Air Conditioning And Heating Technology Professional



Am Schacht Hubert, 4 45139 Essen - Germany www.fista-gmbh.de

■ Technical specifications

Size (m)	16	20	25	32	40	50	63
Dimensions (inner & outer)	12-16	16-20	20-25	26-32	32-40	41-50	51-63
Weight per meter (gr./m)	105	145	200	310	490	730	1220
Pipe water load (litr./m)	0.113	0.201	0.314	0.498	0.804	1.320	2.042
Min. pipe thickness	1.65	1.90	2.25	2.90	3.40	4.00	4.60
Roughness Index (m)				0.007			
Thermal conductivity coefficient (W/m²K)	0.40						
Linear expansion coefficient (m/mK)	25x10 ⁻⁶						
Operating temperature (long time)	80 °c						
Operating temperature (short time)				100 °c			
Operating temperature for liquids	- 40						
Pressure tolerance in 50 years (constantly) (bars)	10						
Pipe usage class	5						







- Production in accordance with international standard ASTMF1281.
- Up to 90 °c heat toleration.
- Low coefficient of linear expansion (as metals).
- Resistant to chemicals (acids, bases,...).
- No oxygen penetration into the pipes and thereby, destruction prevention in central heating systems.
- Excellent pressure resistance due to the aluminum layer and the continuous ultrasonic welding.
- Insignificant pressure drop due to the very low roughness coefficient (inside the pipe).
- No sediments, decays, rusts and water color & smell change.
- Flexibility.
- Easy & fast installation.









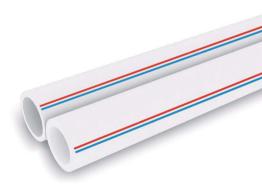


Usages

- Sanitary hot and cold water piping systems.
- Cooling, heating and air conditioning systems.
- Under-floor heating systems.
- Water transfer in risers.
- Sanitary industries, medical,industrial installations.



Pipe Size (mm)	Standard thickness range (mm)/PPRCT	Standard thickness range (mm)/PPR	Standard external diameter range (mm)	Pipe length (m)
20	2.8-3.2	3.4-3.9	20-20.3	4
25	3.5-4	4.2-4.8	25-25.3	4
32	4.4-5	5.4-6.1	32-32.3	4
40	5.5-6.2	6.7-7.5	40-40.4	4
50	6.9-7.7	8.3-9.3	50-50.5	4
63	8.6-9.6	10.5-11.7	63-63.6	4
75	10.3-11.5	12.5-13.9	75-75.7	4
90	12.3-13.7	15-16.7	90-90.9	4
110	15.1-16.8	18.3-20.3	110-111	4
125	17.1-19	20.8-23	125-126.2	4



Raw materials technical specifications

International standards	ISO 15874-2 DIN 8077/8078		
Pipe structure	Single layer		
Consuming materials	Polypropylene (PP) random copolymer with modified crystallization (PPRCT)		
Standard production series and class	S 2.5 SDR6 S 3.2 SDR7.4		
Pipe color	White with blue and red stripes		
Category and user pressure	User category 1-10 bars pressure		

Advantages

- Anti-sediment, anti-decay and anti-rust.
- Insignificant pressure drop due to the low roughness coefficient (inside the pipe).
- Fast and easy to install.
- Resistant to chemicals (acids,...).
- Resistant to physical shock and environmental degradation.
- Guide lines on all pipes and fittings.
- No microorganisms growth.

Usages

- Sanitary hot & cold water piping systems (and potable water application).
- Risers installation systems.
- Industrial installations.













Water supply brass ball valves

Technical specifications:

Applicable pressure: 10 bars.

Test pressure: 16 bars.

Production standard: BS EN 13828.

• Thread standard: ISO 228-1- BS 21.

Applicable temperature: 5°c to 95°c.



Heating and cooling system valves

Technical specifications:

• Applicable pressure: 10 bars.

• Test pressure: 16 bars.

• Production standard: BS EN 13828.

