GF HAKAN PLASTIK is one of the world’s largest plastic piping systems manufacturers. The company develops, produces and markets a comprehensive range of piping systems and components in a variety of materials used worldwide to transport water and gas at the highest quality, service and the right price. GF HAKAN PLASTIK operates in three core segments of piping systems: Building Technology, Utility and Agriculture. Its certified products are used in more than 70 countries in 5 continents worldwide.

With more than 10,000 products, GF HAKAN PLASTIK manages a land and maritime transport operation seamlessly and is able to meet the needs of its clients fully wherever they may be in the world.

**HISTORY**

HAKAN PLASTIK was founded in 1965 by the Karadeniz family. Since its foundation, Hakan Plastik has continuously expanded its presence in the manufacturing and sales of plastic piping systems with a focus on innovation.

In 2002, the company invested in a state of art modern facility in Çerkezköy Industrial Zone (CUSB), one of the three largest industrial zones in Turkey. To increase its production capacity, HAKAN PLASTIK opened up its second facility in 2012 in Şanliurfa. Both facilities totally cover an area of 170,000 m².

In 2013, the leading plastic pipe manufacturer of Europe and the Middle East, HAKAN PLASTIK and the world’s leading manufacturer of piping systems, Swiss-based Company, GEORG FISCHER joined forces under the name of “GF HAKAN PLASTIK” to provide a unique platform for further growth worldwide.

GEORG FISCHER, founded in 1802 is headquartered in Switzerland and has 125 companies, 48 of which are production facilities, in 32 countries with a workforce of 13,500 employees. The company generated sales of 3.6 billion Swiss francs in 2012. Georg Fischer operates in three core businesses GF Piping Systems, GF Automotive and GF Machining Solutions.

GF Piping System Division is a global supplier of plastic piping systems for the conveyance of liquids and gases in industry, building technology and utility applications. With over 5,000 employees, GF Piping Systems generated sales of about CHF 1.3 billion in over 100 countries in 2012.

**ABOUT GF HAKAN PLASTIK**

GF HAKAN PLASTIK operates in 2 production facilities equipped with the latest manufacturing technologies in Çerkezköy and Şanlıurfa with a workforce of 750 employees. Its headquarters is in Çerkezköy. The company has 6 regional directorates, offices and warehouses in Turkey.

The company has taken its place among the top 500 Enterprises in Turkey according to the world-wide known, prestigious Fortune 500 ranking and also one of the top 100 Largest Companies in Turkey according to Istanbul Chamber of Industry (ISO).

The quality of GF HAKAN PLASTIK has been certified by BVQi, ISO 9001 and ISO 14001. As a result of a meticulous quality control approach and continuous research and development, product quality of GF HAKAN PLASTIK is confirmed by its international quality certificates.

The company gives top priority to using the highest standards of technology to manufacture user-friendly products with the highest quality and service.

### APPROVALS & CERTIFICATES

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<thead>
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<th>Country</th>
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</table>

The company gives top priority to using the highest standards of technology to manufacture user-friendly products with the highest quality and service.
GF HAKAN AQUASYSTEM
PIPES & FITTINGS


GENERAL INFORMATION

- GF HAKAN AQUASYSTEM PP-R Pipes and Fittings are suitable for hot and cold water transfers in buildings and underfloor & central heating systems, air ducts or if applicable for other use in industry and agriculture. They have a high resistance for high temperature, pressure and they are suitable for drinking water.

- GF HAKAN AQUASYSTEM is made of PP-R. Its characteristics such as elasticity, tightness, compression strength, special resistance to high temperatures and extraction make AQUASYSTEM one of the most technologically advanced systems available.

- GF HAKAN AQUASYSTEM is produced in diameters between 20mm and 160mm with fittings and complementing accessories.

