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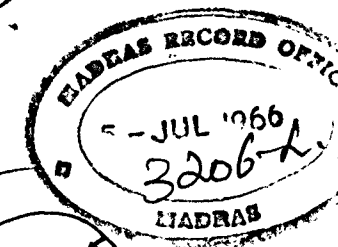
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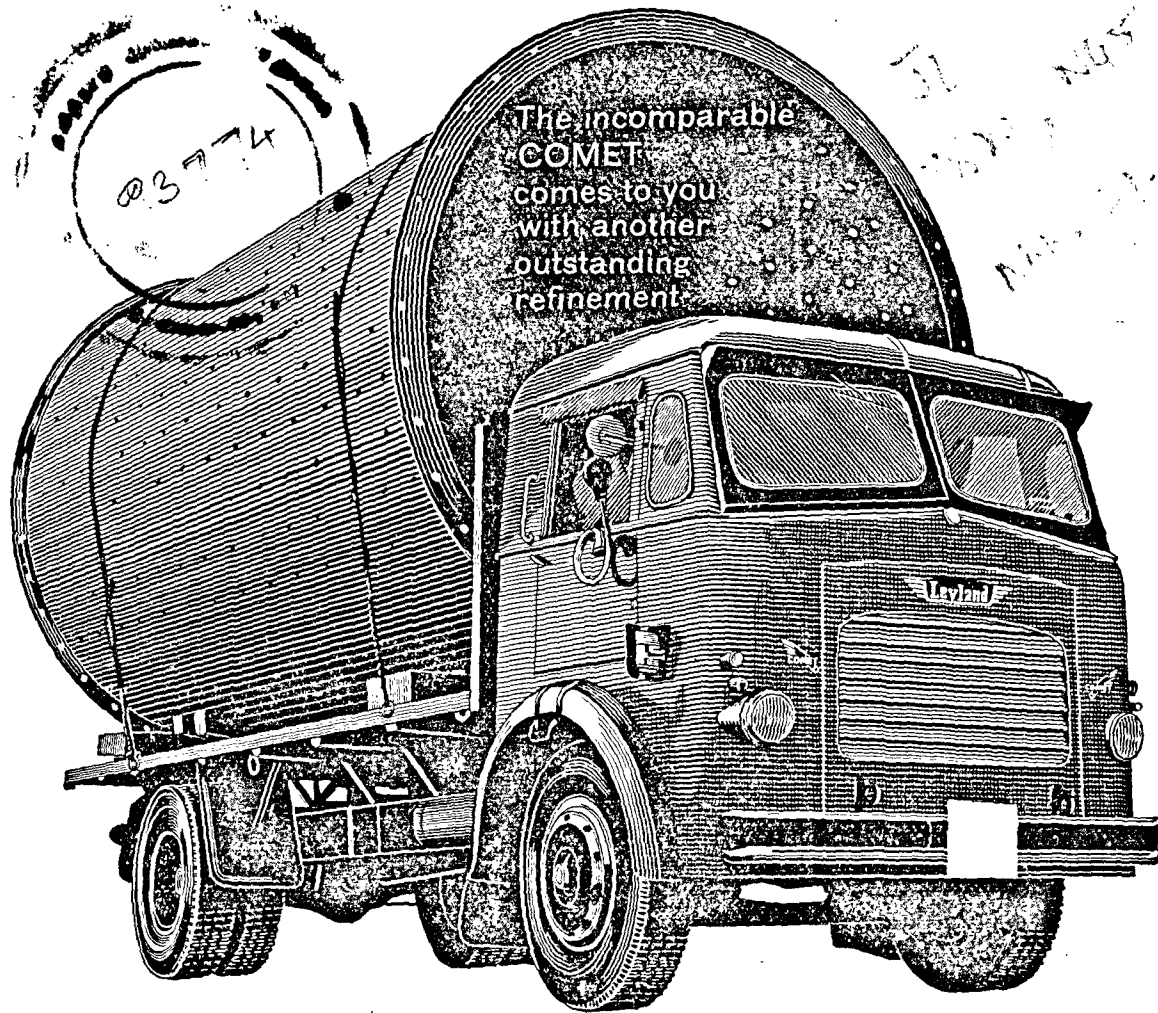
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JANUARY - MARCH 1966

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FULL AIR-PRESSURE BRAKES

... now fitted exclusively to Ashok Leyland vehicles

The powerful air brakes now fitted to Comets have proved most successful with excellent heat dissipation and anti-fade characteristics—scores over all other systems in braking at all points. Ideal for heavy-duty, delivers instant stopping power with minimum pedal pressure, thereby saving driving fatigue. Operates swiftly to slash the time-lag between application and action. □ Ashok Leyland Limited are proud to offer this one more exclusive in a chassis of exclusives, all combining to offer remarkable economy in maintenance and overheads.

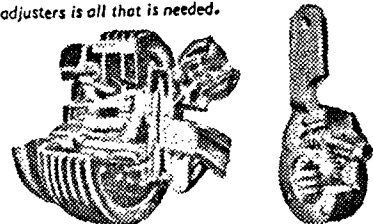
ASHOK LEYLAND COMET
for heavy-duty haulage
at low cost

JWY-AL-121A



ASHOK LEYLAND LIMITED,
Ennore, Madras

The diaphragm operated air brakes give power braking to each wheel. The lightest touch on the pedal gives smooth retardation or full power emergency braking with 555 sq. in. (3,580 sq. cm.) braking area—ensures complete road safety. Adjustment of the brakes is very simple—a mere turn on the slack adjusters is all that is needed.



SMALL SCALE INDUSTRIES MADRAS MARCHES AHEAD

In the last 10 years small industries have made tremendous progress. They have also made an impact on the industrial development in this state. This is due to a large number of reasons.

The first reason and probably the most important is the enterprise of the individual industrialist. A large number of businessmen and young engineers have taken up this job as a mission and have concentrated all their efforts and attention in setting up some kind of productive capacity. But for their enterprise and endeavour this development would not have been achieved.

The second important reason for this rapid development is the advance that the State has made in technical education. The Government has endeavoured to open up new Engineering Colleges, Polytechnics and Industrial Training Institutes. With the result, a large number of skilled men in various levels are available for employment in industrial enterprises.

The third important reason for the development is the special care and attention that Government has bestowed on this sector. Government have given various kinds of assistance. They have acquired land. They have provided loans for buildings and machinery. They have provided machinery on hire purchase schemes. They have provided concessions in Government purchases from the small industries sector. They have provided technical assistance through Small Industries Institutes.

All these have been made use of by the enterprising businessmen.

In small industries there are two broad categories of industries. There is the small unit that concentrates itself on a single item, such as a tooth brush, a card-board carton, a pencil or a time piece. These are what are called product-oriented industries. A number of these items can be made with limited resources and reasonably small capital.

However, the bulk of small industries are actually involved in making components for other larger units. Tool Rooms, Forge Shops and Machine Shops turn out an innumerable large number of parts and components and as the number of larger units increases,

this kind of development is likely to progress further. Difficulties in regard to credit financing, space and other problems are forcing larger units to sub-contract many of their components to smaller units. Some years ago, there were not sufficient number of small units to undertake these jobs. Further, small units were not equipped to produce these components with that degree of accuracy and precision that the buyer insisted upon. Today the situation is fast changing and a large number of small units are proud of being able to make these supplies satisfactorily. A real fillip was

BY
Sri T. A. S. BALAKRISHNAN, I.A.S.
(Director of Industries & Commerce,
Madras)

given to the development of small industries in this State by setting up over 20 Industrial Estates with approximately 400 units. These have proved very useful to the businessman with limited resources. A cluster of such units depends upon each another for production and services. This is also a healthy line of development. Small units have a very bright future. The Defence Ministry in its attempt to locate new sources of supply for weaponry components is trying to interest the small scale sector in manufacturing defence supplies. Larger industrial units are trying to offer the manufacture of components to smaller units. Buyers of components and parts are always on the look out for alternative sources; they do not wish to be held to ransom by single suppliers.

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There would be further and more rapid development if we take one important step. This is the provision of credit to small units. As a whole, the owner of the small unit is not able to provide that level of security the Financing Institutions insist upon before they lend money. Some relaxation in the margins for lending would assist the small owner to a tremendous degree in enlarging his production and his usefulness to the community at large. In the last four years over 9,000 units have registered themselves as Small Units in this State. In the next four years, we could reasonably expect double this number. This is a fairly good indication of how rapidly small industries have forged and are forging ahead in this State.

IMPORT SUBSTITUTION

LIST OF IMPORTED ITEMS FOR DEVELOPMENT INDIGENOUSLY

It is needless to stress the importance of substituting import of tools wherever possible due to the present foreign exchange position. In this connection the Development Commissioner, New Delhi has compiled a list from import statistics of items that are at present being imported and which may be substituted by manufacture within India, if some attempt is made. The list of said items is given below for the benefit of the industrialists who may consider it feasible to take up the manufacture of any of the articles, although the list is itself not exhaustive in information required for the purpose.

Gram: FLATFILES Phone { 25187
29521

P. B. SHAH & CO. (Madras)

21, Linghi Chetty Street :: MADRAS-1

Leading Stockists and Specialists in:
ENGINEERING AND PRECISION TOOLS, HARDWARE AND MACHINERIES

Accredited dealers for:

SAP Hack saw blades and tools ADDISON Tools I/T Drill bits etc. WOLF Electric tools KLIPCO Hose clips	SHIVAJI Vices etc. GECO Revolving centres Etc. HANSA Files GEDORE Tools RAJU Chain pulley blocks
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R. R. BRAND LETTERS & FIGURES

Associates at: **CALCUTTA AND BOMBAY**

Description	Value (Rs.)	Description	Value (Rs.)
Component parts of air compressor ...	71,27,398	Spare parts for air and gas separation plants ...	600
Accessories for lamp making machinery ...	32,215	Air compressor valves ...	52,279
Cigarette making machinery parts ...	26,901	Component parts of air handling equipment ...	3,199
Hydraulic filter press parts ...	1,279	Brake lining for stranding machine ...	327
Air heater for industrial drying ...	7,278	Bronze precision cast guide bar ...	2,578
Automatic box nailing with accessories	11,259	Component parts of braiding machine	4,124
Air springs ...	401	do of bone mill ...	2,983
Asbestos rollers ...	1,547	do for belt press ...	1,958
Aerial ropeway and accessories ...	88,334	do of brick making machine ...	12,579
Assembly fixtures ...	14,124	Parts of banbury mixer (½ h.p.) ...	1,537
Component parts agitator ...	482	Parts of boraz tube straightening machinery ...	120
Component parts of ammonia compressor ...	270	Spare for brine plant ...	6,958
Accessories for precision winder ...	1,950	Compressor motor unit ...	231
Air cleaners ...	466	Component parts of cement making machinery ...	6,94,914
Spare parts for ammanu shaker drum mills ...	128	Cotton sleeving ...	2,328
Component parts for agricultural spraying machine ...	55		

