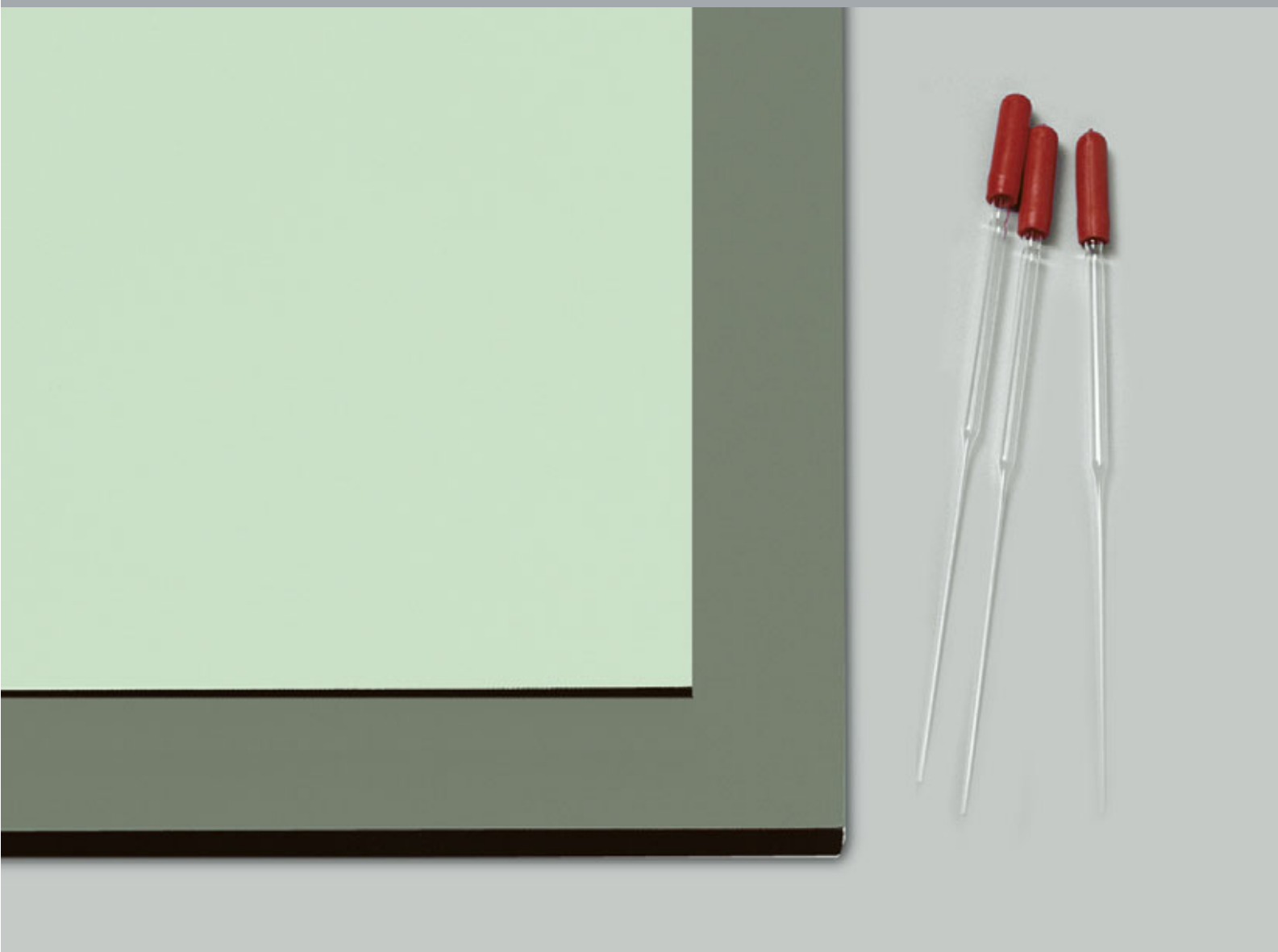
the max.

/TI 6

Properties and Cleaning of
MAX High-Pressure Laminates (HPL),
MAX Compact Laminates (HPL) and
MAX Melamine-Faced Chipboard.