- GF HAKAN AQUASYSTEM PP-R Pipes are available in 4 different types depending on the application fields and customer expectations:
  - STANDARD PP-R SYSTEMS
  - FASER FIBERGLASS REINFORCED PP-R SYSTEMS
  - CLIMAFAFER FIBERGLASS REINFORCED PP-R SYSTEMS
  - STABLE-ALUMINUM PP-R SYSTEMS

- GF HAKAN AQUASYSTEM is manufactured in white, grey, green, blue, beige colours. Different colours are available on request.

BENEFITS

- No Water-Hammer & Low Pressure Drop
  The internal surface of GF HAKAN AQUASYSTEM is smooth, homogeneous and non-porous. Due to low flow resistance, the pressure drop is less. It has higher flow rates and wider range of applications with exceptional impact resistance and reduced noise generation.

- Long Service-Life under Aggressive Working Conditions
  The quality of the raw material and the high manufacturing technology used to produce GF HAKAN AQUASYSTEM ensure long-life reliable products. System lifetime is more than 50 years under normal working conditions.

- Easy & Low Cost of Installation
  GF HAKAN AQUASYSTEM is extremely light and easy to handle on site. Making a connection is simple, quick and safe. Complete installations are practical and fast with a wide range of fittings. The system offers a fast and simple process, reliable connections, strong, resilient joints, visible quality control, no systematic weak points, less weight than with traditional materials, quick, easy and clean installation works with less noise.

- Hygienic, Non-Toxic & Environmentally friendly
  All material used in the production of GF HAKAN AQUASYSTEM is non-toxic in accordance with current international standards and are completely safe for use with liquid consumables. Advantages include: - No health risks - Smell and taste neutral - Potable water and food - safe - Completely recyclable - Meeting all health requirements - Chemically resistant - No corrosion and/or encrustation.
FIELDS OF APPLICATION

GF HAKAN AQUASYSTEM PP-R systems are used for hot and cold water systems, including central heating systems.

GF HAKAN AQUASYSTEM PP-R systems are a part of building heating system, including underfloor, wall and radiant heating systems.

GF HAKAN AQUASYSTEM PP-R systems can be directly used in drinking water supply systems. In the central (concentration) air conditioning systems, PP-R systems always play an important part.

GF HAKAN AQUASYSTEM PP-R systems are used to transfer or discharge chemical media, such as industrial piping system.

APPLICATION AREAS

<table>
<thead>
<tr>
<th></th>
<th>STANDARD PP-R PIPES</th>
<th>FASER FIBERGLASS REINFORCED PP-R PIPES</th>
<th>CLIMAFASER FIBERGLASS REINFORCED PP-R PIPES</th>
<th>STABLE-ALUMINIUM FOLED PP-R PIPES</th>
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<tbody>
<tr>
<td><strong>SANITARY APPLICATION</strong></td>
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<td>Industrial Clean Water Systems</td>
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</table>

*GF HAKAN AQUASYSTEM can be used for exterior applications after insulation.
**PRODUCT PROPERTIES**

**STANDARD PP-R PIPE**
- Raw Material: PP-R
- Diameter: 20 mm - 160 mm
- Pressure Nominal (PN): PN10, PN16, PN 20
- Standard Dimension Ratio (SDR): SDR 6, SDR 7.4, SDR 11
- Service Life: 50 years
- Colour: White, Grey, Green, Beige, Blue
- Temperature of Operating Media: 20°C - 70°C
- Operation & Installation Temperature: 5°C - 45°C
- Pipe Length: 4m
- Connections: Fusion welding
- Coefficient of Thermal Expansion: 0.15 mm/K

**FASTER GLASSFIBER REINFORCED PP-R PIPE**
- Raw Material: PP-R
- Diameter: 20 mm - 160 mm
- Pressure Nominal (PN): PN 20, PN 25
- Standard Dimension Ratio (SDR): SDR 6, SDR 7.4
- Standard: TSE K 28
- Service Life: 50 years
- Colour: White, Grey, Green, Beige, Blue
- Temperature of Operating Media: 20°C - 95°C
- Operation & Installation Temperature: 5°C - 45°C
- Pipe Length: 4m
- Connections: Fusion welding
- Coefficient of Thermal Expansion: 0.035 mm/K

