



Healthcare Team



Plastic Technologies
For Safe & Effective Medical Devices



THERMOPLASTIC ELASTOMERS • STRUCTURAL • WEAR
CONDUCTIVE • COLOR • FLAME RETARDANT



Hospital Cleaner Resistant Thermoplastics

September 2015

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Daily Mail **WIRES** 

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Wires Home

Unchecked superbugs could kill 10 million a year, cost \$100 trillion

By REUTERS

PUBLISHED: 19:01 EST, 10 December 2014 | UPDATED: 19:01 EST, 10 December 2014

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By Kate Kelland, Health and Science Correspondent

LONDON, Dec 11 (Reuters) - Drug-resistant superbugs could kill an extra 10 million people a year and cost up to \$100 trillion by 2050 if their rampant global spread is not halted, according to a British government-commissioned review.



U.S. News & WORLD REPORT **HEALTH**

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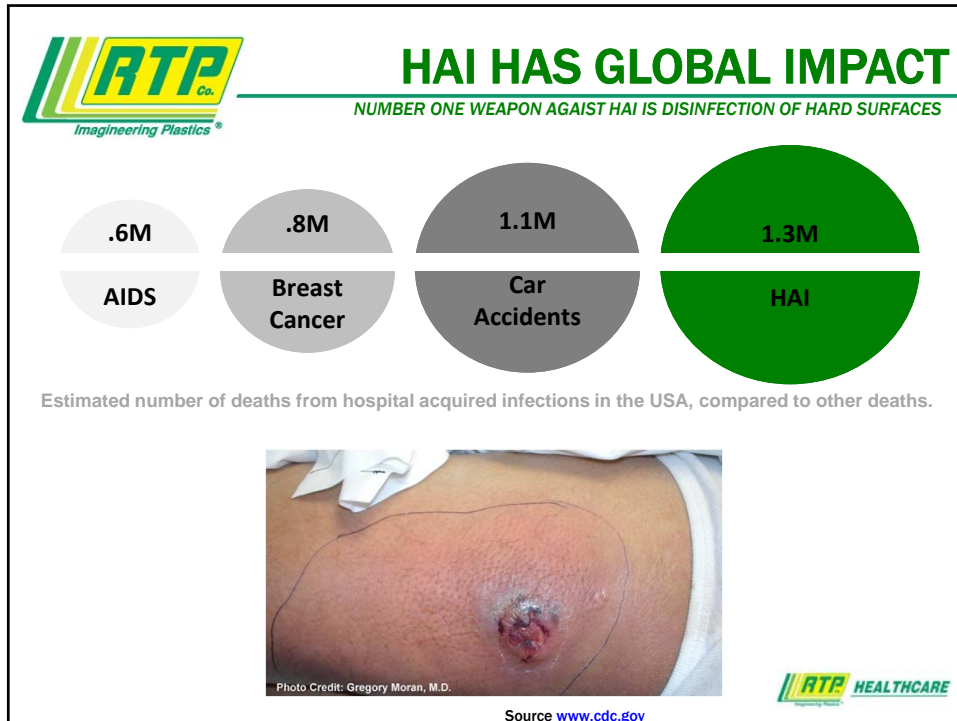
Hospital-Acquired Infections Cost \$10 Billion a Year: Study

Five most common health care-associated infections strike 440,000 U.S. patients each year

HealthDay | Sept. 3, 2013 | 12:00 p.m. EDT

   + More





RTP Co.
Imagineering Plastics®

AGENDA

HOSPITAL CLEANER STUDY AGENDA

- HAI Definition and Problem Statement
- Disinfection is #1 Weapon in the Fight
- Chemical Testing and Plastic Screening
- New Product Development Process
- New Class of Disinfectant Resistant Plastics
- Summary

RTP HEALTHCARE



HAI CAUSING MICROBES

THIS LIST IS GROWING

Bacteria

- Bordetella(s), Campylobacter, Escherichia Coli, Klebsiella

Multi-Drug Resistant Bacteria

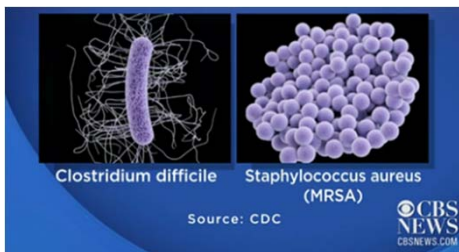
- MRSA, Escherichia coli, Klebsiella(s) etc.

Viruses

- Influenza, Herpes, Respiratory etc.

Bloodborne Pathogens

- Hepatitis B and C, HIV etc.



Yeast and other fungus

- Candida albicans etc.



MEDICAL ELECTRONICS

HOUSINGS AND STRUCTURES THAT GET CLEANED WITH DISINFECTANTS



Even Infrequent Cleaning Can Cause Damage.