MAX on top

Other publications in our Technical Information series:

TI 1:	Tender Recommendations
TI 2:	Working with MAX Postforming Laminates (out of print)
TI 3:	Working with MAX Compact Laminates and MAX Compactforming Elements
TI 4:	Cubicles Made of MAX Compact Laminates and MAX Compactforming Elements
TI 5:	Furnishing Objects with MAX Compact Laminates and MAX Compactforming Elements
TI 6:	Properties and Cleaning of MAX High-Pressure Laminates (HPL), MAX Compact Laminates (HPL), and MAX Melamine-Faced Chipboard
TI 7:	MAX EXTERIOR for Balconies and Railings
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TI 11:	Stair Railings and Filler Panels made of MAX Compact Laminates and MAX Compactforming Elements
TI 12:	MAX EXTERIOR, Facade and Wall Cladding
TI 14:	PU Safety Edges for Doors and Furniture Parts (out of print)
TI 16:	Tender Specifications for Cubicles and Shower Units made of MAX Compact Laminates
TI 17:	MAX EXTERIOR Bonded Panels (out of print)
TI 18:	MAX Alumax, MAX Aluphenol and MAX Alucompact

Please file this Technical Information brochure into section 1 of your MAX Information Folder.

* = changes from previous edition

Contents

MAX Laminates and The Environment

MAX Laminates
of all thicknesses are made from natural fibres, amounting to some 60% of their total weight, and together with synthetic resins are fused under high pressure and temperature, hardening irreversibly in the process. They are thermoset plastics - High Pressure Laminates conforming to European Standard ES 438. Our Laminates contain no organic halogens (chlorine, fluorine, bromine etc.) as are found in propellants or PVC. They contain neither asbestos nor wood preservatives such as fungicides or pesticides and are also free from sulphur, mercury and cadmium.

The Laminates are exceptionally abrasion resistant, perfect for use in conjunction with foodstuffs, and - thanks to their dense surface - they are hygienic and easy to clean. The waste produced in machining (sawing, milling, etc.) is non hazardous to health. Consequently, laminate waste may be burnt off in modern refuse incinerators without emitting environmentally harmful hydro-chloric acid, organic chlorines, or dioxins. At suitably high incineration temperatures, gas dwell times, and a sufficient supply of oxygen, the laminates break down into carbon dioxide, nitrogen, water and ashes. The resulting energy may be put to further use. The product deposits on municipal land fill areas and refuse dumps without problem. Please make sure to observe the national laws and regulations governing waste disposal.

* ON CERT
certifies the compliance of qualities with ON EN 438 all over the world.

MAX Melamine-Faced Chipboard (MFC)
is melamine-coated flat-pressed chipboard produced in accordance with Austrian/German Standards ÖNORM/DIN 68765, consisting of chipboard of quality group V20/E1 and resin-treated decorative paper. These dense, irreversibly hardened surface layers help prevent the emission of minute amounts of formaldehyde from the chipboard. MAX Melamine-Faced Chipboard is particularly suited for all types of carcase furniture in living and office areas. As far as the disposal of MFC waste is concerned, the same rules apply as for MAX Laminates.

On account of their composition, **MAX Furniture Boards** are highly suitable for use in living and open areas, especially in homes, medical environments and areas where hygiene is of utmost importance.
MAX Furniture Boards have had a proven record in these areas of application for decades.

Physical Properties

MAX High Pressure Laminates (HPL) and MAX Compact Laminates (HPL) according to ÖNORM/ES 438

