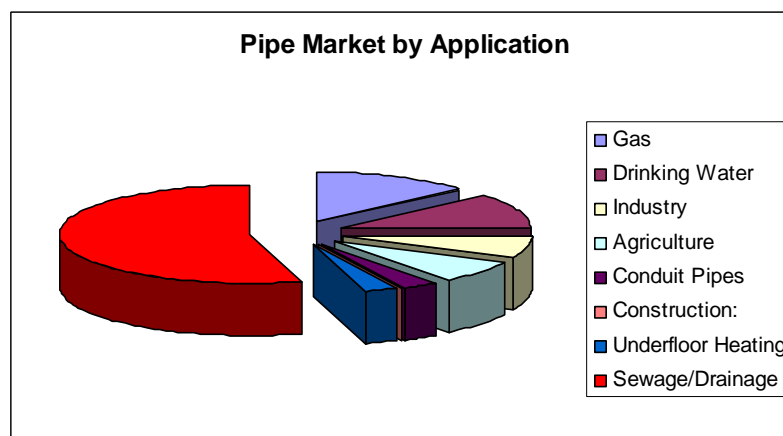


## Market Size and Structure



**Global plastic pipe = 8MM tons of resin.**

Categories of pipe used are **gravity pipe** for building and civil engineering, **pressure pipe** for utilities and plumbing and for industrial use. The gravity sector is by far the largest.

In industrialised countries 89% of all sewage pipes are still made from concrete and stoneware, only 11% are plastic. Despite this, more than 50% of all plastic pipes are sewer and non pressure pipes. **Of this PVC has a market share of 80%.** Despite the moves away from PVC, pipes made from this material grow at average GDP rates.

By 2025 an additional 3bill. people will live on our planet, **demographics have the 2<sup>nd</sup> biggest impact on the growth rates for waterpipes.** The biggest impact is coming from the replacement of concrete, copper and steel pipes however.

For pressure pipes only the PVC standard DIN EN 1452 is published. PrEN drafts cover PVC–sewer, PE–drinking water and sewer. EN for gas pipes is in the formula vote. **Key standards in Europe are DIN 16982 and 16983 apply for hot water pipes, up to diameters of 160 mm.** ISO 13479 is the international standard for stress crack resistance and ISO 13477 covers rapid crack propagation.

<b>Global HDPE Pipe Market - KT</b>					
<u>Polymer</u>	<u>1990</u>	<u>Growth</u>	<u>2000</u>	<u>Growth</u>	<u>2010</u>
W.Europe	395	9.0%	750	7.7%	1'330
E.Europe	80	12.5%	180	9.2%	345
Africa	20	20.0%	60	7.5%	105
M.East	25	26.0%	90	11.1%	190
Japan	70	2.0%	84	1.9%	100
Asia	95	27.9%	360	21.9%	1'150
NAFTA	335	16.9%	900	7.8%	1'600
S.Africa	25	18.0%	70	12.9%	160
Total	<u>1'045</u>	13.9%	<u>2'494</u>	10.0%	<u>4'980</u>

HDPE pipes display good functional properties, toughness, resistance to corrosion, chemicals and micro-organisms. They can be tailored to different requirements and installed at low costs. Today mainly unimodal HDPE grades (PE 63 and 80) are being used allowing wall thicknesses of up to 70mm. Most important area of application for HDPE pipes is drinking water, followed by sewage, gas supply lines and district heating. HDPE has also never been as cost efficient as today.

The industry is facing a number of issues which explain the drive towards plastics;

- ◆ Leakage rates which require oversized treatment plants, and water shortages;
- ◆ Backflow: due to poor fittings connections, a vacuum is pulled on the line which draws in dirt/contaminants;
- ◆ Costs: higher consumer bills and repair expense) with the existing technology.

Since HDPE pipes are joined by heat fusion this creates a leak free system. The joint created is as strong or stronger than the pipe itself. In addition, no bolts, gaskets are required.

It is estimated that 25% of the water that is cleaned and transported through pipes is lost at local water plants, due to poor fittings. Iron pipes also are susceptible to fungi and bacteria, causing decay and negative impact on hydraulic efficiency over time. PE requires no special coatings nor cathodic protection, is more resistant to acids, bases and salts and is unaffected by bacteria/fungi; thereby providing better long term hydraulic / hydrostatic stability over time. PE is smoother than steel which provides excellent flow characteristics thereby offering equivalent flow profiles / velocity with smaller pipe inner diameter.

New bimodular materials (PE 100) manufactured by a cascade process, which equips them with highly crystalline zones of short molecule chains, allowing wall thicknesses well below the more standard PE's. They are the reference materials for gas distribution pipes in Europe today. The term PE 100 indicates the strength this PE (long term strength of at least 10 Mpa at 20°C over 50 years).

PE 100 set new standards in terms of creep rupture strength, stress crack resistance and resistance to rapid crack propagation. Sagging and dimensional stability are however issues for PE100 based pipes at dimensions that exceed 65mm (**Silane xlinking does resolve the sagging issue**). Their higher stiffness is limiting their use in smaller-diameter waterpipes for floor-heating.