THREE DISINFECTION LEVELS

WORLD HEALTH ORGANIZATION HARD SURFACE DISINFECTANT DESCRIPTION

High-level disinfection (critical) – this will destroy all microorganisms, with the exception of heavy contamination by bacterial spores.

Intermediate disinfection (semi-critical) – this inactivates *Mycobacterium tuberculosis*, vegetative bacteria, most viruses and most fungi, but does not necessarily kill bacterial spores.

Low-level disinfection (non-critical) – this can kill most bacteria, some viruses and some fungi, but can-not be relied on for killing more resistant bacteria such as *M. tuberculosis* or bacterial spores.

All three Types of Disinfectants Degrade Plastic Surfaces




CLASSES OF DISINFECTANTS

MANY HOSPITALS USE DISINFECTANTS FROM ALL THREE CATEGORIES

Level of disinfection required	Spectrum of activity of disinfectant	Active ingredients potentially capable of satisfying these spectra of activity	Factors affecting the efficacy of a disinfectant
High Level (critical)	<ul style="list-style-type: none"> • Sporicidal • Mycobactericidal • Virucidal • Fungicidal • Bactericidal 	<ul style="list-style-type: none"> • Peracetic acid • Chlorine dioxide • Formaldehyde • Glutaraldehyde • Sodium hypochlorite • Stabilized hydrogen peroxide • Succinaldehyde 	<ul style="list-style-type: none"> • Concentration • Contact time • Temperature • Presence of organic matter • pH • Presence of calcium or magnesium ions • Formulation of the disinfectant used
Intermediate (semi-critical)	<ul style="list-style-type: none"> • Tuberculocidal • Virucidal • Fungicidal • Bactericidal 	<ul style="list-style-type: none"> • Phenol derivatives • Ethyl and isopropyl alcohols 	
Low Level (Non-critical)	<ul style="list-style-type: none"> • Bactericidal 	<ul style="list-style-type: none"> • Quaternary ammonium • Amphiprotic • Amino acids 	



Choice of Chemical Varies by Hospital and May Include All Classes of Disinfectant.



CHEMICAL CLASSES STUDIED

MOST COMMONLY ENCOUNTERED CHEMICAL DISINFECTANTS GLOBALLY

Base Chemical Class	Typical Brand Names
Alkylamine	T-Spray II
Glutaraldehyde	Cidex Plus
Glucoprotamin	Incidin Plus
Phenol	Birex
Quaternary compound	Sani-Cloth AF3 Sani-Cloth Active
Chlorine releasing compound	Sani-Cloth Bleach Clorox
Alcohol	CaviCide 1 Super Sani-Cloth Sani-Cloth Plus Incides N Incidin Pro






Disinfectant Examples:

- Wipes/cloth
- Liquid sprays

RTP Continues Testing

- Provide a sample
- Will report results





ORIGINAL OEM DESIGN CRITERIA

PC/ABS HAS BEEN A LONG STANDING GO TO ALLOY - UNTIL NOW

Electronic Medical Devices

- Dimensionally accurate and stable
- Excellent appearance and surface
- Good impact or drop resistance
- Available in UL V=0 grades
- Affordable
- Favorite grades included PC/ABS and PC

Chemical Resistance Added Because of Failures



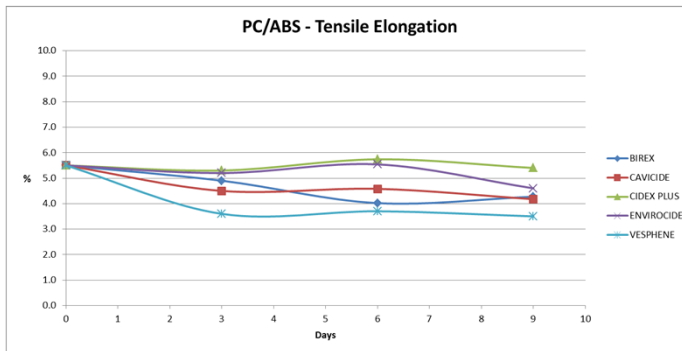
More than a dozen resins were tested against more than a dozen hospital disinfectants

CHEMICAL SCREENING AND DEVELOPMENTAL APPROACH



CHEMICAL IMMERSION TEST

FIVE COMMON DISINFECTANTS WERE PURCHASED AND TESTED



Product tested in 10% stainless steel fiber content for EMI shielding.