Property tested according to ES 438.2	Unit of measure-ment	MAX High-Pressure Laminate		MAX Compact Laminate		MAX Compact Laminate, F-grade		MAX High-Pressure Laminate, F-grade		MAX Postforming Laminate	
		Nominal value [3]	Actual value	Nominal value [3]	Actual value	Nominal value [3]	Actual value	Nominal value [3]	Actual value	Nominal value [3]	Actual value
Type according to ES 438	–	S	–	CGS	–	CGF	–	F	–	P	–
Bulk density DIN 53479	g/cm³	–	1,4	–	1,4	–	1,4	–	1,4	–	1,4
Thickness (e.g.)	mm	[1,0]	1,0	[10]	10	[10]	10	[1,5]	1,5	[0,8]	0,8
Thickness tolerance	mm	± 0,1	±0,1	–	± 0,5	–-	± 0,5	± 0,15	± 0,15	± 0,1	± 0,1
Abrasion resistance	U	≥ 350	450	≥ 350	450	≥ 350	450	≥ 350	450	≥ 350	450
Impact resistance	N	≥ 20	30	–	–	–	–	≥ 20	25	≥ 20	25
Falling ball impact resistance	mm Ø	–	–	≤ 10	8	≤ 10	8	–	–	–	–
Scratch resistance	N	≥ 2	3,0	≥ 2	3,0	≥ 2	3,0	≥ 2	3,0	≥ 2	2,5
Flectional resistance	N/mm²	≥ 85	110	≥ 100	110	≥ 80	100	≥ 70	100	–	100
E-Modulus	N/mm²	–	–	10000	12000	9000	11000	–	–	–	–
Tensile strength	N/mm²	≥ 70	80	≥ 70	80	≥ 60	80	≥ 60	70	≥ 60	70
Susceptibility to cracking		4	5	4	5	4	5	4	5	4	5
Formability (radius)	mm	–	–	–	–	–	–	–	–	15	8 lengthwise
Resistance to blistering	s	–	–	–	–	–	–	–	–	≥ 10	20
Building material class according to DIN 4102	–	B2	B2	B2	B2	–	B1	–	B1	–	B2
Building material class according to ÖNORM B 3800	–	–	B2	–	B1	–	B1	–	B1	–	B2
Resistance to colour change in light	grade	≥ 6	6-8	≥ 6	6-8	≥ 6	6-8	≥ 6	6-8	≥ 6	6-8
Dimensional changes during climatic changes, measured at 20°C	l % q %	≤ 0,3 ≤ 0,5	0,15 0,3	≤ 0,15 ≤ 0,25	– 0,05	≤ 0,15 ≤ 0,25	0,05 0,1	≤ 0,25 ≤ 0,4	0,20 0,35	≤ 0,35 ≤ 0,6	0,10 0,25
Dimensional changes during climatic changes, measured at elevated temperatures	l % q %	< 0,5 < 1,0	0,25 0,60	≤ 0,3 ≤ 0,6	0,05 0,15	≤ 0,3 ≤ 0,6	0,1 0,25	≤ 0,45 ≤ 0,9	0,30 0,70	≤ 0,6 ≤ 1,1	0,20 0,50
Resistance to boiling water	%	≤ 10	4,0	≤ 2,0	0,3	≤ 2	0,5	≤ 10	5,0	≤ 18	13
Behaviour in damp heat alternating atmosphere	%	no noticeable change									
Coefficient of thermal expansion	1/K	–	$20x10^{-6}$	–	$20x\ 10^{-6}$	–	$20x10^{-6}$	–	$20\ x\ 10^{-6}$	–	$20\ x\ 10^{-6}$
Thermal conductivity λ	W/mK	–	ca. 0,3	–	ca. 0,3	–	ca. 0,3	–	ca. 0,3	–	ca. 0,3
Resistance to vapour diffusion	μ	ca. 17200									
Surface resistance	Ohm	–	10^9–10^{11}	–	10^9–10^{11}	–	10^9–10^{11}	–	10^9–10^{11}	–	10^9–10^{11}
Resistance to cigarette burns	–	no noticeable change; [1]									
Resistance to hot soucepans	≤ 180° C	no noticeable change; no blisters or cracks [2]									
Tolerance of nominal sizes	mm	+ 10 - 0									

[1] Minimal change of sheen, yellowish to brownish discoloration permissible according to ES 438
[2] Minimal change of sheen admissible according to ES 438
[3] According to ES 438

Legend:

S Normal quality
P Postforming quality
F Fire retardant
Mpa Megapascal
C Compact Laminate
CF Compact Laminate "F", fire retardant
K Kelvin = temperature difference
W Watt
N Newton

1N ≈ 0,102 kp
1MPa ≈ 1N/mm² ≈ 10 kp/cm²

MAX Melamine-Faced Chipboard according to ÖNORM/DIN 68765

Physical Properties	Unit of Measurement	Nominal value [1]	Actual value	Test Standard
Bulk density KT ≤ 13mm ≥ 13mm	g/dm³	– –	ca. 700 ca. 680	ES 323
Thickness of layer Cl. 1 Cl. 2	mm	 ≤ 0,14 ≥ 0,14	 0,12 ≥ 0,16	ON-C 9751
Flectional resistance ≤ 13mm Cl. 1/Cl. 2 13-20mm Cl. 1/Cl. 2	N/mm²	 17/18 16/17	 20 18	ES 310
Transverse tensile strength ≤ 13mm 13-20mm	N/mm²	 0,40 0,35	 0,45 0,40	ES 319
Thickness tolerance up to 20mm	mm	+ 0,50 – 0,30	+ 0,50 – 0,30	–
Dimensional stability in alternating climate 20°C	–	≤ 0,5	≤ 0,5	ES 438 2.10
Abrasion resistance	Rotation	depending on design		ES 438 2.6
Scratch hardness	N	≥ 1,5	2,0	ES 438 2.14
Resistance to steam	–	Apart from change in sheen no permanent change		ES 438 2.24
Susceptibility to cracking	–	Grade 0		ON-C9751 3.7.2
Resistance to colour change in light	–	≥ Grade 6		ES 438 2.16
Formaldehyde emittance	mg HCHO/hm²	≤ 3,5 E1	0,30 E1	DIN 52368
Resistance to staining	–	1A		ES 438 2.15
Thermal conductivity	W/mK	ca. 0,12		–

[1] Nominal value according to ÖNORM/DIN 68765

Fire Behaviour

MAX High-Pressure Laminates (HPL) and MAX Compact Laminates (HPL)

* ON CERT

■ Standard-quality MAX High-
* Pressure Laminates (HGS), as we produce them for joiners and the furniture industry, are classified B2 construction materials, i.e. normally combustible in accordance with ÖNORM B 3800 Part 1. They are TR1 - non drip - and Q1 - low smoke emission.

