

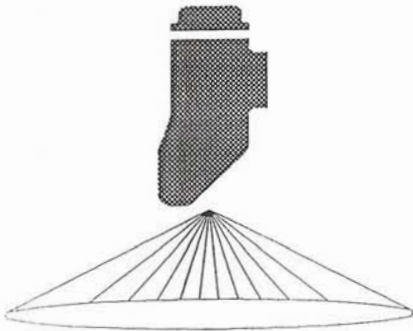


WWW.MECAL.COM.AU

DUST SUPPRESSION

(AGG-13-005)

MECAL-JET DUST CONTROL SYSTEM



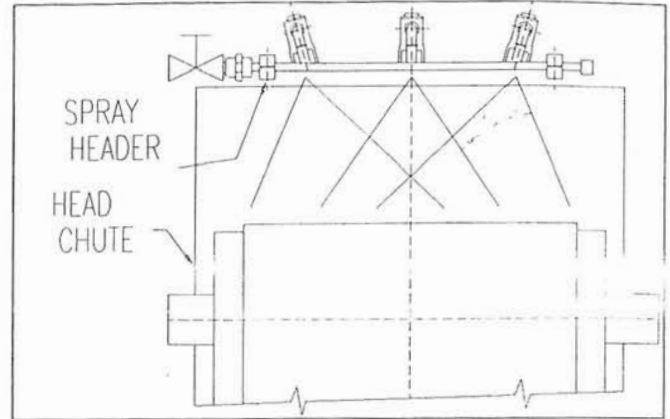
THE ONLY SYSTEM ENGINEERED FOR EFFECTIVE, LOW COST CONTROL OF DUST AT ITS SOURCE.

1. MECAL-JET SUPPRESSES DUST BEFORE IT BECOMES AIRBORNE

Mecal-Jet systems control dust instead of collecting it. With Mecal-Jet, dust never becomes a problem because it is stopped at the source.

2. MECAL-JET ELIMINATES NEED FOR EXTENSIVE COLLECTION EQUIPMENT

Any "dry" or mechanical system involves the use of dust bins, bags, ducts, hoods and large motors not required by Mecal-Jet.



3. MECAL-JET ELIMINATES TIME & COSTS OF EXTENSIVE SERVICING

All equipment used in dry collecting systems must be regularly and periodically cleaned, and the dust disposed of. By doing away with collection, Mecal-Jet reduces maintenance time and costs involved - pays off in low operating costs.

4. MECAL-JET SOLVES "IMPOSSIBLE" DUST PROBLEMS

Where dust-producing areas are large and unconfined, Mecal-Jet is the only practical and economical means of controlling dust . . . does not require the use of elaborate enclosures or duct work.

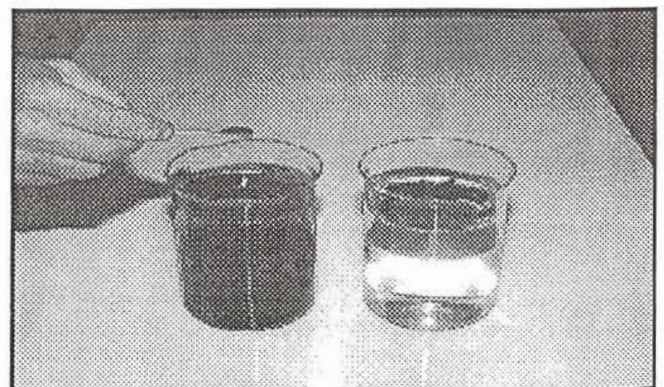
5. MECAL-JET ADDS LESS THAN 1% MOISTURE

Using Compound MDS (one part MDS to 4,000 parts water or more), which is one of the most powerful surface active compounds known, Mecal-Jet adds as little as ½ of 1% total moisture for effective dust suppression.

6. MECAL-JET TREATED MATERIALS HAVE CARRY-OVER ADVANTAGES

Properly applied, Compound MDS provides carry-over dust control through handling, storage and reclaim.

Mecal-Jet has proven it is the only practical method to control dust with an efficiency of 90% plus, from truck dumper area to primary crusher to stockpile and reclaim. Mecal-Jet systems also meet all state and local air pollution control codes.

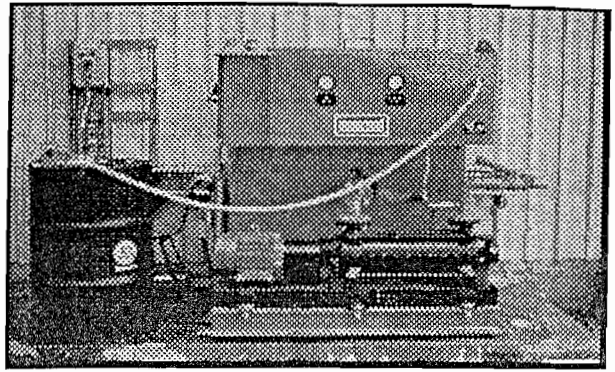
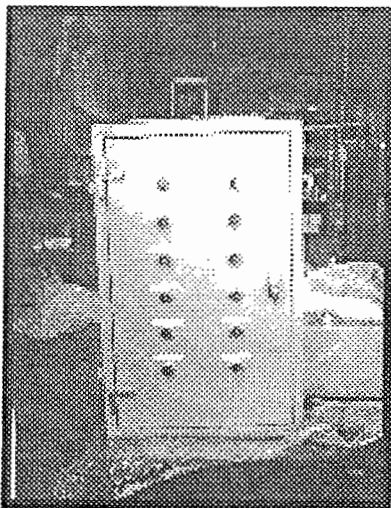
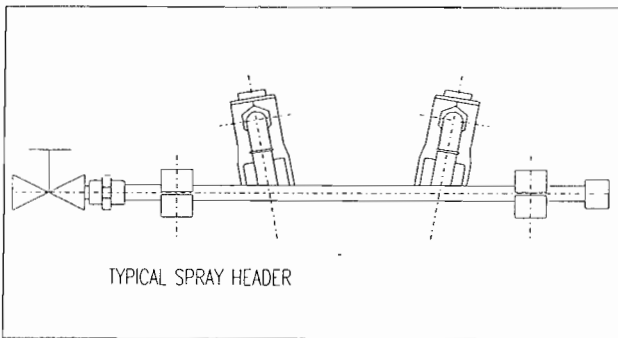
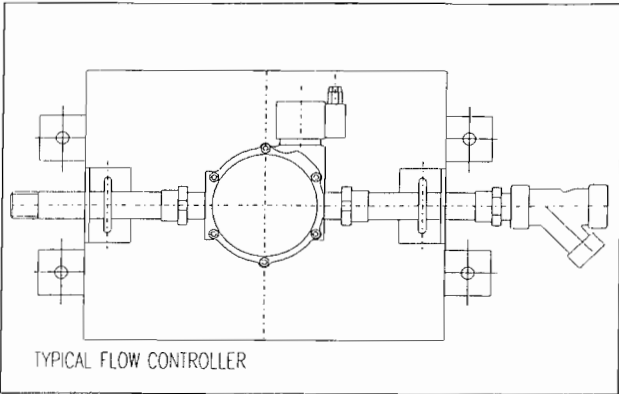


(DOO-01-001/9811)

MECAL-JET PROPORTIONERS

Automatically proportions Compound MDS and water are available in several standard types and capacities or specific designs for specific requirements.

MODEL	PROPORTIONERS
D	Small capacity - 50L/M
T	Medium capacity - 500L/M
S	Large capacity - 3000 TPH



SPRAY JET CONTROLLER

Each spray jet header in the system has a controller which governs the flow of solution supplied by the proportioner. Valve action is positive, either fully on or fully off. Prevents waste of solution; the spray jets are operative only when material is actually flowing.

SPRAY JET HEADER

The spray jet header carries the spray jets which apply the mixed solution to the material. One or more headers are placed at each treatment point, the exact arrangement being determined by the type of spray pattern selected and the dust control effect required.

CONTROL ACTUATORS

Automatically detect presence of material to be sprayed and transmit signal to spray jet controller. Standard models are available that operate on mechanical displacement, weight, mass proximity or electrical interlock.

CONTROL PANEL

The Control Panel gives maximum flexibility of the system allowing individual treatment points to be controlled depending on climatic or material condition.



