%	10	26	48
	Flexural Strength	178	MPa	110	94	105
	Flexural Modulus		GPa	2.8	2.5	2.2
	Charpy Impact Strength (notched)	179-1	kJ/m2	7.3	30	10
	DTUL (1.8MPa)	75	°C	100	100	—
ISO 9080 approval				Done Sep/19	—	○

TORAY – CAE support to customers



- TORAY provides professional technical support based on its original CAE software
- TORAY has supported many developments with its CAE technologies
 - 250 reports/year
 - More than 4,000 CAE case studies in 30 years



TREU - Toray Resins Europe GmbH(2015/8/01~)

TREU location

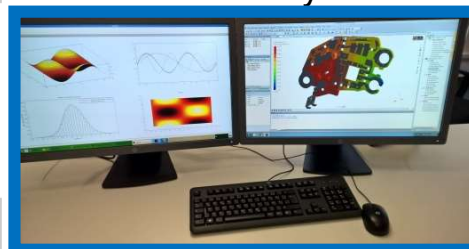
Company name	Toray Resins Europe GmbH
Location	Neu-Isenburg Germany
Launch	2015/5/1 (Register 5/21~) (Business transfer from TIEU 2015/8/1~)
Capital fund	2 Million EUR
Shareholder	TORAY 100 %
Business	Sale and Marketing, Developmental support

Technical Center

1. CAE Analysis (Flow, Structure, Impact)
2. Analytical Equipment for quick trouble shooting
(①SEM-XMA, ②DSC, ③FT-IR & ④TGA)



1.CAE Analysis



② DSC



③FT-IR & ④TGA



①SEM



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