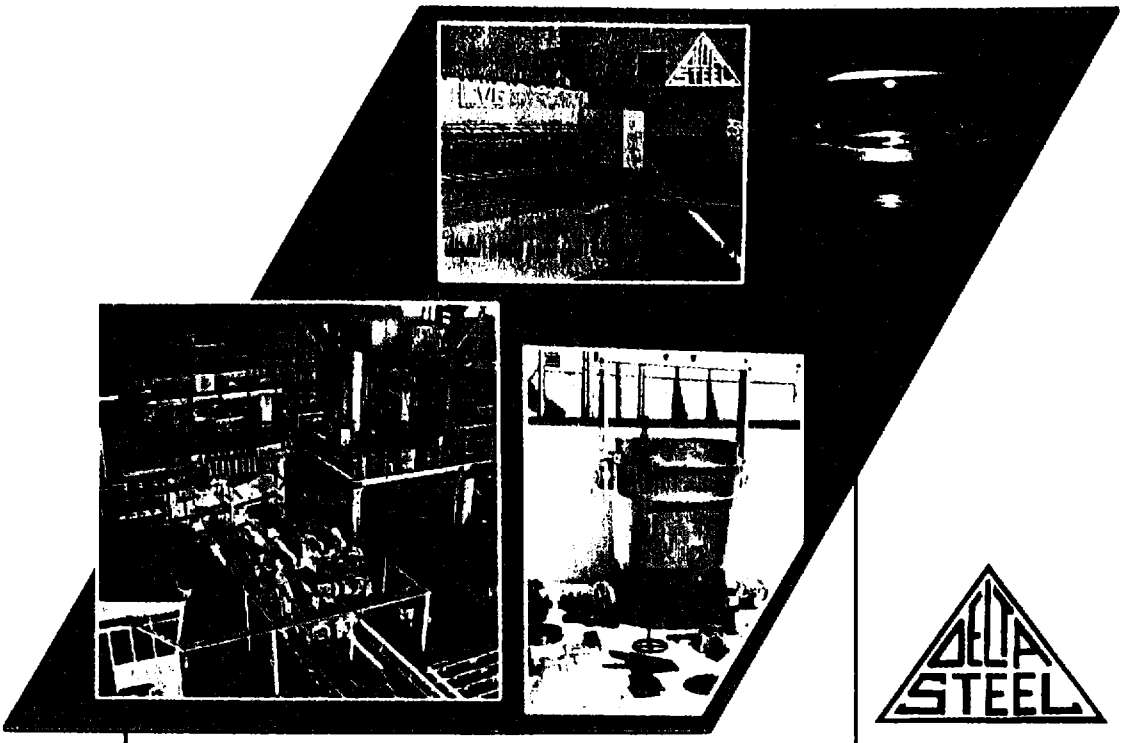
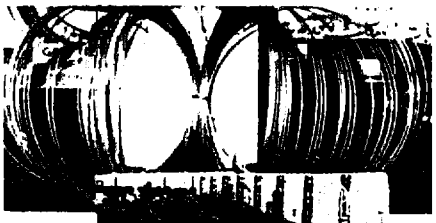
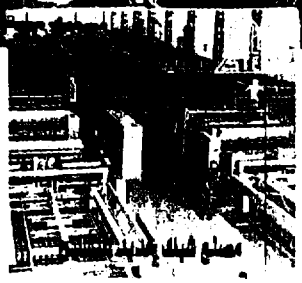






DELTA STEEL MILL Co.

AFFILIATED TO
THE METAL LURGICAL INDUSTRIES Co.

Head Office, Factories & Sales :
Mostorod - Qalioubiya
Factories: Tel: 4705034 - 4705846
2205837 - 2217628
Cairo Office : 18, Emad El Din - Tel: 5754955
P.o. Bag :13 Cairo A.R.E. (code No. 11511)
Telex : 94220 « DEMILL UN »
Fax : (00202) 2205648
Cable Address : « DELMILL » Cairo
Alex . Office : 6 Talaat Harb St.
Tel.: 4833164

AFFILIATED TO

THE METALLURGICAL INDUSTRIES CO.

Standards and
Specifications

July 1998

Delta Steel Mill Co.

Establishment in 1947

Delta steel Mill Company is one of the pioneer companies in the field of metallurgical industries in Egypt, Its production divisions are experienced in the production of steel and cast iron .

Date of Establishment	: 1947
Head office and Factory	: Mostorod
Cable Address	: DELMILL
Telex	: 94220 " DEMILL / UN "
Faximile	: (00202) 2205648
Telephone	: 4705034,4705846 ,2205837,2217627(202)
Authorised Capital	: 35000000 L. E
Annual Sales	: 171 000000 L. E
Total number of employees	: 2600

Main Production Departments

- Steel Making Sector
- Shaping Sector
- Foundries Sector

Historical Hint :

Delta steel Mill Company is one of the pioneer companies in the field of the Steel and Cast iron industry in Egypt .

In 1947 the Delta trading company created a Steel Mill Divison for the production of reinforced concrete bars (Rebars) equipped with two small electric arc furnaces to remelt the thousands tons of scrap left behind in the western desert by the fighting armies of world war II. This venture proved so successful that the new divison was separated into a thriving fully independant concern " Delta Steel Mill Company " .

Since then, the new company is exerting continuing efforts in improving the production techniques by introducing advanced production methods and management techniques, by the effort of its men. The steel manufacture has been developed by adding different capacites of electric arc furnaces as well as the continuous casting line for production of billets which in turn are rolled to produce rebars and sections cold drawn for wire production, welded wire mesh and an integrated foundry for the production of cast steels and cast irons .

Thus during its 50 years of experience Delta Steel Mill has proved that it is one of the leading companies in the field of metallurgical industry in Egypt .

The company's follow up of International progress :

A very good cooperation has been found between the compa - ny and the universities and the research centres for making stud - ies and applied research on the base of a semi and full industrial scale .