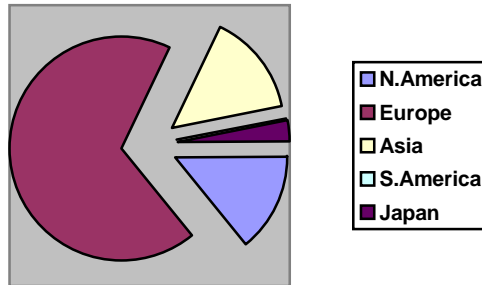
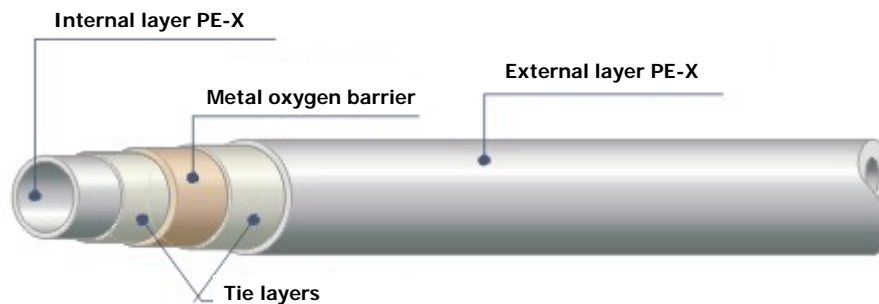


Table 5: Silane Pex globally by country in 2000.



Multilayer pipes (MP) based on an alu-midlayer are making inroads. This layer works as a barrier layer providing 100% diffusion tightness, it also reduces the length expansion of the pipe when exposed to heat and provides larger distances between fixings due to the higher stability. As a consequence, 30% less fixing material less time is used during installation. MP pipes also tend to be 40% lighter than metal pipes and are easy to shape and form.

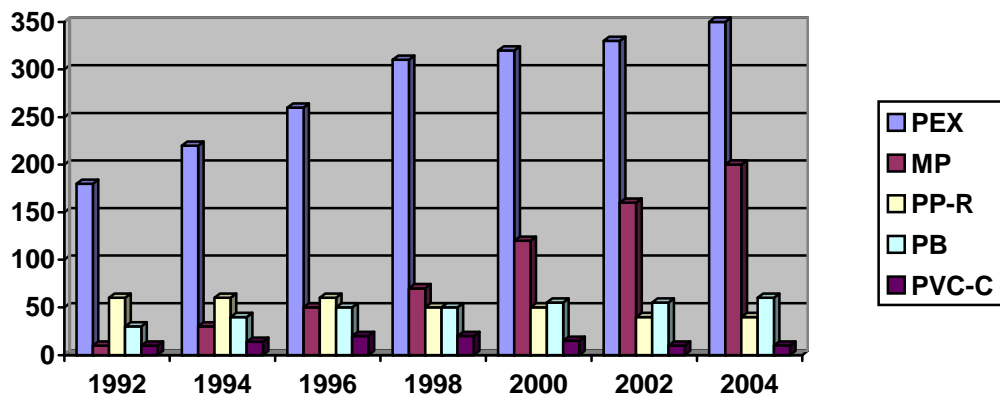
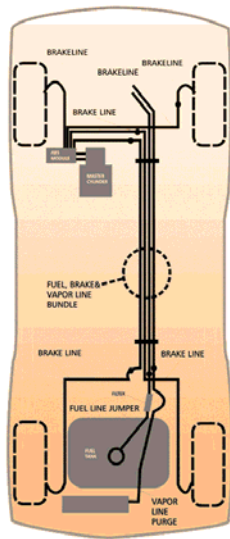


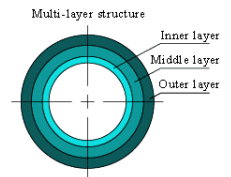
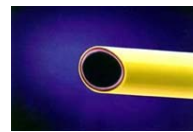
Table: European Hot Water Sanitary Pipe Market in Mill.Meters (KWD)

**Market Overview – PE-X Pipes**

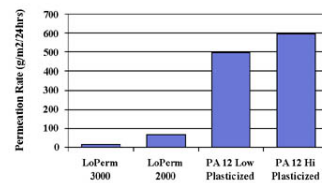
Pex pipes account for 180kT and grow by 12 % pa (02–06). Pex b amounts to 69kT (Europe 30kT, NA 12KT, ME 5kT, Asia 18kT, SA 4kT). Pex pipes make big inroads into pressure pipe markets, **displacing traditional steel and copper through lower installation and in-service costs** (easier installation techniques, lower weight, less crack propagation). Figures published by KWD suggest that PE-X pipes will increase in Europe from 400 Mill.meters in 1998 to around 680 Mill. meters in 2004 (Copper 750Mill. meters 1998 to 650 Mill. in 2004).



LoPerm™ Multilayer Tubing



Dynamic Permeation Test Results  
Conditions: 60 C, 2bar, CM25 fuel



Focus for PE-X remains on hot- and cold water Pipes, Gas pipes. PE-X provides end-users with benefits such as superior temperature-, chemical- and abrasion- resistance. The Pex-MP (Multilayerpipe) market is expected to grow the fastest, due to several handling and performance benefits vs. monolayer pipes (especially in sanitary and floor-heating installations).

Due to their superior performance on permeability, MP pipes also open up huge opportunities as complete fuel, brake and vapour fluid carrying systems.

EVOH is the most widely used agent for Oxygen diffusion barriers on Pex pipes for under-floor and radiator heating .

While the markets for MP using alu midlayers have been in Europe and China, the standards have really been written by the ASTM, describing min./max. wall thicknesses and desired internal pressures.