Description	Value (Rs.)	Description	Value (Rs.)
Component parts of core drilling machinery ...	1,81,384	Component parts of dividing machine	5,587
Spares for circuit breakers ...	3,438	do do dry rock drill ...	233
Condensers cooler ...	1,21,934	do do dust collecting machine ...	20,110
Spare parts for complete batching plant ...	2,304	Component parts of dipping machine	13,350
Component parts of caustic soda chlorine plant ...	1,32,641	Dynamic balancing machine ...	20,781
Circular knives for cutting asbestos ...	1,073	Drill fixtures ...	29,235
Controls panels ...	51,629	Equipment for glass manufacturing plant ...	4,086
Centrifuges peeling knives with accessories ...	5,376	Exposi-patch kits ...	729
Component parts for core laying up machine ...	1,293	Spares for enamelling machine ...	6,695
Component parts for centrifugal sulphuric acid pump ...	13,245	Equipment for chemical plants ...	78,980
Parts for cell making unit ...	11,282	Component parts of earth moving equipment ...	1,692
Clutch spares ...	1,279	Component parts of embossing machine ...	2,378
Centrifugal baskets ...	21,699	Component parts of electric dipping machine ...	11,889
Component parts of cartridge machinery ...	2,241	Electroforge machine parts ...	1,22,892
Spares for cover building machine ...	827	Component parts of extrusion press ...	1,603
Component parts of confectionery machinery ...	9,768	Flanges with screw and joint steel ...	660
Component parts of cellophane machinery ...	76,693	Filter holder etc. ...	1,639
Component parts of centrifugal machinery ...	852	Fallers and pins ...	1,792
Carbide blades bore ...	720	Fixtures etc. ...	35,910
Coal handling crushing plant spares ...	16,000	Feed crank ...	599
Coil winder model with accessories ...	32,736	Component parts of fertilizer plant ...	3,541
Component parts of cable relaying machinery ...	305	Folding rails and etc. ...	1,542
Component parts of cooler ...	23,694	Metallic filters ...	4,555
Spares for clay working machinery ...	2,895	Technical felts ...	2,800
Component parts of crusher ...	563	Flanging machine ...	2,652
Parts of coffee sorting machine ...	5,077	Furnace parts ...	2,243
Parts of coffee machinery ...	909	Component parts of Falax Grate Cooler	6,341
Cement handling machine parts ...	1,696	Foundry equipment spares ...	663
Cylinder assembly ...	1,655	Bag fitter parts ...	2,486
Dies and rollers ...	2,450	Parts of finishing mills over 1/2 H. P. ...	2,159
Drilling spares ...	29,734	Component parts of flange machinery	3,866
		Fertilizer unit spares ...	1,500
		Gate valve ...	2,51,245
		Graphite plates ...	2,996
		Groove pulley ...	971
		Garage equipment ...	16,572
		Graphite contacts ...	1,885

Description	Value (Rs.)	Description	Value (Rs.)
Component parts of grinding machine	3,986	Component parts of ingot casting machine ...	1,20,461
do do gas compressor	9,878	C. P. of industrial vibrocasting screening machinery ...	7,427
do do glass forming machine ...	34,372	C. P. of industrial gas compressor ...	36,031
Component parts of glass machinery	4,949	C. P. of industrial filter machine ...	17,527
do do gaco oil seals ...	1,193	Spare parts for induction of hardening machine ...	9,140
do do glass Engines ...	552	Instruments parts ...	174
do do glass drawing machinery ...	944	C. P. Industrial fan machinery ...	81,260
Graphite anode plate ...	12,924	Stainless steel joints ...	1,332
Governor disc angular steel grits ...	3,498	Spare parts for jet propulsion unit ...	1,360
Graphite stoppers etc. ...	5,216	Spare for jig borer ...	23,915
Spare parts for gramlators ...	3,481	Steam jet air regector ...	13,740
Heat exchange parts ...	92,915	Jigs and fixtures ...	24,302
Spare for halman writt sharpuer and ganging blocks ...	1,759	C. P. of dye jiggers ...	3,139
Heating coolers ...	972	Large casting and forging ...	4,11,799
Spare parts for hydro compressor ...	2,933	C. P. of leather machinery ...	9,829
Component parts hydrain cycle ringh machine ...	2,489	C. P. of leather finishing embroidering and ironing machine ...	2,493
S. P. for hydrosulphite plant ...	6,802	Spares for loader ...	2,048
Piston grind parts ...	202	Diamond tool and lapping wheel project with accessories ...	64,503
Hard Flexible coupling with locks nuts	109	C. P. of linoleums manufacturing plant machinery ...	2,578
S. P. of hardening equipments ...	1,938	C. P. of leather shaving machine ...	588
C. P. of hydraulic press ...	9,382	C. P. of lubricating machine ...	6,408
S. P. for horizontal hardness testers	1,500	Lining plates for single hammer crushing ...	12,456
Hydraulic pump and cylinder parts ...	1,276	C. P. Lamp making machinery ...	3,041
Heating elements for furnace ...	11,427	Parts of leather tanning machine ...	1,380
Hose with coupling ...	91,270	Molybdenum electrodes with other parts ...	32,775
Hot water pump parts ...	1,604	Mining machinery oil lamp ...	2,603
Spares for hot water automatic mercury glass ...	3,172	C. P. of machinery ...	25,08,619
Hubs ...	717	Mill spares ...	41,958
Spares for impellor blades for shot blasting machine ...	410	Mechanical drive lubricators and slide plates ...	12,673
C. P. of industrial machine ...	2,82,95,620	Machine tool machine parts ...	1,02,549
C. P. of industrial apparatus ...	1,22,98,512	Machine parts (gauge) ...	3,561
Industrial spray nozzles ...	1,295	C. P. of mixing machine ...	1,671
Iron rubber mould ...	37,607	Spare parts for machinery volume control ...	840
Component parts of industrial furnace	13,927		
Component parts of industrial blast furnace ...	6,536		

Description	Value (Rs.)	Description	Value (Rs.)
Match making machine parts ...	35,226	Ribs space block ...	4,018
C. P. of nylon yarn manufacturing machine ...	9,010	Rotameter with tubes ...	1,575
C. P. of nitrogen compress ...	5,265	C. P. of ring spinning frame. ...	1,98,342
C. P. of napier turbo blower ...	4,828	Spare parts for roller mills ...	9,676
Air separator and nitrogen work plant parts ...	1,435	C. P. of rock drilling machine ...	8,73,246
C. P. of oil and gas drilling equipment	4,97,519	S. P. and refractor parts and feeders ...	748
C. P. of oil crushing and refining machinery ...	4,61,788	C. P. of rotary kilns ...	1,38,264
C. P. of oxygen acetylene compressor	5,093	C. P. of rope making machinery ...	2,800
C. P. of oil burning equipment ...	10,001	Roller rock bits ...	922
Operation hooks and etc. ...	90,267	Reed making machine parts ...	1,134
Oil cylinder... ...	1,532	C. P. of railway wagon weigh bridges ...	13,400
C. P. of oil well drilling machinery ...	50,857	C. P. of rotary units ...	18,453
Piston and piston rods ...	927	Rectifier materials ...	52,335
Packing rings ...	1,119	Rectifier parts ...	8,706
Pharmaceutical plant machinery ...	9,287	Rubber machinery parts ...	46,053
C. P. of power driven machine ...	292	C. P. of rats wrap steep packing machine ...	3,668
Tube plugs ...	5,663	C. P. rubber extruder ...	20,777
Spray painting equipment ...	114	Splin hobs ...	8,276
Packed bodies etc. ...	69,706	Steam reducing valves ...	1,140
Pneumatic spares ...	2,161	Seamless tubes, steel for cooling plant ...	21,517
C. P. of plastic injection moulding machinery ...	585	Steel compressor eyes ...	748
Machinery parts for manufacturing of polyester fibre ...	1,86,781	Spares for dressing plant ...	20,055
C. P. of pulverising machinery ...	1,249	Stainless steel lower siere bands ...	2,848
C. P. of power operated machinery ...	707	S. P. for silling machine ...	5,486
C. P. of pressure die ...	22,374	Two spares scanner dreve and unit ...	23,111
Pot for furnace ...	38,086	Shaft sheals and stainless steel liner ...	108
Machinery for Manufacturing of wooden pencil ...	2,97,543	Bottle stappling machine with electric motor ...	23,567
Spares for pilot exciter brushers ...	539	Stainless steel cover ...	1,375
C. P. of plastic extruder machine ...	9,500	C. P. of spantix asphalt and bituminus mixing plant ...	8,759
Pneumatic tool parts ...	3,056	Spares of sulphuric acid plant ...	998
C. P. of paraflow ...	2,892	C. P. of steam trap ...	3,071
C. P. of pneumatic grinder ...	323	C. P. of spraying gun ...	476
C. P. of pneumatic controller ...	5,080	C. P. of single fuel injection pump ...	760
C. P. of pneumatic sleeping hammer	114	Spinner sets ...	41,760
Pumping machinery with accessories...	15,019	C. P. of spray machine ...	2,495
C. P. of machinery plants ...	5,70,216		

Description	Value (Rs.)	Description	Value (Rs.)
C. P. of shot blasting machine ...	4,052	C. P. of water separator ...	2,386
C. P. of solid acid tank ...	3,161	C. P. of machinery for manufacturing of steel pipes ...	7,425
Screw lift assembly ...	3,113	Test best replacement ...	2,965
Spares for sodium hydrosulphite plant ...	654	Thread rolls ...	370
Staring clutch ...	541	Spare parts for thermometer ...	4,000
C. P. of steel plant ...	823	Spare for production and testing machine ...	6,335
Compressor parts for steam piston pump ...	10,375	Timken bearings ...	2,405
Silent block ...	1,625	C. P. of tyre making machinery ...	17,726
Staring and regulating valve ...	7,070	Tube filling and closing machinery ...	29,833
Parts for sulphor determinator ...	814	C. P. of tube making mills ...	43,646
Pressure regulator ...	3,478	Spare parts for temperature controls ...	3,368
Gear and shaft ...	901	C. P. machinery (tannery) ...	12,945
C. P. of spark testing unit ...	907	C. P. of tonnage oxygen plant ...	1,760
Stentering machine parts ...	573	C. P. tyre building machinery ...	21,888
C. P. of screening machine ...	315	C. P. of tyre making machine ...	16,226
Sewing machine operated ...	3,433	C. P. of tobacco machinery ...	7,512
Steel flexible tube ...	5,972	Spares for take up parts section ...	4,909
C. P. of steel tube making machine ...	25,433	C. P. tube making machinery ...	18,170
C. P. of steam power workshop machinery ...	1,804	Spare for twin sheel dry blender ...	994
C. P. of spooling ...	8,388	Tandon splitter ...	48,402
Spare for silicon rectifier unit ...	1,41,115	C. P. tube cleaner ...	897
Seaming machine parts ...	374	C. P. of stone grinding machine ...	3,977
Parts for stranding machine ...	3,748	Tarbo charger ...	2,403
Measuring slide wire assembly support ...	559	Tromboric cubber lower assembly ...	4,755
Star wheel ...	193	Triple roller with accessories ...	33,614
C. P. of spraying machine ...	578	Steam air blower parts ...	11,622
C. P. of stappling machine ...	650	Machinery for manufacturing of tracks ...	3,28,649
Sub-solders ...	825	C. P. of tin bending machine ...	4,579
Slip from equipments ...	30,373	Tin plate coating and nurshing machine with accessories ...	1,35,879
Stell valves (materials for tube boilers) ...	2,66,936	Plant and machinery for manufac-turing of grey iron casting ...	44,450
C. P. for star feeders ...	3,250	Pottery machinery parts ...	3,265
C. P. for stone crushing machine ...	887	C. P. for automatic ball casting machine ...	13,173
C. P. for screening machine ...	2,047	Partial shipment of selemium rectifier plant ...	23,022
Spare for sulphuric acid plant ...	6,048	Indication controlling equipment ...	1,673
Spare parts for super phosphate plant ...	13,053	Valves ...	1,024
C. P. of steamlined filter ...	2,963		
C. P. of torcar shuttle ...	20,313		

Description	Value (Rs.)	Description	Value (Rs.)
Valves seats ...	1,219	Equipment for calendar rolls ...	4,368
Crane parts ...	6,013	Filling machine parts ...	2,120
Molybdenum electrodes ...	1,12,504	C. P. of winding machinery ...	7,348
Propellers ...	2,131	C. P. of vibrator ...	972
Plant and machinery parts for		C. P. of bulldozer ...	5,480
detonatory factory ...	1,15,645	Biscuit making parts ...	152
Spare parts of adiabatic plants ...	5,953	Injection moulding machine parts ...	1,717
C. P. of power driven machinery ...	11,562	Trowal vibrator complete with	
C. P. of washing machine ...	8,07,458	accessories ...	5,932
Vibrator coir ...	647	C. P. of conveyor belts ...	3,50,530
Weighing machine parts ...	4,176	C. P. of machinery for manufacture of	
Spare parts driver's ...	2,721	springs of needles ...	2,64,757
Parts and equipment for manufac-		Glass making machinery parts ...	17,970
turing of viscose filament rayon		Enamelled cast iron inner pan ...	1,787
yarn ...	5,486	Component of sewing machines ...	2,50,665
Year guide stand and spares ...	9,414	Spare for vulcanising equipment ...	19,587
Vacuum carbonator ...	13,508	S. P. for vegetable oil mill machinery	3,969
S. P. of break down machine ...	7,595	S. P. for filtering machine ...	47,763
C. P. of blast furnace ...	19,96,841	C. P. of drawing machine ...	33,933
Parts of baizzi glue powder		C. P. of weigh End machinery over	
cartridging machine ...	2,088	3/4 H. P. ...	22,426
Spare for frick ammonia compressor...	3,342	Converters and vibrator ...	32,029
Paper cutting machine ...	22,500	Fertilizer spare parts ...	10,000
Welding machine ...	2,317	Parts of universal milling plant ...	1,00,000
Ribbon inking machinery ...	4,711	Parts of universal sparking and	
Parts for vorjeet cleaner ...	8,156	shifting machine ...	2,000
Vacuum drying oven ...	1,364	Glass liner and reactor parts ...	26,244
C. P. of conveyor belting press ...	8,805	Chemical manufacturing machine	
C. P. of blade machine ...	5,042	parts ...	10,511
C. P. of electric clay working		Parts for guide roller ...	12,000
machinery ...	4,307		
C. P. of industrial centrifuge ...	1,493		
C. P. of workshop machinery ...	181		
C. P. of cold water wash air pipe			
assembly ...	9,825		
		Total ...	6,37,55,362

N. B.:—C. P. stands for 'Component Parts' S. P. stands for 'Spare Parts'

A NEW OPPORTUNITY TO INDUSTRIALISTS

LIST OF SPARE PARTS REQUIRED BY RAILWAYS

In its constant endeavour to place increasing services at the disposal of the entrepreneurs, the Department of Industries and Commerce has now brought a new opportunity to the industrialists in this state. Consequent to the new projects to be taken up in Madras State during the Fourth Five Year Plan period, the Southern Railway would be in need of quite a good number of items of spare parts for Diesel Electric Locomotives. In this context, the Director of Industries and Commerce Sri T. A. S. Balakrishnan, I. A. S., had a discussion recently with the officials of the Railway, as a result of which the Controller of Stores, Southern Railway has given a list showing the spare parts of Diesel Electric Locos both for Broad-gauge and Meter-gauge requiring development indigenously.

It is further stated that the Diesel locomotive works at Varanasi are also locating indigenous capacity for these items and a reference to the General Manager, Diesel Locomotive Works, Varanasi would be of help in this direction.

Director of Industries and Commerce, Madras by the Controller of Stores, Southern Railway is published below for the benefit of the industrialists wishing to take up the manufacture of these items and similar lists of spare parts for A.C. Electric Locomotives will be published in this magazine from time to time.

SPARE PARTS FOR B. G. DIESEL ELECTRIC LOCOS — WDM 2.

No.	Stores Class & Ref. No.	Description	Drg. No.	Estimated annual requirement
1.	EA3/B/IX/ 352	Gasket enclosure	DEL/B/ 305	32
2.	do 183	do filter cover	do 310	1,000
3.	do 226	do for cover	do 601	42
4.	do 224	Cover gasket 008N	do 602	42
5.	do 247	Gasket Reg. Valve flange	do 603	53
6.	do 223	Cover gasket 007N	do 604	42
7.	do 221	do gasket 005N	do 606	42

S. No.	Stores Class & Ref. No.	Description	Drg. No.	Estimated annual requirement
8.	EA3/B/IX/ 72	Gasket Valve to cap	DEL/B/ 607	27
9.	do 262	do Armoured dresser eplg.	do 608	21
10.	do 129	Intake Disc. Manifold gasket	do 609	65
11.	do 243	Gasket flange spill line	do 610	21
12.	do 123	do for valves	do 613	64
13.	do 250	do flange	do 614	21
14.	do 248	do fuel filter flange	do 620	21
15.	do 244	do flange discharge line	do 624	21
16.	do 343	do cover	do 636	131
17.	do 331	do 35 fuel regulating valve	do 646	5
18.	do 266	do armoured	do 649	53
19.	EA3/B/X/ 47	do Water con. to head	do 640	394
20.	do 112	do for retaining screw	do 648	525
21.	do 56	do liner to block centre	do 650	168
22.	do 55	do liner to block lower	do 651	168
23.	do 113	do inlet to Header	do 658	168
24.	do 5	do Elbow to Cylinder block	do 659	722
25.	do 191	do upper to lower housing	do 660	42
26.	EA3/B/IX/ 77	Oil seal	do 301	64
27.	do 256	Gasket Victralic coupling	do 302	21
28.	do 153	do cover top & bottom	do 307	8
29.	do 228	Spider for coupling	do 611	30
30.	do 202	Rubber seat for horn dia kit	do 616	7
31.	EA3/B/X/ 4	'O' Ring Bottom cover	do 639	42

S. No.	Stores Class & Ref. No.	Description	Drg. No.	Estimated annual requirement
32.	EA3/B/X/ 110	'O' Ring tube to cyl. head	DEL/B/ 666	672
33.	EA3/B/IX/ 202	Rubber gasket for horn. Diaphragm kit	do 617	8
34.	do 19 & 35	Nut Elastic stop	do 618	168
35.	do 202	Diaphragm for horn dia. kit	do 615	7
36.	EA3/B/X/ 288	Gasket for secondary fuel oil filter	do 698	432
37.	do 289	do for primary fuel oil filter	do 699	432
38.	do	do upper	do 656	48
39.	do	do indicator connection	do 663	1,300
40.	do	do	do 667	64
41.	do	do water pump discharge	do 671	52
42.		do casing to head	do 673	84
43.		do door to base	do 674	84
44.		'O' Ring for nozzle holder	do 637	64

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— Administrative Office: —

"Metha House"

No. 15, VENKATACHALA MUDALI STREET, PARK TOWN, MADRAS-3.

SPARE PARTS FOR M. G. DIESEL ELECTRIC LOCOS — YDM 4 A.

No. of	Stores class & Ref. No.	Description	Drg. No.	Estimated annual requirement
1.	EA3/M/I/ 48 & 258	Gasket cover to housing	DEL/E & M/ 60 (48)	3,500
2.	EA3/M/I/ 297	'O' Ring rotor	DEL/M 602 (258)	1,500 10
3.	do 251	Gasket, for seal plate & Bearing frame	do 603	50
4.	do 46	Gasket, cover to housing	do 604	200
5.	do 104	Stud-tube to cylinder head	do 605	20
6.	EA3/M/III 601	Piston Packing	do 606	18
7.	EA3/M/I/ 181	Gasket, retaining screw	do 607	50
8.	do 117	Gasket casing to Cyl. head	do 608	240
9.	do 250	Gasket for bearing frame & casing	do 901	50
10.	do 292	Shim	do 302	5
11.	do 244	Gasket to base	do 303	40
12.	EA3/M/III 542	Gasket for bearing cap	do 304	5
13.	EA3/M/III/ 440	Armoured Gasket for 1½" Dresser coupling	DEL/B & M/ 1	90
14.	EA3/M/I/ 48a	Cartridge, filter	DEL/M/ 101	120

LICENCES UNDER THE INDUSTRIES

(Development & Regulation)

ACT 1951

The Government of India have published a list of 235 industries, in respect of which applications for licences under the industries (Development & Regulation) Act, 1951 may ordinarily be rejected without reference to the Licensing Committee. The list comprises of 123 engineering and 112 non-engineering industries and will be current till 30th June 1966 (Category—I).

Simultaneously the Union Government have also announced another list of 98 industries, in respect of which applications for licences under the Industries (Development & Regulation) Act, 1951 will be considered on merits. This list, which consists of 60 engineering and 38 non-engineering industries will also be valid upto the end of June 1966 (Category—II).

CATEGORY I

A—ENGINEERING INDUSTRIES

- | | |
|---|---|
| 1. Adding and calculating machines. | (i) Specialised bodies for buses and trucks and truck-mounted equipment. |
| 2. Aerial-net type. | |
| 3. Aerial-telescopic type. | (ii) Carburettors. |
| 4. Agricultural tractors. | (iii) Door locks and locking devices. |
| 5. Air compressors (expansion schemes for compressors upto 700 cfm. will be permitted). | (iv) Drag links. |
| 6. Airconditioning and refrigeration machinery for industrial use including water coolers and ice plants. | (v) Flywheel magnetos. |
| 7. Amplifiers. | (vi) Front suspension and springing. |
| 8. Antimony (except for expansion schemes). | (vii) Tie rod ends (expansion or diversification in the range of the same products of the existing units will be considered). |
| 9. All automobile ancillaries except the following: | |

10. Automobile leaf springs.
11. Ball and roller bearings (except expansion schemes for making uneconomic units economic).
12. Barbed wire.
13. Bare copper conductors.
14. Bare copper strips.
15. Bicycle and bicycle parts (except when expansion of bicycle tube valves is desirable for making the unit an economic one).
16. Bifurcated rivets.
17. Bolts, nuts and rivets.
18. Brass / copper extruded pipes and tubes / extruded rods and sections and sheets / circles / strips.
19. Builders' hardware.
20. Car lifts.
21. Cast iron castings industry (commercial castings for sale to public).
22. Cast-iron pipes including spun pipes.
23. Chaff cutter blades.
24. Cinema arc carbon.
25. Circles / sheets and rods of stainless steel.
26. Coal washery plants.
27. Coated abrasives.
28. Coil springs of all types (except Rly. coil springs).
29. Collapsible tubes and rigid containers.
30. Commercial vehicles (except expansion schemes).
31. Conductors (ACSR / AAC).
32. Conduit pipes.
33. Conveyors (except diversification).
34. Conveyor belting.
35. Copper wire for non-electrical purposes.
36. Cotton and hair belting.
37. Data processing machines (except for expansion and diversification of existing units).
38. Diamond drill bits.
39. Domestic utensils.
40. Domestic refrigerators.
41. Drums and barrels and tin containers excepting those for manufacturers' own consumption.
42. Dry battery.
43. Electric fans.
44. Electric lamps-GLS, photo flash, mercury vapour, O. T. and studio lamps.
45. Electric transmission line hardware (excepting P. V. C. joints and allied equipments).
46. Expanded metal.
47. Ferro-manganese.
48. Flash light torch containers.
49. Fluorescent lamps.
50. Fork lift trucks and the like (expansion or diversification in the range of the same products of the existing units will be considered).
51. Fractional H. P. Motors.
52. Grinding wheels.
53. Grinding media steel balls and cylinders.
54. Hand-stapling machines.
55. Heavy earth-moving equipment (only shovels of sizes of over one cu. yd. capacity).
56. Hollow and tubular rivets.
57. Household appliances (such as electric irons, heaters and the like).
58. H. T. Bolts and nuts (except expansion).
59. Hurricane lanterns.
60. H. T. switch gears 33 K. V. and above.
61. Industrial chains other than bicycles, motor cycles, scooter and automobile timing chains.
62. Industrial fans and blowers.
63. Industrial process and control instruments.
64. Internal combustion engines including petrol / kerosine and marine engines (except expansion schemes).
65. Iron clad switches and switchfuse units.
66. Jeep type vehicles.
67. Kerbside petrol pumps.
68. Malleable iron castings including pipe fittings.

69. Metal clad electrical switches upto 200 Amps.
70. Meters-single phase and polyphase.
71. Miniature lamps (except automobile head lamps).
72. Motorcycles, scooters, mopeds, autoecycles and three wheelers (except expansion schemes).
73. Motor starters (motor control gear) upto 60 Amps.
74. Non-ferrous alloys.
75. Non-ferrous castings (including pressure die castings).
76. Paper and pulp making plants below 50-tons per day capacity (including wire cloth for paper machinery).
77. Passenger cars and station wagons.
78. Plates and sheets (M.S.) (excluding cold rolled sheets).
79. Power tillers (except expansion of existing units).
80. Pressure gauges.
81. Railway wagons (except expansion schemes).
82. Razor blades (except expansion of existing units).
83. Road rollers (expansion of existing units will be considered).
84. Roller chains for automobiles, motor-cycles and scooters etc.
85. Rolling shutters.
86. Room air-conditioners.
87. Rubber-ply transmission belting.
88. Solvent extraction plants.
89. Saws of all types including hacksaw blades.
90. Sealed compressors.
91. Sewing machines-domestic and parts thereof; and sewing machine needles, both domestic and industrial.
92. Stainless steel hospital wares.
93. Steel castings.
94. Steel ingots/billets (from electric furnace/concast units).
95. Steel pipes and tubes (welded)—(excepting expansion schemes of existing manufacturers).
96. Steel sheets-galvanised and corrugated.
97. Steel measuring tapes.
98. Steel re-rolled products including wire rods.
99. Steel wire.
100. Steering wheels for automobiles.
101. Storage battery.
102. Stranded wire.
103. Sugar mill machinery (except milling plants and centrifugals).
104. Tea processing machinery.
105. Tin plates.
106. Tractors (except expansion of existing units).
107. Tungsten carbide tips.
108. Tungsten wire filaments.
109. Twist drills.
110. Typewriters (except expansion).
111. Utensils of stainless steel.
112. Vacuum cleaners.
113. V. I. R. and P. V. C. cables (except power cables-diversification for 22 and 33 K. V. cables in PILC power cables and diversification upto 11 K. V. in P. V. C. power cables only).
114. Washing machinery (except industrial washing and dry cleaning machines).
115. Water meters.
116. Welding electrodes (except expansion of existing units).
117. Welded wire mesh.
118. Winding wires and strips.
119. Wire nails.
120. Wire ropes (except expansion schemes).
121. Wood screws.
122. X-ray equipment.
123. Zinc sheets/strips.

B—NON-ENGINEERING INDUSTRIES

1. Acetic acid.
2. Activated bleaching earth.
3. Asbestos cement products and sheets.
4. Asbestos textiles, packings, jointings and other asbestos insulation products.
5. Automobile tyres and tubes.
6. Beer.
7. Beta naphthylamine.
8. Bichromates.
9. Bicycle tyres and tubes.
10. Bleaching powder.
11. Blow-moulded containers and other similar products, manufactured by the blow-moulding technique which is normally called extrusion blow-moulding and which consists of extruding a tube into a mould and blowing air to form the finished product.
12. Borax and boric acid.
13. Bottles and vials (excluding penicillin vials).
14. Brake fluid.
15. Calcined petroleum coke.
16. Calcium carbide.
17. Calcium carbonate (precipitated and activated).
18. Camel back.
19. Camphor.
20. Carbon black (other than expansion of existing units).
21. Carbon-di-oxide gas (other than by-product carbon-di-oxide).
22. Cashew kernels (applications from new areas to be considered on merits).
23. Cellulose acetate flakes for moulding powder.
24. Cellulose film (cellophane).
25. Chip board (particle board).
26. Copper sulphate.
27. Cosmetics and toiletries (except export-oriented schemes).
28. Cotton mesh fabrics.
29. D. D. T. (except for expansion)
30. Detonators.
31. Dissolved acetylene gas.
32. 'Drugs and pharmaceuticals'
 - (i) Antibiotics-penicillin, streptomycin and tetracycline (except for expansion).
 - (ii) Bismuth salts.
 - (iii) Chloral hydrate.
 - (iv) Empty hard gelatine capsules.
 - (v) Salicylic acid - sodium salicylate, acetylsalicylic acid.
 - (vi) Sulpha drugs.
 - (vii) Surgical adhesive tapes.
33. Dyes-all types falling under Sch. Ind. No. 21.
34. East India tanned (semi-tanned) kips and skins.
35. Fire works and paper caps.
36. Formaldehyde.
37. Glass, mineral wool and allied products.
38. Glass fibre and products thereof.
39. Glass - hollow ware (semi-automatic).
40. Glass shells (except for captive consumption).
41. Glass - table and pressed ware.
42. Glass tubes for fluorescent lamps.
43. Glass tubes and rods, sheet glass, glass bottles, wired/figured and rolled glass.
44. Glazed tiles.
45. Greases (except for speciality greases).
46. H. T. / L. T. Insulators.
47. Hoses (vacuum brake).
48. Hoses (other types).
49. Hydrogen peroxide.
50. Industrial explosives.
51. Items produced by the compression moulding technique such as bottle caps, buttons, lamp shades, etc. (except medical appliances).
52. Laboratory glassware.
53. Laminates (industrial and decorative, including malamine laminates).
54. Lead oxides.
55. Manufacture of polyester sheets for buttons and the processing of these sheets so produced to manufacture buttons.
56. Matches - safety.
57. Menthol.
58. Methanol.
59. Midget electrodes (electrodes for battery cells).
60. Mono - filaments from polyolefins.
61. Myrobalan extract.
62. Newsprint.*
63. Nitric acid (from saltpetre).
64. Nylon textile yarn.
65. Organic pigments.
66. Oxygen gas (as applied for cutting and welding for steel only).
67. Paper and paper board.*
68. Penicillin vials.
69. Pesticidal formulations (except those based on malathion).
70. P. F. moulding powder: general purpose grade only (similar to BSS : 771 type 'G' and ISS : 1300 GR. 2 and 3).
71. Phenol.
72. Photographic raw film and paper.
73. Phthalic anhydride.
74. Pitch fibre pipes.
75. Polyethylene films (i. e. films with thickness of less than 1 m.m. and products made from the films such as bags etc.).
76. Polynosic fibre.
77. Poly - propylene.
78. Potassium permanganate.
79. Processing (including printing) of cotton textiles.
80. Pulp (paper and rayon grade).*
81. P. V. C. (except for expansion).
82. Rayon tyre cord yarn.
83. Refractories.
84. Refrigeration gases.
85. Rubber accelerators and antioxidants.
86. Saccharine.
87. Safety fuses.
88. Sanitary ware.
89. Soap (except for expansion of uneconomic units).
90. Sodium bi-carbonate.
91. Sodium hydrosulphite and derivatives.
92. Sodium sulphite, bi-sulphite and sulphide.
93. Sodium thio sulphate.
94. Spectacle frames made from sheets by the fabrication technique or by injection moulding.
95. Sulphuric acid.
96. Sulphur dioxide.
97. Synthetic detergents.
98. Synthetic rubber (S. B. R. type).
99. Synthetic tops.
100. Vacuum flasks.
101. Vanaspathi.
102. Various finished products which could be manufactured from expanded (foamed) polystyrene beads.
103. Vegetable oil industry (oil milling).
104. Viscose filament yarn.
105. Viscose staple fibre.
106. Viscose type cord yarn.
107. V. and fan belts.
108. Wool tops.
109. Woollen and shoddy yarn.
110. Woollen/worsted cloth.
111. Worsted yarn.
112. Zinc oxide.

* Applications for substantial expansion from existing units as well as applications for setting up of new units in areas, where raw material resources have remained untapped, would be considered on merit.

CATEGORY II

A—ENGINEERING INDUSTRIES

1. Agricultural machinery (except tractors and power tillers).
2. Air rifles.
3. Air separation plants
4. Alloy steels.
5. Aluminium ingots.
6. Aluminium strips/sheets/circles/foils/extruded rods and sections.
7. Antimony (expansion cases only).
8. Automobile ancillaries:
 - (i) Specialised bodies for buses and trucks and truck-mounted equipment.
 - (ii) Carburettors.
 - (iii) Door locks and locking devices.
 - (iv) Drag links.
 - (v) Flywheel magnetos.
 - (vi) Front suspension and springing.
 - (vii) Shock absorbers.
 - (viii) Tie rod ends.
9. Biscuits and bread making machinery.
10. Boats and crafts.
11. Boilers (expansion only).
12. Ceramic machinery.
13. Chemicals and pharmaceutical plants and equipments.
14. Chip board and fibre board plants.
15. Cigarette making and tobacco machinery.
16. Dairy machinery.
17. Electric furnaces.
18. Electric motors (above 10 H.P.).
19. Electrical measuring instruments (except volt meter, watt meter, ohm-meter, multi-meter and ammeter).
20. Electronic components.
21. Electronic measuring and testing equipments.
22. Ferrosilicon and ferroalloys (excluding ferro-manganese).
23. Flour mill machinery (industrial).
24. Garage equipment (except jacks and lifts and hoists).
25. Hand tools, namely spanners, wrinches and pliers (all types), sockets, hammers and screw drivers.
26. Harvesters and the like (excluding agricultural tractors and power tillers).
27. Heavy earthmoving equipment (except shovels):
 - (i) Crawler tractor.
 - (ii) Motorised jumpers.
 - (iii) Motorised scrapers.
 - (iv) Motorised graders.
 - (v) Dump trucks.
 - (vi) Loaders.
 - (vii) Wheeled dozers.
28. Industrial centrifuges.
29. Industrial gas plants.
30. Industrial sewing machines and sewing machine parts.

31. Jute machinery:
 - (i) Carding engines.
 - (ii) Drawing frames.
 - (iii) H. S. Centrifugal spinning frames.
 - (iv) H. S. High draft first drawing frames.
 - (v) H. S. High draft second drawing frames.
 - (vi) Jute machinery and parts (including 10 jutes sliver spinning frames).
 - (vii) Self-doffing sliver spinning frames.
 - (viii) Spinning frames.
32. Light house equipment.
33. Machine screws (socket head, allen and other specialised types).
34. Machine tools.
35. Medical/surgical instruments, equipment and appliances.
36. Metallurgical machinery.
37. Oil firing equipment.
38. Oil separators.
39. Paper and pulp making plant (above 50 tonnes capacity).
40. Pig iron.
41. Plastic industrial machinery.
42. Power driven pumps (other than water handling pumps).
43. Power factor capacitors.
44. Power rectifiers.
45. Rolling mill rolls.
46. Rubber machinery.
47. Shots and grips.
48. Small tools (threading tools, milling cutters and reamers).
49. Speed reduction units.
50. Steel files (expansion only).
51. Steel forgings (proposals for producing heavier forgings only).
52. Steel pipes and tubes (seamless and expansions in welded to make existing units economic).
53. Steel structurals (heavy).
54. Steel strips—cold rolled.
55. Switchgear and controlled gear (below 33 K.V.).
 - (i) H. T. Switchgear (below 33 K.V.).
 - (ii) L. T. Switchgear.
56. Textile machinery.
57. Tool bits (lathe tools) (expansion only).
58. Transformers (below 33 K.V.A.).
59. Transmission line towers (expansion only).
60. Well-boring equipment.

B—NON-ENGINEERING INDUSTRIES

1. Abrasive grains.
2. Activated carbon (only superior grade).
3. Alcohol industrial.
4. Art silk weaving, hosiery, twisting, doubling and synthetic yarn, crimping-stretching by other than primary yarn manufacturers.
5. Barium carbonate.
6. Barium chloride.
7. Barium nitrate.
8. Barium Sulphate.
9. Blanc fixe.
10. Bromine.
11. Canned fruits and fruit products.
12. Card staves.
13. Cement.
14. Chlorinated paraffin.
15. Cocoa powder.
16. Cotton seed oil.
17. Dextros powder.
18. Essential drugs and pharmaceuticals.
19. Fatty acids.
20. Gelatine (edible, photographic and technical including pharmaceutical).
21. Glycerine.
22. Graphite electrodes.

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- | | |
|---|--|
| 23. Jute bobbins. | 33. Sodium cyanide, potassium cyanide, double cyanide of sodium and potassium, ferrocyanide and ferricyanide etc. (by producers of acrylic plastics only). |
| 24. Jute shuttles. | |
| 25. Liquid glucose. | |
| 26. Manganese di-oxide (dry cell variety). | 34. Pressed porcelain, excepting insulators. |
| 27. Metallic stearates. | 35. Solvent extraction of oil cakes/rice bran. |
| 28. Milk powder. | 36. Super phosphates (applications are to be considered only where by-product sulphuric acid is available). |
| 29. Nitrogenous fertilisers. | |
| 30. Potassium chlorate. | 37. Textiles made of art silk. |
| 31. Reclaimed rubber. | 38. Urea (technical grade). |
| 32. Sodium aluminate (based on indigenous raw materials). | |

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ROLLERS, RLY. FITTINGS AND P.V.C. MOULDINGS.

MANUFACTURE OF DEFENCE ITEMS

MINISTER ON THE NEED FOR INDIGENOUS MANUFACTURE

A meeting of the leading industrialists to discuss the feasibility of indigenous manufacture of components, spares, sub-assemblies and complete items of equipment required for the Defence Department was held at the Guindy Industrial Estate on the 8th February 1966. Sri Jaisukhlal Hathi, Union Minister of State for Home Affairs and Defence Supplies and Sri T. Swaminathan, I. C. S., Secretary, Defence Supplies addressed the meeting. Sri T. A. S. Balakrishnan, I. A. S., Director of Industries and Commerce, Madras, welcomed the Minister and those present and explained the object of the special meeting.

The Minister said that the new Department of Defence Supplies was started in September, 1965 when the necessity for the manufacture of sufficient military equipments arose. He pointed out that the country was not lacking in talents or facilities, but what was needed was an organised pooling of the resources keeping in view the acute shortage of foreign exchange and the necessity for import substitution. The Minister indicated that the technical know-how would be provided by the Defence Supply authorities and in case of any difficulty, the industrialists could contact Sri Swaminathan, Secretary, Defence Supplies who would strive to solve their problems. Sri Hathi pointed out that the quality was an important aspect in the manufacture of defence items and stressed the need to have a well-organised machinery for quality control.

AN OPPORTUNITY FOR INDUSTRIALISTS IN MADRAS

The Minister said that the industrialists in Madras State, which was a progressive place with a lot of engineering industries,

could take up the manufacture of a number of items required by the Defence Department and he mentioned in particular that the Small Scale Industrialists in automobile and electronics should come up and take part in this course. It was stated that the preference would be for materials where no foreign exchange was involved.

SHOW ROOM FOR DEFENCE ITEMS

The Minister said that over 14,000 items were displayed in the sample houses for the Defence equipments in Bombay and Delhi and informed that Madras also would have a similar display very shortly. He invited the industrialists to visit the sample room at Delhi and also requested that as soon as the showroom was opened in Madras, the industrialists should visit the same and make it a success.

After the Minister concluded his speech, Sri T. Swaminathan, Secretary, Defence Supplies spoke and answered the questions raised by some of the industrialists.

Sri K. [Name] proposed the vote of thanks.

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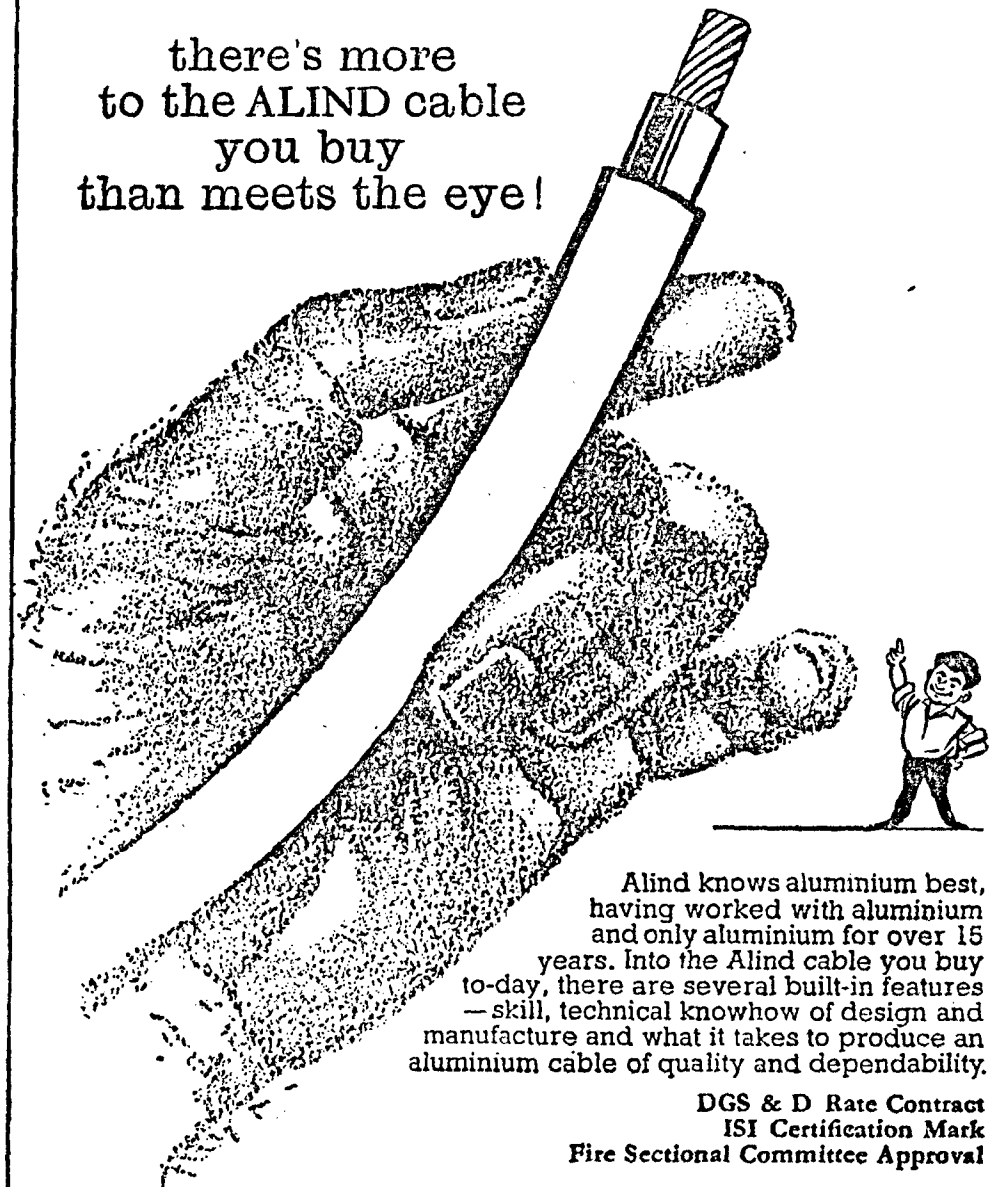


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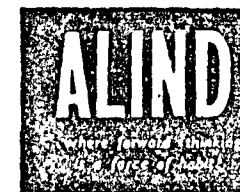
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AVAIL OPPORTUNITY!

WHITE SUGAR MANUFACTURE WITHOUT SULPHUR BY DEFECO-MELT-CRYSTALLIZATION PROCESS

By SRI S. C. GUPTA
(Director, National Sugar Institute, Kanpur)

Sulphur forms an important material for use in the manufacture of direct consumption and plantation white sugar. The quantity of sulphur consumed varies with the process of clarification; 0.6 to 0.8% on sugar in the sulphitation and 0.2 to 0.3% on sugar in the carbonation process. India has to import sulphur for use in sugar industry and in other chemical industries. The annual requirement for the sugar industry is of the order of 20,000 tons involving a foreign exchange of 50 lakhs rupees.

There is a world shortage of sulphur today. In addition, India faces foreign exchange difficulties. The position of importing sulphur this season thus became acute. Government was in difficulty. Industry was faced with the problem as to how the use of sulphur for white sugar manufacture could be cut down or eliminated. National Sugar Institute concerned itself with the task of finding out and suggesting an appropriate solution. Accordingly, in order to focus the attention on the subject, I arranged a Seminar under the auspices of the Sugar Technologists' Association of India. This Seminar was held at the National Sugar Institute on September 10, 1965. A record number of Technologists and other representatives attended the Seminar and took part in the discussions. Various suggestions for reducing the sulphur consumption by modification in equipments and process were suggested. It was generally agreed that sulphur consumption could be cut down to some extent by taking certain precautions.

Since the saleability of sugar is dependent on its quality, it was obvious that any attempt at reduction or elimination of sulphur consumption should not impair the quality of

sugar as far as possible. It was naturally the responsibility of the National Sugar Institute to give serious consideration to this problem and to offer a practicable solution possibly before the commencement of 1965-66 crushing season. It occurred to me if crystallization of sugar could be carried out in a high purity medium, the resulting sugar should be of a better quality. Employing this principle, an experiment was carried out at the Hindustan Sugar Mills. Gola Raw Sugar was melted and fine grain sugar from hopper as seed was developed with this high purity melt. The sugar produced was of a superior quality conforming to ISS-30 grade colour; encouraged from the results of the experiment, a process of manufacture of white sugar was worked out.

The new process called the Defeco-melt-crystallization process (or DMC process) consists of manufacturing raw sugar by defecation process where only lime is used and no sulphur is required. The raw sugar produced is melted and this high purity melt is utilised for developing the nucleus grain taken from an intermediate project namely B sugar (preferably double-cured).

Efforts were made to carry out the trial of the DMC process on a factory scale. Thanks to the co-operation and collaboration of the Pandavapura Sahkari Sakhar Karkhana, the trial was carried out in that factory from October 11, 1965 under the guidance and control of the institute officers and staff deputed for this purpose. I am glad to state that the trial has been successful and a sugar of about 30 colour in ISS 'T' & 'E' grades was produced. Necessary technical data have been collected. Further, the process has worked satisfactorily for about a week. It is proposed to publish a technical paper on the subject very shortly.

Experiments have also been done for the production of white sugar by double-curing of raw sugar. This gave white sugar conforming to ISS grade D-29. Following the defection of raw sugar manufacture, attempts were also made to melt the double-cured C sugar

and use double-cured B sugar as seed for A massecuite which was double-cured. The sugar thus produced was much above ISS-D-29 grade. Some other modification like using double-cured C sugar as seed for B and double-cured B sugar as seed for A, and then double-curing the massecuite have also been done with success. Fine sugar from hopper as seed for A massecuite with the melt of double-cured B & C sugars have also given good result.

It is obvious, therefore, that good quality white sugar can be produced without any sulphur. Further a process (DMC process) has been established by the Institute and this can now be confidently adopted by the industry. The process would have to be suitably modified according to the plant and equipment available in each factory. Necessary technical advice is available from the National Sugar Institute.

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THEN WE WERE THE FIRST

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GOLDEN OIL THAT GREASES THE WHEEL

INDIA is the largest exporter of castor oil, earning for the country more than four crores of rupees. A well known purgative, it is now valued as an excellent industrial lubricant, besides being used extensively in the preparation of hair oils and liquid soaps and in textile and leather industries. In order to ensure that only castor oil of standard quality is exported from India, compulsory quality control and pre-shipment inspection of the oil under Agmark has been enforced.

Who has not heard of castor oil. It has been the solace of countless constipated souls down through the centuries. Only a decade ago, you could not think of your familiar family medicine chest without a phial of this well-known purgative. But to-day, the younger generation hardly has had the taste of it. Where has all this golden oil gone to anyway?

Well, don't feel surprised. It is a regular gold digger now and no more a mere laxative. With the discovery of its value as a non-drying, non-freezing, industrial lubricant, castor has gone to grease the wheels of the world both literally and metaphorically and earn the country its costly gold exchange worth crores of rupees. Four crores and point two to be more precise.

India is, perhaps, the largest exporter of castor oil, with hardly any country in the world which does not buy it from her in some quantity or the other.

Castor plant has been known to India from very ancient times. Its medicinal value was long known to the Indian system of medicine and references to it abound in Ayurveda.

Apart from being a purgative, castor oil has many other medicinal properties. It is

supposed to be an excellent soothing agent and many times it is recommended for inflamed eyes. Castor oil is extensively used in preparing hair oils. For making liquid soaps, it is found to be very useful. Now it is also used in the preparation of Sebacic Acid which is used in the manufacture of Nylon.

Castor oil is a non-drying oil, more thick (viscous) than any other vegetable oil. It retains its thickness even at high temperatures and does not freeze at low temperatures. Because of these properties it forms an excellent lubricant, specially a high speed lubricant, and finds extensive use as one. Many times it is blended with different mineral oils to form special lubricants.

A large quantity of castor oil goes into the making of Turkey Red Oil, which is used in textile dyeing and printing and the leather industries. Castor oil is also used for lighting. Mixed with kerosine in suitable proportions, it is used by the Railways for signal lights, head lamps etc.

Among the little known uses of castor oil is the practice of applying it to foodgrains and pulses in certain areas of Gujarat, as it is supposed to act as a preservative. Newer uses are also being found for castor oil.

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IND-COM JOURNAL

STATE AID TO INDUSTRIES

Rs. 25,02,617 DISBURSED IN MADRAS STATE DURING 1964

Under the provisions of the State Aid to Industries Act, 1922, a sum of Rs. 25,02,617.06 was disbursed as loans to 2,889 industrial units in Madras State during the year 1964

An abstract of the Administration Report of the Industries and Commerce Department for the financial year ending 31—3—1964 is given below :

41 Industrial Co-operatives were granted working capital loans under the Act to the tune of Rs. 1.84 lakhs.

A sum of Rs. 1,21,047 was disbursed to 83 Industrial Co-operatives towards their Reserve Fund under the Small Scale Industries Loans and Subsidy Rules 1956.

Loans and grants to the extent of Rs. 14,01,600 and Rs. 3,14,800 respectively were sanctioned to the Industrial Co-operative Societies in the State during the year.

41 certificates of approval and 105 renewals were granted for mines and minerals. Ten prospecting licences were granted for the schedule minerals and associated minerals. The number of mining leases granted during the year was 25.

Systematic geological mapping and mineral surveys conducted in several parts of the State have revealed several useful mineral occurrences such as Bauxite and Apatite in the Palani Hills, Magnesite in Chengam Taluk, clays in Rangampettai area in Gudiyattam Taluk, Lignite in Karaikudi area and indications of copper mineralisation in Mundradiappu in Tirunelveli District.

Detailed exploratory groundwater survey was undertaken on the southern banks of the Cortalayar between Tamarapakkam and

Agaram villages. Regular pumping tests proved a discharge of around 500 to 600 gallons of water per minute. The alluvial tract between Agaram and Tamarapakkam anicut is being investigated systematically.

Over 1,000 chemical analysis of rocks, minerals (chiefly limestone, clays, bauxite, etc.) and water samples were carried out during the year.

Chemical Testing and Analytical Laboratory received 2,314 samples for test and analysis.

During the year, the Government of India granted 55 licences (excluding textiles) for the establishment of new industrial undertakings / expansion of the existing units in the State. The number of licences revoked during the year was six.

Six schemes for the establishment of Small Scale Industries were sanctioned for implementation during the year.

As on 1—4—64, factory space was provided for 232 industrialists in 237 factory units constructed in the nine industrial estates. 580 labour tenements were provided in the labour colonies. Employment was provided to about 4320 persons in the industrial estates under various categories.

As regards the Industrial Estate, Ambattur, the achievement during the year is about four times that of the financial target fixed.

Thirty five new societies were registered during the year and 4 societies were liquidated.

JANUARY — MARCH 1966

3

33

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**PROMOTION OF ELECTRICAL GOODS EXPORT
 NEW ORGANISATION FORMED IN MADRAS**

A new organisation, The Madras Electrical Export Association to promote the export of electrical goods and allied equipment from the Madras State has been formed with the active support of the State Government. Leading manufacturers of electrical materials who are members of the association will pool the resources of all the electrical industries in the State and prospect for the promotion of export for earning the badly needed foreign exchange for the country

Electrical and allied equipment worth about Rupees two and a half crores was exported during the year 1964—65 from India and this national export figure is rather insignificant. The share of this State in this figure was just a few lakhs. The new association is already on its way to give a boost to the export of electrical items from this part of the country. The first and important step taken by the organisation to achieve its object was a visit by a prospecting team to a number of countries in Africa and the Middle East in March this year to explore the export possibility in such fields as high voltage transmission lines and distribution schemes, high voltage sub-stations and switching stations, outdoor yards of power stations, city distribution and pumping schemes, flood-lighting and street-lighting schemes of large hotels and colony electrifica-

tion and electrification of textile, cement and paper mills.

The Easun Group of Engineering Companies, the Crompton Engineering Company, the English Electric Company, the W. S. Insulators, Phillips India and Hi-velm Industries are the main members of the Association. The Crompton Engineering Company, a main participant of the new organisation, has already completed a Rs. 80 lakhs turnkey job of constructing a 132 K.V. transmission line in Nigeria and it is stated that this company is likely to get another contract valued at Rs. 5 crores from the Niger Dam Authority for supply and construction of 366 miles of 330 K. V. transmission line. About Rs. 2.5 crores worth of steel towers and ACSR conductors would be exported from India for this job.

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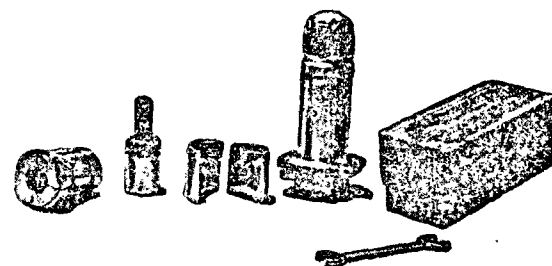
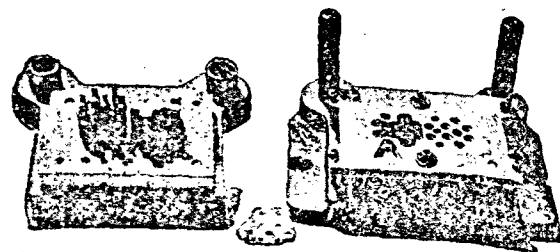
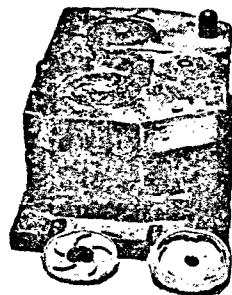
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REGIONAL FOUNDRY STATION AT GUINDY

The Regional Foundry Station of the National Metallurgical Laboratory was inaugurated at Guindy by Sri R. Venkataraman, Minister for Industries, Madras on the 14th December, 1965. Sir Jehangir Ghandy, Chairman of the Executive Council of National Metallurgical Laboratory presided over the function. This is the second in a chain of five foundry stations proposed, the first one having been opened at Batala in Punjab nearly a year ago. The plan is to establish similar stations at Howrah, Ahmedabad and Agra. These foundry stations will study the problems of foundries located in the respective regions, give technical assistance and operational guidance to them.

Following is the full text of the inaugural address delivered by Sri R. Venkataraman, Minister for Industries.

"I am extremely happy to be in your midst today and to inaugurate the Regional Foundry Station of the National Metallurgical Laboratory. The establishment of this Station is not only the manifestation of the magnificent growth of the National Metallurgical Laboratory but also the realisation of a long-felt need of Madras State. It is a creditable achievement of the National Metallurgical Laboratory that during the short period since its inception it has been able to do very valuable research work in various fields of foundry technology and to help the foundries of the country to grow rapidly on sound lines. By undertaking comprehensive investigations on moulding sands and bonding clays, and by evolving national standards for quality castings, this laboratory has become the nucleus of the foundry industry in India. I am sure that during the years to come, the National Metallurgical Laboratory, under the leadership of Dr. Nijhawan, will grow to be one of the

premier international institutions in the field of technological research and service.

GOOD SCOPE FOR FOUNDRY INDUSTRIES

The growth of Indian Foundries during the three plan periods is a matter for gratification and pride. With the development of basic and heavy engineering industries under the plans, a complex base for foundry industry has also been built up through the mechanisation of integrated foundry plants, reclamation of foundry sands and scientific study and utilisation of moulding sands and bonding materials. The development is well exemplified by the fact that at present there are about 4,000 foundries in our country, producing non-ferrous, iron, steel, and malleable iron castings. Though the main field of operation of the foundries continues to be iron castings, there has been, of late, a significant accent on other fields too.

With the diversified progress of engineering industries, there is considerable scope for the development of malleable iron and light alloy

foundry industry on a very rapid scale; and it is my hope that the study and research conducted by the National Metallurgical Laboratory will render necessary guidance to these infants to grow on sound lines.

A BOON TO THE INDUSTRY

The establishment of regional foundry stations at various places of the country in order to extend technical assistance and service facilities to a large number of small foundries is a step in the right direction. Sir Jehangir deserves all our praise for having thought of such an excellent idea. There is no doubt that these stations which are equipped with the most modern and precision facilities for testing of raw materials and analysis of metals and minerals, will be a boon to the many foundries which possess neither the suitable equipments nor the technical know-how for the production of quality castings.

INDUSTRIAL DEVELOPMENT IN MADRAS STATE

It has been pointed out here that Madras State occupies an important place in the Industrial map of India. Yes—we take pride of the fact that we have been able to make rapid strides in industrial development notwithstanding natural handicaps due to the scarcity of essential raw materials. Thanks to certain favourable factors such as the availability of trained manpower, constructive labour leadership, excellent transport facilities, well developed power grid and a progressive entrepreneurial class, this state has been able to make good progress during the last decade. The infra-structure for industrial development in our state is now sound and firm and it is our hope that during the years ahead we will be able to achieve appreciable development in diverse fields of industry, with the active co-operation of the Government of India and the private enterprise.

The industrial complex in our State having an accent on engineering industries manufacturing a wide range of products like rail coaches, automobile units, sugar and cement plants, agricultural implements, textile machinery and electrical equipment has naturally led to the growth of foundries also. There are about 230 foundries in the State centred mostly around Madras and Coimbatore. Most of them are small units and lack in chemical and physical testing facilities and other advanced equipment. The majority of the output of castings comes from a relatively small number of large-sized mechanised units. Large scale manufacture of malleable iron castings, aluminium castings, steel forgings and alloy steel castings is still in the infant stage. The opening of this Foundry Station in Madras is therefore timely, and let us hope that it will help the healthy growth of foundry industry of our State. I find that the National Metallurgical Laboratory has plans to open more such regional foundries, and let us look forward to the day when a similar station will be opened at Coimbatore, around which there is a cluster of foundries, both large and small.

PIG IRON FROM NEYVELI-SALEM STEEL PLANT

There have been considerable handicaps for the growth of foundries in our State, mainly because of the inadequate and irregular supply of raw materials, particularly foundry pig iron. We have to get our pig iron from long leads and, as you know, the supply of pig iron throughout the country has not kept pace with the demand. It is our hope to get over this difficulty atleast during the Fourth Plan. In this connection, it is relevant to point out that the Neyveli Salem Steel Plant as envisaged by us, will meet a part of the demand for pig iron in this area, especially for grey and malleable iron castings.

MACHINE TOOL FACTORY CONTEMPLATED

The progress made by the foundry industry is commendable, but there is no case for complacency. The main drawback with the engineering industry of our State is still the inadequacy of intermediate processing facilities like foundries and forges. This only points out to the need to expand and consolidate the existing foundries in modern lines and to set up new ones wherever necessary. A large number of new engineering units are coming up in our State, and the foundry facilities have to be expanded in proportion to the need. The demand for machine tools is also increasing by leaps and bounds and it has been estimated that the demand in the country will be Rs. 60 crores by the end of the Third Plan and about Rs. 100 crores by Fourth Plan end. In Madras itself, we are contemplating the establishment of a machine tool factory to meet a portion of our demands. Naturally, foundry facilities of the highest precision and quality control will have to be developed to keep pace with these demands successfully. We have to plan our foundry industry on this background.

I am happy to note that the 33-rd International Foundry Congress will be held in India in December 1966. It will be a great event for all of us and I am sure that the National Metallurgical Laboratory and the foundries of India will be able to collect valuable information from the Congress and disseminate it throughout the country.

Well, I am sure that the industrialists of Madras State will utilise the research results and technical facilities offered by this Foundry Station, to the best advantage of the development of our state. Let me congratulate Dr. Nijhawan and his colleagues of the National Metallurgical Laboratory, in their splendid achievement, and thank them for having given me the honour of inaugurating this Station. I also take this opportunity to

assure them that in its effect to intensify the research activities and improve other facilities, the Foundry Station can certainly look forward for the maximum co-operation and assistance from the Government of Madras."

ADDRESS BY SIR JEHANGIR GHANDY

"It is my pleasant duty as Chairman of the Executive Council, National Metallurgical Laboratory to extend you all a hearty welcome on the occasion of the inauguration of the Foundry Station set up by the National Metallurgical Laboratory at this Industrial Estate, at Guindy. The first Foundry Station has been established at Batala in Punjab. The National Metallurgical Laboratory has set up these Foundry Stations to provide technical assistance and service facilities to small foundries all over the country.

ABLE LEADERSHIP

We are very happy to have with us today, Sri R. Venkataraman, Minister for Industries, Government of Madras to inaugurate the function. Under the able leadership of Sri R. Venkataraman, the State of Madras today ranks as one of the most industrially developing States and one of the great centres of the engineering industry in the country. Nearly 40% of the country's manufacturing capacity for bicycles and pump-sets, a fifth for electric motors, over a sixth for electric transformers and a tenth for dry cells is located in the Madras State. With the setting up of the Tank Factory and Surgical Instruments Factory at Madras and High Pressure Boiler Plant and the Small Arms Factory near Tiruchirapalli, the Madras State can rightly be proud of the balanced development of heavy, medium and small engineering industries. The remarkable progress made in the industrial development of the State is due to the drive, depth of vision, planning acumen and ability to appreciate the problems of the industries shown by the Minister for Industries, Sri R. Venkataraman.

I have also great pleasure in welcoming the distinguished industrialists and other officers of the State Government as well as the Chairman of the Southern Regional Branch of the Institute of Indian Foundrymen, Sri R. P. Sarathi and his colleagues.

ASSISTANCE TO FOUNDRIES

The idea of establishing the N M L Foundry Station was initiated sometime ago to give technical assistance to very large number of small foundries. I am glad the National Metallurgical Laboratory has taken immediate steps to establish a number of foundry stations; the first one at Batala, the 2nd at Madras, the 3rd at Howrah, the 4th at Ahmedabad and the 5th at Agra. As you will be going round the Foundry Station shortly after the inauguration, you will see that the Station has been equipped with adequate facilities for testing of foundry sands and bonding clays for routine control of sand mixtures, as well as to find out their suitability for use in foundry moulding purposes. The Station has also been equipped to undertake analysis of both ferrous and non-ferrous alloys and in the second phase, the service facilities will be extended progressively.

GOOD RECORD OF SERVICE

I am happy to see that the N M L is today acting as a nucleus for many of the long range and short term foundry projects which are being referred to in increasing number. Long range fundamental work has also been done for making the best use of foundry raw materials and to evolve national standards. In this connection it is pertinent to record the appreciative remarks made by the Chairman of the Foundry Sectional Committee of the Indian Standards Institution who placed on record the services rendered by the National Metallurgical Laboratory to the industry in making the best use of foundry raw materials. The National Metallurgical Laboratory has done valuable work in diverse fields of foundry

technology and has also carried out comprehensive survey of the moulding sands and bonding clays available in India and has brought out a Monograph which has been acclaimed as monumental work of considerable value to the foundry industry. It is really a creditable recognition that such high appreciation of the exceedingly good work done by the N M L should have come from leading experts like Dr. O. P. Eirnel of the Great Britain and the American Foundrymen's Society. I have no hesitation in saying that the National Metallurgical Laboratory has done commendably well in the field of mineral and metal industries in the country and this fact has been duly acknowledged by the industry in India as also overseas.

I am sure you would all like me to convey our deep appreciation to Dr. B. R. Nijhawan, Director, National Metallurgical Laboratory and his enthusiastic colleagues for their total dedication to research and the excellent work underway at the National Metallurgical Laboratory.

NEED FOR EXPORT

There are at present more than 4000 foundries in India producing ferrous and non-ferrous castings. With the development of basic and heavy engineering industries under the stimulus of the Five Year Plans, the cast metal industry has a very important role to play. We have now entered into the export market and in the present emergency such exports are not only vital, but also a "must" to earn the much needed foreign exchange. Castings should be of good quality and this quality can be maintained only by constant check and re-check of the raw materials employed, production schedules and improving the technology of production by scientific methods. By 1965-66, the national gross production of ferrous castings is estimated to reach 1.875 million tonnes and by 1970-71 we expect to produce approximately 3 million

tonnes at an average growth rate of 10%. The total production of iron castings from the southern states is approximately 1,87,000 tonnes in 1964-65 out of which Madras State alone has accounted for 80,000 tonnes.

Increase in India's demand of machine tools from less than a crore of rupees in the forties to about 30 crores per annum at present is an index of the pace of our economic growth. We have done very well in this important branch of machine tool industry as our machine tools are now finding an export market and their quality by any standard compares very well with the best that is produced elsewhere. It need not be emphasized that the production of castings for the machine tool industry will require rigid quality control for metal and sand besides the design criteria. I am sure with the setting up of the Foundry Station at important centres in the country, foundries will be able to utilise the technical service facilities and will be able to improve the quality of the castings produced. No industry, however big, can make significant progress and survive against highly competitive markets unless it utilises the research and development work carried out by institutions like the National Metallurgical Laboratory. In this and other development fields the National Metallurgical Laboratory is at the total disposal of the Foundry Industry in India in introducing scientific methods of foundry control.

In exactly less than 12 months from now, India will be the host to the 33-rd International Foundry Congress which will be held at New Delhi from 4th to 9th December 1966. This is the first time the International Foundry Congress is being held at any part of the world, east of Suez and India has been given the privilege to play host to over 500 delegates of eminent Foundrymen; Technologists and Industrialists from over 24 countries of the world. The main theme of the International Foundry Congress is "Technological Develop-

ments as Means to Increase Productivity in Foundry Industry". The International Foundry Congress Secretariat at Jamshedpur is doing exceedingly good work in making necessary arrangements conforming to the highest international standards under the able guidance of Mr. R. M. Krishnan, the Executive Secretary of the Congress. This is an international event of great importance to all of us as this will give valuable opportunity to the foundrymen in India to meet their counterparts coming from different parts of the world to discuss problems of common interest.

Dr. B. R. Nijhawan, Director, National Metallurgical Laboratory welcoming the gathering explained the scope and service facilities offered by the Foundry Station.

"The National Metallurgical Laboratory Foundry Station at Madras is equipped with adequate facilities for testing of foundry sands and bonding clays for routine control of sand mixtures, as well as to find out their suitability for use for foundry moulding purposes. The Station has also been equipped to undertake the analysis of both ferrous and non-ferrous metals and also for carrying out chemical analysis of moulding sands etc. During the second phase of its growth, it is proposed to expand the service facilities to enable the Station to undertake metallography and mechanical testing of metals and alloys and the station will also be equipped with necessary melting units for undertaking experimental work on problems relating to metal melting. The Station has a small library which will be gradually expanded to provide facilities for technical reference on diverse fields of foundry technology.

Research at the National Metallurgical Laboratory. Till recently, the Indian Foundries did not have at their disposal adequate data on foundry moulding materials of the country which are very essential for the production of quality castings. The National

Metallurgical Laboratory since its inception, undertook a comprehensive study of the Indian foundry moulding sands and bonding materials to assess their moulding characteristics and to determine their suitability for various types of castings. Samples of foundry moulding sands and bonding clays were obtained from many sources and detailed questionnaires were sent out to important foundries in India to elicit data relating to the foundry sands used by them. Many sands from localities all over India were investigated including study of their properties and suitability for different types of casting jobs. Over fifty different types of moulding sands were studied which included natural moulding sands, bank sands and dune sands which are obtained from river beds, sea coasts, dunes; high silica sands and special sands like zircon sand etc. Results of the investigations carried out in the National Metallurgical Laboratory have been of immense value to the foundry industries in selecting the proper type of sands and bonding clays for their different types of castings.

One of the most modern and biggest steel foundries of the country i. e. TELCO. at Jamshedpur has set up its sand processing plant based on the investigations done at the National Metallurgical Laboratory. Similar investigations were also conducted with bonding clays (number over 20) like bentonites for the preparation of synthetic and mixtures for various types of castings. A Monograph entitled "Foundry Moulding Sands of India" covering the extensive work done in the National Metallurgical Laboratory on foundry moulding sands and bonding clays has already been published and has been reviewed at home and abroad as monumental work of considerable value to the foundry industry. The National Metallurgical Laboratory has also investigated bentonites received from Germany, Spain, U. K. and Poland etc. under the International Programme of the working

group for bonding clays. Besides the exhaustive studies carried out on foundry moulding sands and bonding clays, many extensive investigations on behalf of the public and private sector industries have been conducted on the melting and casting problems of metal and alloys.

RESEARCH AND ITS APPLICATION

It is a common observation that whereas research is often pursued to brilliant conclusions, application of its results can be demonstrated only by the Industry. As such, throughout the world this concept is being implemented to step up scientific research and academic activities designed to promote the applications of industrial research. It is also well known that there is no one distinct known way to calculate the returns from a programme of pure research until its processing has been completed through technological applications which can often take a long time. The foundry industry fits in such a pattern admirably well as it takes the responsibility of closely studying the progress of pure research for the applications of potentially useful results in its various aspects relating to ferrous and non-ferrous metals and alloys. The foundry industry needs, therefore, fundamental as also technological research to accomplish these basic objectives.

33-rd International Foundry Congress. Perhaps all of you may be aware that India will be host to the 33-rd International Foundry Congress which will be held at New Delhi from 4th to 9th December, 1966. This is the first time the International Foundry Congress is being held at any part of the world, east of Suez and over 500 delegates of eminent foundrymen, technologists and industrialists from over 24 countries of the world, will participate in this Congress.

The Institute of Indian Foundrymen has taken the responsibility of organising this

Congress under the patronage of the Government of India in collaboration with the National Metallurgical Laboratory. The International Foundry Congress Secretariat at Jamshedpur has already received the titles of a number of exchange papers for presentation at this Congress. As many as six International Commissions on various aspects of foundry technology such as (a) Metallurgy and Foundry Properties of Material (Commission No. 6) (2) Methods of Testing Cast Iron (Commission No. 7) (3) Cast Steel (Sub-Commission) (4) Foundry Clays (Sub-Commission) (5) Testing of CO₂ Materials (Sub-Commission) (6) Historic research (Sub-Commission) will hold the sessions in India during the Congress Week. We have been assured of the support of all the State Governments and the Indus-

tries. I am sure the Foundrymen in Madras State will fully utilise the opportunity and contribute their best in making the International Foundry Congress a grand success. There has been a tremendous rush for the Registration of Indian participants and since the number of seats for the Indian participants will be limited to 300, we are striving our level best to ensure an equal opportunity to all the segments of the industry as well as Government organisations, scientific and research institutions.

Sri T. A. S. Balakrishnan, Director of Industries and Commerce, Madras spoke on the scope for starting more foundries in the State.

Sri R. M. Krishnan, Assistant Director of the Laboratory proposed the vote of thanks.

DO YOU KNOW?

Nearly 40% of the country's manufacturing capacity for bicycles and pump sets, a fifth for electric motors, over a sixth for electric transformers and a tenth for dry cells is located in the Madras State.

The minerals available in Madras State like iron ore, magnesite, limestone, gypsum, ilmenite, china clay account for a little over one per cent of the value of the mineral output of India.

FOUNDRIES—A FEW FACTS

* There are at present more than 4,000 foundries in India producing non-ferrous, iron, steel and malleable iron castings.

Of these, about 800 are in the southern region and in Madras State alone there are about 230 foundries centred mostly around Madras City and Coimbatore.

The Indian Railways are the major consumers of non-ferrous castings. As much as 3,000 tons of bronze castings and 6,000 tons

of antifriction alloys are at present consumed in the locomotive and rolling stock of the Indian Railways.

The demand for foundry grade pig iron is currently estimated at 2 million tonnes against the estimated production of 1.5 million tonnes during 1965-66.

The first Foundry Station set up by the National Metallurgical Laboratory is the one at the Industrial Estate, Batala in Punjab.

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SELF-RELIANCE IN SMALL INDUSTRY URGENT NEED FOR INNOVATIONS

BY SRI K. L. NANJAPPA

Efforts towards self-reliance have to be intensified in all directions, so that the scarce resources of the country are put to optimum use. While reviewing the progress of Small Industry in the country, the article points out that the urgent need today is to ensure that scarcity of raw materials, particularly imported ones, does not retard its growth and expansion.

Talking of self-reliance in the context of small industry involves a review of the present status of our small industries sector and a statement on its future goals.

As is known the Government launched an extensive programme for the development of small industries as early as 1953, when the Small Scale Industries Board was set up to plan and co-ordinate a programme for the development of small industries. The office of the Development Commissioner, Small Scale Industries was set up in the same year, and the National Small Industries Corporation started functioning in 1955.

The objectives laid down for these organisations have been largely fulfilled, and a social and economic environment has been created for the development of the sector. The development of electric power system and transport facilities has considerably improved the external economics available to small industries. Facilities of education, training, finance and marketing available in varied shapes offer further inducements for the small industries to develop.

PROGRESS OF SMALL INDUSTRY

In 1961, out of 42,900 factories registered under the Factories Act, 39,605 were in the Small Scale Sector. Over 90,000 small units are listed as applicants for various types of assistance from State Directors of Industries. Out of an employment of 37.3 lakhs in 1961 13.6 lakhs or 36.5 per cent was in the small scale sector. Out of Rs. 4528.04 crores worth of gross output, Rs. 1401.54 crores or 30.9 per cent was accounted for by the small industries sector. Out of Rs. 1162.14 crores worth of total value added by manufacture, Rs. 303.80 crores or 26.20 per cent was contributed by the small scale sector.

In 1962-63 the share of small enterprises in national income of Rs. 15,400 crores was as much as Rs. 1201 crores, or 7.8 per cent.

The growth of small industries during the last decade has been away from the traditional types of industries. In other words, more and more industries have taken to improved technical processes. The typical small industry of today is modern in terms of production techniques of production and management.

In achieving these ends the small entrepreneurs have come to depend on imported machinery, technique and raw materials. As we know, the small industrial sector in accordance with the role assigned to it started with the manufacture of consumer articles many of which used to be imported by the country.

IMPORT SUBSTITUTION

In order to achieve a certain level of production with regard to both quantity and quality, it became necessary to import machinery spare parts and components and even raw materials. But assiduous attempts have been made in recent years to provide substitutes for the raw materials by setting up certain basic industries. Industries have also been established for producing standard machinery items which would substitute the import of similar items.

Furthermore, the small enterprises, on their own initiative, have succeeded in duplicating many items which were hitherto imported by the country. Attempts have also been made in the direction of finding indigenous substitutes for basic raw materials and some success has been recorded. With regard to providing training in the techniques of production, a number of institutes have already been setup which train both managers and workers of small industries in management principles and in techniques of production.

In view of the need of the hour, efforts towards self reliance have to be intensified in all directions so that the scarce resources of the country are not depleted but enlarged. The approach will involve consolidation of what has already been achieved and marking out the direction in which the future development programme will proceed. The approach of self reliance will need a change in the attitude of small industrialists all over the country to make the fullest utilisation of indigenous resources and minimum dependence on imports.

ANCILLARY MOVEMENT

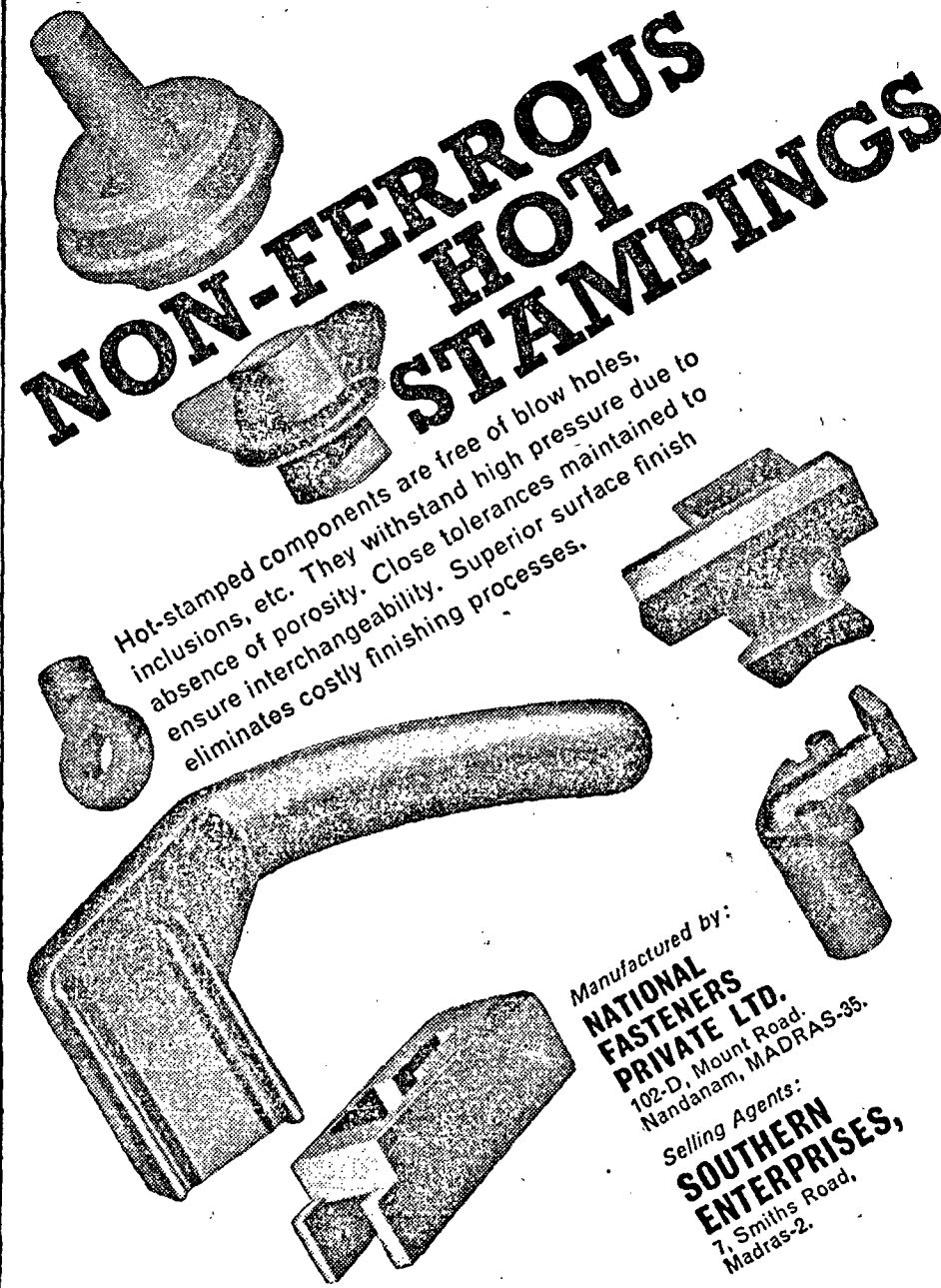
The initiative taken by the Hindustan Machine Tools Limited in having started an industrial estate of its own consisting of small units which are producing parts and components for use in the main factory, is indicative of what can be achieved under such an arrangement. With self reliance as an objective of the small industries sector, the ancillary movement should be intensified.

In surveys conducted by the National Small Industries Corporation many cases of indigenous duplication came to notice which in fact are proving quite reliable. If individuals on their own initiative could achieve this, one wonders why such an attempt has not been made on an institutional level. It should be possible to produce in the country many machinery items, both general machine tools and specialised machinery, for use in the small industries sector.

A stage has now been reached in the course of planned economic development where the shortage of scarce raw materials is telling upon the growth of small industries, thus rendering the establishment of new industries fairly difficult. The urgent need, therefore, is to innovate, so that scarcity of raw materials, imported ones in particular, will not retard the industrial growth of the country.

FUTURE PROGRAMMES

Future programmes must be chalked out keeping in view the available resources, capacities, expertise and technical know-how. Would-be entrepreneurs must be educated as to the availability of resources in the country and the lines of production that can be taken up. The National Small Industries Corporation has brought out a list of more than thirty industries which can be started with indigenous raw materials. An interested entrepreneur can study these industries in relation to location and existing capacities.



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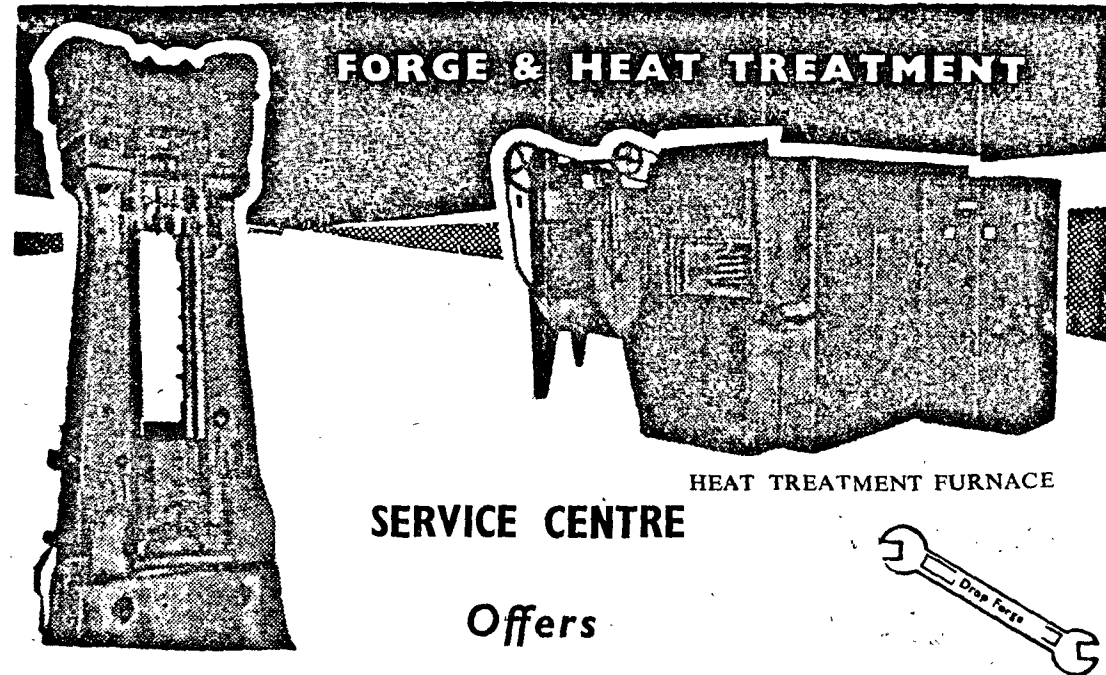
INDUSTRIAL LICENCES

LIST OF LICENCES ISSUED UNDER THE INDUSTRIES (DEVELOPMENT AND REGULATION) ACT, 1951 DURING THE MONTHS OF SEPTEMBER AND OCTOBER, 1965

IN THE STATES OF MADRAS, ANDHRA PRADESH, KERALA, MYSORE AND PONDICHERRY

Name and full address of the undertaking [and location]	Articles of manufacture and capacity [type of licence i.e. NU/SE/NA/COB/shifting]	Licence No. and Date
Schd. Ind. No. 25—Sugar		
Amadalavalasa Co-operative Agricultural & Industrial Society Ltd., Srikakulam Dist. (Amadalavalasa, Andhra Pradesh)	Sugarcane ... [S. E.]	tonnes per day ... 400 L/25/N—143/65 30-8-65
Schd. Ind. No. 29 (1)—Soaps		
The Government Soap Factory, Post Bag No. 1031, Bangalore-12. (Bangalore, Mysore)	Toilet soap ... Washing soap ... Glycerine ... [S. E.]	tonnes p. a. ... 4,200 ... 300 ... 165 L/29(1)/1/65— ch: II S. E. 23-8-65
Schd. Ind. No. 25—Sugar		
Chittoor Co-operative Sugars Ltd., Chittoor, (Chittoor, Andhra Pradesh)	Increased crushing capacity 600 tonnes of sugarcane per day. [S. E.]	L/25/N—144/65 2-9-65
Schd. Ind. No. 23 (1)—Cotton Textiles		
Kancheepuram Kamakshiamman Co-operative Spinning Mills Ltd., No. G. 1897, Kancheepuram, (Madras State)	Spindles for the manufacture of cotton yarn ... [S. E.]	... 12,312 L/23(1)/1002/ Tex (H)/65 31-8-65
Karimnagar Co-operative Spinning Mills Ltd., Karimnagar, (Ramagundam, Andhra Pradesh)	Spindles for the manufacture of cotton yarn ... [N. U.]	... 12,000 L/23(1)/1004/65— Tex (H) 20-9-65

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