On the other hand the company has established an up to date information centre with high computer systems in order to get a modern and complete information system .

Main production Departments

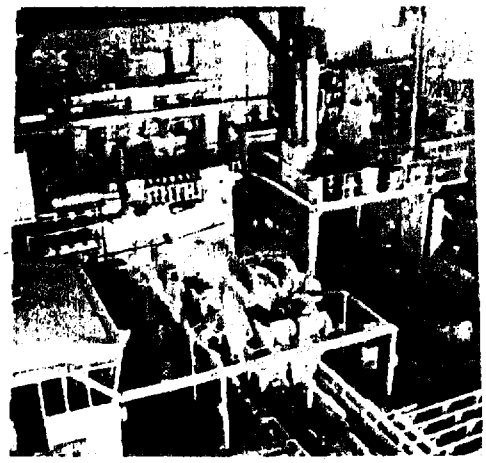
Steel - Making Sector

SteeLmelting and Continuous Casting

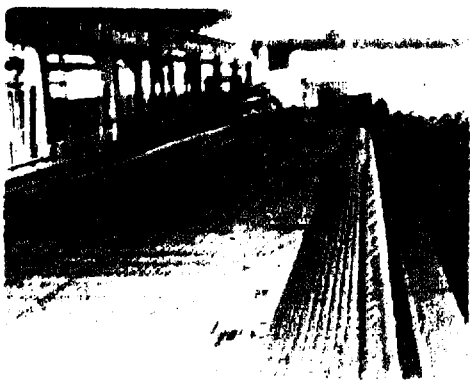
The molten Steel from elecric arc furnaces with the required chemical composition is transfered to be contin - uously casted into steel billets 130 x 130 mm.

The use of this technique rather than the conventional ingot casting leads to decreasing costs and increasing productivity .

Modern techniques such as water cooling panels , oxyfuel burners , carbon oxygen injection , process control , ladle furnace were introduced to achieve improvement in productivity and quality .



Shaping Sector



Hot Rolling :

The hot rolling division consists of two units :

A - The automatic rolling unit which has been developed according to highest technological standards by using the automation controlling systems .

The steel billets produced by the continuous casting line then rolled into mild or high tensile steel grades for reinforcing concrete with different bar diameters from 12 to 40 mm in standard lengths or as requested .

Mild Steel reinforced rebars for coils are produced as well with diameters from 6 to 12 mm.

Egyptian standards for concrete reinforcing steels cover the specifications of the production, yet other international standards as requested can be adopted .

B - Semi automatic rolling unit.

The second division is for production of other sections where the steel ingots and billets are rolled into squares, ovals and other profiles .

The cold charges for rolling are preheated in controlled temperature

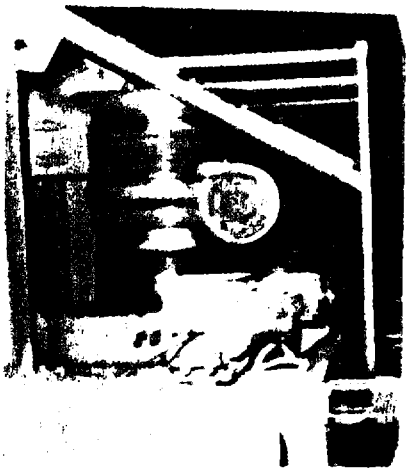
reheating furnaces up to the required hot rolling temperature .

Cold Drawing :

In this shop the cold drawn wires are produced on automatic machines . The produced wires are usually used for general and special engineering purposes after special heat treatment in heat treatment furnaces .

They are usually delivered to the customers in the form of coils .

This shop also produces bright calibrated wires and rods



Wire Mesh :

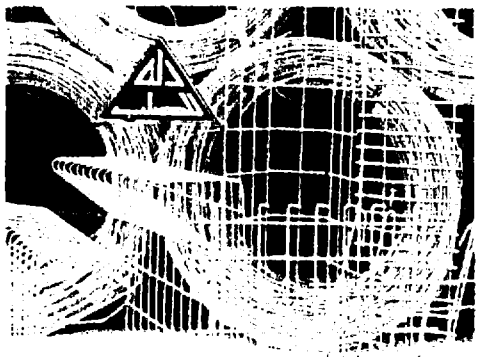
Wire mesh production is one of DSM new activities, it represents our contribution in the recent trends in buildings . The company uses a set of recent machines for preparing and welding the wires to produce the wire mesh.

Using of wire mesh insures the minimization of reinforced concrete processing and consequently the final cost of construction.

The used bars in wire mesh are cold drawn and its strength is not less than 55 kg / mm^2, with elongation 8 % minimum.

Wire mesh share in cost reduction by 30 % in materials and 50 % saving in time, beside the accuracy in dimension .

إحدى الماكينات الحديثة التي تقوم بلحام الشبك



Foundries Sector

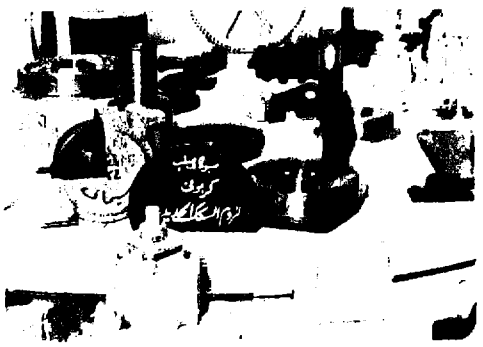
Steel Foundry :

It is one the largest steel foundry shops in Egypt , it consists of two divisons:

The first one is mechanized where the moulds are rammed by jolt squeezing machines, the second division is manual for the production of arge steel castings up to 10 tons Moreover the steel foundry includes a special shell moulding department for the production of castings where precise dimensions and a very high quality surface are required .

After solidification and cooling of the castings they are transported to the fettling shop, where they are subjected to the following sequence of finishing operations.