**Medical Tubes present another interesting growth area for polyolefins in the coming years. However the kinking of pipes when bent too forcibly has been an issue when trying to switch from PVC to polyolefins such as HDPE's. Increasing the wall thickness will reduce kinking but you also reduce bending.**

In Europe PE-X materials are subject to a number of standards: BS EN 1055: Plastics piping systems. Thermoplastics piping systems for soil and waste discharge inside buildings. Test method for resistance to elevated temperature cycling (sorry should be EN 1055 and not EN 155). DIN 16892: Pipes made from crosslinked PE (PEX); Defines the degree of min, gel content needed for PEX A= 75%, PEX B= 65%, and PEX C= 60%. It covers HDPE based PEX pipes and refers for the dimensional requirements to DIN 16893. DIN 16893: Dimensional requirements of PEX pipes.

ISO 13479: Polyolefin pipes for the conveyance of fluids – Determination of resistance to crack propagation – Test method for slow crack growth on notched pipes (notch test) CEN publication date 1997-05-01

ISO/TR 9080: Thermoplastics pipes for the transport of fluids -- Methods of extrapolation of hydrostatic stress rupture data to determine the long-term hydrostatic strength of thermoplastics pipe materials.

A tap water installation is often described as being like a long food package and thus the pipe material taste and **odor neutrality is critical**. For this reason formulations must be in accordance with national and European positive lists for drinking water and food contact. In addition, many authorities require formalized organoleptic taste and odor testing: **EN 1420** influence of organic materials on water intended for human consumption – determination of odour and flavour assessment of water in piping systems, test method.

In the US the **PE-X industry has been very proactive** in ensuring that its' products are suitable for the various plumbing applications. Based on the past **experience with polybutylene (PB) and acetal fittings**, the industry has paid particular attention to ensuring **performance in chlorinated potable water** applications. **ASTM F2023 is a consensus test method** developed by the industry to determine the **oxidative stability of PEX in hot, chlorinated water**.

Currently, specific minimum performance requirements based on this test method are being balloted into the **ASTM PEX tubing product standard, ASTM F876**, which will make it mandatory. **NSF International** has developed a **voluntary protocol (P171)** to which they list PEX materials and/or pipes based on chlorine resistance testing. Both of these documents use aggressive conditions to accelerate the testing of PEX pipe in potable water applications and ensure a minimum level of product performance.

**Chlorine is a very powerful oxidizing agent** not just with PEX but **for any material, including copper**, which is susceptible to oxidation. The effect of chlorine is simply an acceleration of oxidative processes relative to less oxidatively aggressive non-chlorinated water. What is known with great certainty is that overall water quality, and not just chlorine concentration, determines how strong an oxidizer the water is.

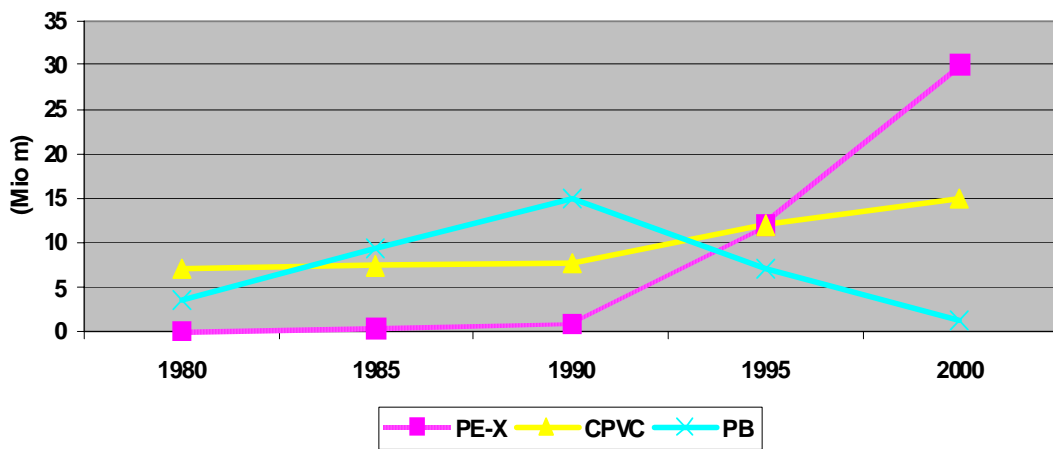
**Regional Market Review – North America**

North American shipments of **polyethylene pipe, tube and conduit totaled 1.4 billion pounds in 1999**, an 18.8% increase from the 1998 rate of 1.2 billion pounds, according to the 1999 Statistical Review (Plastics Pipe Institute, Inc. (PPI)). Copper still has an 80% share in hot & cold water plumbing systems (Pex now 15%).

