

TECHNICAL MANUAL

Kartell



H Hydrogenium



N Nitrogenum



C Carbonium



O Oxygenum



P Phosphorum



S Sulphur



Mg Magnesium



Ca Calcium



Na Natrium



K Kalium



Sr Strontium



Ba Barium



Fe Ferrum



Zn Zincum



Cu Cuprum



Pb Plumbum



Ag Argentum



Au Aurum



Pt Platinum



Hg Hydrargirum

ABBREVIAZIONI, TEMPERATURE E RESISTENZE CHIMICHE DELLE MATERIE PLASTICHE

La tabella seguente elenca le abbreviazioni delle materie plastiche più comunemente usate per la fabbricazione dei prodotti da laboratorio.

Le temperature tra parentesi rappresentano i limiti tollerati solo per brevi periodi di tempo.

ABBREVIATIONS, TEMPERATURE AND CHEMICAL RESISTANCE OF PLASTICS

The table below lists commonly used abbreviations for plastics. This list covers plastics commonly employed in the manufacture of plastic laboratory ware.

Temperatures appearing in parentheses: limits tolerated for intervals only.

ABREVIATIONS, TEMPERATURES ET RESISTANCES CHIMIQUES DES MATIERES PLASTIQUES

Le tableau suivant comprend les abréviations plus communes des matières plastiques dans le domaine de la production des articles pour laboratoire.

Les températures entre parenthèses représentent les limites des résistances pendant périodes de temps brefs.

Abbreviazioni DIN - Abbrev. Abréviations	Denominazione chimica Chemical designation Dénomination chimique	Campo di temperature comunemente tollerato Tolerated temperature range in normal use Résistance températures pour utilisation normale	
		da / from / de	a / to / à
ABS	Acilobutadiene-stirene cop. Acrylobutadiene-styrene copolymer Copolymère Acrylonitrile Butadiène Styrene	- 40°C	+ 85 (100)°C
HDPE	PE Alta Densità High-density PE PE Haute Densité	- 50°C	+ 80 (120)°C
LDPE	PE Bassa Densità Low-density PE PE Basse Densité	- 50°C	+ 75 (90)°C
PA	Poliamide (PA6) Polyamide (PA6) Polyamide (PA6)	- 30°C	+ 80 (140)°C
PC	Policarbonato Polycarbonate Polycarbonate	-100 °C	+135 (140)°C
PE	Polietilene (HDPE/LDPE) PE (cf. HDPE/LDPE) PE (HDPE/LDPE)	- 40°C	+ 80 (90)°C
PMP (Tpx®)	Polimetilpentene Polymethylpentene Polyméthylpentène	0°C	+120 (180)°C
PMMA	Polimetilmetacrilato Polymethylmethacrylate Polyméthacrylate	- 40°C	+ 85 (90)°C
POM	Poliossimetilene Polyoxymethylene Polyoxyméthylène	- 40°C	+ 90 (110)°C
PP	Polipropilene Polypropylene Polypropylène	- 10°C	+120 (140)°C
PS	Polistirene Polystyrene Pstyrene	- 10°C	+ 70 (80)°C
SAN	Stirene-Acilonitrile Styrene-acrylonitrile Styrene-acrylonitrile	- 20°C	+ 85 (95)°C
SI	Gomma Silicone Silicone rubber Gomme Silicone	- 50°C	+180 (250)°C
PVDF	Fluoruro di Polivinilidene Polyvinylidenefluoride Polyvinylidénfluoride	- 40°C	+105 (150)°C
PTFE	Politetrafluoroetilene Polytetrafluoroethylene Polytétrafluoréthylène	- 200°C	+ 260°C
E-CTFE	Etilene-Clorotrifluoroetilene Ethylene-Chlorotrifluoroethylene Ethylène-Chlorotrifluoréthylène	- 76°C	+150 (170)°C
ETFE	Etilene-Tetrafluoroetilene Ethylene-tetrafluoroethylene Ethylène-Tetrafluoréthylène	- 100°C	+ 150 (180)°C
PFA	Perfluoroalcolossido Perfluoroalkoxy Perfluoroalkoxy	- 200°C	+ 260°C
FEP	Tetrafluoroetilene-Perfluoropropilene Tetrafluoroethylene-perfluoropropylene Tetrafluoréthylène-Perfluorpropylène	- 200°C	+ 205°C
PVC	Cloruro di Polivinile Polyvinylchloride Polyvinylchloride	- 20°C	+ 80°C
PUR	Poliuretano Polyurethane Polyuréthane	-40°C	+90°C