Test Results

- PC/ABS FR is most common housing material
- Conducted a nine day soak and property test
- Results did not explain field failures
- Molded -in stress is highlighted



RTP Co. **CAUSES of MOLDED-IN STRESS**
Imageneering Plastics® MOLDED-IN STRESS IS UNAVOIDABLE

Part Design

- Sharp Corners
- Holes
- Thickness Changes

Injection Molding

- Unbalanced Flow
- Differential Cooling
- Overpacking
- Gate Location

RTP HEALTHCARE


RTP Co. **MANAGING MOLDED-IN STRESS**
Imageneering Plastics® MOLDED-IN STRESS IS UNAVOIDABLE

RTP HEALTHCARE

 **DEVELOPMENT APPROACH**
Imagineering Plastics® ROBUST DEVELOPMENT TO FIND SOLUTIONS TO PART CRACKING

- Adopt a New Predictive Test
- Chemical Matrix Tested on PC/ABS - Baseline
- Establish New Product Development Criteria
- Establish Chemical Testing Success Criteria
- Screen Commercially Available Resins
 - PC/ABS, PC/PBT, ABS, PC, Polyester, ASA/Nylon, FR Grades – over a dozen screened
- Create and Test RTP Proprietary Alloys
- Validate Results with Customers





 **DEVELOPMENT CRITERIA**
Imagineering Plastics® ABILITY TO USE EXISTING MOLDS BECOMES AN IMPORTANT CRITERIA


Improved Disinfectant Resistance

Overall Desired Qualities

- High Impact/Ductility
- Good dimensional stability
- Shrinkage similar to PC/ABS
- Colorable
- Good surface appearance

Flame retardant grades 







TEST METHODOLOGY

COLLABORATION WITH GLOBAL DEVICE OEMs TO VALIDATE TEST

- Exposure @ 1% Strain
- Patch Method
 - Saturate patch every 24 hours
 - Air dry
- Test physical properties after exposure (96 hours)



Test Replicated Field Failures and Relative Resistance




TARGET PROPERTIES

TOUGH CRITERIA FOR SUCCESS WAS ESTABLISHED

Physical Property	Targets for Housings
Healthcare Chemical Resistance	Excellent
Izod, Notched (J/m)	> 535
Tensile Strength (MPa)	> 31
Tensile Elongation (%)	> 10
Flexural Modulus (MPa)	1400 – 3500
HDT @ 1.8 MPa (°C)	> 80
Mold Shrinkage (%)	0.6
UL 94	V-0 / 5VA

Similar Physicals to PC/ABS, Better Cleaner Resistance






PASS/FAIL CRITERIA


PASSING THE CHEMICAL TEST IS THE DRIVING SUCCESS CHARACTERISTIC

- **Tensile Strength**
 - 75% retention or greater

- **Tensile Elongation**
 - Minimum 10% tensile elongation






INITIAL CHEMICAL TESTING

MORE THAN ONE DOZEN COMMERCIALY AVAILABLE RESINS FAILED

- All Tested Resins and Alloys **Failed** to Meet the Success Criteria.

- **RTP Polyester Alloy** had the Best All Around Performance.

- RTP Proprietary Alloy was Selected to be Optimized for Physicals, Chemical Resistance and Flame Retardant Performance





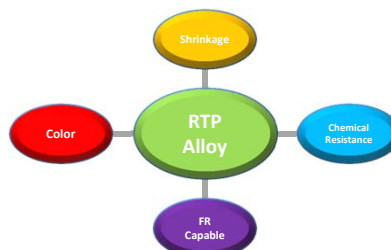
New HC Grade - Hospital Cleaner Resistant Resin Alloy


INTRODUCING RTP 2000 HC A SERIES



INTRODUCING 2000 HC A SERIES

- Much improved chemical resistance over existing products on the market
- Meets or exceeds development criteria
- Excellent colorability
- FR grades available
- Available in all global locations






TENSILE STRENGTH RESULTS

YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS


Cleaner	RTP 2000 HC	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
T-Spray II (Chlorine)	✓	✓	✓	✗	✓	✓	✓
Cidex Plus (Glutaraldehyde)	✓	✗	✓	✗	✓	✓	✓
Incidin Plus (Glucoprotamin)	✓	✗	✗	✗	✓	✗	✗
Birex (Phenol)	✓	✓	✓	✓	✓	✓	✓
Sani-Cloth AF3 (Quaternary Cmpd)	✓	✗	✗	✗	✓	✗	✓
Sani-Cloth Active (Quaternary Cmpd)	✓	✓	✓	✗	✓	✓	✓
Sani-Cloth Bleach (Chlorine)	✓	✓	✓	✓	✓	✓	✓
CaviCide 1 (Alcohol)	✓	✗	✓	✗	✓	✗	✓
Super Sani-Cloth (Alcohol)	✓	✓	✓	✓	✓	✓	✓
Sani-Cloth Plus (Alcohol)	✓	✗	✓	✗	✓	✗	✓
Incides N (Alcohol)	✓	✓	✓	✓	✓	✓	✓
Incidin Pro (Alcohol)	✓	✗	✓	✗	✓	✗	✓