A.C.N. 004 322 650

MECAL PTY. LTD.

9 Paramount Road (P.O. Box 4140)

West Footscray 3012

Melbourne

AUSTRALIA

Phone: 03-9314-0144

Fax: 03-9314-2576

Int'l Phone: +61-3-9314-0144

Fax: +61-3-9314-2576

Email: mecal@engineer.com

(DOO-01-001/9811)

HAURAKI QUARRY, NEW ZEALAND

DUST SUPPRESSION SYSTEM



Primary Crusher.



(DOO-10-0995/1)

HAURAKI QUARRY, NEW ZEALAND

DUST SUPPRESSION SYSTEM



Before MECAL-JET it was not possible to see this crusher because of the dust.

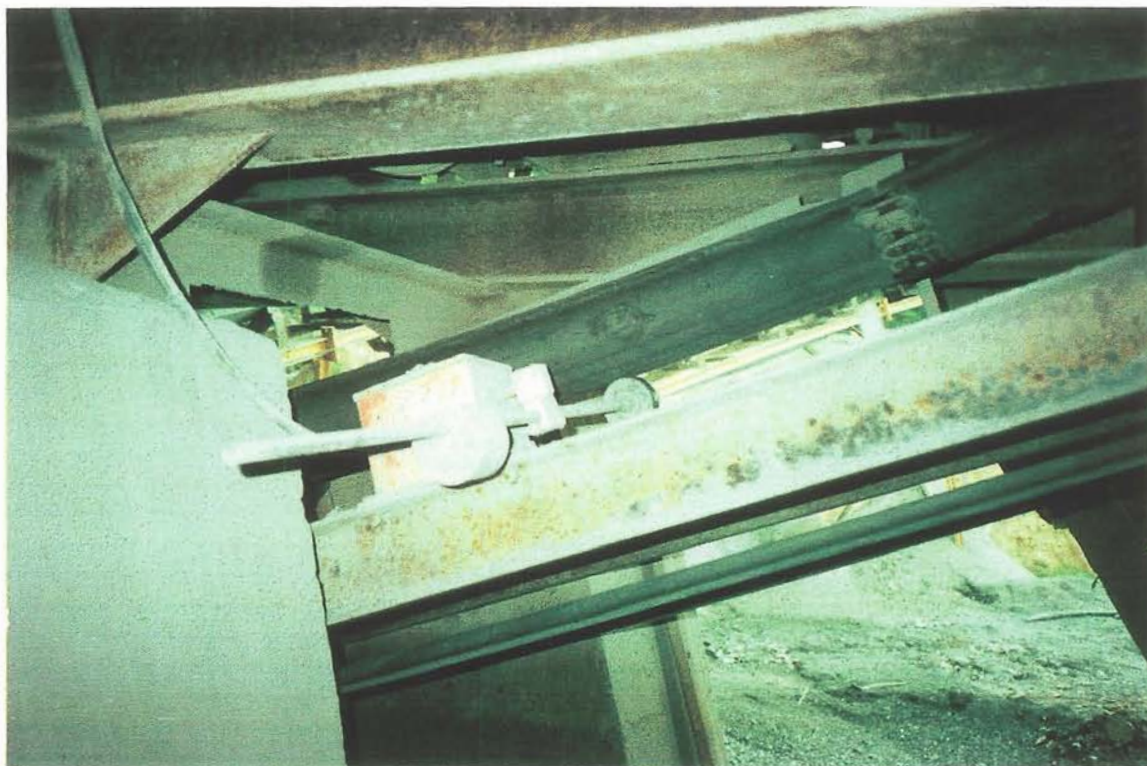


(DOO-10-0995/2)

HAURAKI QUARRY, NEW ZEALAND

DUST SUPPRESSION SYSTEM

Underbelt Switch



Proportioner Tank & Pump





*Receiving Hopper
(Surface Charger).*

1.1 Proportioning Unit.

*Solution Pump Capacity - 12000L/hr @ 700 kPa.
Compound Pump Capacity - 2.66L/hr, set @ 0.28/hr.
Motor - 4KW, 1450 RPM.
Solution Tank Capacity - 800L.*

*MDS Compound - 205L.
Water Supply Required - 1200L/hr @ 200 kPa.
Compound Ratio - 4000 parts
Water : 1 part M.D.S.*



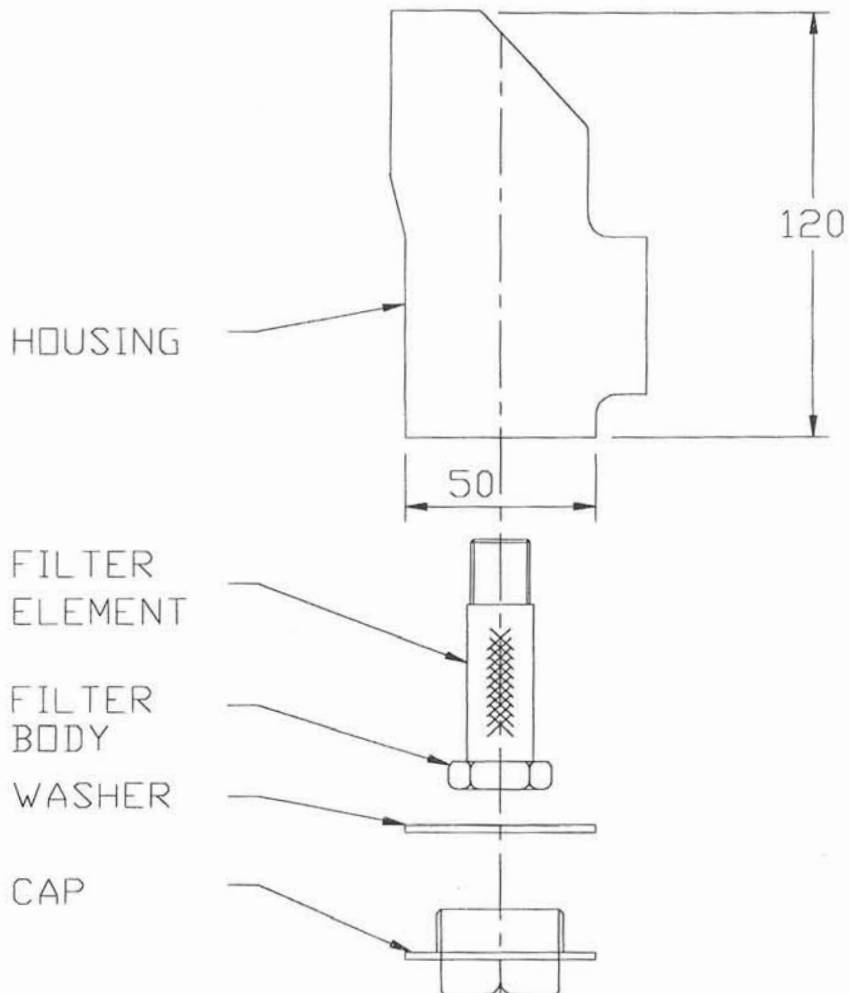
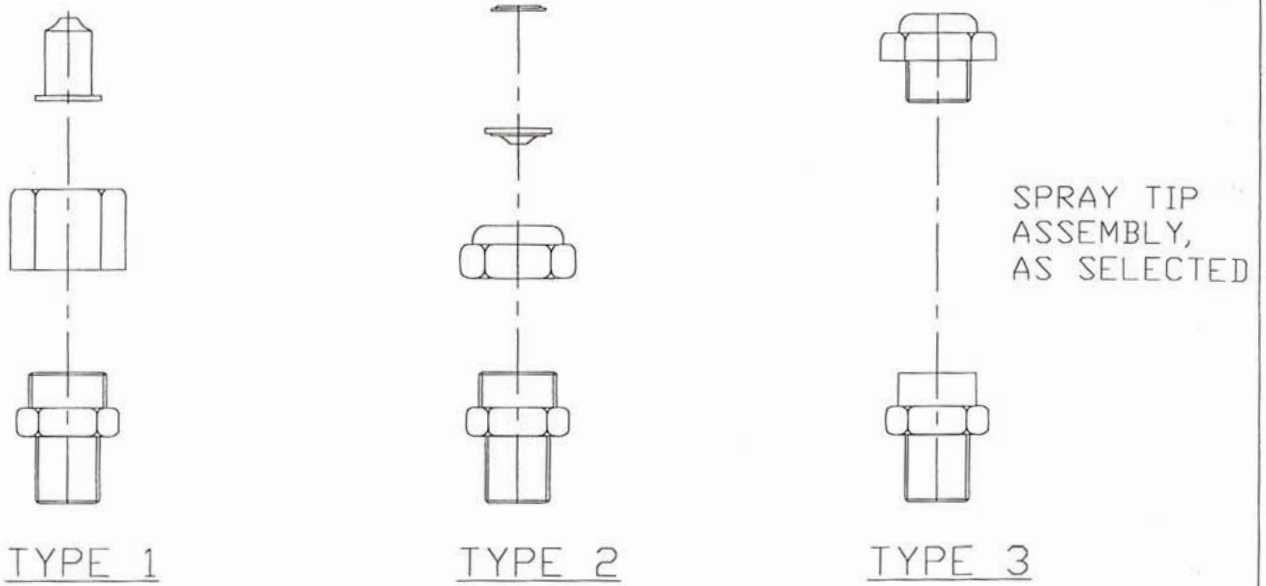
*Proportioning
Unit.*