**RESISTENZE CHIMICHE DELLE
MATERIE PLASTICHE PER
TIPOLOGIE DI PRODOTTI CHIMICI**
**LIST OF PLASTICS AND THEIR
CHEMICAL RESISTANCES TO
SUBSTANCE GROUPS**
**RESISTANCES CHIMIQUES DES
MATIERES PLASTIQUES PAR
TYPOLOGIES DES PRODUITS
CHIMIQUES**

Tipologie di prodotti chimici Substance Group, at +20°C Typologies des substances PFA chimiques	LDPE	HDPE	PP	PMP Tpx®	PTFE FEP PFA	ECTFE ETFE	PA	PA
Alcoli alifatici Alcohols aliphatic Alcools aliphatiques	●	●	●	●	●	●	●	●
Aldeidi Aldehydes Aldehydes	●	●	●	●	●	●	●	●
Alkali Alkalis Alkalis	●	●	●	●	●	●	●	●
Esteri Esters Esters	●	●	●	●	●	●	●	●
Idrocarburi alifatici, Hydrocarbons, aliphatic Hydrocarbures aliphatiques	●	●	●	●	●	●	●	●
Idrocarburi aromatici Hydrocarbons, aromatic Hydrocarbures aromatiques	●	●	●	●	●	●	●	●
Idrocarburi alogenati Hydrocarbons, halogenated Hydrocarbures halogenes	●	●	●	●	●	●	●	●
Ketoni Ketones Ketons	●	●	●	●	●	●	●	●
Ossidanti (acidi) forti Oxidants (oxidizing acids), strong Oxydants (Acides oxydants) forts	●	●	●	●	●	●	●	●
Acidi deboli diluiti Acids, diluted, weak Acides dilués, taibles	●	●	●	●	●	●	●	●
Acidi forti concentrati Acids, conc., strong Acides concentrés, forts	●	●	●	●	●	●	●	●

- Resistenza elevata.
High resistance.
Résistance excellente.
- Resistenza buona; nessun o minimo attacco per un'esposizione di oltre 30 giorni.
Good resistance; no, or only minor, damage resulting from exposures of more than 30 days.
Bonne résistance; aucun ou attaque minimale après 30 jours d'exposition.
- Resistenza scarsa; un'esposizione prolungata può causare danni ad alcuni tipi di plastica.
Marginal resistance; for some types of plastics, extended exposure can result in damage (hairline cracks, loss of mechanical strength, discolouration, etc.).
Résistance insuffisante; l'exposition prolongée peut provoquer des dégâts à certains types de plastique.
- Resistenza nulla; il contatto può causare deformazioni o forte degrado del materiale.
Non resistant; exposure can lead to deformation or destruction.
Résistance nulle; le contact peut provoquer des déformations ou graves dommages à la matière.

**PLASTICHE "PULITE" ED
ECOLOGICHE**

L'innovazione tecnologica ed il progressivo adeguamento ai più elevati standard di eco-compatibilità, ha reso i materiali plastici primari utilizzati da Kartell Labware all'avanguardia. Infatti i materiali plastici utilizzati godono di numerose compatibilità; di seguito ricordiamo alcune delle conformità possedute, in relazione alle loro caratteristiche.

- Idoneità al contatto con alimenti (Direttiva Nazionale ed Europea CE 1935/2004)
- Idoneità al contatto con alimenti (US FDA CFR 170/199)
- PTFE: idoneità al contatto con alimenti (FDA CFR TITLE 177.1550)
- Assenza o limitazione secondo le Direttive Internazionali di: metalli pesanti, bifenili e ftalati
- Idoneità alle Direttive RoHS
- Idoneità alle Direttive relative alla BSE e/o TSE
- Idoneità alle Direttive Atex

Kartell Labware promuove la ricerca nel campo dei materiali plastici, attraverso il contatto diretto con i più affermati Produttori Mondiali e la ricerca di materiali innovativi. Ricordiamo che le plastiche Kartell Labware, se non chimicamente contaminate, sono totalmente riciclabili.

**"CLEAN" AND ECOLOGICAL
PLASTICS**

Thanks to technological innovation and progressive adaptation to the most elevated eco-compatibility standards, Kartell plastic raw material are of excellent quality. In fact the used plastic materials grant wide compatibilities; hereunder you can find some standards conformities related to their characteristics.