TENSILE ELONGATION RESULTS


YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

Cleaner	RTP 2000 HC	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
T-Spray II (Chlorine)	✓	✓	✓	✗	✓	✓	✓
Cidex Plus (Glutaraldehyde)	✓	✗	✓	✗	✓	✓	✓
Incidin Plus (Glucoprotamin)	✓	✗	✗	✗	✓	✗	✗
Birex (Phenol)	✓	✓	✓	✓	✓	✓	✓
Sani-Cloth AF3 (Quaternary Cmpd)	✗	✗	✗	✗	✗	✗	✗
Sani-Cloth Active (Quaternary Cmpd)	✓	✗	✗	✗	✓	✗	✓
Sani-Cloth Bleach (Chlorine)	✓	✓	✓	✓	✓	✓	✓
CaviCide 1 (Alcohol)	✓	✗	✓	✗	✓	✗	✓
Super Sani-Cloth (Alcohol)	✓	✓	✓	✗	✓	✓	✓
Sani-Cloth Plus (Alcohol)	✓	✗	✓	✗	✓	✗	✓
Incides N (Alcohol)	✓	✓	✗	✗	✓	✓	✓
Incidin Pro (Alcohol)	✓	✗	✗	✗	✓	✗	✓



DATASHEET 2000 HC A SERIES

DATA SHEETS AVAILABE AT WWW.RTPCOMPANY.COM



Product Data Sheet & General Processing Conditions

RTP 2000 HC A
Polyester Alloy
Medical Cleaner Resistant
UV Stabilized

RTP 2000 HC series are polyester alloys designed to withstand the aggressive cleaners used to disinfect medical equipment

PROPERTIES & AVERAGE VALUES OF INJECTION MOLDED SPECIMENS

PERFORMANCE	English	SI Metric	ASTM TEST
Specific Gravity	1.17	1.17	D 792
Molding Shrinkage 1/8 in (3.2 mm) section	0.000 - 0.0070 in/in	0.00 - 0.70 %	D 959

MECHANICAL

Impact Strength, Iodol notched 1/8 in (3.2 mm) section	15.0 ft-lb/in	801 J/m	D 256
	unnotched 1/8 in (3.2 mm) section	No Break	D 4812
Tensile Strength	8700 psi	60 MPa	D 638
Tensile Elongation	> 100.0 %	> 100.0 %	D 638
Tensile Modulus	0.19 x 10 ⁶ psi	1310 MPa	D 638
Flexural Strength	8200 psi	57 MPa	D 790
Flexural Modulus	0.21 x 10 ⁶ psi	1448 MPa	D 790

THERMAL

Deflection Temperature @ 204 psi (1423 kPa)	173 °F	77 °C	D 648
	@ 66 psi (452 kPa)	192 °F	89 °C
Ignition Resistance*	HB @ 1/16 in	HB @ 1.5 mm	D 635

PROPERTIES NOTES


Data herein is typical and not to be construed as specifications. Unless otherwise specified, all data listed is for natural or black colored materials. Pigments can affect properties.
*This testing is not intended to reflect hazards of this or any other material under actual fire conditions.
** Values per RTP Company testing.

GENERAL PROCESSING FOR INJECTION MOLDING

English	SI Metric
Injection Pressure	15000 - 20000 psi
Melt Temperature	480 - 520 °F
Mold Temperature	128 - 175 °F
Drying	4 - 6 hrs @ 180 °F
Moisture Content	< 0.02 %
Draw Point	-42 °F

PROCESSING NOTES

14 Apr 2015 JSD



Product Data Sheet & General Processing Conditions

RTP 2000 HC FR A
Polyester Alloy
Flame Retardant
UV Stabilized
Medical Cleaner Resistant

RTP 2000 HC series are polyester alloys designed to withstand the aggressive cleaners used to disinfect medical equipment

PROPERTIES & AVERAGE VALUES OF INJECTION MOLDED SPECIMENS

PERFORMANCE	English	SI Metric	ASTM TEST
Specific Gravity	1.27	1.27	D 792
Mold Flow Rate @ 243 °C / 5 kg	7.00 g/10 min	7.00 g/10 min	D 1238
Molding Shrinkage 1/8 in (3.2 mm) section	0.0000 - 0.0080 in/in	0.00 - 0.80 %	D 959

MECHANICAL

Impact Strength, Iodol notched 1/8 in (3.2 mm) section	12.0 ft-lb/in	641 J/m	D 256
	unnotched 1/8 in (3.2 mm) section	No Break	D 4812
Tensile Strength	8500 psi	61 MPa	D 638
Tensile Elongation	> 80.0 %	> 80.0 %	D 638
Tensile Modulus	0.21 x 10 ⁶ psi	1448 MPa	D 638
Flexural Strength	8000 psi	57 MPa	D 790
Flexural Modulus	0.21 x 10 ⁶ psi	1448 MPa	D 790

THERMAL

Deflection Temperature @ 204 psi (1423 kPa)	180 °F	82 °C	D 648
	@ 66 psi (452 kPa)	200 °F	93 °C
Ignition Resistance*	V-0 @ 1/16 in	V-0 @ 1.5 mm	D 5681
Flammability**	5VA @ 1/8 in	5VA @ 3.0 mm	D 5681


PROPERTIES NOTES

Data herein is typical and not to be construed as specifications. Unless otherwise specified, all data listed is for natural or black colored materials. Pigments can affect properties.
*This testing is not intended to reflect hazards of this or any other material under actual fire conditions.
** Values per RTP Company testing.