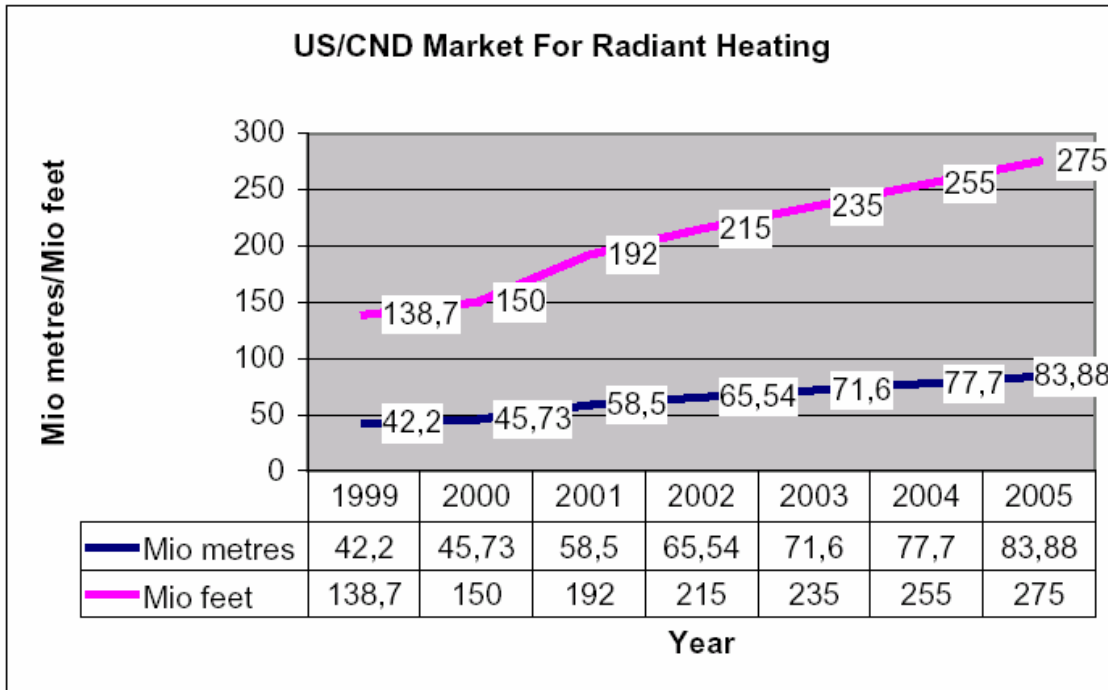
The pipe and profile market in the US accounts for **10% of the total plastics industry**, estimated at \$ 137bn (US Census Bureau). Fittings account for another 2% of the total. Pipe markets in North America still dominated by copper and PVC.

**Indoor plumbing and radiant floor heating are making xlinked PE a highly sought material in the US market.** In 2002 approx. 650million lbs of xlinked polyethylene were consumed in the US, of which 26% went into pipe applications (46% in wire and cable). PEX does not exhibit the issues of corrosion as present with copper, reducing water-flow. It has better stress crack performance than PB and better impact resistance than PVC and PP. For radiant heating it also has better flexibility. As from 2000 national plumbing codes accepted PEX and it is finding growth because more and more households are switching from hot-air heating to radiant-floor heating.

**Potable Water Systems**



In Europe, pipes in heating mainly go into **radiator connections and ufh**, while in the States they also go into sundry **baseboards**, and in Canada up to 40% are **used outdoors**, mainly to keep ramps and drive-ways clear. The **copper Industry** has started feeling the brunt from this **massive attack triggered by PE-X** and the likes, and is fighting back with all means fair and foul (watch the struggle for approval of plastic systems in Florida, for instance).

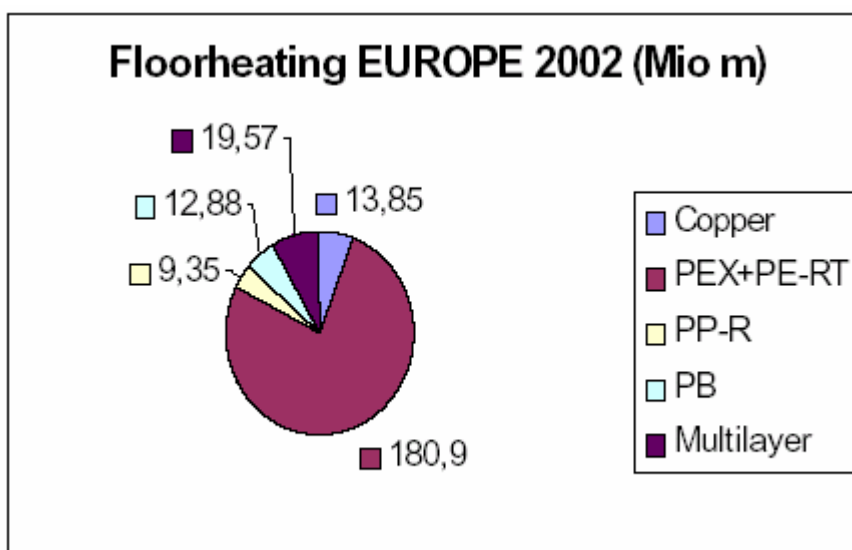


Main players in the US are Wirsbo–Uponor (Pex–A), Vanguard, Plasco Canada and Zurn (Pex–b). Wirsbo uses for all their Pex production the Engel – CV process (peroxide crosslinking), only facility within their group that uses some Sioplas compounds is the Plasco site in Canada. Sioplas materials are predominantly used in the US Pex–B markets. Only Zurn / US Brass have pursued the Monosil route and have converted three extrusion lines to that process in the meantime.

## Regional Market Review – Europe

From the early Seventies underfloor heating (ufh) with hot water pipes started spreading from Switzerland, Austria and Germany whereas electrical systems (foils in Spain, cables elsewhere) never got far beyond a dismal 5% market share.

