

## Chemical resistance of the materials

|                           | PC | PMMA | CHEMO |
|---------------------------|----|------|-------|
| Acetic acid < 10%         | ■  | ■    | ■     |
| Acetic acid > 10%         | —  | □    | —     |
| Acetone                   | —  | —    | □     |
| Aliphatic hydrocarbons    | ■  | ■    | ■     |
| Ammonia < 25%             | —  | ■    | ■     |
| Aniline                   | —  | —    | —     |
| Aromatic hydrocarbons     | —  | —    | ■     |
| Beer                      | ■  | ■    | ■     |
| Benzene                   | —  | —    | ■     |
| Benzine (cleaning spirit) | ■  | ■    | ■     |
| Blood                     | ■  | ■    | ■     |
| Bromic acid               | —  | —    | —     |
| Carbon dioxide gas        | ■  | ■    | ■     |
| Carbon monoxide gas       | ■  | ■    | ■     |
| Carbon tetrachloride      | —  | —    | ■     |
| Chloroform                | —  | —    | —     |
| Chlorphenol               | —  | —    | —     |
| Cresol                    | —  | —    | —     |
| Diesel fuel               | —  | —    | ■     |
| Dioxane                   | —  | —    | ■     |
| Ethanol < 30 %            | ■  | □    | —     |
| Ethanol > 30 %            | ■  | —    | —     |
| Ether                     | —  | —    | ■     |
| Ethyl acetate             | —  | —    | ■     |
| Fats: animal              | —  | ■    | ■     |
| Fats: mineral             | —  | ■    | ■     |
| Fats: vegetable           | —  | ■    | ■     |
| Fuel oil                  | —  | —    | ■     |
| Glycerol                  | □  | ■    | ■     |
| Glycol                    | ■  | ■    | ■     |

|   | PC | PMMA | CHEMO |
|---|----|------|-------|
| Hydrochloric acid (HCL) < 10%                                 | ■  | ■    | ■     |
| Hydrochloric acid (HCL) > 10 < 20%                            | ■  | ■    | —     |
| Hydrogen peroxide < 10 %                                      | ■  | ■    | ■     |
| Hydrogen peroxide > 10 % < 30 %                               | ■  | ■    | —     |
| Hydrogen sulphide   | —  | —    | —     |
| Isopropyl alcohol   | ■  | —    | —     |
| Ketones   | —  | —    | □     |
| Lime milk   | □  | ■    | ■     |
| Methanol  | —  | —    | —     |
| Methylene chloride  | —  | —    | —     |
| Nitric acid < 20 %  | —  | —    | —     |
| Nitric acid > 10 % < 20 %                                     | □  | ■    | —     |
| Nitric acid up to 10 %  | ■  | ■    | —     |
| Petroleum ether   | □  | ■    | ■     |
| Phenol  | —  | —    | —     |
| Potassium hydroxide < 30%                                     | —  | ■    | ■     |
| Pyridine  | —  | —    | ■     |
| Regular petrol  | —  | —    | ■     |
| Seawater  | ■  | ■    | ■     |
| Saline solution   | ■  | ■    | ■     |
| Soapsuds  | ■  | ■    | ■     |
| Soda (sodium carbonate)                                       | ■  | ■    | ■     |
| Sodium hydroxide solution < 10%                               | —  | ■    | ■     |
| Spirit of turpentine  | ■  | ■    | ■     |
| Sulphuric acid (H <sub>2</sub> SO <sub>4</sub> ) < 30 %       | ■  | ■    | ■     |
| Sulphuric acid (H <sub>2</sub> SO <sub>4</sub> ) > 30 % < 50% | ■  | —    | —     |
| Sulphuric acid (H <sub>2</sub> SO <sub>4</sub> ) > 50%        | —  | —    | —     |
| Toluene   | —  | —    | ■     |
| Trichloroethane   | —  | —    | ■     |
| Water up to 60 °C   | ■  | ■    | ■     |
| Xylene  | —  | —    | ■     |

## Cleaning agents, disinfectants and coolants

|   | PC | PMMA | CHEMO |
|---|----|------|-------|
| ACMOSIL 37-5504   | —  | —    | ■     |
| Coolants QUAKERCOOL 7200 HBF  | —  | □    | ■     |
| Coolants QUAKERCOOL 7200 BFF  | —  | □    | ■     |
| Coolants QUAKERCOOL 7100 HD   | —  | □    | ■     |
| GORAPUR LI 2920-40 E  | —  | —    | ■     |
| MV Quartacid plus from Schülke  | ■  | ■    | ■     |
| MV Quartasept plus from Schülke   | □  | ■    | ■     |
| MV perform classic alcohol IPA from Schülke                               | ■  | ■    | ■     |
| P3-topactive OKTO (disinfectant; acid solution with peroxide) from ECOLAB | □  | ■    | ■     |
| P3-topax 66 (cleaner/disinfectant; alkaline with chlorine) from ECOLAB    | —  | ■    | ■     |
| P3-topactive 200 (cleaner, alkaline with tenside) from ECOLAB             | □  | ■    | ■     |
| P3-topactive 500 (cleaner, acid solution with tenside) from ECOLAB        | □  | ■    | ■     |
| P3-topax 990(neutral disinfectant; basis alkylaminacetat) from ECOLAB     | □  | ■    | ■     |
| PU-5408H, PU-1706M, PU-5421H, PU-4111M from Chem-Trend                    | —  | —    | ■     |
| PU-HS-Antiblock 6291/21, A-PU-Antiblock 6/428-5 from Bomix                | —  | —    | ■     |

DISCLAIMER: our recommendations concerning the chemical resistance of the materials are based upon information from material suppliers, careful examination of available published documents and our experience in different industry applications. However, since the resistance of metals, plastics and elastomers can be affected by the concentration, temperature, presence of various chemicals and other factors, the above datasheet should be considered as a general guide rather than an unqualified guarantee. Ultimately, the customer must determine the suitability of the luminaires in various solutions and applications.

## Suitable materials and temperature ranges

|  | PC                         | PMMA  | CHEMO  |
|--|----------------------------|---|--|
| Resistance to ageing of the material                               | very good                  | good  | good   |
| Flammability according to UL94 (ISO 60695)                         | not applicable             | not applicable  | not applicable                                 |
| Requirements for the new parking standard met                      | yes                        | yes   | yes  |
| FOOD INDUSTRY:   |                            |   |  |
| Food suitability (FOOD DESIGN)                                     | yes, HACCP, EU VO 852/2004 | yes, plus HACCP, FOOD (EU VO 852/2004), ECOLAB, DLG (ammonia) | yes, plus HACCP, FOOD (EU VO 852/2004), ECOLAB |
| Chemical resistance (ECOLAB certificate)                           | no                         | yes, ECOLAB, DLG (ammonia)                                    | yes, ECOLAB                                    |
| Glow wire test   | 850 °C                     | 650 °C  | 850 °C   |
| Halogen-free   | yes                        | yes   | yes  |
| Suitability for use in agriculture (livestock farming – DLG cert.) | no                         | yes   | no   |
| Impact resistance (IK rating)                                      | IK08                       | IK03  | IK07   |
| Silicone-free  | yes *                      | yes *   | yes *  |
| Temperature resistance   | -40 °C - +54 °C            | -10 °C - +35 °C   | -40 °C - +35 °C                                |

\* Not for types with through wiring

DISCLAIMER: the above is not showing all available variants (for example, variant with emergency, variant through wiring), therefore for more details please consult the full product datasheet.

### POLYCARBONATE (PC)

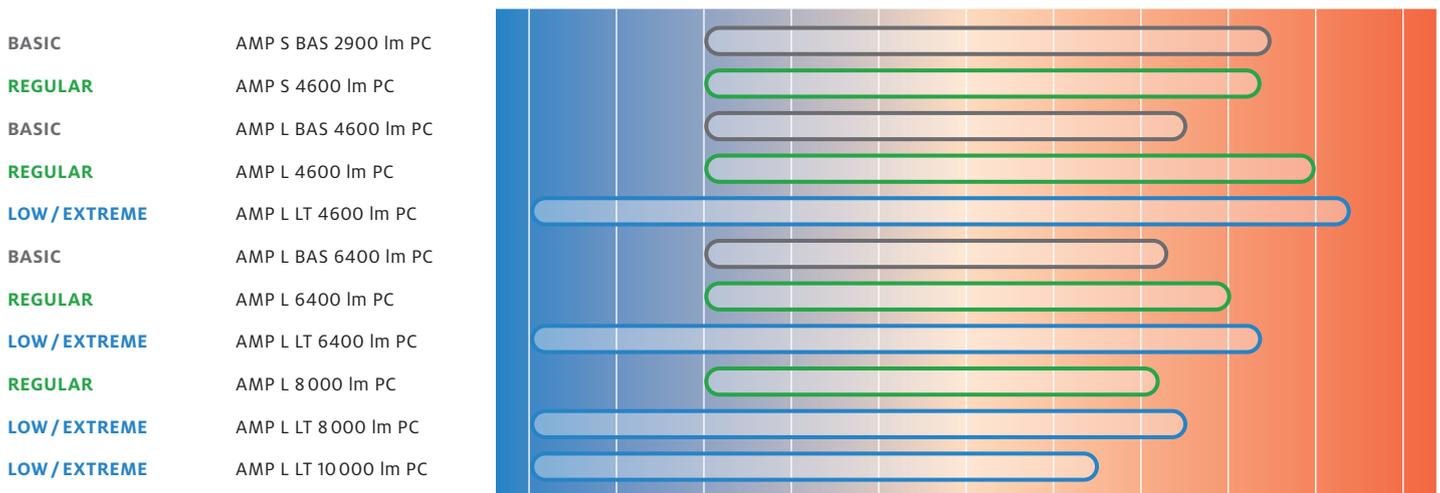
- the most mechanically robust luminaire in the portfolio
- UV-stable and high impact resistant
- chemical resistant against alcohol, ethanol or hydrogen peroxide

### ACRYLIC (PMMA)

- highly transparent
- resistant against impacts, weather and UV-radiation
- minimised risk of tension cracking
- chemical resistant against a variety of acids, alkalis, halogens, mineral oils, fats and oils

### CHEMO (CH)

- highly transparent
- high impact resistance and durability
- no tension cracks
- highly translucent luminaire is also able to cope with alkalis, unorganic salts, solvents, fuels, fats and oils



### Basic, Regular, Low and Extreme variants: what's the difference?

Basic has got no special gear tray/additional cooling kit. For Regular and Low and Extreme temperature variants we developed a special gear tray/additional cooling kit for an improved thermal management.

AMPHIBIA S (short version): 2900 lm, 4600 lm

AMPHIBIA L (long version): 4600 lm, 6400 lm, 8000 lm, 10000 lm

**DLG:** the DLG (German Agricultural Society) has tested and certified the resistance to ammonia of AMPHIBIA PM version.

**ECOLAB:** the ECOLAB Product Certificate confirms the resistance of AMPHIBIA PM and AMPHIBIA CH to the most common cleaning agents in Food Industry as Topactive 200, Topactive 500, P3 Topactive OKTO (and more) and demineralized water.

**HACCP/Food:** the HACCP Food Product Certificate guarantees the suitability of luminaires as food-safe and suitable for use in facilities or environments where food is produced or traded.

The certificates can be downloaded from Zumtobel Group website.