GENERAL PROCESSING FOR INJECTION MOLDING

English	SI Metric
Injection Pressure	15000 - 20000 psi
Melt Temperature	480 - 520 °F
Mold Temperature	150 - 180 °F
Drying	4 - 6 hrs @ 180 °F
Moisture Content	< 0.02 %
Draw Point	-42 °F

PROCESSING NOTES



PROPERTY COMPARISON

YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

Property	RTP 2000 HC A	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
Tensile Strength (MPa)	46	52	43	55	41	50	51
Tensile Modulus (MPa)	1310	2200	1450	2500	1450	2200	2150
Tensile Elongation(%)	140%	65%	55%	15%	95%	30%	25%
Flex Strength (MPa)	57	86	69	103	62	88	76
Notched Impact (J/m)	800	640	640	640	640	750	320
HDT @ 1.8 MPa (°C)	78	96	82	99	80	105	85
Shrinkage (%)	0.5 - 0.7	0.5-0.8	0.5-0.7	0.5-0.8	0.5-0.7	0.7-1.0	1.2-1.4
Specific Gravity	1.17	1.14	1.27	1.20	1.27	1.29	1.35
UL 94	HB	HB	V-0 / 5VA	V-0 / 5VA	V-0 / 5VA	V-0 / 5VA	V-0 / 5VA



YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

CASE STUDY

Market: Electronic Medical Device

Application: Housing – Hard Surface

Problem: Experiencing field failures and all commercially available housing materials were failing chemical testing

Solution: RTP 2000 HC A FR

Benefit: Provided required cleaner resistance, utilizing the existing tooling



ADDITIONAL INFORMATION

DETAILED TECHNICAL INFORMATION IS AVAILABLE

- Technical Brief – at the back table
- <http://www.rtpcompany.com/rtp-company-develops-plastic-technology-that-resists-chemical-attack-from-hospital-disinfectants/>
- Data Sheets – www.rtpcompany.com
- Ask someone here for more information





SUMMARY

NEW HOSPITAL DISINFECTANT RESISTANT ALLOY FROM RTP COMPANY

RTP 2000 HC A Series – a polyester alloy

- Greatly improved resistance to hospital disinfectants
- Available in UL94 V-0/5VA grade
- Physical properties well suited for housings
- Dimensional accuracy and stability
- Similar shrink to PC/ABS
 - Can uses existing tooling: (PC/ABS, PC/PBT, ABS, PC, PC/ASA)
- Fully colorable

Available for immediate sampling/testing globally



Healthcare Team

Plastic Technologies
For Safe & Effective Medical Devices



STRUCTURAL • ELASTOMERS • WEAR • COLOR
CONDUCTIVE • FLAME RETARDANT • FILM/SHEET




Data Slides

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Cidex Plus - Glutaraldehyde

YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

Property	RTP 2000 HC	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
Tensile Strength (psi)	6420	Fail	6713	Fail	5566	7438	7245
Δ Strength	-7%	-100%	+10%	-100%	-2%	+1%	+0%
Tensile Modulus (psi *10 ⁶)	0.21	Fail	0.25	Fail	0.19	0.32	0.31
Δ Tensile Modulus	+0%	-100%	+9%	-100%	-10%	+0%	+0%
Tensile Elongation (%)	118.5% Ductile	Fail	109.1% Ductile	Fail	87.3% Ductile	18.3% Ductile	35.5% Ductile

- Glutaraldehyde 3.4%



T-Spray II - Alkylamine

YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

Property	RTP 2000 HC	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
Tensile Strength (psi)	6718	7505	6172	5124	5671	7272	7055
Δ Strength	-2%	+1%	+1%	-37%	+0%	-1%	-2%
Tensile Modulus (psi *10 ⁶)	0.21	0.33	0.25	0.37	0.20	0.33	0.30
Δ Tensile Modulus	+0%	+3%	+9%	+3%	-5%	+3%	-3%
Tensile Elongation (%)	128.1% Ductile	18.3% Ductile	32.5% Ductile	3.1% Brittle	82.9% Ductile	10.0% Ductile	23.0% Ductile

- Alkyl dimethyl benzyl ammonium chloride (C12 - C16) 4.339%
- Octyl decyl dimethyl ammonium chloride 3.255%
- Dioctyl dimethyl ammonium chloride 1.628%
- Didecyl dimethyl ammonium chloride 1.628%