Cleaning the sticking sands by shot blasting machines, cut - off the ingates and risers, heat treatment , shot blasting to remove any oxide films due to heat treatment and finally the castings are machined to final dimensions according to the customers needs in a special machining shop. With two 3 ton electric arc furnaces, 1.5 ton induction furnace and 3/4 ton induction furnace,the steel foundry shop is capable for producing most carbon and alloy steels .



Cast Iron Foundry :

The cast iron foundry consists of two divisons:-

A mechanical one, where jolt - squeeze machines are used to prepare the sand moulds for small and medium castings and a manual section for ramming the big ones .

Usually , the castings are poured from grey cast iron , which is melted in B.B.C induction melting furnaces to

get a homogeneous metal concerning either the chemical composition or the casting temperature. During the last two years this foundry has begun the production of several other grades of cast iron such as alloyed cast iron, Ni-hard, wear heat resisting cast irons and ductile iron. these special cast iron grades are produced in an induction furnace 1.5 ton capacity.

Steel Foundry Shop for the production of Grinding Media :

This is the new project of Steel Foundry for the production of grinding media and liners for cement industry with production capacity of 5000 T/ Y, (production of balls and cylpebs capacity about 3200 T/Y, production of liner plates, 1800 T/Y) which is enough to cover the needs of the Egyptian Cement Industry

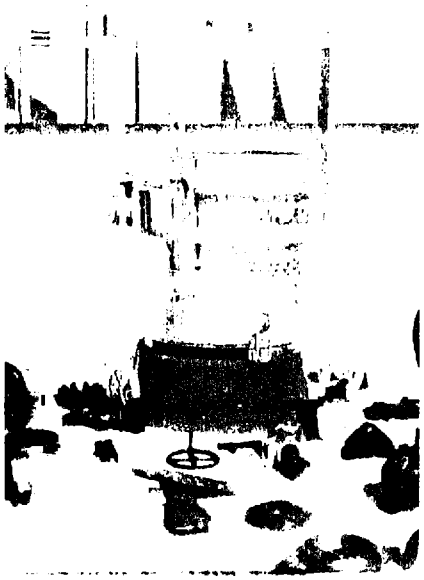
The Foundries are eqiupped with a pattern shop capable for producing and finishing either metallic patterns or wooden with the help of very qualified and experienced technicians.

Central Work shops :

Mainly the mechanical and electrical, central workshops manufacture most of the spare parts necessary for running the company departments and utilities .

The workshops have succeeded in diversifying and increasing the variety of spare parts to be locally manufacturing due to the existing modern steel and cast iron foundries in the company which led to the manufacturing and working of a lot of spare parts sufficient to substitute the imported ones and also to feed other companies with its requirements of spare parts such as overhead crane wheels and most types of gears .

In the field of manufactring capital equipments to replace the imported ones , some of these equipments have been manufactured for the first time such as ladles for pouring liquid steel from the electric arc furnaces .



Chemical and physical Laboratories :

To be sure that our products are according to the required standards concerning either the chemical analysis or the mechanical & physical properties also to check the quality of the new material to be used in the production process and to control the different production stages the company relies on physical and chemical laboratories equipped with recent high standard machines such as spectrographic quantometer, tension and bending machines, hardness and ultra - sonic detection of internal cracks in the finished products .

Management Information System :

It is well known that the information system and its activities plays a big role

to supply the Managers with the data which help to achieve the targets. To obtain information in very short time and suitable way in order to give the right decision, we should have computer systems to assist the ordinary routine paper work and to guarantee the flow of the information feeding to get a better directors performance and decrease the accumulation of the reports as well as keeping information and reuse it again at the right time with minimum costs. That was the aim for establishing the information system center in our company which started on 1981 to computerize the manual administrative financial and commercial systems. Now the automation is stepped forward to the stage of establishing CIM with new computers linked with production process computers .

Main production

I - HR - Hot Rolling :

HR_1 - Hot rolled mild steel bars (Steel 35) .
HR_2 - High tensile steel bars for reinforcing concrete . (Steel 52) .
HR_3 - High strength, reinforced concrete bars with vanadium additon .
HR_4 - Hot rolled mild steel bars for engineering purposes .
HR_5 - Hot rolled steel sections . (Rounds - Flats - Squares and Angles) .

II - CD - Cold Drawing :

CD_1 - Cold drawn, low carbon bright calibrated mild steel bars .
CD_2 - Cold drawn, low carbon steel wires .
CD_3 - Cold drawn, mild steel bars .
CD_4 - Cold drawn, mild steel wires for welding electrodes .
CD_5 - Cold drawn, wires for steel wool production .

III - WM Welding Wire Mesh

IV - CS - Steel Casting :

$C\ S_1$ - Plain carbon steel castings .
$C\ S_2$ - Carbon steel castings for railway stock .
$C\ S_3$ - Alloy abrasion resistant steel castings .
$C\ S_4$ - Austenitic manganese steel castings .
$C\ S_5$ - Nickel chromium cast steels .
$C\ S_6$ - Alloy steel castings .
$C\ S_7$ - Cast steel gate valves for petroleum industry .
$C\ S_8$ - Castings for cement Industries .

V - CI - Cast Iron Castings :

CI_1 - Grey iron castings for general engineering purposes .
CI_2 - Cast iron casting for automotive industry .
CI_3 - Heat and corrosion resisting chromium alloyed cast iron .
CI_4 - Hematite cast iron ingot moulds .
CI_5 - Nodular iron castings .
CI_6 - Alloy cast iron castings .
(equivalent to Ni - Hard) .
CI_7 - Sanitary cast iron pipes .