■ Standard quality MAX Compact
* Laminates (CGS) in thicknesses of 2 mm and over classify as B1 construction materials, i.e. fire resitant in accordance with ÖNORM B 3800 Part 1: Österreichisches Kunststoffinstitut (Austrian Plastics Institute), test certificate no. 37338/97.4.29.

For special applications, we produce F-grade MAX High-Pressure Laminates and F-grade MAX Compact Laminates,
* corresponding to types HGF and
* CGF in ON EN 438.
They are fire retardant (B1), non-drip (TR1), and have a low emission of smoke - all in accordance with ÖNORM B 3800 Part 1: ÖKI (Austrian Plastics Institute) test certificate no. 37337/97.4.28. In accordance with DIN 4102 Compact
* Laminates CGF are B1 fire resistant: the thicknesses of 6 - 10 mm are monitored under test mark PA-III 2.2100 by the Institut für Bautechnik, Berlin.

Seeberufsgenossenschaft Hamburg-Schiffssicherheits-abteilung, licence no. 705 K 17. Please contact us for complete information if you require this special quality, as is used in ship-building, tunnel construction and underground applications in building construction.

MAX Melamine-Faced Chipboard

MAX Melamine-Faced Chipboard is classified a B2 construction material, i.e. normally combustible in accordance with ÖNORM B 3800 and DIN 4102. Upon request we produce Melamine-Faced Chipboard that is non-readily combustible B1 in accordance with ÖNORM B 3800, Part 1: Österr. Kunststoffinstitut 37339/97.4.29.

Resistance to Chemicals

MAX High-Pressure Laminates (HPL) and MAX Compact Laminates (HPL)

* ON CERT

Technical Information Brochure No. 6 focuses on the chemical stability of MAX High-Pressure Laminates and MAX Compact Laminates, advising on possible applications.

Thanks to their high-density surface, MAX High-Pressure Laminates (HPL according to
* ON EN 438 and ISO 4586/I) have excellent mechanical properties and are resistant to high temperatures while being highly resistant to a great number of chemicals. Therefore, MAX Laminates may safely be used in areas where surfaces are exposed to chemicals such as:

- chemicals used in laboratories
- solvents
- disinfectants
- * colouring agents (restr.)
- cosmetics

Laboratories and medical facilities are heavy-duty applications, calling for utmost care in production and installation. For this reason, the use of MAX Compact Laminates (HPL) should seriously be taken into consideration.

While MAX High-Pressure Laminates are resistant to a vast number of chemicals, there are some agents that may damage their surfaces. The extent of damage is a function of

- the concentration of
- the exposure time to
- and the temperature of the agents used.

Without claim to completeness, the following list summarises commonly used substances (solid, dissolved, liquid, gaseous), indicating the resistance of MAX High-Pressure Laminates and MAX Compact Laminates to these at room temperature. Please contact us for more detailed information on the use of agents not contained in the summary. In addition, we recommend you to make tests of your own.

No damage even under long exposure

MAX High-Pressure Laminates and MAX Compact Laminates are resistant to the following substances and agents. Even with longer exposure times (e.g., an exposure time of 16 hours according to DIN 53799 and ISO 4586), these chemicals will not affect the surface of MAX High-Pressure Laminates.