Incidin Plus – Glucoprotamin

YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

Property	RTP 2000 HC	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
Tensile Strength (psi)	5750	Fail	4436	Fail	5267	3792	5426
Δ Strength	-16%	-100%	-27%	-100%	-7%	-49%	-25%
Tensile Modulus (psi *10 ⁶)	0.22	Fail	0.22	Fail	0.20	0.33	0.30
Δ Tensile Modulus	+5%	-100%	-4%	-100%	-5%	+3%	-3%
Tensile Elongation (%)	10.6% Ductile	Fail	2.1% Brittle	Fail	15.1% Ductile	2.4% Brittle	4.2% Brittle

- Glucoprotamin 25-25%
- 2-(2-butylethoxy) ethanol (Butyldiglycol) 10-20%
- 2-Phenoxyethanol 10-20%
- Fatty alcohol ethoxylate 1-5%



Birex - Phenol

YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

Property	RTP 2000 HC	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
Tensile Strength (psi)	6585	7530	6620	8151	5522	7440	7234
Δ Strength	-4%	+1%	+9%	+1%	-3%	+1%	+0%
Tensile Modulus (psi *10 ⁶)	0.21	0.33	0.25	0.39	0.20	0.33	0.31
Δ Tensile Modulus	+0%	+3%	+9%	+8%	-5%	+3%	+0%
Tensile Elongation (%)	123.0% Ductile	49.8% Ductile	105.5% Ductile	13.9% Ductile	88.0% Ductile	41.1% Ductile	26.7% Ductile

- p-tertiary amyphenol 5-10%
- #2 phenylphenol 5-10%
- Phosphoric acid 15%
- Isopropanol 7.5%
- Dodecylbenzene sulfonic acid <5



Sani-Cloth AF3 - Quaternary Compound

YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

Property	RTP 2000 HC	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
Tensile Strength (psi)	5617	Fail	4011	Fail	4331	Fail	6860
Δ Strength	-18%	-100%	-34%	-100%	-24%	-100%	-5%
Tensile Modulus (psi *10 ⁶)	0.21	Fail	0.21	Fail	0.20	Fail	0.32
Δ Tensile Modulus	+0%	-100%	-9%	-100%	-5%	-100%	+3%
Tensile Elongation (%)	6.3% Brittle	Fail	2.8% Brittle	Fail	3.7% Brittle	Fail	7.7% Brittle

- Dipropylene glycol n-propyl ether 2.5-10%
- N-alkyl (60% C14, 30% C16, 5% C12, 5% C18) dimethyl benzyl ammonium chloride 0.1-1%
- N-alkyl (68% C12, 32% C14) dimethyl ethylbenzyl ammonium chloride 0.1-1%



Sani-Cloth Active – Quaternary Compound

YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

Property	RTP 2000 HC	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
Tensile Strength (psi)	6443	7042	5752	4223	5566	7369	7038
Δ Strength	-6%	-6%	-6%	-48%	-2%	+0%	-3%
Tensile Modulus (psi *10 ⁶)	0.24	0.34	0.23	0.32	0.20	0.32	0.29
Δ Tensile Modulus	+14%	+6%	+0%	-11%	-5%	+0%	-6%
Tensile Elongation (%)	76.8% Ductile	4.6% Brittle	4.3% Brittle	2.6% Brittle	87.2% Ductile	22.6% Ductile	7.9% Brittle

– Quaternary compounds



Sani-Cloth Bleach – Chlorine Releasing

YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

Property	RTP 2000 HC	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
Tensile Strength (psi)	6534	7620	5988	8668	5537	7509	7151
Δ Strength	-5%	+2%	-2%	+7%	-2%	+2%	-1%
Tensile Modulus (psi *10 ⁶)	0.22	0.34	0.24	0.40	0.20	0.34	0.31
Δ Tensile Modulus	+5%	+6%	+4%	+11%	+5%	+6%	+0%
Tensile Elongation (%)	120.4% Ductile	47.3% Ductile	93.7% Ductile	11.9% Ductile	89.6% Ductile	35.1% Ductile	22.7% Ductile

– Trisodium phosphate dodecahydrate 1-2.5%
– Sodium hypochlorite < 1%



CaviCide 1 - Alcohol

YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

Property	RTP 2000 HC	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
Tensile Strength (psi)	5672	Fail	5701	Fail	5668	Fail	7258
Δ Strength	-18%	-100%	-7%	-100%	+0%	-100%	+0%
Tensile Modulus (psi *10 ⁶)	0.23	Fail	0.23	Fail	0.20	Fail	0.31
Δ Tensile Modulus	+10%	-100%	+0%	-100%	+5%	-100%	+0%
Tensile Elongation (%)	82.9% Ductile	Fail	13.2% Ductile	Fail	83.5% Ductile	Fail	27.3% Ductile