1.2 Areas of Application.

a)	Surface Charger	-	13 Sprays with DS-76 Tips	-	9600L/hr.
b)	Vibrating Feeder C1	-	2 Sprays with DS-66 Tips	-	200L/hr.
c)	Head Chute Converyor C1 (Optional)	-	2 Sprays with DS-66 Tips	-	200L/hr.
d)	Concrete Hopper C2	-	4 Sprays with DS-66 Tips	-	400L/hr.
e)	Feed Chute C2	-	2 Sprays with DS-66 Tips	-	200L/hr.
f)	Emergency Hopper C2	-	6 Sprays with DS-66 Tips	-	1300L/hr.

(DOO-10-006/9603)

"MECAL JET" DUST SUPPRESSION



NOZZLE UNIT ASSEMBLY



MECAL PTY. LTD.
9 PARAMOUNT RD (PO BOX 4140)
WEST FOOTSCRAY VIC 3012
AUSTRALIA

A.B.N. 63 103 035 687

Tel: 03-9314-0144
Fax: 03-9314-2576
INTERNATIONAL
Tel: +61-3-9314-0144
Fax: +61-3-9314-2576

DDA70001/0104

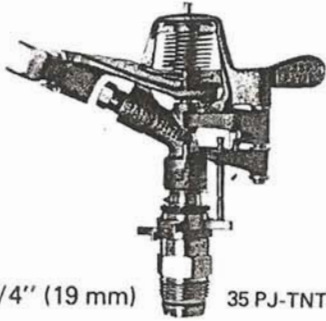


A.B.N. 63 103 035 687

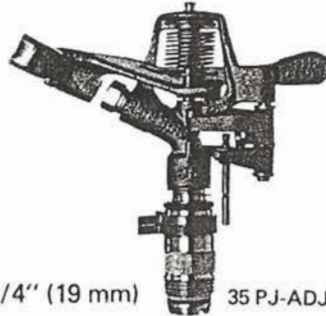
MECAL PTY. LTD.
 9 Paramount Road (P.O. Box 4140)
 West Footscray Vic 3012
 AUSTRALIA
 Website: www.mecal.com.au

Phone: 03 9314 0144
 Fax: 03 9314 2576
 Int'l Phone: +61 3 9314 0144
 Fax: +61 3 9314 2576
 Email: mecal@mecal.com.au

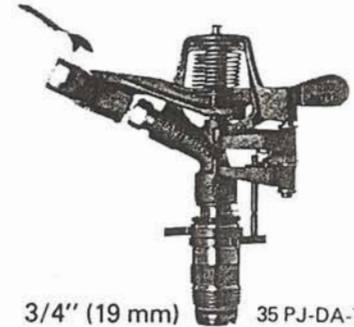
PART CIRCLE IMPACT SPRINKLERS /35 PJ SERIES



3/4" (19 mm) 35 PJ-TNT



3/4" (19 mm) 35 PJ-ADJ-TNT



3/4" (19 mm) 35 PJ-DA-TNT

35 PJ -TNT

3/4" male bearing. TNT only. Cast bronze body, trips and Precision Jet "PJ" arm with brass tube, which eliminates arm side splash. Brass bearing sleeve, nipple and straight bore nozzle. Stainless steel arm spring, trip spring and trip collars. Stainless steel slip trip pin (capable of full or part circle operation as desired). Full circle operation obtained by sliding the trip pin up.

35 PJ ADJ-TNT

3/4" male bearing. TNT only. Cast bronze body, trips, and Precision Jet "PJ" arm with brass tube, which eliminates arm side splash. Brass bearing sleeve and nipple and adjustable brass nozzle. Nozzle has a stainless steel adjusting pin and spring for control of stream break-up. Stainless steel arm spring, trip spring and trip collars. Stainless steel slip trip pin (capable of full or part circle operation as desired). Full circle operation obtained by sliding the trip pin up.

35 PJ DA-TNT

3/4" male bearing. TNT only. Cast bronze body, trips and Précision Jet "PJ" arm with brass tube, which eliminates arm side splash. Brass bearing sleeve and nipple and a distance control nozzle to allow adjustment of radius down to 9 m. Nozzle is brass with a stainless steel deflector. Stainless steel arm spring, trip spring and trip collars. Stainless steel slip trip pin (capable of full or part circle operation as desired). Full circle operation obtained by sliding trip pin up.

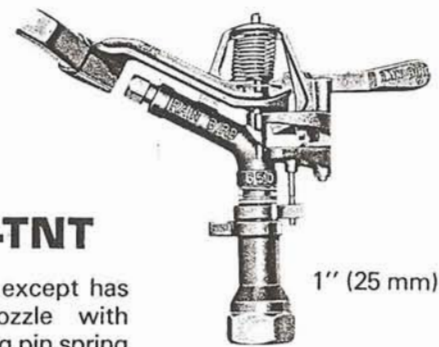
PERFORMANCE FOR 35 PJ SERIES

Highest point of stream is 2,7 m above nozzle*.

Nozzle pressure (Bars) - 100kPa	NOZZLE 5/32" - 3.96mm			NOZZLE 11/64" - 4.36mm			NOZZLE* 3/16" - 4.76mm			NOZZLE 13/64" - 5.16mm			NOZZLE 7/32" - 5.55mm		
	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s
2.0	12.8	0.86	0.24	13.0	1.04	0.29	13.3	1.22	0.34	14.0	1.45	0.40	14.6	1.69	0.47
2.5	13.2	0.96	0.27	13.5	1.17	0.33	14.0	1.39	0.39	14.6	1.64	0.46	15.0	1.91	0.53
3.0	13.5	1.05	0.29	13.9	1.27	0.35	14.6	1.53	0.43	15.1	1.81	0.50	15.5	2.10	0.58
3.5	13.8	1.14	0.32	14.3	1.37	0.38	15.0	1.64	0.46	15.5	1.94	0.54	15.9	2.25	0.63
4.0	14.0	1.22	0.34	14.6	1.47	0.41	15.4	1.75	0.49	15.9	2.06	0.57	16.3	2.38	0.66

PART CIRCLE IMPACT SPRINKLERS

65 SERIES



1" (25 mm)

65 PJ-TNT

65 PJ-TNT

1" female TNT BSP. Cast bronze body, bearing sleeve, trips and Precision Jet ("PJ") arm with brass tube, which eliminates arm side splash. Brass bearing nipple and straight bore range nozzle. Stainless steel arm spring, trip spring and trip collars. Stainless steel slip trip pin (capable of full or part circle operation as desired). Full circle operation obtained by sliding trip pin up.

65 PJ ADJ-TNT

Same as 65 PJ-TNT except has adjustable brass nozzle with stainless steel adjusting pin spring for control of stream break-up.

M = Radius in meters

PERFORMANCE FOR 65 SERIES

Highest point of stream is 3 m above nozzle*.