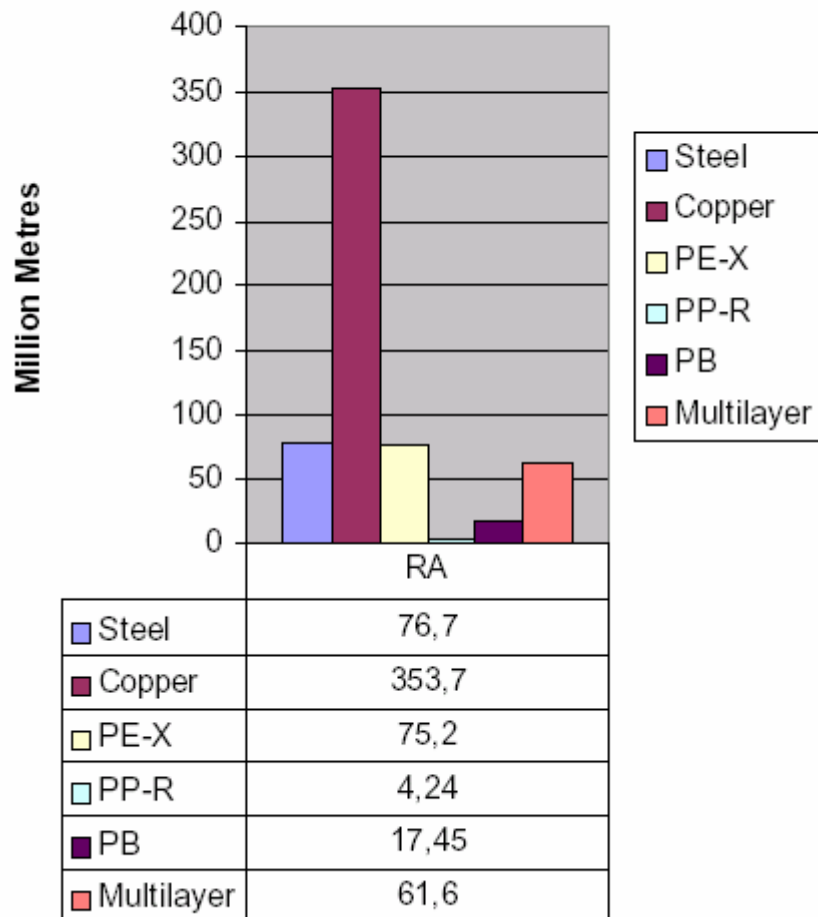
Only after the breakthrough made by plastic pipes (PP, followed by PB and PE-X) ufh has become one of the most widely used systems. In Germany copper pipes can occasionally be found in ufh but their share is negligible and so is hot air's and electric radiators'. In Germany hydronic ufh with plastic pipe has reached 70% in houses and around 30% in apartments.



In South Europe ufh's breath-taking rise is fed by those countries' habit of tiled floors. Plastic pipes started off with diameters of 20 mm and more (still 25 mm for outdoor use in ramps etc). A combination of energy-saving legislation and improved insulation has brought a steady reduction in diameters to the present average of 14 mm with 12 and even 10 mm already showing on the horizon. The original PP (polypropylene) has been mostly displaced by PE-X (cross-linked polyethylene) as the material of choice while PB (polybutylene) remains marginal

Plastic pipes in hydronic heating are plagued by a common and recurring scourge : they are not oxygen-proof. This has led pipes to be coated with an odb (=oxygen diffusion barrier). Oxygen can be absorbed into the water stream through the pipe wall and cause havoc in the boiler if a tiny metal particle has been left in the system by a careless plumber. Pinhole perforation is the undesirable consequence. The recently improved welding of ever thinner aluminium foils for multilayer pipe which is oxygen-proof by

## Radiator Heating EUROPE 2002



KWD-globalpipe 78, 12.4.2003 page 7

### 2000 European Pipe Market by Volume (Tons)

	HD/MDPE	LDPE	XLPE	PB	PP	ABS	PVC	Total
	MT	MT	MT	MT	MT	MT	MT	MT
Gas	155'000	0	15'600	0	0	0	205'000	375'600
Drinking Water	238'000	15'000	9'600	0	0	0	13'000	275'600
Industry	25'900	4'300	0	0	33'000	3'400	103'000	169'600
Agriculture	17'600	88'000	0	0	0	0	78'000	183'600
Conduit Pipes	85'000	9'000	0	0	20'200	0	0	114'200
District Heating	25'000	0	0	0	0	0	0	25'000
Underfloor Heating	8'500	2'600	33'400	11'000	20'000	0	1'000	76'500
Sewage/Drainage	195'000	4'200	0	0	52'000	6'600	1'125'000	1'382'800
<b>Total</b>	<b>750'000</b>	<b>123'100</b>	<b>58'600</b>	<b>11'000</b>	<b>125'200</b>	<b>10'000</b>	<b>1'525'000</b>	<b>2'602'900</b>
In % of Total	28.8%	4.7%	2.3%	0.4%	4.8%	0.4%	58.6%	100.0%

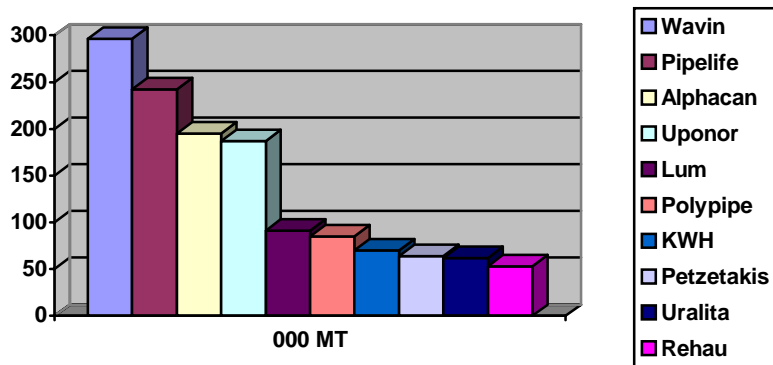
In 2000 2.6 Mill. tons of plastic were used in pipes (valued at Euro 10bn), that's 7% of total production compared to the automotive industry's consumption of 8% of all plastics.