- Isopropanol 15%
- Ethanol 7.5%
- Ethylene glycol monobutyl ether (2-butoxyethanol) 1-5%
- Didecyldimethyl ammonium chloride 0.76%



Super Sani-Cloth - Alcohol

YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

Property	RTP 2000 HC	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
Tensile Strength (psi)	6371	7671	6109	8739	5677	7598	7463
Δ Strength	-7%	+3%	+0%	+8%	+0%	+3%	+3%
Tensile Modulus (psi *10 ⁶)	0.21	0.35	0.24	0.40	0.20	0.33	0.32
Δ Tensile Modulus	+0%	+9%	+4%	+11%	-5%	+3%	+3%
Tensile Elongation (%)	114.5% Ductile	42.8% Ductile	58.8% Ductile	6.3% Brittle	82.3% Ductile	56.4% Ductile	28.4% Ductile

- Isopropanol 30-60%
- Benzyl-C12-18-alkyldimethyl ammonium chloride 0.1-1%
- Quaternary ammonium compounds, C12-18-alkyl [(ethylphenyl) methyl] dimethyl, chloride 0.1-1%



Sani-Cloth Plus - Alcohol

YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

Property	RTP 2000 HC	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
Tensile Strength (psi)	5831	Fail	5946	Fail	5661	Fail	7144
Δ Strength	-15%	-100%	-3%	-100%	+0%	-100%	-1%
Tensile Modulus (psi *10 ⁶)	0.22	Fail	0.24	Fail	0.20	Fail	0.31
Δ Tensile Modulus	+5%	-100%	+4%	-100%	-5%	-100%	+0%
Tensile Elongation (%)	46.6% Ductile	Fail	19.8% Ductile	Fail	81.1% Ductile	Fail	21.2% Ductile

- Isopropanol 10-20%
- Ethanol, 2-butoxy- 1-4%
- Benzyl-C12-18-alkyldimethyl ammonium chloride < 0.125%
- Quaternary ammonium compounds, C12-18-alkyl [(ethylphenyl) methyl] dimethyl, chloride < 0.125%



Incides N - Alcohol

YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

Property	RTP 2000 HC	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
Tensile Strength (psi)	6164	7593	5212	6199	5634	7377	7097
Δ Strength	-10%	+2%	-15%	-23%	-1%	+0%	-2%
Tensile Modulus (psi *10 ⁶)	0.23	0.34	0.23	0.37	0.20	0.32	0.30
Δ Tensile Modulus	+10%	+6%	+0%	+3%	-5%	+0%	-3%
Tensile Elongation (%)	105.3% Ductile	37.4% Ductile	3.91% Brittle	3.4% Brittle	68.7% Ductile	20.8% Ductile	20.7% Ductile

- Propan-2-ol 25-35%
- n-Propanol 25-35%



Incidin Pro - Alcohol

YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS

Property	RTP 2000 HC	PC/ABS	RTP 2000 HC FR	FR PC/ABS	RTP 2000 HC FR A	FR PC/PBT (High PC)	FR PC/PBT (High PBT)
Tensile Strength (psi)	5835	Fail	5621	Fail	5628	Fail	7003
Δ Strength	-15%	-100%	-8%	-100%	-1%	-100%	-3%
Tensile Modulus (psi *10 ⁶)	0.23	Fail	0.22	Fail	0.20	Fail	0.30
Δ Tensile Modulus	+10%	-100%	-4%	-100%	-5%	-100%	-3%
Tensile Elongation (%)	14.9% Ductile	Fail	3.8% Brittle	Fail	64.6% Ductile	Fail	17.1% Ductile

- 2-phenoxyethanol 10-20%
- N-(3-aminopropyl)-N-dodecylpropane-1,3-diamine 5-10%
- Benzalkonium chloride 5-10%
- Ethanolamine 1-2.5%
- d-glucopyranose, oligomeric, decyl octyl glycosides 1-2.5%
- Alkylpolyglycosides 1-2.5%



By JESSICA FIRGER / CBS NEWS / March 26, 2014, 5:39 PM

In U.S., hospital-acquired infections run rampant

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Each year, in the United States, thousands of patients seek medical care at both inpatient and outpatient facilities, but emerge from routine, urgent or surgical care with an additional -- and sometime untreatable -- life-threatening illness. On an average day, 1 in 25 patients has at least one infection contracted from a hospital visit, according to the Centers for Disease Control and Prevention.