- Foodstuff contact suitable (National and European Directive CE 1935/2004)
- Foodstuff contact suitable (US FDA CFR 170/199)
- PTFE: foodstuff contact suitable (FDA CFR TITLE 177.1550)
- Absence or limitation according to the International Directives of: heavy metals, biphenyls and phthalates
- RoHS Directives Conformity
- BSE and/or TSE Directives Conformity
- Atex Directives Conformity

Kartell Labware promotes the research in the field of the plastic materials, through the direct contact with the most important worldwide raw materials manufacturers and the research of innovative materials. We would like to underline that Kartell Labware materials, if not chemically contaminated, are totally recyclable

**PLASTIQUE "PROPRE" ET
ECOLOGIQUE**

L'innovation technologique et la progressive adaptation aux plus élevés standards d'éco-compatibilité, a rendu les matières premières plastiques utilisées par Kartell Labware à l'avant-garde. En effet les matières plastiques utilisées garantissent de nombreuses compatibilités; ci-dessous quelques conformités aux normes internationales liées à leurs caractéristiques.

- Conformité au contact alimentaire (Directives Nationales et Européennes CE 1935/2004)
- Conformité au contact alimentaire (US FDA CFR 170/199)
- PTFE: adapté aux aliments (FDA CFR TITLE 177.1550)
- Absence ou limitation selon les normes internationales de: métaux lourds, biphenyles and phthalates
- Conformité aux Directives RoHS
- Conformité aux Directives BSE et/ou TSE -
- Conformités aux Directives Atex

Kartell Labware promeut la recherche dans le champ des matières plastiques, à travers le contacte directe avec les Producteurs plus affirmés dans le monde et la recherche de matières nouvelles. Nous voudrions souligner que les matières plastiques Kartell, non chimiquement contaminées, sont totalement recyclables

RÉSISTANCE CHIMIQUE

Les données pour la résistance chimique des sels s'appliquent également à leurs solutés.

	PS		SAN		PMMA		PC		PVC		POM		PE-LD		PE-HD	
	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C
Acetaldehyde	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Acetic acid 50%	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Acetic acid (glacial) 100%	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Acetic anhydride	●	●					●	●	●	●	●	●	●	●	●	●
Acetone	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Acetonitrile	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●
Acetophenone	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●
Acetylacetone	●	●	●	●	●	●	●	●	●	●	●		●		●	●
Acetylchloride	●	●	●	●	●	●	●	●	●	●			●		●	
Acrylic acid	●	●	●	●	●	●	●	●	●	●	●	●	●		●	
Acrylonitrile	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●
Adipic acid	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Allyl alcohol	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Aluminium chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Aluminium hydroxide	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Amino acids	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ammonium chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ammonium fluoride	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ammonium hydroxide 30%	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ammonium sulphate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
n-Amyl acetate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
n-Amyl alcohol (Pentanol)	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●
Amyl chloride	●	●	●	●		●		●	●	●	●	●	●	●	●	●
Aniline	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Aqua regia	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Barium chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Benzaldehyde	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Benzene (Benzol)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Benzine (Gasoline)	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●
Benzoyl chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Benzyl alcohol	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Benzyl chloride	●	●					●	●	●	●	●	●	●	●	●	●
Benzylamine	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●
Boric acid, 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bromide	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bromobenzene	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bromoform	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Bromonaphthalene	●	●	●	●												
Butanediol	●	●	●	●							●	●	●	●	●	●
1-Butanol (Butyl alcohol)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
n-Butyl acetate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Butylamine	●	●	●	●							●	●				
Butyl methyl ether	●	●	●	●			●	●	●	●	●	●	●	●	●	●
Butyric acid	●	●	●	●			●	●	●	●			●	●	●	●
Calcium carbonate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Calcium chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Calcium hydroxide	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Calcium hypochlorite	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Carbon disulphide	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Carbon tetrachloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Chloro naphthalene											●	●				
Chloroacetaldehyd	●	●	●	●	●	●										
Chloroacetic acid	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Chloroacetone	●	●	●	●												
Chlorobenzene	●	●	●	●	●	●	●	●	●	●			●	●	●	●
Chlorobutano	●	●	●	●	●	●										
Chloroform	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Chlorosulfonic acid											●	●				
Chromic acid 10%	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Chromic acid 50%	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Chromosulphuric acid	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Copper sulfate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cresol	●	●					●	●	●	●			●	●	●	●
Cumene (Isopropyl benzene)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cyclohexane	●	●					●	●	●	●	●	●			●	●
Cyclohexanone	●	●					●	●	●	●			●	●	●	●
Cyclopentane	●	●					●	●	●	●			●	●	●	●
Decane							●			●					●	●
Decanol	●		●				●			●					●	
Dibenzyl ether	●	●	●	●	●	●				●					●	

- **Resistenza chimica: eccellente.**
Chemical resistance: excellent.
Résistance chimique: excellent.