<b>European Pipe Market - KT</b>					
<u>Polymer</u>	<u>1990</u>	<u>Growth</u>	<u>2000</u>	<u>Growth</u>	<u>2010</u>
PVC	1'435	0.6%	1'525	0.8%	1'650
HDPE	395	9.0%	750	7.7%	1'330
LDPE	105	1.7%	123	1.4%	140
PP	65	9.2%	125	8.0%	225
Others	50	6.0%	80	4.4%	115
					147
Total	<u>2'050</u>	2.7%	<u>2'603</u>	3.3%	<u>3'460</u>

The European hot water – sanitary pipe market accounted for 720Mill m. of copper pipe and 480Mill. m. of Pex & MP pipe in the year 2000. With the continuing growth of eating German underfloor heating market amounts to 93Mill meters, of which Pex pipes have captured 74Mill. and copper are down to 10.5Mill meters in 2000. The French market for underfloor–heating amounts 30,6 Mill. meters of which Pex accounts for 27,6 Mill. meters. Key players are Alphacan (Pex–b) and Acome (Pex–c).

There are about 655 thermoplastic pipe production plants in Europe (40% of them account for 80% output and are owned by 50 pipe producing groups). Largest number of plants (151) are to be found in Italy, which has the highest fragmentation. Germany accounts for 82 pipe extrusion plants (average throughput of 5'700MT/annum) followed by Scandinavia (66), Poland (66 – 2'530 MT of throughput) and France (53). Market Value in 1999 was estimated around € 7 billion. **In Europe PE pipes account for 70 – 82% of all drinking water pressure pipes.**

The ten biggest pipe producers are listed below;



Wavin has long been the leading group, however Pipelife and Uponor are the strongest contenders. Recent corporate changes include the acquisition of Deka (D) by Georg Fischer, Geberit acquired Caradon Terrain (UK), Glynwed acquired Friatec (D) and Ipex (CD), Etex took over Marley (UK) and Pipelife took over Jet Stream (US).

In the rest of the Middle East (excl. Israel) there are now around 93 plastic pipe processors producing a total of 450'000 tons of pipes. PVC still accounts for the lion share with 320'000 tons, however capacity utilisation of the remaining 130'000 tons of PE is only around 50%. Sales of PVC pipe outnumber that of PE by 21:1, mainly due to the lack of natural gas.

### **Regional Market Reviews – Asia**

China will encourage the use of plastic pipes, according to an outlined development programme for chemical building materials industry in the Tenth Five-Year Plan period (2001-05) and up to 2010. Plastic pipes will also benefit from China's low and falling local supply of copper.

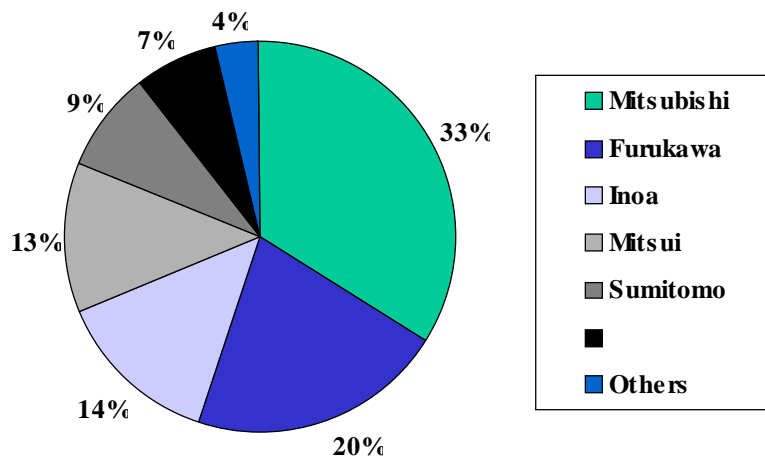
By 2005, the use of plastic pipes, is expected to account for 70% of construction drainage pipelines in new and expansion projects, 50% of hot water and heating pipelines, 10% of city drainage pipeline, 60% of construction water, hot water and heating supply pipelines, 50% of city water supply pipelines (of less than DN400mm), 70% of rural water supply, 20% in city gas pipelines (medium and low pressure pipes), and 80% in electric wire jacket pipes.

According to statistics, China has about 2,000 pipe production lines, of which 15% are imported equipment. The **production capacity of various pipe products was 1.5 million tons in 1998** and the total output was 900,000 tons. Of them, 450,000 tons were UPVC pipes and 320,000 tons were PE pipes. Chinese pipe manufacturers produce around 100Mill meters of MP (Multilayer Pipe) annually.

Whereas profile producers adhere to Austrian / German standards, **pipe producers have so far adopted ASTM standards**. PlyPipe is by far the biggest single extruder of MP pipes, with a total of 47 extrusion lines.

