

FAST FLOW PRESENTS

# psPipe™ & psFittings™

LEAD-FREE UPVC Pressure Pipe System



Fast Flow is pleased to announce that in the process of continuous improvement of our product, and our commitment to a better environment, we have produced a full series of 50mm, 75mm and 100mm diameter LEAD-FREE UPVC pipes and fittings. The new psPipe™ will be used to replace the current UPVC JIS K 6741 pipes and SS213 pipes used in Fast Flow Siphonic and Pressurised systems.

In recent years environmental consciousness has become a major theme in the construction sector. Attention has focused on materials, building methods and climate considerations that can help construct green, sustainable buildings which can promote energy savings, water savings and healthier indoor environments. Singapore's Building Construction Authority has established environmentally friendly practices for the planning, design and construction of Buildings which would help mitigate the environmental impact of built structures.

Fast Flow psPipe™ and psFittings™ are the materialization of our commitment as a responsible company that is not only providing leadership in innovative rainwater management technologies, but also leading the market towards a better and healthier environment.

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## Advantages of Fast Flow psPipe™ & psFittings™

- Both pipes and fittings are specially designed for pressure (positive and negative) that occurs in siphonic and pressurised flow.
- Fast Flow psPipes™ and psFittings™ are produced with high level QA/QC to ensure reliability. Pipes, fittings and joints are fully tested and validated by accredited laboratories (TUV SUD PSB, SIRIM).
- Fast Flow psPipes™ and psFittings™ are LEAD-FREE which minimizes water pollution if the water is to be used for consumption in the future.
- UV stabilized for outdoor application.
- Complete system with design and material warranty.



## Introducing psStackH™

Fast Flow psStackH™ works on the principle of Fast Flow Pressurised Technology. It combines high capacity pressurised flow in a system with multiple side connections. It is specially designed to cater for drainage from balconies, corridors and staircases of high-rise residential and multi-storey factories.

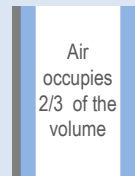
Traditionally 200mm diameter pipes are used to drain the roofs and repetitive corridors of typical residential blocks. Large diameter pipes are necessary to prevent fluctuation of pressure inside a rainwater downpipe (rwdp) with multiple side connections (eg. connection to balconies). Undersize rwdps often resulted in water spouting through the side connections, leading to flooding of corridors and balconies.

Fast Flow psStackH™ enables the draining of roofs, balconies, corridors with small diameter (75mm diameter) stacks. Making use of Fast Flow Pressurised Technology, which is designed to work under 2-phase flow, psStackH™ Systems are able to achieve very high drainage capacity while preventing backflow of water at the side branches. This is attributed to our renowned, patented psVent™ anti-backflow junctions, which is a result of years of research and development, practical experience.

A typical psStackH™ System comprises of the following components:

- Fast Flow psPipes™ and psFittings™ ranging from 50mm to 100mm diameters.
- Fast Flow patented psVent™ anti-backflow junctions.
- Fast Flow proprietary psOutlet75H™ roof outlets.

### Conventional Gravity System



Non pressure gravity flow  
Large volume of air inside pipe

Slow flow velocity

Low drainage capacity

Many big pipes

Deep water depth in roof

### Fast Flow Pressurised System



2-phase pressure flow  
Mixture of air and water inside pipe work

High flow velocity

High drainage capacity

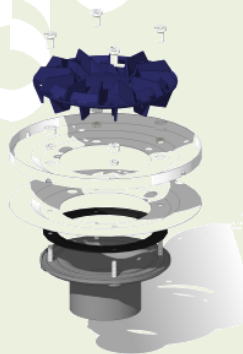
Lesser and smaller pipes

Shallow water depth

Headquartered in Singapore, Fast Flow Group has been a pioneer in rainwater management to the construction market for nearly two decades. Fast Flow continues to set the standard in the industry with a system of products and services that offer efficient, quality installation.

## The Components of psStackH™ System

### psOutlet75H™



#### *Elegant design*

A rainwater outlet specially designed to suit reinforced concrete roof application with capability to drain up to 14 l/s when used in psStackH™ System. The psOutlet75H™ is stylish and follows in the same footsteps as the Fast Flow Primo range. The air baffle is made from ASA (Acrylonitrile Styrene Acrylate), which is highly durable plastic material with good UV resistance to distortion from heat, add to the aesthetic value of building rooftops.

### psVent™



#### *Our invention*

Fast Flow psVent™ is an invention proven to prevent backflow especially at balconies. Fast Flow has been granted an international technology patent for this system.

