



NAANDANJAIN MINING SOLUTIONS

NaanDanJain manufactures, markets and designs drip sprinkler and micro-sprinkler systems for various industrial applications.

The mining product range was constructed using engineering-grade thermoplastic resins which are specially selected for their resistance to corrosion, abrasion, ultra-violet and the rugged conditions specific to silver, gold and copper mining.

The Mining products enable optimal design of heap leaching, taking the following factors into consideration



NaanDanJain as a Partner

Since 1936, NaanDanJain has been accumulating a wealth of experience and knowledge of water application and irrigation systems in agriculture, industrial and municipal projects.

We execute projects of all sizes and cover a wide range of solutions that deal with:

- Marginal water sources
- Waste water
- Recycled water
- Dust suppression
- Climate control

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- High uniformity for maximal results
- Minimum waste of water and run-off
- Minimal maintenance

Efficiency

The NaanDanJain irrigation concept is derived from the harsh conditions of Israel's dry climate, desert soil and the need for high water efficiency.

The single most important component in company solutions has been to strive for the highest water distribution uniformity in all our systems—sprinkler irrigation, micro-sprinklers and drip systems. Optimal water distribution uniformity, in turn, contributes to optimal long term investment.

Heap leaching that deals with maximizing metal recovery face similar challenges.

Typical applications for the mine industry are:

- Leaching
- Rinsing
- Dust suppression
- Evaporation





NAANDANJAIN'S RANGE OF SOLUTIONS

The objective of lixivate application is to achieve uniform and complete wetting of ore through continuous percolation of liquids between the ore particles. Selection of the spraying or drip system is generally based on the climatic conditions of the mine region, taking into consideration the evaporation rate and freezing potential, as well as the uniformity of heap aggregates.



Drip Systems

Mining driplines are made from high quality PE, especially suitable for mining industry conditions.

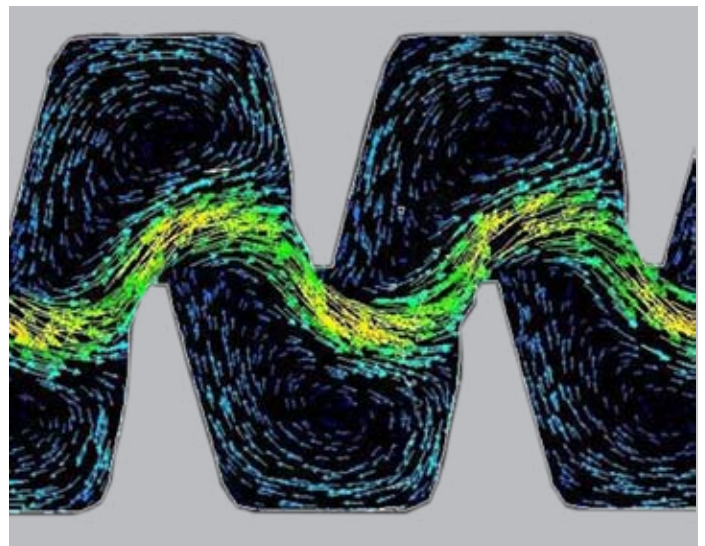
The integrated, welded drippers have a special built-in, self-cleaning structure, known as the unique Cascade labyrinth.

The drip system for leaching offers high uniformity and flexibility in design.

The flow rate ranges from 1- 8 l/h, facilitating optimal configuration of the dripline network, according to surface conditions and customer requirements. The same flow rate and pumping cost, per given valve, can be maintained with more wetted points.

Main characteristics:

- High clogging resistance - the Cascade labyrinth provides the strongest, most effective self-cleaning mechanism.
- Flow rate accuracy is $\pm 5\%$.
- The simple Dripline Collar (optional) prevents drops from running in slope conditions and ensures precise dripping.