Nozzle pressure (Bars) - 100kPa	NOZZLE 7/32" - 5.55mm			NOZZLE* 1/4" - 6.35mm			NOZZLE 9/32" - 7.14mm			NOZZLE 5/16" - 7.93mm			NOZZLE 11/32" - 8.73mm			NOZZLE 3/8" - 9.52mm		
	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s
3.00	16.0	2.09	0.58	16.7	2.73	0.76	17.6	3.46	0.96	18.4	4.21	1.17	18.9	5.01	1.39	19.6	5.80	1.61
3.50	16.8	2.26	0.63	17.4	2.96	0.82	18.4	3.75	1.04	19.3	4.57	1.27	19.9	5.45	1.51	20.6	6.32	1.75
4.00	17.4	2.42	0.67	17.6	3.17	0.88	19.4	4.02	1.12	20.2	4.91	1.36	20.8	5.85	1.62	21.9	6.80	1.89
4.50	18.0	2.58	0.72	18.9	3.37	0.94	20.5	4.27	1.19	21.1	5.23	1.45	21.4	6.23	1.73	22.6	7.25	2.01
5.00	18.6	2.72	0.76	19.4	3.56	0.99	21.5	4.51	1.25	21.9	5.54	1.54	22.2	6.59	1.83	23.0	7.68	2.13
5.50	19.2	2.86	0.79	19.8	3.74	1.04	21.9	4.74	1.32	22.8	5.83	1.62	23.1	6.94	1.93	23.5	8.10	2.25

NOTE:

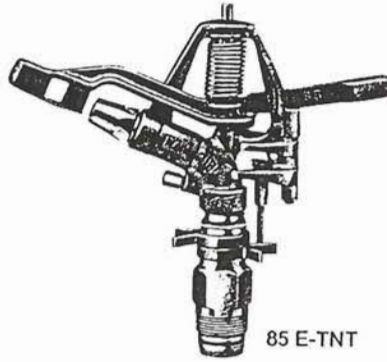
MODELS AVAILABLE LESS PJ TUBE.
 SPECIFY 65 D ADJ-TNT, 65 D-TNT



A.B.N. 63 103 035 687

MECAL PTY. LTD.
 9 Paramount Road (P.O. Box 4140)
 West Footscray 3012
 Melbourne, AUSTRALIA
 Website: www.mecal.com.au

Phone: 03-9314-0144
 Fax: 03-9314-2576
 Int'l Phone: +61-3-9314-0144
 Fax: +61-3-9314-2576
 Email: mecal@mecal.com.au



85 E-TNT

85E-TNT/85EW-TNT Series

Widely used as an end gun on center pivot machines. Throw is increased substantially under windy conditions because this model has a non-clog vane. Full or part circle operation. Wide range of nozzle sizes extends application of this series. 85EW-TNT gives lower precipitation rates with plug in place of spreader nozzle. 1 1/4" male BSP bearing (32 mm).

PERFORMANCE FOR 85 E-TNT
 Highest point of stream is 4,2 m above nozzle*.

Nozzle pressure (Bar) = 100kPa	NOZZLE 1 1/32" - 7/32" 20° - 8.73mm x 5.55mm			NOZZLE* 3/8" - 7/32" 20° - 9.52mm x 5.55mm			NOZZLE 13/32" - 7/32" 20° - 10.3mm x 5.55mm			NOZZLE 7/16" - 7/32" 20° - 11.1mm x 5.55mm			NOZZLE 15/32" - 7/32" 20° - 11.9mm x 5.55mm			NOZZLE 1/2" x 1/4" - 12.7mm x 6.35mm			NOZZLE 17/32" - 1/4" - 13.4mm x 6.35mm			NOZZLE 9/16" - 1/4" - 14.2mm x 6.35mm			NOZZLE 5/8" - 1/4" - 15.8mm x 6.35mm					
	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s
	3.50	22.3	7.60	2.11	23.0	8.63	2.40	24.2	9.84	2.68	24.8	10.72	2.88	25.7	11.88	3.30	26.6	13.06	3.88	27.5	15.08	4.18	28.7	16.74	4.66	29.7	19.13	5.48		
4.00	23.2	8.16	2.27	23.8	9.27	2.57	25.1	10.36	2.88	25.8	11.60	3.13	26.6	12.75	3.54	27.5	14.06	4.16	28.4	16.16	4.49	29.4	17.94	4.98	30.5	21.11	5.88			
4.50	24.1	8.68	2.41	24.7	9.87	2.74	25.6	11.04	3.07	26.5	12.24	3.40	27.4	13.57	3.77	28.4	15.90	4.42	29.3	17.18	4.77	30.2	19.08	5.30	31.1	22.52	6.25			
5.00	24.8	9.18	2.55	25.4	10.43	2.90	26.4	11.69	3.25	27.3	12.94	3.59	28.0	14.34	3.98	29.0	16.78	4.66	30.0	18.10	5.04	30.9	20.16	5.60	31.9	23.80	6.81			
5.50	25.3	9.65	2.68	26.2	10.98	3.05	27.1	12.30	3.42	28.0	13.61	3.78	28.6	15.08	4.19	29.5	17.63	4.90	30.8	19.03	5.30	31.7	21.39	5.89	32.6	25.02	6.95			
6.00	26.0	10.11	2.81	26.8	11.50	3.19	27.7	12.80	3.58	28.6	14.25	3.96	29.4	15.79	4.39	30.3	18.44	5.12	31.3	19.98	5.55	32.1	22.18	6.16	33.2	26.18	7.27			
6.50	26.5	10.55	2.93	27.4	12.00	3.33	28.3	13.46	3.74	29.2	14.86	4.13	29.8	16.47	4.57	30.7	19.21	5.34	32.0	20.83	5.79	32.8	23.13	6.42	33.8	27.31	7.59			
7.00	26.9	10.97	3.05	27.8	12.48	3.47	28.7	14.01	3.89	29.7	15.45	4.29	30.3	17.13	4.76	31.2	19.96	5.54	32.4	21.66	6.02	33.3	24.04	6.68	34.2	28.39	7.89			

PERFORMANCE FOR 85 EW-TNT
 Highest point of stream is 4,2 m above nozzle*.

Nozzle pressure (Bar) = 100kPa	NOZZLE 1 1/32" - 8.73mm			NOZZLE* 3/8" - 9.52mm			NOZZLE 13/32" - 10.3mm			NOZZLE 7/16" - 11.1mm			NOZZLE 15/32" - 11.9mm			NOZZLE 1/2" - 12.7mm			NOZZLE 17/32" - 13.4mm			NOZZLE 9/16" - 14.2mm			NOZZLE 5/8" - 15.8mm					
	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s	M	M3h	L/s
	3.50	22.3	5.58	1.55	23.0	6.61	1.84	24.2	7.82	2.12	24.8	8.70	2.42	25.7	9.87	2.74	26.6	11.01	3.06	27.5	12.11	3.36	28.7	13.78	3.83	29.7	16.78	4.66		
4.00	23.2	5.95	1.65	23.8	7.06	1.96	25.1	8.16	2.27	25.8	9.33	2.59	26.6	10.57	2.93	27.5	11.89	3.28	28.4	13.00	3.61	29.4	14.80	4.11	30.5	17.89	5.00			
4.50	24.1	6.30	1.75	24.7	7.49	2.08	25.6	8.66	2.41	26.5	9.81	2.75	27.4	11.22	3.12	28.4	12.54	3.48	29.3	13.84	3.84	30.2	15.77	4.38	31.1	19.13	5.31			
5.00	24.8	6.62	1.84	25.4	7.89	2.19	26.4	9.14	2.54	27.3	10.47	2.91	28.0	11.85	3.29	29.0	13.25	3.68	30.0	14.63	4.06	30.9	16.68	4.63	31.9	20.21	5.61			
5.50	25.3	6.93	1.93	26.2	8.27	2.30	27.1	9.60	2.67	28.0	11.01	3.06	28.6	12.44	3.46	29.5	13.92	3.87	30.8	15.39	4.28	31.7	17.55	4.88	32.6	21.24	5.90			
6.00	26.0	7.23	2.01	26.8	8.63	2.40	27.7	10.03	2.79	28.6	11.51	3.20	29.4	13.01	3.61	30.3	14.58	4.04	31.3	16.12	4.48	32.1	18.39	5.11	33.2	22.22	6.17			
6.50	26.5	7.51	2.09	27.4	8.98	2.49	28.3	10.45	2.90	29.2	12.00	3.33	29.8	13.55	3.76	30.7	15.18	4.22	32.0	16.82	4.67	32.8	19.19	5.33	33.8	23.17	6.44			
7.00	26.9	7.78	2.16	27.8	9.31	2.59	28.7	10.85	3.01	29.7	12.48	3.47	30.3	14.08	3.91	31.2	15.77	4.38	32.4	17.49	4.86	33.3	19.97	5.55	34.2	24.08	6.69			