**CLIMAFASER GLASSFIBER REINFORCED PP-R PIPE**
- Raw Material: PP-R
- Pressure Nominal (PN): PN 16, PN 20
- Diameter: 20 mm - 160 mm
- Standard Dimension Ratio (SDR): SDR 7.4, SDR 11
- Standard: TSE K 28
- Colour: Green (Blue Striped)
- Service Life: 50 years
- Temperature of Operating Media: 20°C - 95°C
- Operation & Installation Temperature: 5°C - 45°C
- Pipe Length: 4m
- Connections: Fusion welding
- Coefficient of Thermal Expansion: 0.035 mm/K

**STABIL - ALUMINUM FOILED PP-R PIPE**
- Raw Material: PP-R
- Diameter: 20 mm - 160 mm
- Pressure Nominal (PN): PN 25
- Standard Dimension Ratio (SDR): SDR 6
- Service Life: 50 years
- Colour: White, Grey, Green, Beige, Blue
- Temperature of Operating Media: 20°C - 95°C
- Operation & Installation Temperature: 5°C - 45°C
- Pipe Length: 4m
- Connections: Peeling + Fusion welding
- Coefficient of Thermal Expansion: 0.030 mm/K
All GF HAKAN AQUASYSTEM PP-R pipes and fittings are designed outstandingly by liquidity analysis. This means, the liquid passing through the fittings leaves the fitting with a minimum loss of pressure.
EASY & RAPID INSTALLATION

CONNECTING THE PIPES WITH THE FITTINGS

1. Check whether there is any adverse situation at the working area before starting the machine.

2. Heater bushes should be placed on the welding machine so that the parts do not move or are not turned.

3. Plug the welding machine in a 220 volts standard outlet. There is also 110 volts welding machine option.

4. Adjust the temperature to 260°C (500°F). GF Hakan Plastik welding machine involves a fast-indicating surface thermometer.

5. Switch on the power button. Heating up takes 1-3 minutes. (Switching two buttons will provide the heat up time to be shorter.)

6. Thermostat light will dim down automatically as the temperature reaches 260°C (500°F).

7. Insert the pipes and fittings to their respective heater bushes.

8. If UV or stabil pipe is used, completely peel off the exterior layer first. Blunt peeling blades must be replaced by GF HAKAN AQUASYSTEM - approved blades. It will be necessary to make trial peelings to ensure the correct setting of the new blade. Push the end of the pipe into the guide of the peeling tool. Peel off the outer layer up to the stop of the peeling tool. It is not necessary to mark the welding depth as the stop of the peeling tool indicates the correct welding depth. Before starting the fusion, check to ensure the exterior layer has been completely removed.

9. Pipes and Fittings should be heated at the same time. Heating times vary depending on the diameter of the pipe. Heating for too short time can result in improper bonding. Heating for too long can result in ID restriction.

10. After the heating time, quickly remove the pipe and the fitting from the welding tools.

11. Join them immediately, by inserting the pipe straight into the fitting without turning. The result of the fusion is a homogeneous material joining of pipe and fitting.

12. Wait for the cooling down period after the jointing.

13. After the cooling period the fused joint is ready for use.

14. After use, switch off and unplug the welding device. Let it cool down. Never use water to cool the welding device, as this will destroy the temper of the metal. Always keep the heater bushes dry.

15. After completion of the welding process, clean the layouts with a clean cloth or absorbent paper.

The welding of the GF HAKAN AQUASYSTEM FASER FIBERGLASS REINFORCED PP-R Systems are same as of plain, peeling will not be required.

As GF HAKAN AQUASYSTEM FASER FIBERGLASS REINFORCED PP-R Systems do not require peeling, they enable 30% faster application opportunity in comparison with the foil pipes.