• Thread standard: ISO 228-1- BS 21.

• Applicable temperature: 5 °c to 95 °c.



Radiator valves

Technical specifications:

• Applicable pressure: 10 bars.

Test pressure: 16 bars.

Production standard: BS 2767.

• Thread standard: ISO 228-1- BS 21.

Applicable temperature: 120 °c.



Automatic bleed valves

Technical specifications:

• Applicable pressure: 10 bars.

Test pressure: 16 bars.

• Thread standard: ISO 228-1- BS 21.

• Applicable temperature: 120 °c.



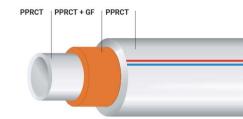






■ Technical specifications

Size (mm)	Thickness (mm)	Outer diameter (mm)
20	3.4	20.3
25	4.2	25.3
32	5.4	32.3
40	6.7	40.4
50	8.3	50.5
63	10.5	63.6
75	12.5	75.7
90	15	90.9
110	18.3	110
125	20.8	125



Features

Standards	ISO 21003-2 & ISO 15874-2 DIN 8077/8078
Class	S 2.5 - SDR 6 - PN 25
Туре	PPRC TYPE 3
Color	White
PN	10 Bars
Application Class	Class 1& 5

Advantages

- Increased pressure & temperature resistance of the product compared to single-layer PPR pipes.
- Very low linear expansion coefficient in comparison with single-layer PPR pipes (about 75% less):
 - Minimizes the changes in the pipe length caused by temperature fluctuations inside the piping system.
 - Minimizes the number of pipe clips used in the piping system and hence, reduces the costs.
- Higher mechanical properties as compared to single layer PPR pipes.
- Quick and easy installation that saves about 30% of installation time compared with PPR foil pipes.
- Less heat loss compared to PPR foil pipes and metal ones due to its lower thermal conductivity coefficient.
- impossibility of layers separation.
- Lower weight than PPR foil and metal pipes and easy transportation.

Usages

- Sanitary hot & cold water piping systems (and potable water application).
- Cooling tower risers.
- Compressed air distribution systems.
- Fan coil unit drain piping.
- Risers installation systems.







■ Technical specifications

Color		Mid-gray RAL 7037
Density	g/cm ³	0.91
Tensile strength at 20 c°	N/mm²	30
Yield stress	N/mm²	21
Flexibility factor	N/mm²	1200
Elongation	%	800
Bending stress	N/mm ²	20
Elasticity	N/mm ²	350
Impact strength	kJ/m²	25
Thermal conductivity	W/m^2K	0.23
Linear expansion coefficient	m/mK	0.00015
Roughness index	mm	0.007
PH rate		2-12



Advantages

- High impact resistance, even at temperatures below 0 °c.
- High thermal resistance to hot outlet water of dishwashers and washing machines.
- Easy installation (no adhesive or welding).
- Smooth inner surfaces of the pipes and the fittings.
- No sediment due to roughness index less than 0.007 mm.
- Quick installation without using any complex equipment.
- Resistace to various types of chemicals (acids, bases, ...), detergents, stain removers, and etc.
- Fire resistance in likely combustions.
- Wide variety of fittings for easy installation and disassembling.
- Resistance to microorganisms and rodents.
- Lightweight and easy to carry.
- Long life.
- Quake and subsidence resistance.

Usages

- Sewage disposal systems of residential buildings, offices, complexes, hotels and hospitals.
- Condensate water drainage of air conditioning systems.
- Urban sewage pipes.
- Rain water collection systems.