Chemical Composition For Main Products

A - For Steel

Code	Grade	Average chemical composition %									
		C	Mn	max S	max P	Si	S + P	Ni	Cr	V	Mo
HR1	HR Δ 35	0. 08 - 0.25	0.45-0.75	0.055	0.055	0.15-0.35	0.1/00 Max				
HR2	HR Δ 52	0.19 - 0.38	0.65-0.85	0.055	0.050	0.15-0.35	"				
HR3	Weldable High Strength Steel	0.21 - 0.29	1.2-1.4	0.050	0.050	0.15-0.60	"			0.05-0.1	
HR4	High Strength Steel	0.35 - 0.42	0.80-1.0	0.055	0.050	0.15-0.35	"				
CD3	C Δ	0.18 - 0.28	0.50-0.80	0.050	0.020	0.35					
CD4	CD Δ E	0.10 max	0.40-0.65	0.030 max	0..020	0.03 max					
CS1,2	CS Δ 40	0.22 - 0.27	0.5-0.7	0.050	0.050	0.2 - 0.35					
CS1,2	CS Δ 50	0.28 - 0.33	0.5-0.7	0.050	0.050	0.2 - 0.35					
CS1	CS Δ 60	0.35 - 0.40	0.6-0.8	0.050	0.050	0.2 - 0.35					
CS1	CS Δ 60 Cr	0.34 - 0.40	0.6-0.8	0.050	0.050	0.30 - 0.40			0.9-1.2		
CS3	CS Δ 75 Mn	0.7 - 0.8	0.9-1.2	0.050	0.050	0.30 - 0.45					
CS3	CS Δ 100 MnCr	0.9 - 1.3	0.9-1.2	0.050	0.050	0.30 - 0.45			0.9-1.2		
CS4	CS Δ 14 Mn heat treatment	1.1 - 1.3	11-14	0.050	0.050	0.40 - 0.80					1
CS4	CS Δ 14 Mn Mo Treatment	1.1 - 1.3	11-14	0.050	0.050	0.40 - 0.80					
CS4	CS Δ 18 Mn	0.40 - 0.55	0.17-0.19	0.030	0.100	0.80					
CS5	CS Δ Ni8 Cr 18	0.15 max	2max	0.030	0.030	2 max		8-11	18-20		
CS5	CS Δ Ni3 Cr 13	0.15 max	0.5max	0.030	0.030	1 max		25-35	12-14		
CS5	CS Δ Ni 20 Cr 25	0.20 max	1.5max	0.030	0.030	1.5 max		18-22	23-27		
CS6	CS Δ 56Cr NiMo V 7	0.50 - 0.60	0.65-0.95	0.035	0.035	0.1 - 0.4		1.5-1.8	1-1.2	.07-.12	.45 -. 55
CS6	CS Δ Ni2Cr 25	0.40 - 0.60	0.4-0.7	0.050	0.050	1. 2		1.5-2.0	24-26		
CS6	CS Δ Ni8 Cr 25	0.25	0.50	0.035	0.035	1.2		8	25		
CS8	CS Δ 2 Ni 20 Cr 25	0.45	2	0.030	0.030	2		18-21	23-26		
CS8	CS Δ Cr13	0.55	0.80	0.050	0.050	0.30			12-13		

B - For Cast Iron

Code	Grade	Average chemical composition %							
		C	Mn	max S	max P	Si	Cr	Mg	Ni
Cl	Cl Δ 14	3.80	0.5	0.1	0.3	2.4			
Cl_1	Cl Δ 18	3.60	0.6	0.1	0.25	2.0			
Cl_1	Cl Δ 22	3.45	0.7	0.1	0.2	1.9			
Cl_1	Cl Δ 26	3.40	0.8	0.1	0.2	1.75			
Cl_3	Cl Δcr 27	2.10	1.0	0.1	0.7	1.50	27		
Cl_4	Cl Δ 14 H	3.60	0.8	0.1	0.1	1.80			
Cl_5	Cl Δ 50	3.4 - 3.6	0.4 max	0.03	0.08	2.2 - 2.5		0.05	
Cl_6	Ni - Hard.	2.8 - 3.2	0.3 - 0.7	0.15	0.30	0.3 - 0.5	1.5 - 2.5		3.5 - 4.5
Cl_7	Cl Δ P	3.6	0.5	0.10	0.40	2.0			

Hot Rolling

Hot Rolled Mild Steel Bars (Steel 37) (HR_1)

Designation

HR △ 35

Technical Data :

1 - Chemical Composition :

According to Egyptian Standard Specification
E .S.S 262/ 88 grade 24 / 35

2 - Mechanical Properties : (min)

Yield Stress kg / mm^2	U . T . S kg / mm^2	Elongation %	Single Cold Bending 180°	
			Sizes ℓ mm	Diameter
24	35	20	⩽ 25	2 d
			> 25	3 d

3-Sizes And Tolerances :

Sizes mm Diam	Tolerances ±	Weight Kg/ m	Notes
6	0.5	0.222	Delivery : A - Coils In bundles each 350 Kg weight
8	0.5	0.395	
10	0.5	0.617	
12	0.5	0.888	
12	0.5	0.888	B - straight bars Straight bars with standard length 12 m for diameters From 12 - 32 mm In Bundles each of 4-5 ton weight C - Straight bars with diameters from 19 - 40 mm and up to 30 m length .
16	0.5	1.58	
19	0.5	2.22	
22	0.5	2.98	
25	0.5	3.85	
32	1	6.31	
38	1	8.90	
40	1	9.85	

4 - Typical Uses :

1 - For concrete reinforcement .
2 - Coils up to 12 mm bar dia . for cold drawing purposes .
3 - For wire mesh production .