- Resistenza chimica: da buona a limitata.
Chemical resistance: between good and limited.
Résistance chimique: entre bonne et suffisant.

- **Resistenza chimica: insufficiente.**
Chemical resistance: poor.
Résistance chimique: pauvre.

[illegible]

RÉSISTANCE CHIMIQUE

Les données pour la résistance chimique des sels s'appliquent également à leurs solutés.

	PS		SAN		PMMA		PC		PVC		POM		PE-LD		PE-HD	
	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C
Dibromoethane																
Dibutyl phthalate	●	●	●	■	●	■	●	●	●	●	●	●	●	●	●	●
Dichlorobenzene	●	●	●	■	●	■	●	●	●	●	●	●	●	●	●	●
Dichloromethane (Methylene chloride)	●	●					●	●	●	●			●	●	●	●
Dichloroacetic acid	●	●					●	●	●	●			●	●	●	●
Dichloroethane																
Diesel oil	●	●	●	■	●	■	●	●	●	●	●	●	●	●	●	●
Diethanolamine	●	●	●	■	●	■	●	●							●	
Diethyl ether	●	●	●	■	●	■	●	●	●	●	●	●	●	●	●	●
Diethylamine	●	●					●	●	●	●			●	●	●	●
Diethylbenzene	●	●					●	●	●	●			●	●	●	●
Diethylene glycol	●	●	●	●	●	■	●	●	●	●	●	●	●	●	●	●
Dimethylaniline	●	●	●	■	●	■	●	●								
Dimethylformamide (DMF)	●	●	●		●	■	●	■	●	●	●	●	●	●	●	●
Dimethyl sulfoxide (DMSO)	●	●	●	■	●	■	●	●	●	●			●	●	●	●
1,4 Dioxane	●	●	●	■	●	■	●	●	●	●	●	●	●	●	●	●
Diphenyl ether	●	●	●	■	●	■					●					
Ethanol (Ethyl alcohol)	●	●	●	■	●	■	●	●	●	●	●	●	●	●	●	●
Ethanolamine																
Ethyl acetate	●	●					●	●	●	●			●	●	●	●
Ethyl methyl ketone	●	●	●	■	●	■	●	●	●	●	●	●	●	●	●	●
Ethylbenzene	●	●	●	■	●	■	●	●	●	●			●	●	●	●
Ethylene chloride	●	●	●	■	●	■	●	●	●	●	●	●	●	●	●	●
Ethylene glycol (Glycol)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ethylene oxide	●	●	●	■	●	■	●	■	●	●	●	●	●	●	●	●
Fluoroacetic acid	●	●	●	■	●	■	●	●	●	●	●	●				
Formaldehyde 40%	●	●	●	●	●	■	●	●	●	●			●	●	●	●
Formamide											●	●	●	●	●	●
Formic acid 98-100%	●	●	●	●	●	■	●	●	●	●	●	●	●	●	●	●
Glycerol	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Glycolic acid 70%													●	●	●	●
Heating oil	●	●	●	■	●	■	●	●	●	●	●	●	●	●	●	●
Heptane	●	●			●	■	●	●	●	●			●	●	●	●
Hexane	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hexanoic acid																
Hexanol													●	●	●	●
Hydriodic acid													●	●	●	●
Hydrobromic acid	●	●					●	●			●	●	●	●	●	●
Hydrochloric acid 10%	●	●	●	■	●	■	●	■	●	●	●	●	●	●	●	●
Hydrochloric acid 20%	●	●	●	■	●	■	●	■	●	●			●	●	●	●
Hydrochloric acid 37%	●	●	●	■	●	■	●	■	●	●	●	●	●	●	●	●
Hydrofluoric acid 40%	●	●	●	●	●	■	●	■	●	●	●	●	●	●	●	●
Hydrofluoric acid 70%	●	●	●	■	●	■	●	■	●	●	●	●	●	■	●	●
Hydrogen peroxide 35%	●	●	●	●	●	■	●	●	●	●	●	●	●	●	●	●
Iodine / potassium iodine solution	●		●	■	●	■	●	■	●	●	●	●	●	●	●	●
Iso octane	●	●	●	■			●									
Isoamyl alcohol											●	●	●	●	●	●
Isobutanol (Isobutyl alcohol)	●	●	●	■	●	■	●	●	●	●	●	●	●	●	●	●
Isopropanol (2-Propanol)	●	●	●	■	●	■	●	●	●	●	●	●	●	●	●	●
Isopropyl ether	●	●					●	■	●	●			●	■	●	■
Lactic acid	●	●	●	●	●	■	●	●	●	●	●	●	●	●	●	●
Mercury	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Mercury chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Methanol	●	●	●	■	●	■	●	■	●	●	●	●	●	●	●	●
Methoxybenzene	●	●	●	■	●	■	●	■			●					
Methyl butyl ether	●	●	●	■	●	■	●	■	●	●	●	●	●	■	●	■
Methyl formate	●	●	●		●	■	●	■			●					
Methyl propyl ketone	●	●	●	■	●	■	●	■	●	●	●	●	●	●	●	●
Methylene chloride (Dichloro methane)	●	●	●	■	●	■	●	■	●	●	●	●	●	●	●	●
Minerale oil (Engine oil)	●		●		●	■	●		●	●	●	●	●	●	●	●
Monochloroacetic acid	●	●		■	●	■	●	■	●	●	●	●	●	●	●	●
Nitric acid 10%	●	●	●	●	●	■	●	■	●	●	●	●	●	●	●	●
Nitric acid 30%	●	●	●	■	●	■	●	■	●	●	●	●	●	●	●	●
Nitric acid 70%	●	●	●	■	●	■	●	■	●	●	●	●	●	●	●	●
Nitrobenzene	●	●	●	■	●	■	●	■	●	●	●	●	●	●	●	●
Oleic acid	●	●	●	■	●	■					●	●	●	■	●	■
Oxalic acid	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ozone	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
n-Pentane																
Peracetic acid							●	■			●	●				