■ Technical specifications

Color		Papyrus white RAL 9018
Density	g/cm³	1.507
Tensile strength at 20 °c	N/mm²	25
Yield stress	N/mm²	20
Flexibility factor	N/mm²	800
Elongation	%	150
Bending stress	N/mm²	20
Elasticity	N/mm²	2600
Impact strength	kJ/m²	30
Thermal conductivity	W/m^2K	0.55
Linear expansion coefficient	m/mK	0.09
Roughness index	mm	0.007
PH rate		2-12

Advantages

- Less sound transmission to adjacent surroundings.
- Impact resistance even at below zero temperatures.
- Smooth inner surfaces of the pipes and the fittings and hence, no sediments.
- Easy installation (no adhesive or welding).
- Quick installation without using any complex equipment.
- Wide variety of fittings for easy installation and disassembling.
- Long life.
- Quake and subsidence resistance.



Usages

- Sewage disposal systems of residential buildings, offices, complexes, hotels and hospitals.
- Condensate water drainage of air conditioning systems.
- Urban sewage pipes.
- Rain water collection systems.





■ Technical specifications

Size	Thickness (mm)	Application
50	3	В
63	3	В
90	3	BD
110	3.2	BD
125	3.2	BD
160	3.2	В
160	4	BD

Size	Thickness (mm)	Application
50	1.8	R
63	1.8	R
90	1.8	R
110	2.2	R
125	2.5	R

Sewage (adhesive) pipes

Rainwater pipes (spout)

Advantages

- Efficient and economical.
- Non-clogging or sedimentation.
- Completely smooth and polished inner surface.
- Ease of access.
- Quick installation.
- Fire & heat resistance (slow-burning).
- Long life.
- Resistance to decay and corrosion.
- Electricity resistant.
- Resistance to impact and pressure.



Usages

- Wastewater disposal of residential and commercial buildings, offices, hotels, hospitals, etc.
- Building ventilation systems.
- Rainwater drainage systems.





■ Technical specifications

	Pressure range PN in bar							
PE 80	F	PN 5	PN 6		PN 8		PN 10	
PE 100	F	PN 6	-	PN 8	Р	N 10	PN 12.5	
	Pipes' head							
External diameter	SI	DR 26	SI	DR 21	SI	DR 17	SDR 13.6	
ulameter	S	12.5		S 10		S8	S 6.3	
(DN) mm	thickness (mm)	Pipe's weight per meter (kg/m)	thickness (mm)	Pipe's weight per meter (kg/m)	thickness (mm)	Pipe's weight per meter (kg/m)	thickness (mm)	Pipe's weight per meter (kg/m)
16								
20								
25							2.0	0.150
32					2.0	0.197	2.4	0.232
40			2.0	0.250	2.4	0.295	3.0	0.356
50	2.0	0.314	2.4	0.374	3.0	0.453	3.7	0.549
63	2.5	0.494	3.0	0.580	3.8	0.721	4.7	0.873
75	2.9	0.675	3.6	0.828	4.5	1.020	5.6	1.240
90	3.5	0.978	4.3	1.180	5.4	1.460	6.7	1.770
110	4.2	1.430	5.3	1.770	6.6	2.170	8.1	2.620
125	4.8	1.840	6.0	2.270	7.4	2.760	9.2	3.370
140	5.4	2.320	6.7	2.830	8.3	3.460	10.3	4.220
160	6.2	3.040	7.7	3.720	9.5	4.520	11.8	5.500
180	6.9	3.790	8.6	4.670	10.7	5.710	13.3	6.980
200	7.7	4.690	9.6	5.780	11.9	7.050	14.7	8.560
225	8.6	5.890	10.8	7.300	13.4	8.930	16.6	10.900
250	9.6	7.300	11.9	8.930	14.8	11.000	18.4	13.400
315	12.1	11.600	15.0	14.200	18.7	17.400	23.2	21.200

Advantages

- Life expectancy between 50 to100 years.
- Resistance to sudden pressure changes.
- Sound, temperature and electricity resistance.
- Mechanical strength despite low density.
- Corrosion and chemical effect resistance.
- Low weight and simple handling with the least number of fittings, leads to a fast, easy and cheap installation, with no leaking.
- Capability of being used in areas with unstable cortical tissue.
- Using modern European machineries in production process.
- Equipped with an accredited laboratory to perform some 23 tests.
- High reliability and insignificant failures against quakes in hazardous areas.
- Low friction coefficient and its constancy throughout the application period.