High Tensile Steel Bars For Concrete Reinforcing (HR_2)

Designation

HR △ 52

Technical Data :

1 - Chemical Composition :

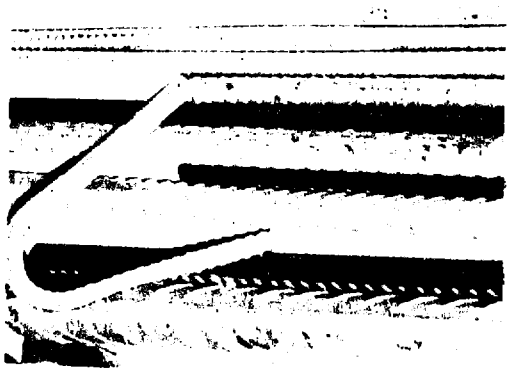
According to Egyptian Standard Specification
E . S . S 262/ 88 grade 36 / 52

2 - Mechanical Properties : (min)

Yield Stress kg / mm^2	U . T . S kg / mm^2	Elongation %	Single Cold Bending 180°	
			Sizes ℄ mm	Diameter
36	52	12	≤ 20 > 20 ≤ 36 > 36	4 d - 5 d

3 - Sizes And Tolerances :

Sizes mm dia	Tolerances ±	Weight Kg/ m
12	0.5	0.888
16	0.5	1.580
19	0.5	2.220
22	0.5	2.980
25	0.5	3.850
32	1.0	6.310
38	1.0	8.900
40	1.0	9.860



These barse are produced with longitudinal ribs on both sides parallel to the bar axis and ribs inclined on the bar axis. This highly increases the bonding strength between the bars and concrete .

High Strength Reinforced Concrete Bars (HR3) With Vanadium addition

Technical Data :

Chemical Composition And Mechanical Properties :

Weldable High Strength Steel

Size ø mm	C %	Mn %	Si %	V %	C. E max	Specification
22-32	0.25-0.29	1.3-1.5	0.2-0.5	-	0.51	- According to : ASTM A 706 JIS G3112 SD 40 Grade 40 / 60
12-32	0.22-0.25	1.3-1.6	0.4-0.6	-	0.51	- According to : E.S.S 262 Grade 40 / 60 T.S = 60 Kg/mm^2 Y.S. = 40 kg / mm^2 E = 10 %
12-32	0.21-0.25	1.2-1.5	0.15-0.40	0.05-0.1	0.51	- According to : BS 4449 Grade 460 Y. S> 47 kg / mm^2

Advantages :

- Higher Strength properties .
- More saving in the weight of reinforcing steel that may reach about 45% of the mild steel .
- Weldable .

Remark :

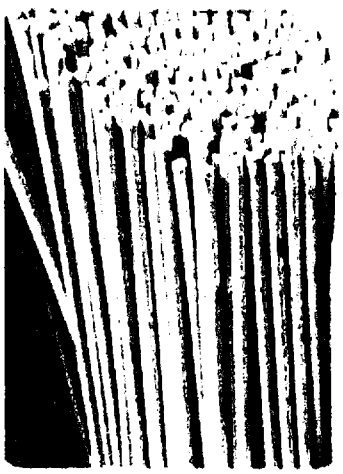
- Another non weldable high strength steel is produced with minimum U.T.S 63 Kg / mm^2.

According to ASTM A615 Grade 60 and the following chemical analysis :

Non - Weldable High Strength Steel HR3	C %	Mn %	S % max	P % max	Si %
	0.35-0.42	0.8 - 1.0	0.055	0.050	0.15-0.35

Steel Bars For General Engineering Purposes (HR 4)

Technical Data :



1 - Chemical Composition :

According to international specifications or customer requirement .

2 - Mechanical Properties :

According to international specifications or customer requirement .

3 -Sizes and Tolerances :

Sizes Ø mm	Tolerances ± mm
6 - 22	0 . 5
25 - 40	1 . 0

4 - Typical Uses :

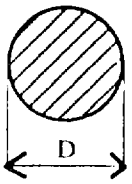
It is suitable for cold and hot steel working purposes .

Hot Rolled Sections (HR5)

Technical Data :

1- Mechanical Properties :

According to Δ 35, Δ 52 or special steel

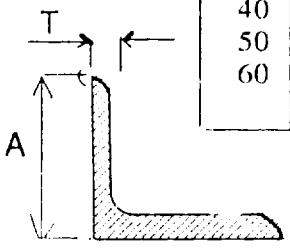


2 - Sizes and Tolerances :

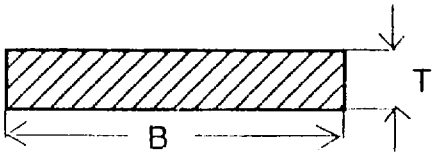
A - Rounds

Dimensions		Cross Sectional	Weight	Dimensions		Cross Sectional	Weight
Ø mm	Tolerances ± mm	cm^2	kg / m	Ø mm	Tolerances ± mm	cm^2	kg / m
6	0.5	0.28	0.22	18	0.5	2.84	2.00
8	0.5	0.50	0.40	22	0.5	3.80	2.98
10	0.5	0.79	0.62	25	1.0	4.91	3.85
12	0.5	1.13	0.89	28	1.0	6.16	4.83
14	0.5	1.60	1.21	32	1.0	8.04	6.31
16	0.5	2.01	1.58	38	1.0	11.20	8.90
				40	1.0	19.60	9.87

B - Angles



Dimensions (mm)				Sectional Area cm^2	Weight kg / m	Length m
A	Tolerances ±	T	Tolerances ±			
25	1.0	3	0.5	1.42	1.12	4 ,5 ,6
30	1.0	3.0	0.5	1.74	1.36	4 ,5 ,6
40	1.0	4.0	0.5	3.08	2.42	4 ,5 ,6
50	1.0	5.0	0.75	4.80	3.77	4 ,5 ,6
60	1.5	6.0	0.75	6.91	5.42	4 ,5 ,6



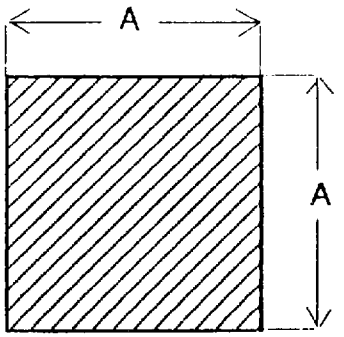
C - Flats :