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[illegible]

RÉSISTANCE CHIMIQUE

Les données pour la résistance chimique des sels s'appliquent également à leurs solutés.

	PS		SAN		PMMA		PC		PVC		POM		PE-LD		PE-HD		
	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C	20° C	50° C	
Perchloric acid	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Perchloroethylene	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Petroleum	●	●			●				●		●	●	●	●	●	●	●
Petroleum ether	●	●			●				●	●	●	●					
Phenol	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Phenylethanol																●	
Phenylhydrazine																●	
Phosphoric acid 85%	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Piperidine																●	
Potassium chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Potassium dichromate																	
Potassium hydroxide	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Potassium permanganate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Propanediol (Propylene glycol)	●	●	●	●					●	●	●	●	●	●	●	●	●
Propanol	●		●	●	●				●	●	●	●	●	●	●	●	●
Propionic acid	●	●							●	●	●	●	●	●	●	●	●
Pyridine	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Salicyl acid	●	●	●	●					●	●	●	●	●	●	●	●	●
Salicylaldehyde	●	●	●	●					●	●	●	●	●	●	●	●	●
Silver acetate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Silver nitrate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sodium acetate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sodium chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sodium dichromate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sodium fluoride	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sodium hydroxide	●	●	●	●					●	●	●	●	●	●	●	●	●
Sulphuric acid 60%	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Sulphuric acid 98%	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tartaric acid	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tetrachloroethylene																	
Tetrahydrofuran	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Tetramethylammonium hydroxide									●	●		●	●				
Toulene	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Trichloroacetic acid	●	●							●	●	●	●			●	●	●
Trichlorobenzene	●	●							●	●	●	●			●	●	●
Trichloroethane	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Trichloroethylene	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Trichlorotrifluoro ethane	●	●	●	●													
Triethanolamine	●	●	●	●													
Triethylene glycol	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Trifluoro ethane	●	●	●	●													
Trifluoroacetic acid (TFA)	●	●	●	●								●	●				
Tripropylene glycol	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Turpentine	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Urea	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Xylene	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Zinc chloride	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Zinc sulphate	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

- **Resistenza chimica: eccellente.**
Chemical resistance: excellent.
Résistance chimique: excellent.