Certificates

- Product conformity certificate to International Standard DIN 8074: 2011 from IQS UK Compliance Certificate.
- Product conformity certificate to International Standard EN 1555: 2010 of IQS UK.
- Certificate of Compliance with Russian Standards for Pipelines and Fittings by Water and Gas Supply.
- ISO 9001: 2008 Quality Management Certificate from LLC-CERTIFICATION.
- Membership of Polyethylene Pipes and Fittings Producers.









■ Technical specifications

Color		Black
Hazen-Williams roughness index		150
long term elasticity	Мра	200
Tensile strength	Мра	23
Linear coefficient of thermal expansion	m/mK	0.17
Thermal conductivity coefficient	W/m²K	0.43
standard life time	Years	50
Chemical resistance	PH	ISO 10358

Features

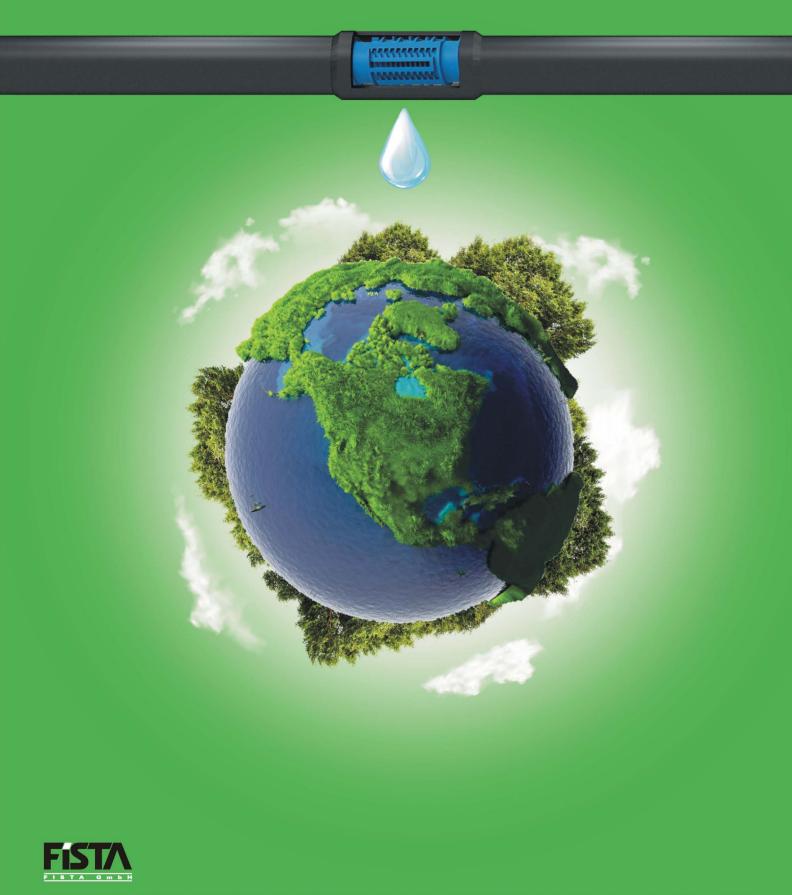
- High flexibility and impact resistance.
- Polished internal surfaces and hence, no sediments.
- High resistance to all kinds of chemicals (acids, bases, etc.).
- A variety of connections to ease implementation.
- Light weight and easy to carry.
- Long life.
- Quake and subsidence resistance.



Usages

- Wastewater disposal of commercial and high buildings, hotels and hospitals.
- Rainwater piping systems.
- Branch sewer pipes.





■ Technical specifications

Dripper pipes

Pipe diameter (mm)	16	20
Pressure range (bars)	4	4
Packing size (m)	400	400
Average water flow in drippers (Lit/hr)	4 & 2	4 & 2
Drippers space (cm)	min.20	min. 20

Non-dripper pipes

Pipe range (bars)	16			20		
Pressure range (bars)	4	5	6	4	5	6
Packing size (m)	100 & 400		400			

Usages

Irrigation of gardens, green roofs, building enclosures and urban green spaces.