### Fast Flow psPipe™ and psFittings™



#### *Our LEAD-FREE pipes and fittings help to minimize the water pollution*

Lead is a heavy metal that can enter drinking water from the corrosion of pipes and plumbing materials. Ongoing exposure to even small amounts of lead may eventually result in harmful levels in human body. Fast Flow psPipe™ and psFittings™ are high quality LEAD-FREE UPVC pipes and fittings that are specially designed and manufactured by Fast Flow.



### psPipe™ (LEAD-FREE UPVC Pressure Pipe System)

**Applications:** For pressure flow rainwater drainage systems including siphonic roof drainage systems and pressurised rainwater downpipe systems. It is also applicable for rainwater harvesting system where positive and negative pressure may occur during pressure flow.

**Pressure rating:** PN6 and -0.9bar

**Standard:** JIS K 6741 VU (Enhanced)

**Color:** Grey

**Length:** 5.8m

**Type of joint:** Solvent cement joint

### psFittings™ (LEAD-FREE)



**Pressure rating:**

PN6 and -0.9bar

**Standard:** Japan PVC Pipe & Fittings Association Standard AS38

**Color:** Grey

**Type of joint:** Solvent cement joint



## Singapore: Future HDB towns to go green

With the launching of the psStackH™ System, Fast Flow is now one step closer in penetrating the HDB (Housing and Development Board) market in Singapore. SINGAPORE: Acting Manpower Minister Tan Chuan-Jin has said future HDB towns will not only be well-designed but they will also be more environmentally-friendly, as plans for three new housing areas were unveiled in early September 2013.

The Housing and Development Board has a set of criteria for the architects to design the rainwater drainage. Fast Flow psStackH™ offers one-to-one replacement to what HDB market has been using in its conventional system. However, instead of using 200mm diameter pipes, psStackH™ system replaces the pipes with 75mm diameter downpipes and 100mm diameter for the discharge pipe. Small diameter rainwater downpipes offer flexible convenient downpipe positioning and elegant solutions in rainwater system design. It provides flexibility in pipe locations and free up crucial space of a building.

The psStackH™ system's components reveal clearly that Fast Flow R&D programme has ensured that we always provide the best products and solutions for all requirements. The psOutlet75H™ design resembles elements of durable ASA (Acrylonitrile Styrene Acrylate) material which resists fading, discoloring and heat distortion.

Both Fast Flow psPipes™ and psFittings™ are LEAD-FREE, providing an eco-friendly rainwater system for the long term sustainability of the building which is aligned with the government policy to build good quality living environment.

The psStackH™ system demonstrates our commitment towards supplying our target market with a solution to create a better and healthier environment. We are looking to create a strong HDB market presence in Singapore, after a successful Pinnacle@Duxton as an iconic project in Singapore's public housing history. And to support eco-friendly high-rise building to deliver a sustainable and liveable green lifestyle for its residents.



## Our Innovation Our Design Our Identity

Aesthetics, functionality and excellent space planning are crucial aspects when it comes to both exterior and interior part of a house. As a leader in intelligent rainwater management industry, Fast Flow helps clients in diverse markets worldwide articulate and align their needs with dynamic use of space.

Nowadays, most of high-end home projects come with smart and modern architectural designs which include rainwater harvesting system. Through our licensed distributor, PT Siphonic Flow Mandiri; our state-of-art Siphonic Systems are installed in several high-end private residences in Indonesia. The demand of space management and modern fittings of these houses required Fast Flow Siphonic System to bring out the beauty of the house's design rather than work against it.

Fast Flow solutions maximise the efficient use of multiple materials that enable a single siphonic system across any structure demanding different materials at different locations. Our Siphonic System is the ideal transportation tool for rainwater harvesting. Using smaller pipes diameter and with the flexibility of rainwater outlet position have allowed Fast Flow to create new ways to solve tomorrow's drainage challenges. Be it a high-rise residential or a flatted factory, an airport or a sport complex, an iconic building or a mixed development. Our market sectors represent shared experience and expertise of our best systems consultants and design engineers. With a shared creative vision, interdisciplinary approach and our professional experience, we are able to ensure each project is completed with absolute inventiveness.