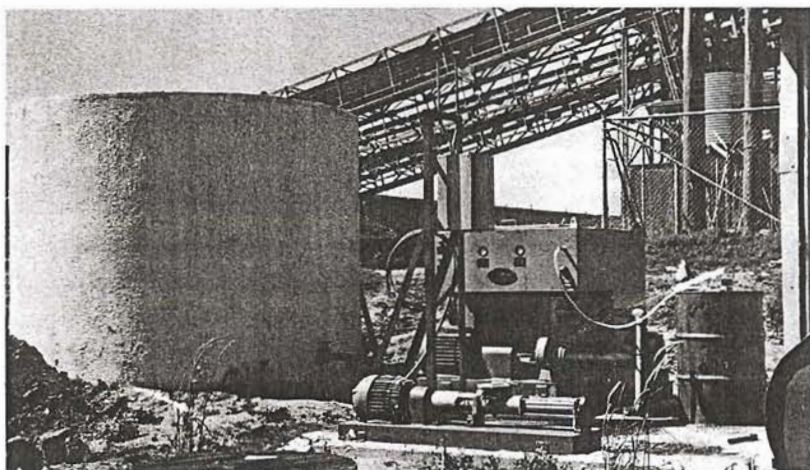
M = Radius in meters

DUST CONTROL FOR RAVENSWORTH OPEN CUT COAL MINE

Some 130 miles north west of Sydney in the Hunter Valley is Costains Ravensworth No. 2 Open Cut Coal Mine, one of Australia's newest and most important power sources. The handling and crushing plant processes some 3000 tons/hour of run of mine coal.



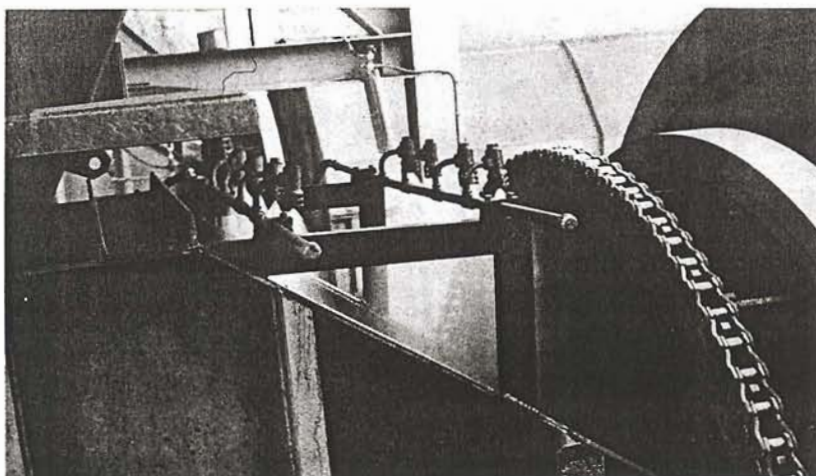
Truck Dump Hoppers and Conveyors
One and Two Feeding Surge Hoppers



Type S Proportioner and Water Tank

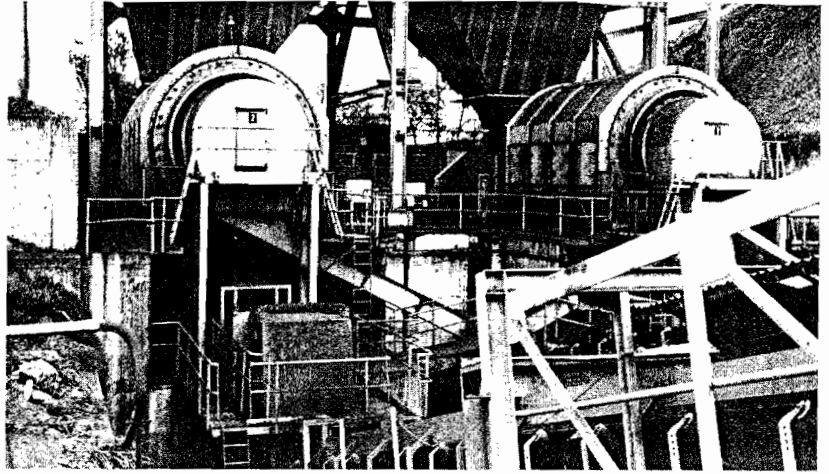
A dust problem was created and so Costains decided that dust control, using the Chem-Jet method, was necessary for this plant. To achieve the acceptable level of dust control, a Chem-Jet solution of up to 1% by weight is applied to every ton of material handled. The solution is automatically blended in a type 'S' proportioner and is then pumped under pressure to the 13 application points throughout the plant.

The treatment is controlled from a central panel and automatic controls are located throughout the plant to ensure that the solution is not wasted, but applied only when coal is passing the selected application points.

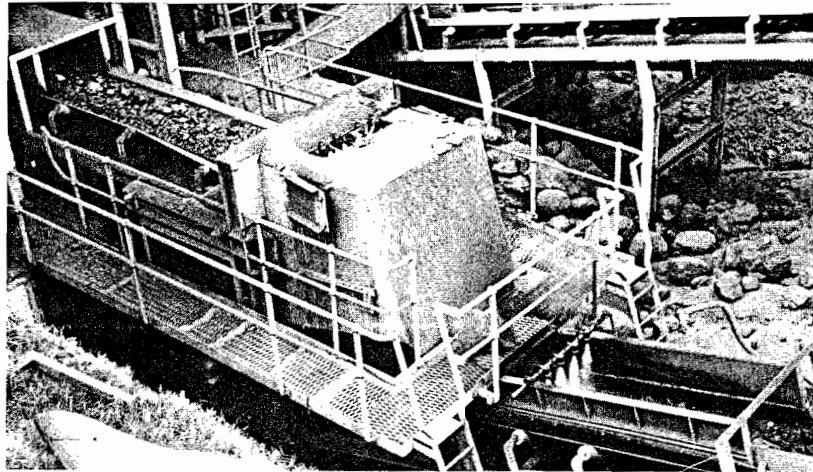


Sprays treating Coal at Vibratory Feeders

Coal is discharged from bottom dump 110 ton capacity trucks into 2 hoppers, and from there is fed by twin vibratory feeders to two 12' diameter Bradford Breakers. A total of 28 sprays are located at the vibratory feeders and discharge from the breakers which prevents dust being liberated to atmosphere and commences pre-treatment of the coal.



Hoppers Feed Twin Bradford Breakers



Discharge from Initial Crushing



Six Surge Bins and Ring Mills
Concrete Silo in Rear

The third application takes place at transfer stations on conveyors 1 and 2. From the initial crushing, the $- 8\frac{1}{2}''$ coal is transported to 6 surge bins and from these, the product is fed to 6 ring mills which produce $- 1\frac{1}{4}''$ coal. Sprays are located at each of the ring mills and a further application point is provided on conveyor No. 4. From this point the coal is conveyed a distance of 600 ft. to a concrete 6000 ton silo, before further shipment.