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One in 20 patients will contract a serious hospital infection

By Rita Rubin, Special for USA TODAY Updated 9/20/2011 3:06 PM

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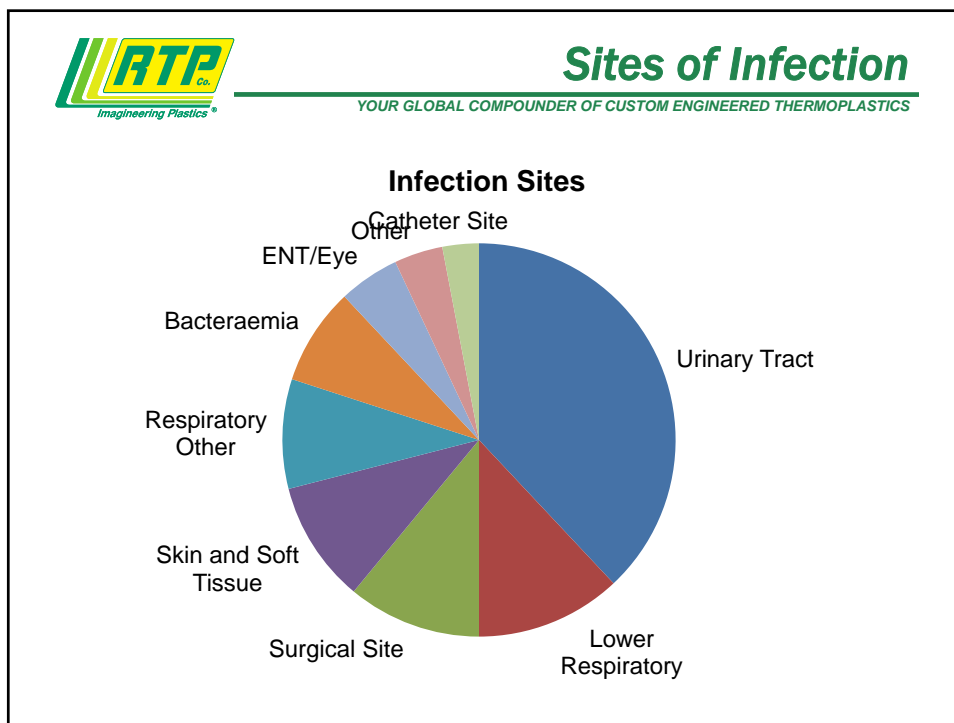
At a time when most new moms are bonding with their babies, Cheri Stout-Robinson was hospitalized for treatment of flesh-eating bacteria.



Her C-section wound had become infected with **Group A strep**, a bacterium often found in the throat and on the skin that usually causes strep throat or impetigo, at worst. In rare cases, it can invade the blood, muscle or lungs and cause severe disease such as necrotizing fasciitis, the so-called flesh-eating bacteria.

Although the hospital disagrees, she is certain that someone involved in her care gave her the bug. Upon discharge, she says, her incision was painful and oozing;

Mark Zimmerman, for USA TODAY



- **Hospital Management - budgets**

- Doctor & Nursing Staff
- Central Sterilization
- Food Service
- Pharmacist
- Clinical Microbiology Lab
- Maintenance – plumbing, heating, water
- House Keeping – laundry, waste disposable and cleaning



- Meet criteria for killing organisms
- Have a detergent effect
- Act independently of the number of bacteria present, the degree of hardness of the water, or presence of soap and proteins that inhibit some disinfectants.
- Easy to use
- Non-volatile
- Not harmful to equipment, staff or patients
- Free of unpleasant smells
- Effective within a relatively short time.



TARGETED AREAS FOR

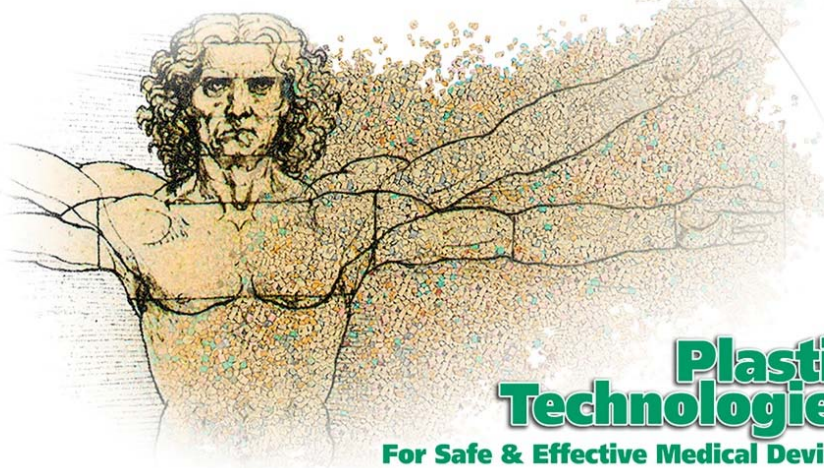
MEDICAL DEVICE COLOR CREATION



Increased frequency of cleaning/disinfection of all hard surfaces.
Wide range of cleaning techniques that vary by hospital.
Wide range of disinfectants used that vary by hospital.
Use of antimicrobial plastics.



Healthcare Team



Plastic Technologies

For Safe & Effective Medical Devices