Double self cleaning flow in the Cascade labyrinth



MINING DRIPLINE RANGE

Tif Drip

The traditional, reliable cylindrical drippers with peripheral water inlet design minimize clogging of the drippers, which may result from mineral precipitation. 2/4 water outlets increase reliability and performance, ensure precise drops, and prevent water jets.

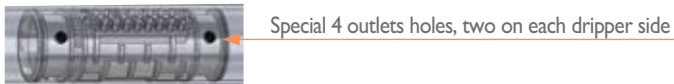
Technical Data

Diameter: 16 mm
 Flow rate: 1.0-8.0 l/hr
 Recommended working pressure: 1.0–3.0 bar
 (according to operating pressure)



NaanPC

This is a pressure-compensated, cylindrical dripper solution. Main application is steep installation ground and hillsides. The peripheral water inlet design minimizes clogging caused by mineral precipitation in the pipe. 2/4 water outlets increase reliability and performance, ensure precise drops, and prevent water jets.



Technical Data

Diameter: 16, 20 mm
 Flow rate: 0.95-3.8 l/hr
 Recommended working pressure: 1.0-3.0 bar



Tal Drip

This dripline has thin- and medium wall thickness and is the perfect solution for specific site conditions with a low budget.

Technical Data

Diameter: 17 mm
 Wall thickness: 18–25 mil
 Flow rate: 1.0, 1.7, 4.0 l/hr
 Recommended working pressure: 1.0–2.0 bar, according to W.T.



Technical Data

Product name	Diameter	Dripper flow rate (l/h)	Wall thickness (mm)	
Tif Drip	16	1.0, 2.0, 4.0, 8.0	0.9, 1.0, 1.15	Non-regulated
NaanPC	16	1.1-3.5	0.9, 1.0, 1.15	Pressure-compensated drippers
NaanPC	20	0.95-3.8	1.0, 1.2	Pressure-compensated drippers
Tal Drip Thin wall	17	1.0, 1.7, 4.0	18–25 mil 0.45–0.63 mm	Non-regulated

Filtration recommendation:

The standard requirement is 130 microns (120 mesh). Specific recommendations will be given according to local conditions.



Dripline Design

Dripline Design

Closer drippers and lateral spacing can improve leaching effectiveness.

The ratio between the number of dripping points per square meter and precipitation rate can be kept with careful design.

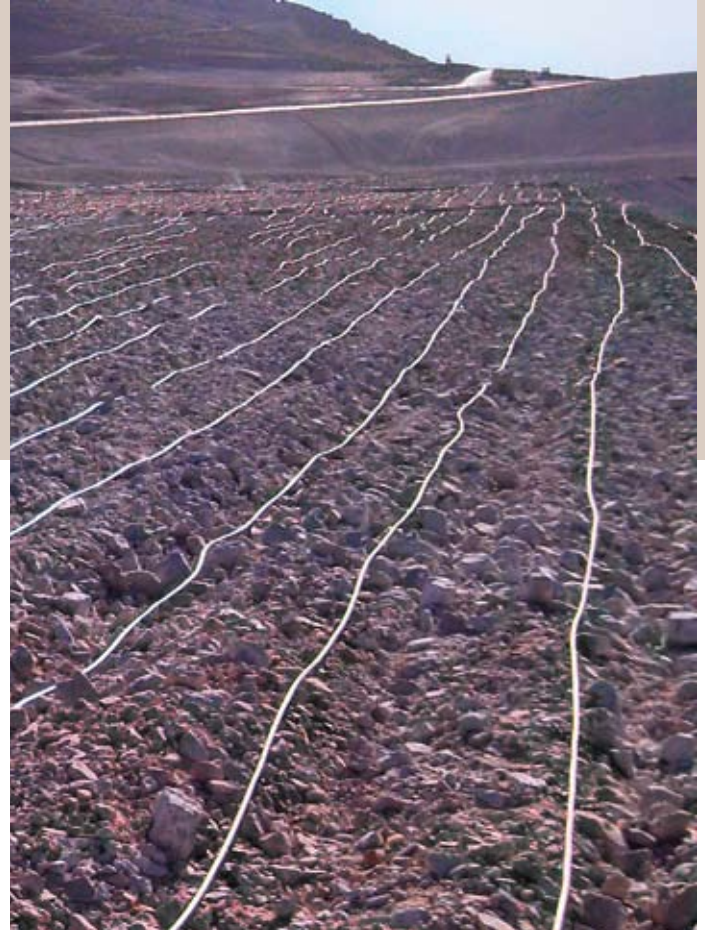
For example:

8.0 l/hr dripper at spacing 80 x 80 cm = 1.5 drippers per m² (P.R. - 12.5 mm/hr)

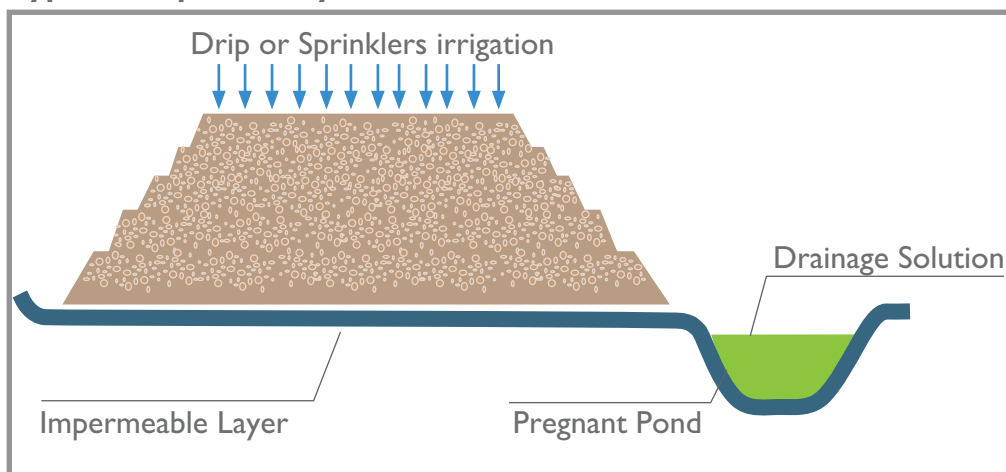
Alternative with closer spacing:

2.0 l/hr. dripper at 40 x 50 cm = 5 drippers per sq. meter (P.R. - 10 mm/hr)

Clogging sensitivity: Each 2 l/hr dripper will deliver only a third of the amount of solution and dirt that an 8.0 l/hr dripper does!



Typical heap leach layout



Dripline Connectors

A special range of drip connectors is available.





MICRO-SPRINKLERS

The micro-system is the best choice when full uniform coverage is required. When the crushed ore is not uniform in aggregate size, full overhead irrigation can be more effective.

The micro-sprinklers provide large droplets with high uniformity of water distribution, creating gravity water movement through the ore layers. This ensures that every square centimeter is leached.