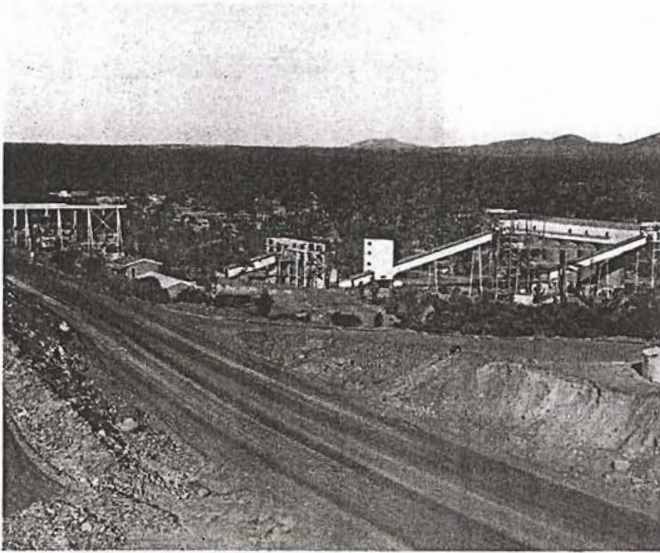


A.B.N. 63 103 035 687

MECAL PTY. LTD.
9 Paramount Road (P.O. Box 140)
West Footscray Vic 3012
Australia

Tel: 03-9314-0144
Fax: 03-9314-2576
International
Tel: + 61-3-9314-0144
Fax: + 61-3-9314-2576

CHEM-JET CONTROLS DUST IN W.A. IRON ORE PLANT

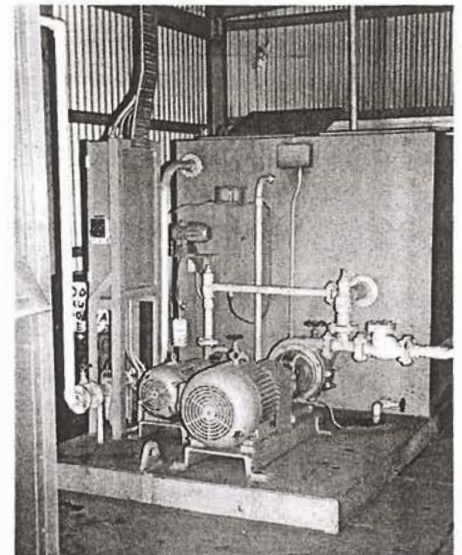


Koolyanobbing Crushing Plant

Handling iron ore always produces dust, especially in the hot dry climate of Western Australia. In an effort to reduce air pollution, Engineers and Management of the Dampier Mining Company Limited's Koolyanobbing Crushing plant decided to install a Chem-Jet Wet Spray Dust Control System.

The Koolyanobbing Crushing plant produces some 900 tons per hour of very dry and friable ore. Dump trucks of 50 short ton capacity discharge ore into the receiving hopper, it is then fed to the primary jaw crusher. The minus 9" material is conveyed direct to twin secondary gyratory crushers. The product is then conveyed to a vibratory screen, which separates the minus 1¼" material with the oversize going to the tertiary gyratory crusher set to produce 1¼" ore. This combined material is then conveyed to the storage bunkers by inclined conveyors and travelling tripper conveyor.

The Chem-Jet Dust Control System prevents dust becoming air borne, by wetting the ore at all crushing and conveying points in the initial handling operation where dust is being liberated to the atmosphere. To produce the wetting action, a specially formulated surface active agent, known as Compound M.S.T. is



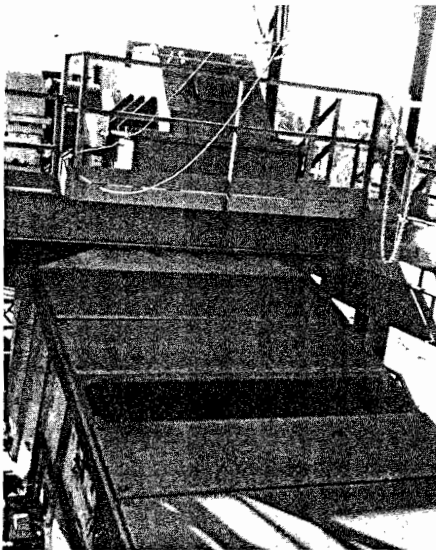
Chem-Jet Proportioner. The heart of the Chem-Jet System.

utilised. This highly concentrated chemical solution is mixed with water in small amounts, and sprayed in dust producing areas. The Compound M.S.T. is non-toxic, non-corrosive, odourless and fully biodegradable.

The heart of the Chem-Jet System is the proportioning unit, which automatically meters and mixes the M.S.T. Compound at a ratio of 4000 parts water to one part Compound M.S.T. The solution is then pumped into a specially engineered piping system for dispersal to the strategically located spray headers.



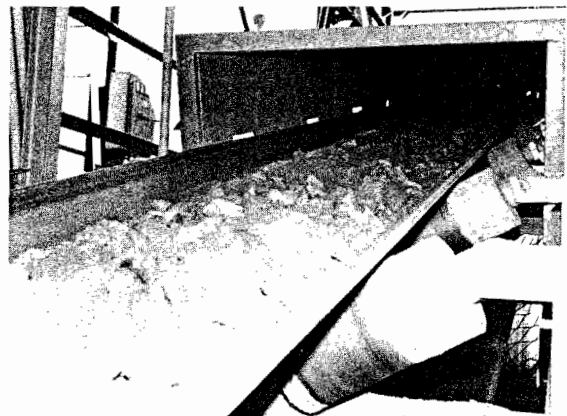
Dump Hopper where initial Chem-Jet Treatment begins.



Screens emit no dust even with cover removed.

Dust control begins at the truck dump hopper and treatment is given at 15 points which are automatically controlled by Chem-Jet Flow Controllers and Actuators. The Chem-Jet system has the capacity to add a maximum of 3 gallons per ton of moisture throughout the handling and crushing plant. In addition to effective dust control at the various application points, the carry over effect gained by the treatment allows screening, discharges to storage bunkers and eventual train loading to take place without generating dust.

The benefits obtained from this system by keeping the atmosphere clean are intangible. In addition to reducing material losses and improving employee morale, clean up time is cut to a minimum and equipment maintenance has been reduced.



Conveyor Transfer Points. Treated ore is handled in a dust-free condition.

This article is printed with kind permission of the Dampier Mining Co. Ltd.



A.B.N. 63 103 035 687

MECAL PTY. LTD.
9 Paramount Road (P.O. Box 140)
West Footscray Vic 3012
Australia

Tel: 03-9314-0144
Fax: 03-9314-2576
International
Tel: + 61-3-9314-0144
Fax: + 61-3-9314-2576



A.B.N. 63 103 035 687

MECAL PTY. LTD.
9 Paramount Road (P.O. Box 4140)
West Footscray Vic 3012
AUSTRALIA
Website: www.mecal.com.au

Phone: 03-9314-0144
Fax: 03-9314 2576
Int'l Phone: + 61-3-9314-0144
Fax: +61-3-9314-2576
Email: mecal@mecal.com.au