Advantages

- Having a large flow cross section.
- Excellent resistance to pore clogging.
- Clean filter due to higher water flow speed.
- UV resistance.
- Resistance to corrosion of chemicals and usual fertilizers.
- High irrigation efficiency (about 90%) and loss reduce followed in irrigation systems.
- No runoff or mud and thus, preserving the beauty of urban landscape.
- Protection of valuable herb species, through safe irrigation systems.

Certificates

- Certificate of conformity of the product with international standard BS EN ISO 9261:2010 from the UK IQS company.
- ISO 9001:2008 quality management certificate from LLC-CERTIFICATION.
- Certificate of compliance with some contries standards for drip irrigation pipes and fittings.







■ Five-layer Pipe Hydraulic Press

This press is a useful tool for installing press fittings from the size 16 to 63 mm. The time of each operating period equals to 10,000 press cycles, after which the tool must be delivered to the company official agency for technical services. The tool warranty period is one year or 10,000 initial press cycles.

Driving force	Battery charging time	Pressing time	Press performance	Sound level	Vibrations	Battery voltage
33KN At least	1h	4 to 11 seconds depending on the ring size	About 150 presses per charge	75 dB at a distance of one meter	3.5 m/s	12 V



■ Fusion Welding Set box

In order to carry out plumbing with one and three layer PPRCT pipes, a welding tool and its accessories are produced and placed in a box for ease of transportation and supplied to customers with one-year warranty.

This box contains welding machine, element plate, support, meter, pipe cutter, mold wrench and molds in the sizes of 20 to 40 mm.



Fusion Welding Tool

This device can be supplied separately with one-year warranty and used for plumping purposes of large-size PPRCT pipes from 63 to 125 mm.



Welding Molds

Welding molds can be provided in sizes of 20, 25, 32, 40, 50, 63, 75, 90, 110 and 125 mm.



Five-layer Pipes Press Jaw

This set including 4 sizes of jaws, for pressing different sizes (16, 20, 25, 32,40,50,63 mm) of pipes, is offered to the market along with the hydraulic press of SGP brand.

Five Layer Pipe Bending Tool

In order to facilitate bending and avoid breaking the aluminum foil of five-layer pipes, this pipe bender has been designed and built for accurate bending of pipes involving four sizes of 16, 20, 25 and 32 mm up to 90°.



■ Newflex Stopper Test Tool

This device can be used in order to facilitate the pipe testing process and to ensure proper and standard plumbing for push-fit PP pipes in the size of 110 to 160 mm.



■ Five-laver Pipe Tool Box

Tools required by a five-layer pipe plumber include three sizes of springs (16, 20 and 25 mm), 32 mm calibrator, star PEX calibrators (the sizes 16, 20 and 25 mm), a pipe cutter and a meter in the tool box.



This device has been produced and marketed to improve the quality level, and to speed up the piping installation and implementation procedures during which floor heating systems are set up using five-layer pipes.









■ Technical specifications

Polyethylene foams are produced in the thicknesses of 0.5 to 35 mm in the form of sheets and in the thicknesses of 40 to 120 mm in the shape of mats. These insulators are capable of being laminated with a variety of aluminum foils, metalized coat, polymer films and PVC.

The product is also available in the sizes of 2 to 3.8 inches in the form of pipe foams.

EPE technical specifications:

Density (ASTM D3575-W)	25 Kg/m³
Compression set (ASTM D3575-B)	29 %
Thermal conductivity coefficient (ASTM c335)	0.035 W/m° K
Water absorption (ASTM D3575-L)	0.107 Kg/m ²
Tensile strength (ASTM D412)	0.2 MPa
Linear expansion (ASTM D412)	75 %
Thermal tolerance	70 °c



Polyethylene foams are produced in the thicknesses of 0.5 to 35 mm in the form of sheets and in the thicknesses of 40 to 120 mm in the shape of mats. These insulators are capable of being laminated with a variety of aluminum foils, metalized coat, polymer films and PVC.