The Japanese market is switching rapidly to plastic pipes (incl.PVC lined pipes, Pex and Polybutene). This followed major earthquakes in recent years and the comparative advantages that plastic pipes have over copper and other metal pipes. Japanese producers still have a preference for PB pipes in potable water applications, also related to the easier weldability of that material.

## Business Review TP



Key issues for silane Pex pipes today continue to be tin catalysts.

Philmac, Australia has become the first company to supply Japan with specialist plastic water fittings for use in connecting households to the mains water supply. Philmac signed a contract with major Japanese trading company Kurimoto Ltd, which in turn will supply the fittings to Japan's 5000 domestic water supply companies. **It is the first time Japan has approved the use of plastic fittings for its domestic water supply system.**

The Japanese water market traditionally used metal fittings and had extremely tough standards which had to be overcome before any other material would be considered. In the past, plastic fittings have been unable to meet these standards. The Kobe earthquake in 1995 had been the catalyst for the development and use of plastics in the domestic supply of water in Japan.

Current situation of plastic pipe market in China :

Now there are only three kinds of plastic pipe used in in-house application : AL-XLPE composite pipe, PEX pipe and PP-R pipe. PP-R pipe was promoted and recommended by China Construction Material Bureau and the people of PP-R industry last year, and quickly PP-R pipe take over the market of AL-XLPE composite pipe and occupy about 60% of total plastic pipe market in China because of the advantages :

1. PP-R pipe's installation is same as steel pipe, local construction designers get used to it.
2. PP-R pipe don't need fitting. Many accidents of AL-XLPE composite pipe (also PEX pipe) is caused by the broken between copper fitting and pipe before, leave bad impression on China Construction industry.

PP-R compound is made by 90-95% PP, 5% Ethylene and other additives, is compounded by the twin-screw extruder, the compounding temperature is close to

Sioplas compounding. According to the specification released by China Construction Material Bureau, PP-R pipe with 3.5mm diameter can pass the testing under 1000 hours, 95°C and 3.5Mpa. For the same requirement, PEX pipe only need 2.7mm diameter. Now flooring-heating pipe become popular in northeast China and will expand to northwest China soon.

### Competitive Offerings

PP-R plumbing and heating pipes have reached 60Ktons in Germany and replaced mainly FE (galvanised steel) pipes, due to big corrosion issues. Also copper pipes have been displaced in areas where the acidic water quality can quickly cause pitting erosion. German BgVV issues a health warning in 1998 over the use of copper pipes for water with PH values below 7.3. PP-R is used in hot and cold water as well as radiator connection systems (however life expectancy at 95Deg C is only 10 years - 50 years 5Mpa hoop stress for 50 years).

PP-R pipes are growing fast in China and Turkey, due to this system approach. Tap-water installation is usually described as a long food package and thus pipe material taste and odour are critical.

Dow Chemical continue to attack Pex-B pipes with their range of their Dowlex polymers, on grounds of their organoleptic performance in potable water systems. Dowlex polyethylenes are ethylene-octene copolymers produced via their proprietary solution process. Dowlex 2344E for pipes is targeted at the hot-tap water market (< 60 DegC) and the lower temperature floor heating market (< 70 Deg C).

Dow introduced at the K 2001 DOWLEX\* 2388 resin for pipe applications. The resin, which is the newest member of Dow's versatile DOWLEX polyethylene (PE) family of resins, offers improved hydrostatic strength and processability over existing materials in a variety of heating/cooling systems and hot and cold drinking water supply networks. The resin is well suited for applications such as floor heating, radiator connections, snow melt systems, heat exchangers, solar panels, heat recovery systems and hot/cold domestic drinking water networks. And, due to its high strength at high temperatures, it can be used in technical applications where conventional PE usually fails.

DOWLEX 2388 resin is an ethylene-octene copolymer, produced by a proprietary solution process from Dow. DOWLEX 2388 resin features a unique molecular structure with a controlled side chain distribution.

*K/WA* feel there is a strong pressure from PERT against PEX and would advise us to position PEX directly against it. PERT has had some field problems related to creep (fitting release) and taste (BFP is highest compared to all other plastic pipes). PEX has on the other hand never had any field problems reported to them. The only problems heard of were related to installation errors where the coefficient of expansion had not

been taken into account (failure at main connection due to local stresses resulting from not having left enough expansion length). As mentioned, PERT has a very high BFP, as have all uncrosslinked PE materials (incl PE100) in general. Of the PEX systems, PEX-a has by far the highest BFP, and PEX-a is also under scrutiny due to the alleged mutagenic byproducts generated by peroxides (producers have to prove otherwise).

### **Strategic Alliances in Pipes**

#### **ETEX**

Etex Group is an industrial holding company specializing in building materials. The Group, with its head office in Brussels, has 180 subsidiaries across 45 countries and employs 30,000 people. There are four major product groups within the Group: roofing materials, plastic pipes and fittings, boards, floor and wall covering. Glynwed divested their complete plastic pipe business to ETEX, after years of aggressive acquisitions, incl. Companies such as FIP, Masa, Durapipe, Friatec, Ipex (USA) and Philmac (Australia). Etex (family owned producer of building products incl. Roofing ) of Belgium acquired the whole business for € 1.24bn. Etex was already owner of Marley and other pipe producers.