Substance	Chemical formula
Acetic Acid	CH_3COOH
Acetone	CH_3COCH_3
Active charcoal	
Alcohol	ROH
Alcohol, beverages	
Alcohol, primary	RCH2OH
secondary	RR'CHOH
tertiary	RR'R''COH
Aldehyde	RCHO
Alum liquor	$KAl(SO_4)_2.12H_2O$
Aluminium chloride	$AlCl_3$.aq.
Aluminium sulphate	$Al_2(SO_4)_3$
Aluminium potassium sulphate	$KAl(SO_4)_2$
Amides	$RCONH_2$
Amines, primary	RNH2
secondary	(RR')NH
tertiary	(RR'R'')N
Ammonia	NH_4OH
Ammonium chloride	NH_4Cl
Ammonium sulphate	$(NH_4)_2SO_4$
Ammonium sulphate	NH_4SCN
Amyl acetate	$CH_3COOC_5H_{11}$
Amyl alcohol	$C_5H_{11}OH$
Aniline	$C_6H_5NH_2$
Animal fat	
Animal fodder	
Arabinose	$C_5H_{10}O_5$
Ascorbic acid	$C_6H_8O_6$
Asparagine	$C_4H_8O_3N_2$
Aspartic acid	$C_4H_7O_4N$
p-Aminoacetophenon	$NH_2.C_6H_4COCH_3$
Baker's yeast	
Barium chloride	$BaCl_2$
Barium sulphate	$BaSO_4$
Benzaldehyde	C_6H_5CHO
Benzene	C_6H_6
Benzidine	$NH_2C_6H_4.C_6H_4NH_2$
Benzoic acid	C_6H_5COOH
Biogel	
Blood	
Boric acid	H_3BO_3
Butylacetate	$CH_3COOC_4H_9$
Butyl alcohol	C_4H_9OH
Cadmium acetate	$Cd(CH_3COO)_2$
Cadmium sulphate	$CdSO_4$
Caffeine	
Calcium carbonate (lime)	$CaCO_3$
Calcium chloride	$CaCl_2$
Calcium hydroxide	$Ca(OH)_2$
Calcium nitrate	$Ca(NO_3)_2$
Cane sugar	$C_{12}H_{22}O_{11}$
Carbolic acid	$C_6H_5O_4$
Carbolic acid - xylene	C_6H_5OH-$C_6H_4(CH_3)_2$
Carbon tetrachloride	CCl_4
Casein	
Castor oil	
Cedarwood oil (concentrated)	
Cement	
Chloral hydrate	$CCl_3CH(OH)_2$
Chlorobenzene	C_6H_5Cl
Chloroform	$CHCl_3$
Cholesterol	$C_{27}H_{45}OH$
Citric acid	$C_6H_8O_7$
Clay	
Coal	
Cocaine	$C_{17}H_{21}O_4N$
Coffee	
Common salt	NaCl
Copper sulphate	$CuSO_4$.aq
Cosmetics	
Cresol	$CH_3C_6H_4OH$
Cresylic acid	$CH_3C_6H_4COOH$
Cyclohexane	C_6H_{12}
Cyclohexanol	$C_6H_{11}OH$
Detergents	
Dextrose	$C_6H_{12}O_6$
Digitonin	$C_{56}H_{92}O_{29}$
Dimethyl formamide	$HCON(CH_3)_2$
Dimetyhl acetic acid	CH_3COOH
Dioxan	$C_4H_8O_2$
Dulcitol	$C_6H_{14}O_6$
Ester	RCOOR'
Ethanol	C_2H_5OH
Ether	ROR'
Ethyl acetate	$CH_3COOC_2H_5$
Ethylene dichloride	CH_2:CCl
Fodder	
Foodstuffs	
Formaldehyde	HCOH
Formic acid up to 10%	HCOOH
Fructose	$C_6H_{12}O_6$
Galactose	$C_6H_{12}O_6$
Gelatine	
Glacial acetic acid	CH_3COOH
Glucose	$C_6H_{12}O_6$
Glycerine	$CH_2OH.CHOH.CH_2OH$
Glycocoll	NH_2CH_2COOH
Glycol	$HOCH_2.CH_2OH$
Graphite	C
Greases	
Gypsum	$CaSO_4.2H_2O$
Heparin	
Heptanol	$C_7H_{15}OH$
Hexane	C_6H_{14}
Hexanol	$C_6H_{13}OH$
Hydrogen peroxide 3%	H_2O_2
Hypophysin	
Imido "Roche"	
Immersion oil	
Ink	
Inorganic salts and their mixtures	
Inositol	$C_6H_6(OH)_6$
Insecticides	
Isoamyl acetate	$CH_3COOC_5H_{11}$
Isopropanol	C_3H_7OH
Ketone	RC:OR'