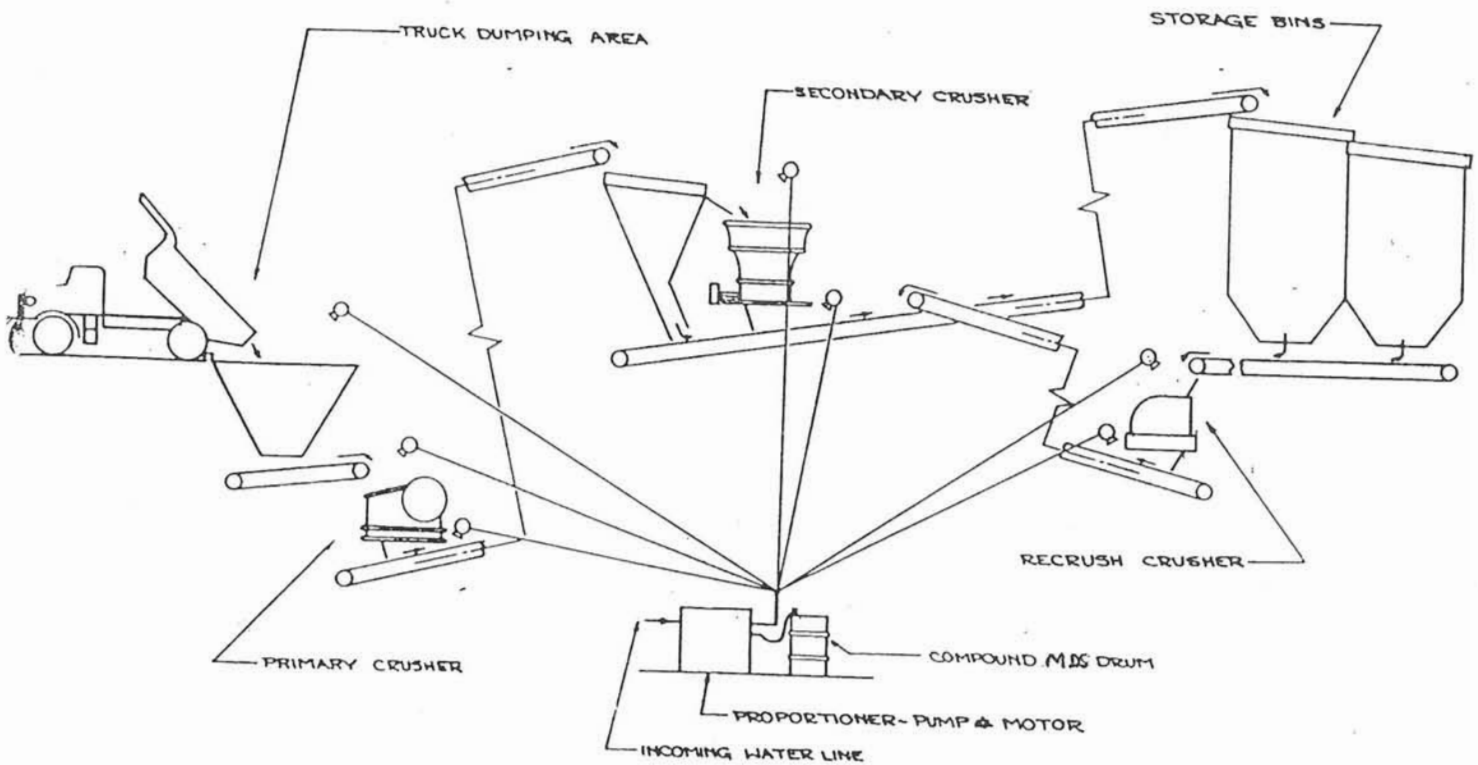
ROCK CRUSHING PLANT

Material flow starts at the truck dump, where the two headers (above and below hopper) are manually controlled by push-button switches. The crushed stone discharged from the primary crusher is treated before it passes to a sorting hopper, which diverts material of proper screen size to the storage bins. Out-sized material is fed into the secondary crusher. Note that the material is treated both *before* and *after* crushing. This action is necessary to control the excessively dusty conditions created by the inevitable breaking-up of the material in transit.

From the secondary crusher, the stone, now

the same size as the screened material, is conveyed to the storage bins. In the example shown here, there is yet another material breakdown (there may be several more in a plant). The stone, then, is fed from the storage bins to the recrusher, where it receives another spray treatment. Crushing completed, the now properly sized and dustless material is returned to the bins for storage or sent out to the loading area.

Control of the spray jet headers at the discharge of the primary crusher and at the input and discharge of the secondary and recrusher crushers is automatic.



ROCK CRUSHING PLANT
MECAL-JET DUST CONTROL SYSTEM



A.B.N. 63 103 035 687

MECAL PTY. LTD.
9 Paramount Road (P.O. Box 4140)
West Footscray 3012
Melbourne, AUSTRALIA

Website: www.mecal.com.au

Phone: 03-9314-0144
Fax: 03-9314-257
Int'l Phone: +61-3-9314-014
Fax: +61-3-9314-257
Email: mecal@mecal.com.au

COAL HANDLING, POWER PLANT METHOD NO.1, ROTARY CAR DUMPER.

All sprays are off until the rotating platform has turned 18 degrees, when automatic controls turn on the overhead spray to suppress the initial dust. At 37 degrees off vertical, the headers at the hopper mouth are set in operation. These three headers remain on until the dumping is complete. When outdoor temperature is below freezing, the header at the feeder is used alone for initial treatment. This header is actuated by a separate automatic control and may be operated independently of the others. After initial treatment, the dust-free coal is sent on to the breaker building without further spray application.

METHOD NO. 2, CAR SHAKEOUT.

Here the headers are controlled manually by the shakeout operator, who starts the spray jets when the clamps have lowered over the car. The flow of material from the shakeout hopper is the same as from the dumper.

METHOD NO. 3, BARGE UNLOADING.

With this method, the headers are controlled by the action of a limit switch placed along the trolley rails travelled by the bucket scoop. The headers operate only when coal is being unloaded into the hopper. In this application the dust itself is not treated. Instead, the area where the clam-shell is unloaded is curtained off by the Chem-Jet sprays.

METHOD NO. 4, CONTINUOUS HOPPER DUMPER.

Some unit trains provide for continuous dumping of coal while the trains move over a long hopper area under the tracks. The Chem-Jet System is similar to the car shakeout system. It extends for the full length of the dump area and is actuated by the presence of the loaded cars and the coal on the conveyor belts.

THE CRUSHER

From the initial treatment point the coal passes along a conveyor to a pair of chutes having a common mouth. If the coal is to be sent to storage (reclaim), it passes without treatment down the left-hand chute and out to the stockpile. If it is to be crushed and conveyed to the furnaces, it flows down the right hand leg and into the crusher. Since the coal is crushed here and new dust-producing surfaces created, the coal is given a secondary spray application as it enters and leaves the crusher.

During times when the crusher is running empty the sprays at the top of the crusher are automatically turned on for short intermittent periods to prevent dusting from the crusher.

THE RECALIM HOPPER.

Coal drawn from open-air stockpiles usually has been in storage for days or even weeks. To ensure dust-free transfer to the crusher, the coal is treated at the reclaim hopper. Header control is accomplished by either an under-belt or over-belt automatic spray jet control.



MECAL PTY. LTD.
9 Paramount Road (P.O. Box 4140)
West Footscray Vic 3012
AUSTRALIA
Website: www.mecal.com.au

Phone: 03-9314-0144
Fax: 03-9314 2576
Int'l Phone: + 61-3-9314-0144
Fax: +61-3-9314-2576
Email: mecal@mecal.com.au

MECAL-JET - MDS COMPOUND.

MDS Compound is a non-ionic, fully bio-degradable, non-toxic, non-flammable and most effective dust suppressant.

MDS Compound is a Linear Alcohol Ethoxylate Chemical.

Effect of MDS on Product.

The small amount of moisture (MDS plus water) required to suppress dust is not harmful to most materials.

1. To suppress coal dust, for example, which is quite oily and moisture-resistant, requires the addition of only one-half of one per cent (0.5%) or 5 litres of moisture per tonne of coal. This figure is the total amount of moisture added to the material, regardless of the number of spray application points.

This is based on a mixed solution of 1 part Compound MDS to 4000 parts water.

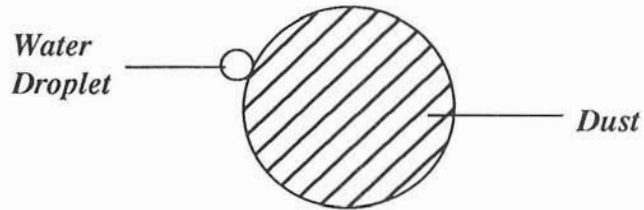
If water alone is used, much greater quantities of moisture must be added to do even a partially effective job. With just about any material, less than 1% total addition of mixed solution (moisture) is usually the maximum required.

2. Compound MDS has no effect on a material's burning qualities. The Compound vaporizes at 110° C, leaving no trace.
3. Compound MDS mixed solution has no corrosive effect on machinery, belts, etc: this has been demonstrated on many Mecal-Jet installations over many years.
4. For stockpiles or after shipment, the effects of Compound MDS can be 're-energised' simply by respraying the product with water only.

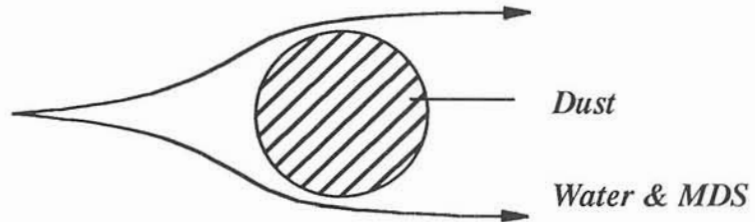
How does Compound MDS work?

1. The basic principle: Compound MDS reduces the surface tension of water from about 75 dynes/cm to less than 25 dynes/cm. This reduction in surface tension improves water's surface-active qualities, producing a solution with excellent wetting, spreading and penetrating powers.