- Resistenza chimica: da buona a limitata.
Chemical resistance: between good and limited.
Résistance chimique: entre bonne et suffisant.

- **Resistenza chimica: insufficiente.**
Chemical resistance: poor.
Résistance chimique: pauvre.

[illegible]

STERILIZZAZIONE DEI PRODOTTI IN PLASTICA DA LABORATORIO

Prima di sterilizzare qualsiasi articolo verificare che non contenga alcun residuo o tracce di contaminanti, poiché la loro presenza potrebbe danneggiare la plastica durante le operazioni di sterilizzazione o autoclavaggio.

Si raccomanda di togliere qualsiasi tappo, accessorio o coperchio dagli articoli in plastica prima di autoclavarli; i contenitori devono essere autoclavati separatamente dai propri tappi o coperchi di chiusura altrimenti si corre il rischio di causare deformazioni e danneggiamento del contenitore. Tutte le notizie tecniche riportate sono indicative e non implicano alcuna responsabilità da parte di Kartell.

Tutte le notizie relative alle resistenze delle materie plastiche alle alte temperature, alla sterilizzazione e ai trattamenti di lavaggio sono state formulate basandosi sui bollettini dei produttori di materie plastiche, sui dati pubblicati in letteratura e sull'esperienza acquisita nell'uso dei prodotti.

STERILISING PLASTIC LABORATORY WARE

Before sterilising any items of plastic laboratory ware, verify that no contamination or residues are present. Their presence could destroy plastics during sterilisation or autoclaving.

Observe the tolerated temperature ranges of plastic when autoclaving plastic laboratory ware. Remove any stoppers, fittings, or caps from plastic laboratory ware prior to autoclaving. Plastic vessels should be autoclaved separately from their closures and other fitting. Autoclaving vessels with their closures in place can lead to deformation and destruction of the vessels. All statements are advisory only, and imply no liability on the part of Kartell.

All statements relating to the resistances of plastic laboratory ware to high temperatures, chemicals, and to sterilisation and cleaning procedures have been cautiously formulated, based on statements of raw material manufacturers, on statements appearing in the literature, plus experience gained in actual practice.

STERILISATION DES PRODUITS EN PLASTIQUE POUR LABORATOIRE

Avant de stériliser un article, il faut vérifier qu'il ne contienne pas de résidus ou traces de contaminants, car leur présence pourrait abîmer le plastique pendant les opérations de stérilisation ou autoclavage.

Il est conseillé d'enlever tout, bouchon, accessoire ou couvercle des articles en plastique avant de les autoclaver; les Récipients doivent être autoclavés séparément des leurs bouchons ou couvercles pour éviter le risque de déformations ou graves dommages. Toutes les informations techniques mentionnées sont indicatives et n'impliquent aucune responsabilité de la part de Kartell.

Toutes les informations concernant les résistances des matières plastiques aux hautes températures à la stérilisation et aux traitements de lavage, ont été formulées sur la base des fiches des producteurs de matières plastiques, sur les données publiées en littérature et sur l'expérience acquise avec l'utilisation des produits.

		Sterilizzazione / Sterilization / Stérilisation				
Materia Prima Plastics Mat. première	Autoclavabilità* Autoclavable*	Gas (Oss. Etilene) Gas (Ethylene Oxide) Gas (Oxyde Ethylène)	Secco a +160° C Dry at 160° C À sec 160° C	Chimica (in Formal.) Chemical (in Formalin) Chimique (en Formal.)	Radiazioni gamma By Gamma Radiations Gamma	Microonde Microwaves Micro-onde
ABS	No / no / no	Si / yes / oui	No / no / no	Si / yes / oui	Si / yes / oui	No / no / no
HDPE	No / no / no	Si / yes / oui	No / no / no	Si / yes / oui	Si / yes / oui	Si / yes / oui
LDPE	No / no / no	Si / yes / oui	No / no / no	Si / yes / oui	Si / yes / oui	Si / yes / oui
PC	Si / yes / oui	Si / yes / oui	No / no / no	Si / yes / oui	Si / yes / oui	Si / yes / oui
PFA/FEP	Si / yes / oui	Si / yes / oui	Si / yes / oui	Si / yes / oui	No / no / no	Si / yes / oui
PMP (TPX)	Si / yes / oui	Si / yes / oui	No / no / no	Si / yes / oui	No / no / no	Si / yes / oui
PP	Si / yes / oui	Si / yes / oui	No / no / no	Si / yes / oui	Si / yes / oui	Si / yes / oui
PS	No / no / no	Si / yes / oui	No / no / no	Si / yes / oui	Si / yes / oui	No / no / no
PTFE	Si / yes / oui	Si / yes / oui	Si / yes / oui	Si / yes / oui	No / no / no	Si / yes / oui
ETFE/E-CTFE	Si / yes / oui	Si / yes / oui	Si / yes / oui	Si / yes / oui	No / no / no	Si / yes / oui
PVC	No / no / no	Si / yes / oui	No / no / no	Si / yes / oui	No / no / no	Si / yes / oui
POM	Si / yes / oui	Si / yes / oui	Si / yes / oui	Si / yes / oui	No / no / no	No / no / no