T mm	Tolerances ± mm	B mm	Tolerances ± mm
5 - 20	0.55	10 - 35	0.75
22 - 40	1.0	38 - 75	1.0
50 - 60	1.5	80 - 100	1.5
		110 - 120	2.0
		130 - 150	2.5

According to Egyptian Standard Specification E.S.S 1095 / 70

D - Squares :

A mm	Tolerances ± mm	Weight kg/m
12	0.4	1.13
16	0.5	2.01
19	0.5	2.83
25	0.5	4.91



Cold Drawing :

Cold Drawn Low Carbon Bright Calibrated Mild Steel Bars (CD_1)

Designation

CD △

Technical Data :

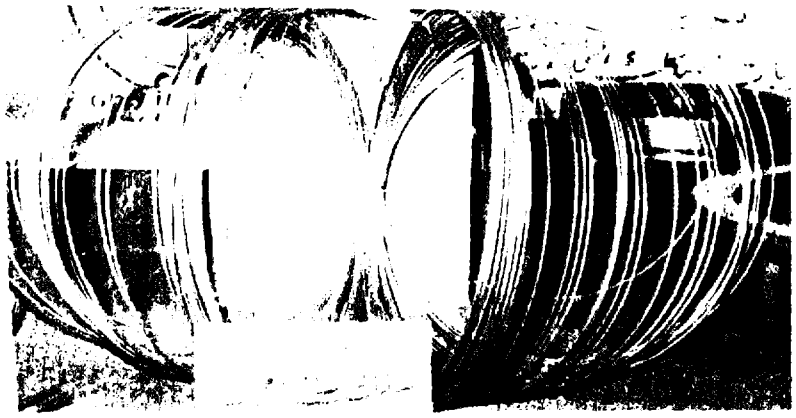
1- Specification :

According to German specification DIN 17140

2 - Sizes and Tolerances :

Lengths m	Sizes Ø mm	Tolerances ± mm
3 - 11	2 - 6	0.02

We can produce steel bars either polished or with special engineering section shapes , square up to 7 X 7 mm , flat up to 6 X 2 mm and hexagon up to Ø 9 mm .



Cold Drawn Low Carbon Steel Wires (CD 2)

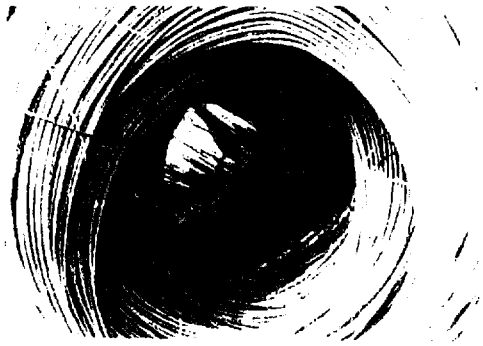
Technical Data :

1- Chemical Composition :

According to CD △ specification DIN 17140

2 - Mechanical Properties :

U.T.S Kg/ mm^2	Elongation % min
50 - 80	8



3 - Sizes : Coils

Sizes Ø mm	Coil with internal diameter cm	Weight kg
0.8 - 1.8	35	15
2 - 7	50 - 70	80 - 120

4 - Tolerances :

Sizes Ø mm	Tolerances ± mm
0.8 - 3	0.025
Over 3	0.05

5 - Typical Uses :

These types of steel wires are used for general engineering purposes and for fabrication of wood nails .

Cold Drawn Mild Steel Bars (CD 3)

Designation

CD △

Technical Data :

1 - Chemical Composition And Mechanical Properties :

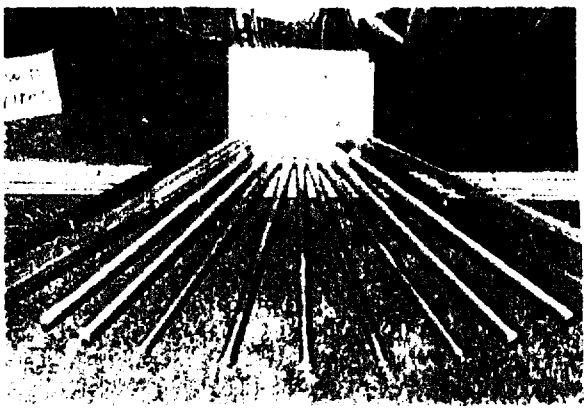
C %	Mn %	Si %	P % max	S % max	U.T.S kg / mm^2	Elongation % min
0.18 - 0.28	0.50 - 0.80	0.35	0.02	0.05	40 - 55	12

2 - Sizes and Tolerances :

Sizes ⌀ mm	Length m	Tolerances ± mm
15 - 25	6	0.05

3 - Typical Uses :

Cold drawn mild steel bars for general engineering purposes and for fabrication of bolts



Cold Drawn Mild Carbon Steel Wires
For Welding Electrodes (CD 4)

Designation CD △ E

Technical Data :

1 - Chemical Composition and Mechanical Properties :

C% max	Mn %	Si % max	P% max	S% max	Cu % max	U. T. S Kg / mm2	Y. S Kg / mm2	E% (L=5d)
0.10	0.40-0.65	0.03	0.020	0.030	0.2	45 - 48	30 - 35	27 - 35

2 - Sizes and Tolerances :

Sizes Ø mm	Tolerances ± mm	Delivery
2.25 - 3	0 . 025	In 100 kgs coils
Over 3 - 6	0.05	

Cold Drawn Steel Wires
For Steel Wool (CD 5)

Technical Data:

1 - Mechanical Properties :