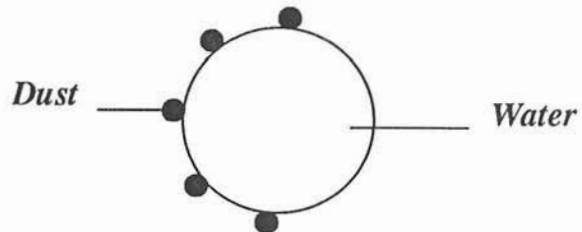
a) Where dust is of larger sizes (several microns or more) a droplet of water appear something like this:



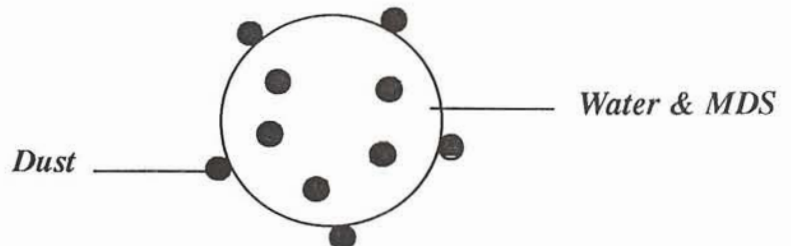
Note that there is very little contact between water and particle; consequently, there is very little effective wetting action. With a 1:1000 solution of MDS and water, the droplet has greater wetting and spreading power because of reduced surface tension. The particle is surrounded by water.



b) Dust of sub-micron size is smaller than droplet size. Interfacial tension (surface tensions of the material at point of contact) of dust and untreated water is such that dust does not enter the droplet; it forms a film.



But with the same MDS and water solution as above, sub-micron dust is readily taken into the droplet.



c) Water wetted with MDS is, because of lower surface tension, more readily formed into smaller droplets, putting more droplets per unit volume into the air where they can make contact with dust particles. Larger droplets, it is obvious, would necessitate using more water to do the same job.

2. Compound MDS is not "just another wetting agent". It has been specially formulated to provide the best combination of properties for most types of dust.



MECAL PTY. LTD.
9 Paramount Road (P.O. Box 4140)
West Footscray 3012
Melbourne, AUSTRALIA

A.B.N. 63 103 035 687

Website: www.mecal.com.au

Phone: 03-9314-0144
Fax: 03-9314-2576
Int'l Phone: +61-3-9314-0144
Fax: +61-3-9314-2576
Email: mecal@mecal.com.au

MECAL-JET USERS LIST

<u>AUSTRALIA</u>	<u>LOCATION</u>	<u>STATE</u>	<u>INDUSTRY</u>	<u>PRODUCT</u>
Adelaide Brighton Cement	Kline Point	SA	Cement	Limestone
A.P.M.	Maryvale	VIC	Paper Mill	
Agnew Mining Co.	Leinster	WA	Mine	Iron Ore
Boyne Smelters Ltd	Boyne Island	QLD	Aluminium	
BHP	Stockton Bore	NSW	Mine	Coal
BHP Iron Ore		WA	Mine	Iron Ore
Bell Basic Industries	Maddington	WA	Quarry	
C.S. Energy	Biloela	QLD	Power Station	Coal
Comalco Ltd	Weipa	QLD	Aluminium	Bauxite
Dalrymple Bay Coal Terminal	MacKay	QLD	Terminal	Coal
David Mitchell Estate		VIC	Quarry	Limestone
Drayton Coal	Muswellbrook	NSW	Mine	Coal
Energy Resources Australia	Jabiru	NT	Mine	Uranium
George Fisher Project (MIM)	Mt. Isa	QLD	Mine	
Hymix Quarries	Gosford	NSW	Mine	Stone
J & A Brown	Catherine Hill Bay Hunter Valley No. 1	NSW	Mine	Coal
Mackay Sugar	Mackay	QLD	Sugar	Coal
Maritime Services	Balmain	NSW	Loader	Coal
Mt Gunson Mine	Woomera	SA	Mine	
Mt Leyshon Gold Mine	Charters Towers	QLD	Mine	Gold
Mt Newman Mining Co.	Tom Price	WA	Mine	Iron Ore
Newcom Collieries	Cooranbong Myuna	NSW	Mine	Coal

<u>AUSTRALIA</u>	<u>LOCATION</u>	<u>STATE</u>	<u>INDUSTRY</u>	<u>PRODUCT</u>
Pacific Power	Eraring Liddell	NSW	Power Station	Coal
Pivot	Geelong	VIC	Fertilizer	
Port Waratah Coal Services	Newcastle	NSW	Loader	Coal
Poseidon Gold	Tennant Creek	NT	Mine	Gold
QEC	Callide 'B' Gladstone Stanwell	QLD	Power Station	Coal
QEGB	Tarong	QLD	Power Station	Coal
Queensland Alumina	Gladstone	QLD	Aluminium	Alumina
Queensland Fertilizer (ABB)	Townsville	QLD	Fertilizer	
Robe River Iron Associates		WA	Mine	Iron Ore
SEC of VIC	Loy Yang	VIC	Power Station	Coal
Three Springs Talc Pty Ltd	Three Springs	WA	Mine	Talc
Ulan Coal	Ulan	NSW	Mine	Coal
Western Power	Muja	WA	Power Station	Coal
Westfarmers Coal	Muja	WA	Mine	Coal
Whim Creek Consolidated	Meekatharra	WA	Mine	Coal

	<u>LOCATION</u>	<u>INDUSTRY</u>	<u>PRODUCT</u>
<u>INDIA.</u>			
Indian Aluminium Co Ltd		Mine	Haul Road
		1. Stockpiles	Bauxite
		2. Dumper Unloading Hopper.	Overburden
		3. Crusher House	Bauxite
		4. Ropeway Loading Station.	Bauxite
Mahanadi Coalfields Ltd IB-Valley Area, Chingriguda Belpahar	ORISSA	Mine	Coal
		5. Haul Road	
		2. Crusher House.	
		3. Stockpiles at Rly Siding Platform No: 1 & II.	
Pipawah (White Equipment)			
Radiant Industries Ltd Birla Copper Project	BHARUCH, GUJARAT	Mine	Lignite
		1. Track Hopper	
		2. Reclaim Hopper	
		3. Stockpiles	
		4. Crusher	
		5. Screen House	
Rashtriya Ispat Nigam Ltd Visakhapatnam Steel Plant Jagyapeta	ANDHRA, PRADESH	Mine	Limestone
		Wagon Loading Hopper	
South Eastern Coalfields Ltd Kusmunda Area	MADHYA, PRADESH	Mine	Coal
		Stockpiles at Rly Siding Platform No: I & II.	
Steel Authority of India Ltd Bhilai Steel Plant	MADHYA PRADESH	Wagon Tippler	Dolomite Limestone
		Track Hopper	Limestone
		Central Storage Yard	Iron Ore, Dolomite Limestone
<u>MEXICO.</u>			
Rio Escondido Power Station		Power Station	Coal
Sicartsa		Mine	Iron Ore

LOCATION

INDUSTRY

PRODUCT

NEW ZEALAND.

Electric Corporation

HUNTLEY

Power Station

Coal

Hauraki District Council

PAEROA

Mine

Limestone

PHILIPPINES.

Solid Cement Corp.

Cement

Limestone

TAIWAN.

Taiwan Power Corporation

TAICHUNG

Power Station

Coal



MECAL PTY. LTD.
 9 Paramount Road (P.O. Box 4140)
 West Footscray 3012
 Melbourne, AUSTRALIA
 Website: www.mecal.com.au

A.B.N. 63 103 035 687

Phone: 03-9314-0144
 Fax: 03-9314-2576
 Int'l Phone: +61-3-9314-0144
 Fax: +61-3-9314-2576
 Email: mecal@mecal.com.au

DUST SUPPRESSION - QUESTIONNAIRE.

Date:

Company Name: Phone:

Contact Name: Fax:

Type of Plant: Plant Tonnage per Hour: Max Min

Material to be Processed:

Moisture Content: Max Min

Receiving Hopper.

Discharge Vehicle:
 Tonnes per Load:
 Max Size:

Primary Crusher.

Type :
 Discharge
 Size :
 Screen
 Analysis :

Secondary Crusher.

Type :
 Discharge
 Size :
 Screen
 Analysis :

Tertiary Crusher.

Type :
 Discharge
 Size :
 Screen
 Analysis :

Conveyor.

Type:
 Speed:
 Width:
 Tonnes/hr:

Conveyor.

Type:
 Speed:
 Width:
 Tonnes/hr:

 Number of
 Transfer Points:

Conveyor.

Type:
 Speed:
 Width:
 Tonnes/hr:

 Number of
 Transfer Points: