RÖCHLING
Formaterm

ABS (acryl nitrile butadiene styrene)

ABS is a copolymer in which the main constituent is styrene. The material offers a good combination of mechanical and chemical properties. It is very well suited for vacuum and hot forming.
Its natural colour is milky-white or light brown. The possibilities for colouring are unlimited.

Advantages

ABS has good low-temperature and vacuum-forming properties and low mould shrinkage. The plastic is resistant to water, inorganic salts, alkalis and certain acids. It can be electro- and chromium plated. ABS can be co-extruded with PMMA or ASA. A surface layer of PMMA or ASA gives it excellent outdoor properties.

Limitations

The weathering resistance of ABS is limited. It yellows, ages and becomes brittle. The resistance of the material to solvents is low. The softening temperature of the normal grade is low.

Applications

The areas in which ABS is used include small boats, refrigerators, covers, helmets, toys, kitchen appliances, office machines, vehicles, furniture, sanitary applications and car roof boxes.

Identification

Burns with a sooty, orange-yellow flame. Smells like rubber.

Recycling

ABS can be recycled. The material is re-used in the production of new discs.

When the product has served its original purpose, the material can be melted down and re-moulded for re-use in new products, or used for energy recovery. Recycling of materials has begun in most European countries. However, products made from recycled plastics must not come into contact with foodstuffs or medicines.

Sorted, used styrene may be regarded as a pure fuel. It has the same energy content as heating oil but styrene is a cleaner source of energy. For example, various European steel and cement producers have begin to use plants in which recycled plastics account for a proportion of the supplied process energy. In Sweden, packaging legislation allows a proportion of the amounts collected to be used for energy recovery in special, approved waste incineration plants.

Röchling Formaterm AB
Box 27, Målillavägen 13, S-570 80 Virserum, Sweden
Registered office: Hultsfred
Tel +46(0)495249090
Fax +46(0)49530521
info@formaterm.se
organisationsnummer: 556337-2761
www.formaterm.com / www.roechling-haren.deinfo@formaterm.se

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Machining

Semi-manufactured ABS items can be machined without difficulty. ABS is tough and does not crack in machining operations that involve the removal of material. Obviously the tool must be correctly ground and sharp. ABS plastics and be stamped, cut, milled and drilled.

Vacuum forming

ABS is one of the most widely used plastics for vacuum forming and similar hot-forming methods. The material can be formed easily into complex parts with deep draws. The heating time of the material is short.

Mechanical joining

ABS plastics can be secured with mechanical fixing devices such as screws, rivets, etc.
Note that the coefficient of expansion of ABS may differ from that of the material to which it is attached.

Adhesive bonding

ABS can be bonded using a solvent adhesive. Adhesion is achieved after mild solvent action on the surfaces. After evaporation, the surfaces are pressed together for about 10 minutes. The joints must not be mechanically stressed for 48 hours after bonding. When bonding ABS to other materials, a contact adhesive or a two-component adhesive must be used.

Surface treatment

It is possible to paint the plastic or apply printing by lamination, provided that it is cleaned thoroughly first.

Chemical resistance

1 = Excellent (no attack)
2 = Good (no significant attack)
3 = Fair (slight attack, limited use)
4 = Unacceptable (significant attack)
5 = Very poor (cracking, possibly fracture or dissolving)

Miscellaneous salts	
Potassium bicarbonate	2
Potassium permanganate	3
Acid salts	1
Basic salts	1
Neutral salts	1
Sodium hypochlorite	2
Organic substances and solvents	
Acetone	4
Benzene	4
Gasoline	2
Ethyl alcohol	2
Phenol	4
Chloroform	4
Carbon tetrachloride	4
Methyl alcohol	2
Gases	
Chlorine	2
Chlorine dioxide	1
Carbon monoxide	1
Sulphur dioxide	2
Hydrogen sulphide	1
Acids	
Benzoic acid	1
Boric acid	1
Citric acid	1
Oxalic acid	2
Nitric acid	2
Hydrochloric acid	2
Butyric acid	4
Sulphuric acid	2
Tartaric acid	2
Acetic acid	2
Bases	
Ammonia in solution	3
Calcium hydroxide	1
Potassium hydroxide	1
Sodium hydroxide	1

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