U .T. S 80 - 120 Kg / mm 2

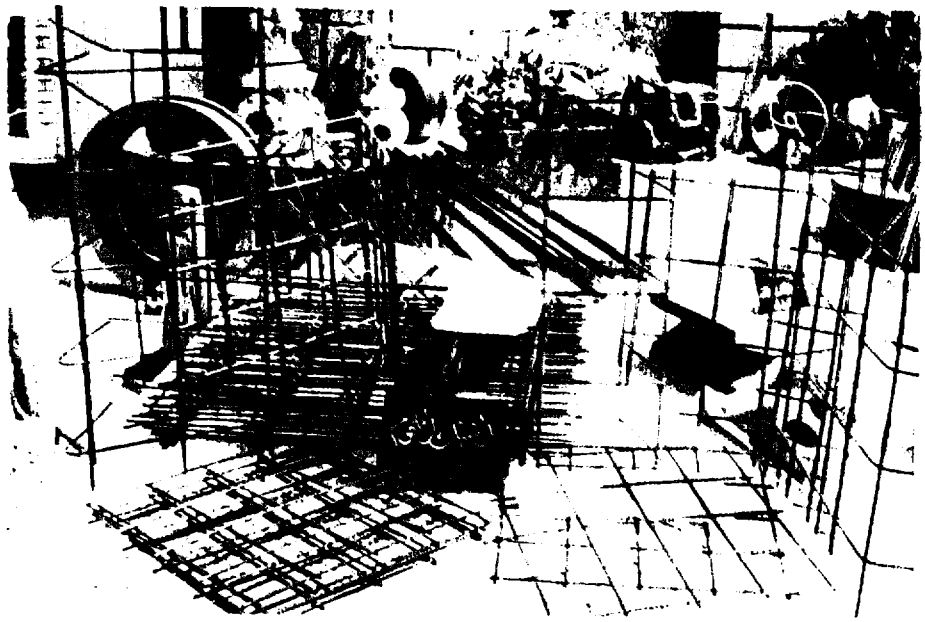
2 - Sizes and Tolerances :

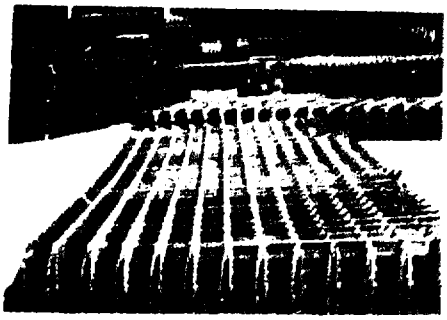
Size : 3.10 mm Dia
Tolerances : + 0.05 mm

3 - Typical Uses :

Cold drawn wires for steel wool production .

Wire Mesh





Now ,company Is producing four fupical models from the welded wire mesh and all (except that which Is used In walls) are with predefined dimensions (length - 6 m width 2 .45 m).

Welded wire mesh can be speciticall produced to meet the reinforcing requirements and dimensions of individual projects according to civil engineers drawings

Technical Data : max . length 12 m

max . width 2 . 63 m

The allowance design stress 2200 Kg / cm^2 for slabs and 2000Kg / cm^2 for columns and beams

Specifications : According to Egyptian standard specification16 / 1986

Stndards on stock

Delta ref no.	Mesh specification				Cross sectional area of wires		Mass values per		Bundle	
	Spacing		Wire diameter							
	Line wire	Cross wire	Line wire	Cross wire	Line wire	Cross wire	Sheet	Area 1mx1m		
Type	mm	mm	mm	mm	cm^2 /m	cm^2 /m	Kg	Kg/m^2	Kg	Pieces
S44	100	100	4	4	1.26	1.26	29.40	2.00	1470	50
S55	100	100	5	5	1.96	1.96	45.74	3.11	2287	50
S66	100	100	6	6	2.83	2.83	65.93	4.49	1648	25
S77	100	100	7	7	3.85	3.85	89.69	6.10	2242	25
S88	100	100	8	8	5.03	5.03	117.32	7.98	2933	25
S99	100	100	9	9	6.036	6.036	133.35	9.07	3334	25
S1010	100	100	10	10	7.085	7.085	182.954	12.045	4574	25
S1111	100	100	11	11	9.500	9.500	221.562	15.002	5539	25
S1212	100	100	12	12	11.30	11.30	263.736	17.95	6593	25
S_1 44	150	150	4	4	0.84	0.84	19.800	1.374	990	50
S_1 55	150	150	5	5	1.31	1.31	30.80	2.095	1540	50
S_1 66	150	150	6	6	1.88	1.88	44.40	3.020	1110	25
S_1 77	150	150	7	7	2.57	2.57	60.40	4.109	1510	25
S_1 88	150	150	8	8	3.35	3.35	79.00	5.374	1975	25
S_1 99	150	150	9	9	4.24	4.24	99.80	6.789	2495	25
S_1 1010	150	150	10	10	5.24	5.24	123.40	8.395	3085	25
S_1 1111	150	150	11	11	6.34	6.34	149.20	10.150	3730	25
S_1 1212	150	150	12	12	7.54	7.54	177.60	12.082	4440	25
S_2 44	200	200	4	4	0.63	0.63	14.999	1 .020	750	50
S_2 55	200	200	5	5	0.98	0.98	23.331	1.587	1167	50
S_2 66	200	200	6	6	1.41	1.41	33.633	2.288	841	25
S_2 77	200	200	7	7	1.92	1.92	45.753	3.112	1144	25
S_2 88	200	200	8	8	2.51	2.51	59.843	4.071	1496	25
S_2 99	200	200	9	9	3.16	3.16	75,599	5.143	1890	25
S_2 1010	200	200	10	10	4.92	4.92	93.476	6.359	2337	25
S_2 1111	200	200	11	11	4.74	4.74	113.019	7.688	2825	25
S_2 1212	200	200	12	12	5.66	5.66	134.532	9.152	3363	25