#### **DRISCOPE & PLEXCO**

Phillips Petroleum Company (NYSE: P) and Chevron Corp. (NYSE: CHV) announced June 30, 2000 that they have received the final necessary regulatory clearance to proceed with the combination of their worldwide chemicals businesses. The transaction creating Chevron Phillips Chemical Company, LP closed July 1, 2000.

**This means that the polyethylene pipe units of PLEXCO (formerly of Chevron Chemical Company LLC) and Phillips Driscopipe (formerly a division of Phillips Petroleum Company) have been combined.** The combined pipe operation is named Performance Pipe, a Division of Chevron Phillips Chemical Company, LP. The combined plants of PLEXCO and Driscopipe will have unprecedented flexibility and capability to produce and provide polyethylene pipe systems. With 14 plants throughout the country, Performance Pipe will be able to quickly respond to orders no matter the size or quantity.

#### **WATTS INDUSTRIES acquire Dumser Metallbau, Germany**

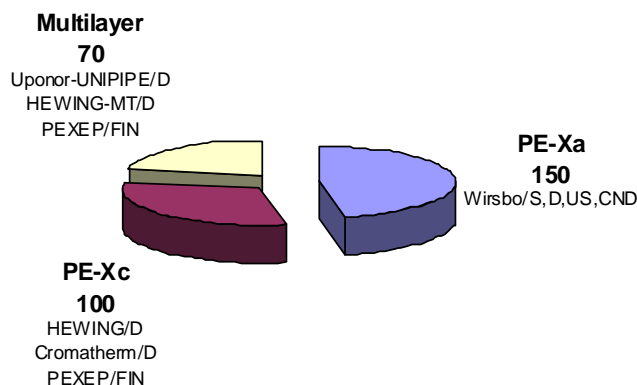
Main products of Dumser are brass and steel manifolds used as prime distribution devices in heating systems. Acquisition will strengthen Watts leadership in the European hydronic heating market. Dumser holds 51% in Stern Rubinetti. Watts Industries with worldwide sales exceeding € 532 Mill, includes

companies in nearly every European country (Watts Londa, I; Watts Intermes, CH; Watts Ocean, B; Watts MTR, D etc). <http://www.wattsind.com> .

### UPONOR licenses DPI Plastics of South Africa

Uponor also became the 1<sup>st</sup> pipe company in the US for selling composite pipes in water supply installations. Their Wirsbo unit also received approval in 2000 for a new sprinkler tube / system in homes.

### Worldwide (Mio m)



### GEORG FISCHER AG

Georg Fischer AG (HQ: CH-8201 Schaffhausen) acquired Schwab Sanitär-Plastic GmbH. For Georg Fischer, the acquisition is a move to expand its business in the growth market of home plumbing and to substantially strengthen its European position. Georg Fischer is a group that focuses exclusively on pipe distribution systems (fittings, connectors etc.) employs 2,700 and has group sales of EUR 500m.

### PIPELIFE International

50:50 joint venture between Solvay and Wienerberger to produce pipes. Pipelife signed partnership deal with Changzhou Reinforced Plastics Factory (CRPF) for the creation of a joint company for making pipes. CRPF is a medium sized company that makes plastic pipes 200km north of Shanghai, with profits around \$ 5 Mill. They focus on water and gas pressure pipes (PVC and PE). Total annual capacity is around 8'000 tons. Reason for this joint venture is the 20% annual growth that pipes have seen in the Shanghai region during the last three years.

### Acquisition Agreement signed by WAVIN for EKOPLASTIK in the CZECH REPUBLIC

Wavin and Ekoplastik are announcing that an Acquisition Agreement has been concluded. In order to complete the project successfully, which is expected by the end of the year, all the necessary administrative steps and formalities have been commenced as well as a due diligence process.

With its wide range of plastic pipes and fittings, Ekoplastik is one of the leading companies in hot & cold tap water pipe systems in Central and Eastern Europe. At its production location near Prague Ekoplastik has about 250 employees and realises a sales turnover of EUR 27 million per year.

Wavin is the European market leader in plastic pipe systems with a turnover of EUR 922 million in 2002 and 4,700 employees.

Wavin is already well represented in Central and Eastern Europe with factories in Poland, Hungary and Lithuania and sales companies in nearly all countries of the region. Wavin has currently no production facilities in the Czech Republic but sells sewer and utility pipes and fittings for underground applications via a number of own depots. The market position of Ekoplastik with its extensive range of above-ground tap water and soil & waste systems is fully complementary to Wavin's market coverage in the region.

Wavin's CEO Mr Houben commented on the acquisition: "This takeover fits very well in our drive to establish a leading position in Central Europe and to expand our sanitary product range. We see Ekoplastik as a very reputable company in its field and are impressed by its strong performance over the years. I will be pleased to welcome Ekoplastik and its employees to the Wavin group of companies in the nearest future and hope that it will establish its position in Wavin as the centre of excellence for PPr tap water pipe and fittings".

### **Profile of Wavin**

Founded in 1955, Wavin operates in 24 European countries and is a leading manufacturer of plastic pipe systems in Europe. It also has a global network of more than 90 agents, licensees and distributors. Its stated aim is "to be

the unrivalled European supplier of plastic pipe systems in terms of product range, innovation, logistical services and geographical presence.” In order to supply its customers with value-added products, Wavin has its own research and development centre, in which it invests considerable sums towards the development of new products and processes.