The product is also available in the sizes of 2 to 3.8 inches in the form of pipe foams.

XPE technical specifications:

Density (ASTM D3575-W)	30-200 Kg/m ³	Thermal tolerance	90 °c
Compression set (ASTM D3575-B)	%20<	Flammability (DIN 4102)	class B2
Thermal conductivity coefficient (ASTM C335)	0.033 W/m° K	Water vapor permeability (WVP)	0.003 mg/hmpa
Water absorption (ASTM D3575-L)	0.03 Kg/m ²	Water vapor resistance factor	6.788 mm²pa/mg
Tensile strength (ASTM D412)	0.3 MPa	water vapor permeability index	0.169 mg/hm²pa
Linear expansion (ASTM D412)	110 %	Water transmission rate	204.26 mg/hm ²







Technical specifications

Maximum nominal power (Minimum nominal power (Maximum thermal power (Nominal efficiency Efficiency class at 100% p .(according to EEC 92/4 Degree of electrical protect Nox class Gas category	Qm) (Pn) Pm) ower 2)	KW KW KW Z Category IP class	Star 24 25.6 9.5 23.5 8.5 92.5 **** x4D	29.6 11.1 27.1 10 92.3 ***	33.9 11.5 31.3 10.2 92.4 ****
Minimum nominal power (Maximum thermal power (Minimum thermal power (Nominal efficiency Efficiency class at 100% p .(according to EEC 92/4 Degree of electrical protect	Qm) (Pn) Pm) ower 2)	KW KW KW % category	9.5 23.5 8.5 92.5	11.1 27.1 10 92.3 ***	11.5 31.3 10.2 92.4
Maximum thermal power (Minimum thermal power (Nominal efficiency Efficiency class at 100% p .(according to EEC 92/4 Degree of electrical protect	(Pn) Pm) ower 2)	KW KW % category	23.5 8.5 92.5	27.1 10 92.3	31.3 10.2 92.4
Minimum thermal power (Nominal efficiency Efficiency class at 100% p .(according to EEC 92/4) Degree of electrical protect	Pm) ower 2)	KW % category	8.5 92.5 ***	10 92.3 ***	10.2
Nominal efficiency Efficiency class at 100% p .(according to EEC 92/4 Degree of electrical protect	ower 2)	% category	92.5	92.3	92.4
Efficiency class at 100% p .(according to EEC 92/4 Degree of electrical protections) Nox class	2)	category	***	***	7=
.(according to EEC 92/4 Degree of electrical protection Nox class	2)	IP			***
Nox class	etion		x4D	x4D	
3340.3,222		class			x4D
Gas category		Olubb	2	2	2
		-		G20	
Allowed installation typ	e	-		B22-C12-C32-C42	~220/50
	Radia	tor	35-80	35-80	35-80
Femperature of the heating sys (low temperature / high temper		°C	0.5 - 3	0.5 - 3	0.5 - 3
	Underfloor h	eating	25-50	25-50	25-50
Heating system min & max pr	ressure	bar	0.5 - 3	0.5 - 3	0.5 - 3
The volume of the expansion	source	Ţ	6	7	7
Heating system min & max pr	ressure	bar	0.3 - 6	0.3 - 6	0.3 - 6
minimum spa literage us	sed T ∆=۳∘	l/min	3	3	3
Spa temperature adjustment	t range	°C	30 - 65	30 - 65	30 - 65
Hot water discharge		l/min	10	12.2	14.8
Dimensions (width, height, o	depth)	mm	404X330X712	404X330X712	404X330X712
Weight		kg	28	33	34
Dimensions of coaxial chimne	ey pipes	mm	100/60	100/60	100/60
leating system input and output	connections	Ø	3/4"-3/4"	3/4"-3/4"	3/4"-3/4"
Hot water temperature adjustm	ent range	Ø	1/2"-1/2"	1/2"-1/2"	1/2"-1/2"
Gas inlet connection		Ø	3/4"	3/4"	3/4"
Voltage and frequency of ele	ectricity	V/Hz	~230/50	~230/50	~230/50
Maximum power consump	otion	W	125	135	140