*Autoclavabile a +121° C per un periodo di 20 minuti / autoclavable at 121° C for 20 minutes / autoclavable à 121° C pendant 20 minutes

LAVAGGIO DEGLI ARTICOLI IN PLASTICA DA LABORATORIO

Tutte le poliolefine, quali LDPE, HDPE, PP e PMP (Tpx®), come pure le resine fluorurate PTFE, PFA, FEP, ETFE e E-CTFE hanno superfici bagnabili che sono molto resistenti sia alle alte temperature che agli attacchi chimici e quindi facili da lavare. Una leggera contaminazione può essere eliminata mediante lavaggio con detergenti neutri (pH 7). Contaminazioni più consistenti possono essere eliminate mediante l'uso di detergenti alcalini (pH fino a 12).

Si raccomanda di usare solo detergenti neutri (pH7) con articoli in Policarbonato (PC) o Polistirene (PS).

Gli articoli da laboratorio usati per analisi di tracce devono essere lavati con una soluzione di Acido Cloridrico (HCl) 1-N per un massimo di 6 ore e poi risciacquati con acqua distillata per impedire una contaminazione da cationi o anioni.

Nella pulizia degli articoli in plastica da laboratorio evitare sempre l'uso di polveri o spugne abrasive e non usare mai detergenti alcalini con oggetti di Policarbonato.

CLEANING PLASTIC LABORATORY WARE

All polyolefins, such as LDPE, HDPE, PP and PMP (Tpx®), as well as the fluorinated hydrocarbons PTFE, PFA, FEP, ETFE and E-CTFE, have wettable surfaces that are both highly resistant to high temperatures and chemical attack and easy to clean. Slight contamination can be removed using a chemically neutral (pH 7) cleaning agent. Heavy contamination can be removed using an alkaline (pH up to 12) cleaning agent.

Use only chemically neutral (pH7) cleaning agents on polycarbonate (PC) or Polystyrene (PS).

Laboratory ware used in trace analyses should be cleaned in a 1-N hydrochloric acid (HCl) solution for periods of not more than 6 hours and then rinsed in distilled water in order to preclude contamination by cations or anions.

Never use scouring powders or abrasive sponges when cleaning plastic laboratory ware. Use no alkaline cleaning agents on polycarbonate (PC) laboratory ware.

NETTOYAGE DES ARTICLES EN PLASTIQUE DE LABORATOIRE

Toutes les résines polyoléfiniques comme LDPE, HDPE, PP et PMP (Tpx®), at aussi les résines fluorées comme PTFE, PFA, FEP, ETFE et E-CTFE ont des surfaces à laver qui sont très résistantes soit aux hautes températures que aux attaques chimiques, donc très faciles à nettoyer. Une contamination légère peut être éliminée grace ou lavage avec détergents neutres (pH 7). Contaminations plus graves peuvent être éliminées avec l'utilisation de détergents alcalins (pH jusqu'à 12).

Avec des articles en Polycarbonate (PC) et Polystyrène (PS) il est conseillé d'utiliser seulement des détergents neutres (pH7).

Les articles de laboratoire utilisés pour analyses de traces doivent être lavés avec une solution d'acide chlorhydrique (HCl) 1-N pendant 6 heures max. et après rincés avec de l'eau distillée pour empêcher la contamination des cations et anions.

Pendant le nettoyage des produits de laboratoire en plastique il faut toujours éviter l'utilisation de poudres ou éponges abrasives et jamais laver les objets en Polycarbonate avec des détergents alcalins.