2005 AquaMaster

Specifications

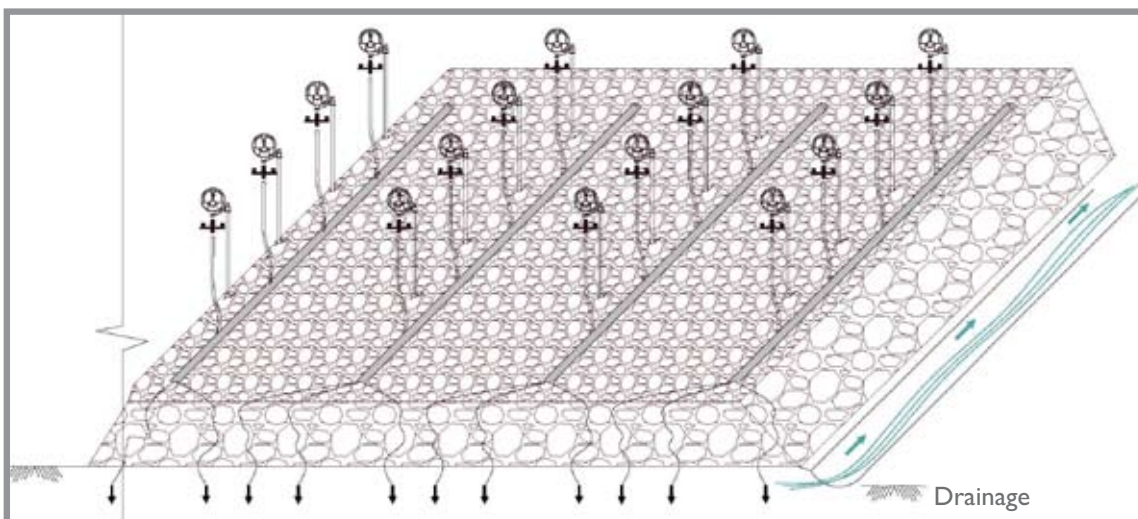
- Special row material construction, resistant to acid and corrosive conditions in mines
- Very robust micro-sprinkler
- Excellent water distribution uniformity around 90% CU
- Large droplet size reduces wind effect and evaporation losses
- Special shut-off mechanism protects the nozzle from dirt penetration
- Easy maintenance and cleaning
- Spacing up to 7 m
- Filtration recommendation: 50 mesh screen



Performance Table

Nozzle Color	P (bar)	Q (l/h)	D (m)
Orange	1.5	104	9.5
	2.0	120	9.5
	2.5	134	9.5
Black	1.5	138	9.5
	2.0	160	10.0
	2.5	179	10.5
Blue	1.5	173	10.5
	2.0	200	11.0
	2.5	223	11.0
Yellow	1.5	215	10.5
	2.0	250	11.5
	2.5	305	12.0
Red	1.5	260	12.0
	2.0	300	12.5
	2.5	335	13.0

Heap Leaching with 2005 micro sprinkler





Sprinkling Concept with Sprinklers

Over-head sprinkler systems for heap leaching achieve full coverage, maintaining uniform ore profile leaching. Better control can be achieved using sprinklers with a low precipitation rate to match the heap and crushed rock permeability.

Low precipitation can maintain better aeration conditions that can help when bio-leaching is involved.

Irrigation with over-head sprinkler systems is more efficient in tropical areas where there are less evaporation losses.

This sprinkler system solution for mineral recovery can cover larger areas with fewer pipes at reduced costs. Larger

spacing of the sprinklers' laterals reduces installation and maintenance time.

The mining sprinklers are designed to operate at low pressure with very high uniformity coverage.

The sprinklers are constructed from special resins in order to provide maximal operation reliability under the rugged conditions of the mining industry.

Mamkad I6

Specifications

- Compact, sturdy, closed and protected ball engine
- Uniform water distribution at low pressure and precipitation rate
- Strong low-angle single jet reduces water losses due to evaporation
- Special construction and plastic compounds for specific silver, gold and copper mine conditions.
- Pop-up nozzle prevents dust and dirt penetration
- Optional road deflector
- Recommended spacing: 6–8 m
- Optional Flow Regulator (F.R.)
- Operating pressure:
 - 2.0–4.0 bar w/o regulator
 - 2.5–5.0 bar with regulator

Performance Table

Nozzle Color	P (bar)	Q (l/h)	D (m)	msh (cm)
Orange	2.0	180	13	60
	3.0	220	13	60
	4.0	255	13	60
F.R.	2.5-5.0	180	13	60
Red	2.0	225	13	65
	3.0	275	13	65
	4.0	320	13	65
F.R.	2.5-5.0	225	13	65

msh = max. stream height (above nozzle)



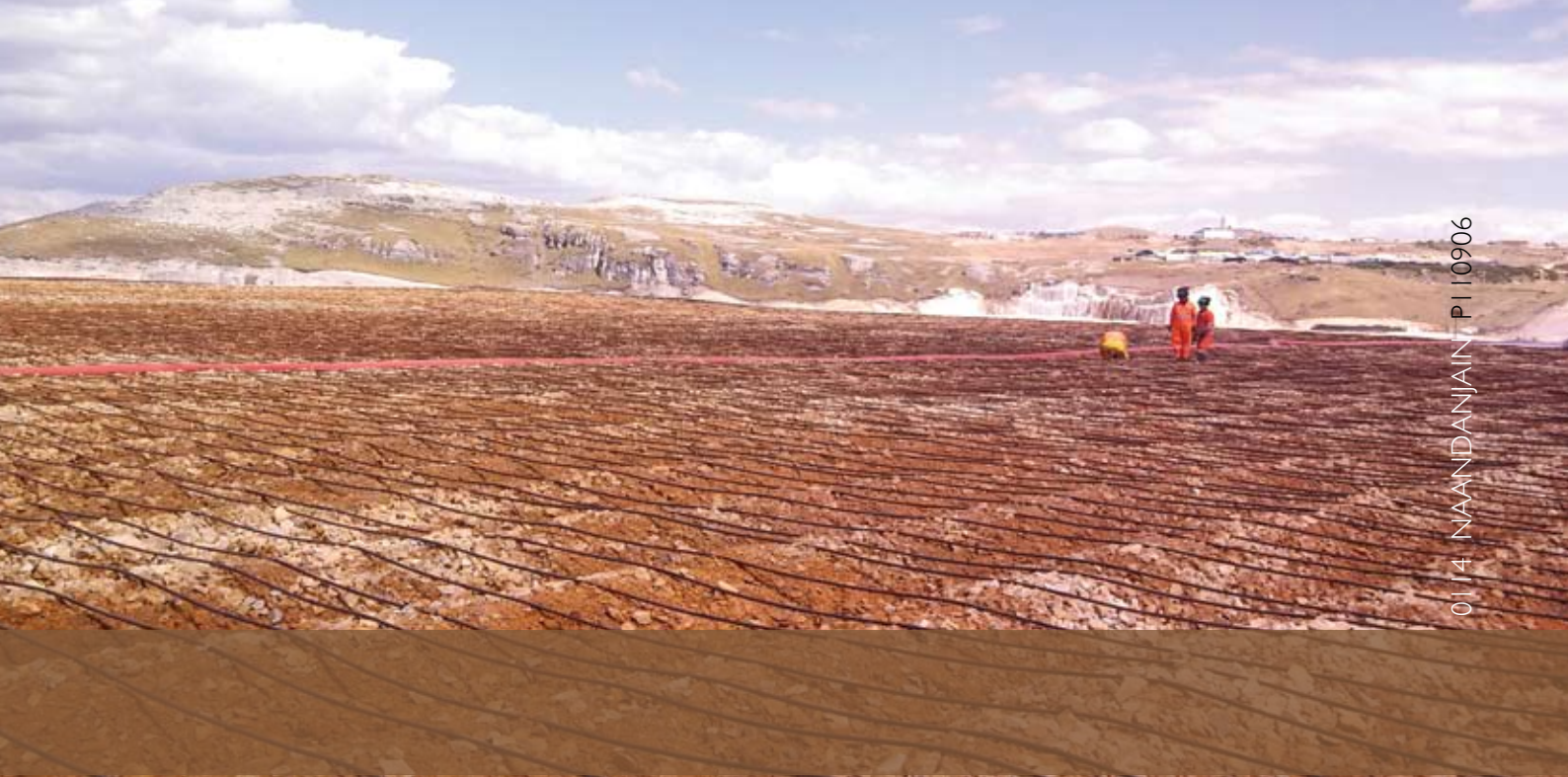
Pop-up nozzle

Flow regulated model



Road deflector





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One year warranty on our mining products
For more information and a price quote,
please contact our office.