Device equipment properties

- Top quality Italian fan (FIME).
- Original best quality heat exchanger made in Italy (Valmex).
- Top quality burner made in Italy (Polidoro).
- High quality electric 3 way Italian valve (Elbi/Bitron).
- Best quality brass hydroblock complete kit made in Türkiye (Brass Arcell).
- Top quality european water circulation pump (Grundfos).
- Quality European plate heat exchanger (ZILMET/SWEP)
- Remote control and electronic board made in Italy/Türkiye (NORDGAD/ENPI).

Features

- Compact dimensions of 330X710X400 (mm) in all Hermetic sizes.
- Anti-freeze function for both sanitary hot water and heating systems circuits.
- Protection system against pumps' and three-way valves gripage.
- Armed with a safety approach for toxic fume exhaust (caused by combustion) through a microprocessor control system.
- Protection against heating circuit blocking (automatic bypass).
- 93% efficiency.
- Capability of being connected to a room thermostat.







■ Technical specifications

	Brand	Thermal power	Sheet thickness	Tees	Installation kit	Warranty
	Istanbul	2000 kcal per hour	1.1 mm	Made in Türkiye (under license)	brass	144 months
	Hamgam General (Star Plus)	1910 kcal per hour	1.1 mm	Made in Iran (with some items imported)	polymeric	120 months
	Star	1910 kcal per hour	1 mm	Made in Iran (with some items imported)	polymeric	120 months

Features

- Axis 50 cm with lengths 60,80,100,120,140,160 cm
- Half panel and full block leakage test up to 12 bars.
- Reducing the number of air venting times compared to the aluminum radiators.
- Phosphate coating and corrosion-resistant (polyester static powder) painting done by robots.
- Compatibility with copper heat exchangers of heating circuits (in houses equipped with wall-hang combi boilrers).









Gypsum boards

These are gypsum cored boards, the surfaces and edges of which are covered with a special firm kind of paper. They are generally used in dry construction systems (such as separator walls, covering treatment walls and dropped ceilings).

Technical specifications

- Two regular (RG) and moisture resistant (MR)
 Types.
- Dimensions 2400 x 1200 mm.
- Thickness 9.5 and 12.5 mm.
- Produced in compliance with international standard EN520.

Features

- Easy installation.
- Sound, temperature and moisture insulated.
- Capable of being painted or wallpapered immediately after installation.
- Lightening the buildings.

Usages

- Dropped ceilings.
- Separating walls.
- Interior walls of the building.
- Prefabricated buildings.
- Alternative to traditional whitewashing.

■ Light steel sections (structures)

Structures play an important role in strength and longevity of integrated roofs and separating walls. Battis structures are produced from light galvanized steel sheets with U-L-F shaped sections through cold rolling method and out of the best galvanized sheets found in the country.

Sealant powder

Batis sealant is used for sealing gypsum coated plates. the putty is applied as a thin layer of 1 to 2 mm thickness and forms a reinforced and strong structure.

Ceiling tiles

Patterned gypsum tiles are applied mostly in movable, closed and decorative ceilings. Those with PVC coating are produced and offered to the market in 7 different designs and in two types: plain backed and aluminum backed tiles, the latter of which are used in places where there is a possibility of water spillage caused by sweating behind the tiles (such as the passage of utility pipes or in wet areas such as swimming pools).

Technical specifications

- Dimensions 600 x 600 mm.
- Thickness 7.5 mm.

Features

- Quick and easy installation.
- Beautiful appearance.
- Easy access to the home installations space.
- No more painting operations needed.
- Ease of maintenance.