Lactic acid	$CH_3CHOHCOOH$
Lactose	$C_{12}H_{22}O_{11}$
Lead acetate	$Pb(CH_3COO)_2$
Lead nitrate	$Pb(NO_3)_2$
Laevoluse	$C_6H_{12}O_6$
Lipstick	
Lithium carbonate	Li_2CO_3
Magnesium carbonate	$MgCO_3$
Magnesium chloride	$MgCl_2$
Magnesium sulphate	$MgSO_4$
Maltose	$C_{12}H_{22}O_{11}$
Manitol	$C_6H_{14}O_6$
Mannose	$C_6H_{12}O_6$
Mercury	Hg
Mesoinositol	$C_6H_6(OH)_6$
Methanol	CH_3OH
Milk	
Mineral oils	
Mineral salts	
Nail varnish	
Nail varnish remover	
α-Naphtol	$C_{10}H_7O_7$
α-Naphtylamine	$C_{10}H_7NH_2$
Nickel sulphate	$NiSO_4$
Nicotine	$C_{10}H_{14}N_2$
p-Nitrophenol	$C_6H_4NO_2OH$
Nonne-Appelt-reagent	
Octanol	$C_8H_{17}OH$
n-Octyl alcohol	$C_8H_{17}OH$
Olive oil	
Oleic acid	$CH_3(CH_2)_7CH:$ $CH(CH_2)_7COOH$
Organic solvents	
Ointments	
Pandy´s reagent	
Paraffin waxes	CnH_2n+_2
Paraffinic oil	
Pentanol	$C_5H_{11}OH$
Peptone	
Petroleum benzin	
Phenol and phenol derivatives	C_6H_5OH
○Phenolphtalein	$C_{20}H_{14}O_4$
○Polishing agents (creams and waxes)	
Potash lye up to approx. 10%.	KOH
Potassium bromate	$KBrO_3$
Potassium bromide	KBr
Potassium carbonate	K_2CO_3
Potassium chloride	LCl
Potassium hexacyanoferrate	$K_4Fe(CN)_6$
Potassium iodate	KJO_3
Potassium nitrate	KNO_3
Potassium sodium tartrate	$KNaC_4H_4O_6$
Potassium sulphate	K_2SO_4
Potassium tartrate	$K_2C_4H_4O_6$
Potato starch	
Propanol	C_3H_7OH

1,2-Propylene glycol	$CH_3CHOHCH_2OH$
Pyridine	C_5H_5N
Qinol	HOC_6H_4OH
Raffinose	$C_{18}H_{32}O_{15}.5H_2O$
Rhamnose	$C_6H_{12}O_5.H_2O$
Rochelle salt	
Saccarose	= Cane sugar
Salicylaldehyde	$C_6H_4OH.CHO$
Salicylic acid	$C_6H_4OHCOOH$
Saponon	
Soap	
Sodium acetate	CH_3COONa
Sodium carbonate	Na_2CO_3
Sodium chloride	NACl
Sodium citrate	$Na_3C_6H_5O_7.5H_2O$
Sodium diethylene barbiturate	$NaC_6H_{11}N_2O_3$
Sodium hydrogen sulphite	$NaHSO_3$
Sodium hydrogen-carbonate (Sodium carbonate)	$NaHCO_3$
Sodium hydroxide solution up to approx. 10%	NaOH
Sodium hyposulphite	$Na_2S_2O_4$
Sodium nitrate	$NaNO_3$
Sodium phosphate	Na_3PO_4
Sodium silicate	Na_2SiO_3
Sodium sulphate	Na_2SO_4
Sodium sulphide	Na_2S
Sodium sulphite	Na_2SO_3
Sodium tartrate	$Na_2C_4H_4O_6$
Soil	
Soot	
Sorbitol	C6H14O6
Standard acetate solution	
Standard I -Nutrient agar	
Standard I -Nutrient broth	
Standard II -Nutrient agar	
Standard II -Nutrient broth	
Starch	
Starch -common salt solution	
Stearic acid	$C_{17}H_{35}COOH$
Styrene	$C_6H_5.CH:CH_2$
Sugar and sugar derivates	
Sulphur	S
Talcum powder	$3MgO,4SiO_2, H_2O$
Tannic acid	$C_{76}H_{52}O_{46}$
Tartaric acid	$C_4H_8O_6$
Tea	
Test serum for blood grouping	
Tetrahydrofuran	C_4H_8O

Tetraline	$C_{10}H_{12}$
Thiourea	NH_2CSNH_2
Toepfer´s reagent	
Toulene	$C_6H_5CH_3$
Trehalose	$C_{12}H_{22}O_{11}$
Tricholoro ethylene	$CHCl:CCl_2$
Trypsin	
Trytophane	$C_{11}H_{12}O_2N_2$
Turpentine	
Tymol	$C_{10}H_{14}O$
Tymol buffer solution	
Urea solution	$CO(NH_2)_2$
Urease	
Uric acid	$C_5H_4N_4O_3$
Urine	
Vanillin	$C_8H_8O_3$
Vaseline	
Water	H_2O
Water colours	
Xylene	$C_6H_4(CH_3)_2$
Yeasts	
Zinc chloride	$ZnCl_2$
Zinc sulphate	$ZnSO_4$

■ No damage under short exposure

Spilling or allowing the substances listed hereinafter to act only briefly (esp. in liquid or dissolved form) will not affect the surfaces of MAX High-Pressure Laminates and MAX Compact Laminates if these are wiped dry within 10 to 15 minutes. Please note that exposure time is an important factor even with diluted agents. As the diluent evaporates, the concentration of the agent itself increases, attacking the surfaces of MAX High-Pressure Laminates and MAX Compact Laminates. Thus, agents may damage the surface even if the concentrations used are lower than specified in the following summary. We recommend you to make some tests of your own.

Substance	Chemical formula
Amino-S acid up to 10%	NH_2SO_3H
Aniline dyes	
Antiliming agents	
Arsenic acid up to 10%	H_3AsO_4
Boric acid	H_3BO_3
Crystal violet (Gentian violet)	$C_{24}H_{28}N3Cl$
Esbach's reagent	
Formic acid over 10%	HCOOH
Fuchsine solution	$C_{19}H_{19}N_3O$
Hair dyes and bleaches	
Hydrochloric acid up to 10%	Hcl
Hydrogen peroxide over 3-30% (Perhydrol)	H_2O_2
Inorganic acids up to 10%	
Iodine solution	J
Iron (II) chloride solution	$FeCl_2$
Iron (III) chloride	$FeCl_3$
Mercury (II) chromate	$HgCr_2O_7$
Methylene blue	$C_{16}H_{18}N_3ClS$
Millon's reagent	OHg_2NH_2Cl
Nitric acid up to 10%	HNO_3
Nylander´s reagent	
Oxalic acid	COOH.COOH
Phosphoric acid up to 10%	HPO_4
Picric acid	$C_6H_2OH(NO_2)_3$
Potash lye over 10%	KOH
Potassium hydrogensulphate	$KHSO_4$
Potassium chromate	K_2CrO_4
Potassium dichromate	$K_2Cr_2O_7$
Potassium iodide	KJ
Potassium permanganate	$KMnO_4$
Silver nitrate	$AgNO_3$
Sodium hydrogen-sulphate	$NaHSO_4$
Sodium hydroxide solution over 10%	NaOH
Sodium hypochloride	NaOCl
Sodium thiosulphate	$Na_2S_2O_3$
Sublimate solution (= mercury (II) chloride)	$HgCl_2$
Sulphuric acid up to 10%	H_2SO_4
Sulphurous acid up to 10%	H_2SO_3
Varnishes and adhesives, (chemically curing)	

■ High damage risk even under short exposure

The chemicals listed hereinafter will destroy MAX Laminate surfaces. Even if acting only very briefly, these substances may lead to matt and rough patches on the surface. Therefore, they have to be removed instantly.

Substance	Chemical formula
In concentrations above ca. 10%:	
Amino sulpho acid	NH_2SO_3H
Inorganic acids such as:	
Arsenic acid	H_3AsO_4
Aqua regia	HNO_3 + HCL = 1:3
Hydrochloric acid	HCl
Hydrofluoric acid	HF
Hydrogen bromide	HBr
Nitric acid	HNO_3
Phosphoric acid	H_3PO_4
Potassium dichromate sulphuric acid	$K_2CrO_7 + H_2SO_4$
Sulphuric acid	H_2SO_4

■ Aggressive gases

Frequent exposure to the volatile substances listed below will result in damage to MAX High-Pressure Laminate surfaces:

Substance	Chemical formula
Acid vapours	
Bromine	Br_2
Chlorine	Cl_2
Nitrous vitriol vapours	N_xO_y
Sulphur dioxide	SO_2

MAX Melamine-Faced Chipboard

MAX Melamine-Faced Chipboard has a resistance to chemicals similar to MAX High-Pressure Laminates. Please contact us if you need additional information.

Cleaning

MAX High-Pressure Laminates, MAX Compact Laminates and MAX Melamine-Faced Chipboard are all characterized by their hard and hygienic surfaces, which do not call for any particular maintenance. However they do need to be cleaned. The following table serves to advise on when and how to clean the panels and boards.