House of Green Garden, West Jakarta (2012)  
Total roof area: 249,65 sqm  
Siphonic rainwater outlet: Arteco-R™



Kelapa Gading House, North Jakarta (2012)  
Total roof area: 203,86 sqm  
Siphonic rainwater outlet: Arteco-R™

### Fast Flow's Arteco-R™

#### Technical Information

##### Suitability:

On R.C roof and R.C gutters

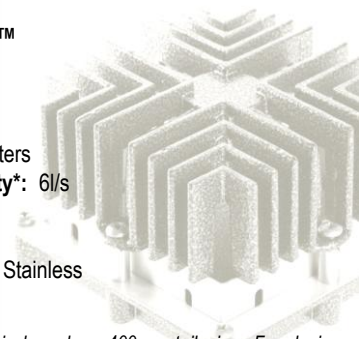
**Nominal Design Capacity\*:** 6l/s

**Max. Capacity\*\*:**  
10l/s

**Material Specifications:** Stainless steel and aluminum alloy

*\* Nominal design capacity is based on 400mm tail pipe. For design capacity during installation without tail pipe, please consult Fast Flow Design Centre for further assistance.*

*\*\* Maximum capacity is subject to acceptable water level at balconies, available head and pipework configurations*



## IKEA Comes to Indonesia

Thanks to our licensed distributor (PT Siphonic Flow Mandiri), Fast Flow recently secured a do-it-yourself furniture chain IKEA project in Alam Sutera, Tangerang in the western suburbs of Jakarta, Indonesia.



IKEA Store Alam Sutera, Indonesia  
Total roof area: 25,427sqm.

The multinational firm plans to open the shop in July 2014 in a step that marks its further expansion in ASEAN after it opened a store in Bangkok 2012 IKEA MEGA BANGNA, which is also one of Fast Flow's projects.

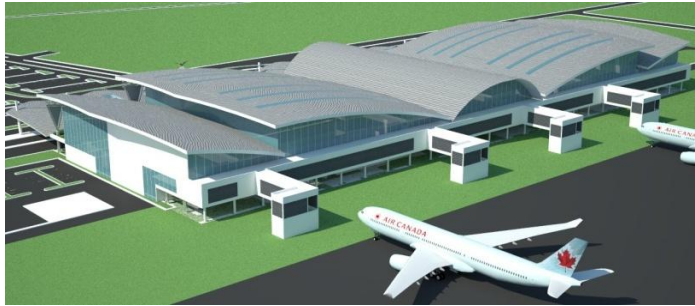


IKEA Mega Bangna, Thailand

## Indonesia

Newly secured projects:

- 1) IKEA Store Alam Sutera ,Tangerang
- 2) Gran Rubina Business Park , South Jakarta
- 3) Woodland Park Residence, South Jakarta
- 4) Airmas Office, Central Jakarta
- 5) Samarinda Baru Airport , Samarinda, East Kalimantan
- 6) Supadio International Airport , Pontianak, West Kalimantan
- 7) Komodo Labuan Bajo Airport , Labuan Bajo, East Nusa Tenggara
- 8) Coca Cola Amatil Warehouse Indonesia, Semarang, Central Java



Samarinda Baru Airport



Komodo Labuan Bajo Airport



Gran Rubina Business Park

## Singapore

Recent completed projects:

- 1) Urban Suite
- 2) Urban Resort
- 3) Asia Square Tower 2
- 4) Garden By the Bay, Ventilation Building
- 5) New - Fort Road, Ventilation Building
- 6) The Interlace

### Asia Square Tower 2



The Asia Square Tower 2 project covers a total roof area of 10,369.55 sqm. This highly environmentally sustainable design is one of the first buildings in Singapore to be awarded Leadership in Energy and Environmental Design Core & Shell (LEED-CS) Platinum pre-certification by the US Green Building Council (USGBC). We are deeply honoured to be appointed as a rainwater system provider for Asia Square Tower 2.

## China

Newly secured projects:

- 1) Beijing Inter IKEA center phase II
- 2) East Lake National Innovation Demonstration Zone public service center No. 8 building
- 3) Tianjin International Trade Centre
- 4) Foshan FAW-Volkswagen welding workshop renovation project
- 5) Beijing Yuan Bo Fu/Beijing Changxindian northern residential area phase i (Southern District) Residential Project B- 53 block
- 6) Wuxi metro line 2, 4 siphon elevated station project
- 7) Shanghai Xiang Lun Garden Hotel (Jiading Sheraton)
- 8) Islamabad, Pakistan Bhutto International Airport Terminal building
- 9) Guangzhou Pearl River New Town Liede Commercial Zone C
- 10) China Railway Southern Headquarter Building
- 11) Xiamen-Shenzhen Railway, Chaoyang、Puning station siphon project

Recent completed projects:

- 1) Nanjing-Hangzhou Railway Changxing Station canopy part
- 2) Yan Chai Hospital, Minhang Branch
- 3) Chongqing Global Center
- 4) Shanghai Yuexing Global Business Center podium
- 5) Hanzhong station expansion and reconstruction project HZS-1 station building
- 6) Lingang prologis F1, 2 plot
- 7) Lingang prologis F3, 4 plot
- 8) Wuxi Mixc
- 9) Nanchang Hengmao Red Valley New Town
- 10) Guangzhou electrical transmission and distribution equipment industry base (phase I) A, B Plant
- 11) Wuxi inter IKEA furnishing Plaza
- 12) Shenzhen talent Park Project



Yan Chai Hospital Minhang Branch



Wuxi Mixc



## Thailand

Projects under construction:

- 1) MK Coolroom DC
- 2) Nissan Plant
- 3) Bangkok Skyline



### MK Coolroom DC

Owner : MK Restaurant Co., Ltd.  
Location : Bangna, Bangkok  
Rainfall Intensity : @180 mm/hr  
Roof area : 10,497 square meters.  
Type of pipe used : HDPE



### Nissan Plant

Owner : Nissan Motor (Thailand) Co., Ltd.  
Location : Bangna, Bangkok  
Rainfall Intensity : @180 mm/hr  
Roof area : 81,686 square meters.  
Type of pipe used : PVC



### Bangkok Skyline

Project title : Bangkok Skyline  
Owner : The Platinum Fashion Mall  
Location : Pratunam, Bangkok  
Rainfall Intensity : @200 mm/hr  
Roof area : 950 Square meters.  
Type of pipe used : PVC





## Fast Flow revolutionises rainwater drainage technology

The Marina Bay Sands SkyPark, one of today's architectural wonders, boasts a highly efficient rainwater drainage system. About 12,400 square metres of roof drains rainwater using only nine stacking pipes merely 150mm in diameter each. Leading rainwater drainage systems designer Fast Flow made this feat possible using siphonic technology.

Rainwater normally flows through only a third of a pipe's diameter with air occupying the remaining two-thirds. Siphonics eliminates air from the pipes to allow water to flow through full bore. The technology allows the use of fewer and more slender pipes, which reduce costs and enhance building design and space as pipes can be hidden inside walls.

Fast Flow has introduced siphonic technology throughout many parts of Asia, particularly to high-rise buildings. It has applied the technology to iconic projects such as the Bird's Nest, CCTV Headquarters



Colin Thoms, CEO

and the upcoming West Kowloon Terminus. The company also developed the world's first pressurised rainwater drainage system featuring an anti-backflow device, which is ideal for balconies. Combining this patented technology with siphonics, Fast Flow creates hybrid systems featuring both innovations.

Moving upstream, Fast Flow has brought to the market its own brand of lead-free pipes – the psRWDP or Pressurised System Rainwater Downpipe.

Customers can order the product from the company's website, which also allows them to design their own rainwater drainage systems. Fast Flow is also venturing into rainwater harvesting.

With a presence on the mainland, Hong Kong, Singapore, Malaysia, Thailand and Indonesia, Fast Flow has committed to expand into other Asian countries in the next two years. It plans to venture into more markets including Taiwan, South Korea and Japan.

"The internal markets of Asia are driving the region's growth and we're keeping up with the infrastructure that's going on," says CEO Colin Thoms. "We welcome like-minded professionals and distributors who want to join an industry that calls out for innovation."



## Effect of Roof Material and Water Quality for Rainwater Harvesting System

Contamination in harvested rainwater is affected by roof type, including roofing materials, slope and length. Due to the acidic nature of ambient rainwater, chemical compounds from roofing material may leach into the harvested rainwater. In addition to leaching chemical, rooftops also can release contaminants that accumulate during wet deposition, such as leaves, tree branches, animal and bird droppings, and other solids.

Provided the rainwater is for non-drinking water purposes, virtually any materials can be used in the collection system. However, if the rainwater will also be used to meet the potable water needs of a home's residents, it is important that the homeowner use care in selecting materials and coatings which will come into contact with the water as it is collected, since some impurities can be picked up by the rainwater as it travels through the collection system.

### Did You Know?

Specifically, heavy metals such as cadmium, copper, lead, zinc and chromium have been detected in rooftop harvested rainwater. Studies showed that older roofs leach more metals, suggesting that the age of roof can negatively impact the quality of harvested rainwater.

Although several additional studies in other countries have examined the effect of roofing material on harvested rainwater quality, domestic studies of the effect of roofing material on harvested rainwater quality might be more useful because roofing material, coatings, and building practices vary globally.





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