Type of soiling ▶ / **Degree of soiling ▼**	Dust Dirt Dust/grease mixture pencil Chalk	Lime residues Lime stains (Water stains) Rust	Coffee Tea Fruit juices Sugar solutions	Grease Oil Fingerprints, feltpen, markers, ball-point, nicotine stains (tar stains), rubber streaks	Wax stains (candles, separating agents for presses) Crayons	
Little soiling, short exposure time	■ **Paper towel; soft, clean cloth (dry or moist); sponge or the like. When using moist cloth, wipe panel dry with absorbent paper towel**					
	■ **Note: When cleaning with organic solvents or cold water and when using cloths or chamois leathers that have been used several times, smears may result. For best results, wipe panels clean with warm water, then wipe dry with paper towels**					
	Clean HPL surfaces regularly! Polishing is not necessary!					
Normal soiling, longer exposure time	■ **Clean hot water, clean cloth, soft sponge or brush (e.g., nylon brush). - Usual household detergents without scouring components (e.g. washing powder, soft soap or curd soap). Apply detergent. Allow to work into surface depending on degree of soiling. Then remove with clean water or window cleaning agent; repeat several times, if necessary. Remove detergent carefully to prevent streaks and smears. Rub dry with absorbent clean cloth (preferentially paper towels). Wipe surfaces dry, changing cloth frequently. Glass cleaner may also be used, but is more expensive.**					
				Organic solvents such as acetone, spirit, benzin, trichloroethane, nail-varnish remover		
					Paraffin and wax stains should be removed mechanically. Note: Avoid scratches. Use plastic edge or wooden spatula. Iron off residues by means of blotting paper	
	■ **For regular cleaning do not use abrasive or scouring agents (scouring powder, steel wool), polishing agents, waxes or bleaches. Do not use detergents containing strong acids or highly acidic salts such as decalcifiers containing formic acid or aminosulphoacid, hydrochloric acid, silver polish, or oven cleaners.**					
Extremely stubborn stains		Allow detergents or pastes consisting of detergents and water to act on the surface overnight. Liquid detergents with ultrafine polishing lime. Mild bleaches (with reservation). Note: Liquid detergents containing polishing lime and bleaches should be used sparingly!				
		To remove particularly stubborn lime stains, acidic detergents may be used (e.g., 10% acetic or citric acid).				
	Be sure to follow safety regulations when cleaning with solvent! Open windows! No open flame!					

	Lipstick Shoe polish Floor polish	Bacteriologic contamination (soap stains, epithelia, germs, blood, urine, faeces)	Water-soluble paint, mordanting agents, dispersion paint, water-soluble adhesives, dispersions (PVAc)	Solvents, varnishes, dyes and adhesives (varnish stains, spray paint, stamp paint)	Two-component varnishes and adhesives, synthetic resins such as aminoplastresin, polyurethane foam	Silicone, Sealing compounds Furniture polishes
				Organic solvents	Remove instantly, using water or organic solvents	Use cloth to wipe dry Silicone remover
				Organic solvents such as acetone, spirit, benzin, trichloroethane, nail-varnish remover	Cleaning is only possible before curing, therefore, remove immediately, using water or organic solvent	Silicone remover
		Use disinfectants in addition	Water and organic solvents			
		Steam cleaning is possible. Disinfection according to regulation. Be careful not to damage base material!	Please contact the producers of adhesives and varnishes for the best possible cleaning agents when using such substances on a regular/professional basis.			
			Soften with water or organic solvents, then peel or pull off.		Cleaning no longer possible! Condensation and reaction resin adhesives can no longer be removed after curing.	
				Dye stains can often be removed mechanically after curing.		

Special Fields of Application for MAX Furniture Boards

Pharmacies
Surgeries, hospitals,
Veterinary medicine
Drugstores
Laboratories:
- chemical laboratories
- photo laboratories
- medical laboratories
- food laboratories

Store construction
- hairdressers
- butchers
- food stores
- fishmongers

Meat-processing industry:
- meat and sausage factories
- slaughter houses

Animal keeping in medicine and agriculture.

MAX-HPL surfaces are perfect for use in conjunction with foodstuffs:
ISEGA/Aschaffenburg
* 12264 U 98 Institute for Foodstuff Testing, Vienna
Certificate no. 4700/JG/90.

Disinfecting MAX Furniture Board Surfaces

■ MAX HPL surfaces have been found highly suitable for use in the aseptic areas of hospitals, laboratories, surgeries, etc.
* by the Austrian Plastics Institute (Österreichisches Kunststoffinstitut) which has also confirmed the resistance of MAX HPL surfaces to disinfectants in its expertise no. 37114/97.6.20.

* ■ The Hygieneinstitut of the University of Vienna certifies the disinfectebility of MAX laminates and MAX compact laminates and their surfaces and edges of an equal degree with ceramic tiles, PVC and stainless steel.

■ MAX High-Pressure Laminates, MAX Compact Laminates, and MAX Melamine-Faced Chipboard are resistant to disinfectants based on the following chemicals:

Ethanol 70%
Formalin 1% and 5%
p-chlorine-m-cresole 0.3%
Tosyl chloramide sodium 1%, 5%
Alkyl dimethylbenzyl ammonium chloride 0.1%
Alcohols
Aldehydes
Phenols
Quaternary ammonium compounds

This list does not lay any claim to completeness. If other disinfectants are used, we recommend you to contact us and carry out some tests of your own.

Warranty

ISOVOLTA warrant the quality of MAX High-Pressure Laminates, MAX Compact Laminates, and MAX Melamine-Faced Chipboard with regard to the values and specifications given in this Technical Information brochure. They shall clearly not be liable for imperfect processing, construction, and installation, as these are outside their influence. Local regulations are to be followed at all times. All information is based on current know-how. Suitability for certain applications cannot be confirmed in general.

3-1/2000-781GB.31

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