Delta ref no.	Mesh specification				Cross sectional area of wires		Mass values per		Bundle	
	Spacing		Wire diameter							
	Line wire	Cross wire	Line wire	Cross wire	Line wire	Cross wire	Sheet	area 1mx1m		
R55	100	150	5	5	1.96	1.31	38.19	2.60	1910	50
R65	100	150	6	5	2.83	1.31	48.39	3.29	2420	50
R66	100	150	6	6	2.83	1.88	55.06	3.75	1377	25
R76	100	150	7	6	3.85	1.88	67.60	4.56	1677	25
R77	100	150	7	7	3.85	2.57	74.80	5.09	1870	25
R88	100	150	8	8	5.03	3.35	97.96	6.66	2449	25
R99	100	150	9	9	6.36	4.24	123.75	8.42	2475	20
R1010	100	150	10	10	7.85	5.23	123.02	10.41	3060	20
R1111	100	150	11	11	9.50	6.33	183.01	12.59	3700	20
R1212	100	150	12	12	11.30	7.54	220.22	14.98	4404	20
W66	100	150	6	6	2.83	1.88	31.14	3.48	1557	50
065	100	250	6	5	2.83	0.79	42.36	2.88	2118	50
075	100	250	7	5	3.83	0.79	54.36	3.70	1359	25
086	100	250	8	6	5.03	1.13	72.30	4.92	1808	25

Plain Carbon Steel Castings (CS_1)

Designation | Cs △ 40 | Cs △ 50 | Cs △ 60 | Cs △60cr

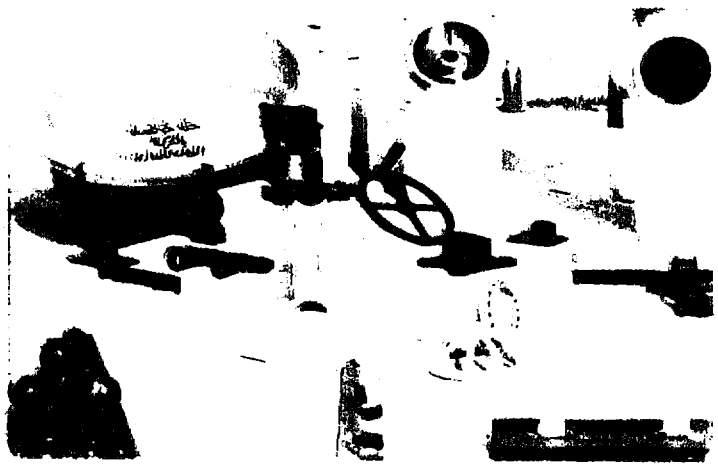
Technical Data :

1 - Chemical Composition And Mechanical Properties;

Grade	Chemical Composition %						Mechanical Properties	
	C	Si	Mn	S Max	P Max	Cr	U. T. S Kg/mm^2	E %
CS△ 40	.22 - .27	.2 - .35	.5 - .7	0.05	0.05	-	40 - 52	18
CS △ 50	.28 - .33	.2 - .35	.5 - .7	0.05	0.05	-	50 - 60	12
CS △ 60	.35 - .40	.2 - .35	.6 - .8	0.05	0.05	-	60 - 70	10
CS△60 cr	.34 - .40	.3- .40	.6 - .8	0.05	0.05	0.9 - 1.2		

2 -Typical Uses :

-Plain Carbon Steel Castings For General Engineering Purposes



Carbon Steel Casting For Railway Stock (CS 2)

Designation CS △ 40 CS △ 50

Technical Data :

1 - Chemical Composition and Mechanical Properties :

Grade	Chemical Composition %					Mechanical Properties	
	C	Si	Mn	S max	P max	U.T.S kg / mm 2	E% min
CS△40 (M8B)	. 22 -. 27	. 2 - .35	0. 5 - 0. 7	0. 05	0 . 05	40 - 52	18
CS△50 (M8C)	. 28 -. 33	. 2 - . 35	0. 5 - 0.7	0 . 05	0 . 05	50 - 60	12

2 - Typical Uses :

- Buffer case
- Buffer sleeve
- Drawbar - Guide plate
- Drawhook - Guide block
- Center plates
- Side bearers
- Rope ring bracket

3 - Specifications :

Casting are produced according to E.S.R Specification M.10 Class B and Class C .

Alloy Abrasion Resistant Steel Castings (CS3)

Designation CS △ 75 Mn CS △ 100 Mn Cr

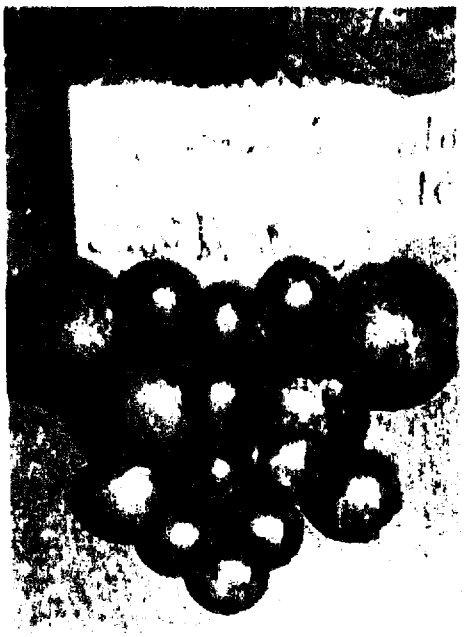
Technical Data :

1 - Chemical Composition and Mechanical Properties :

Grade	Chemical Composition %						Mechanical Properties	
	C	Si	Mn	Cr	S max	P max	U.T.S kg / mm 2	B.H.N
CS△ 75 Mn	.7 - .8	.3 -.45	.9 - 1.2	---	0.05	0.05	80- 100	250 - 300
CS△100 Mn Cr	.9 - 1.3	.3 - .45	.9 - 1.2	0.9 -1.2	0.05	0.05	105 - 130	300 - 350

2 - Typical Uses

- Grade CS △ 75Mn for ball mill lining plats .
- Grade CS △ 100 Mn Cr for grinding balls and cylpebs .



Austenitic Manganese Steel Castings (CS 4)

Designation | CS△14 Mn (H .T) * | CS △14 Mn | CS △18 Mn |

Technical Data

1 - Chemical Composition : %

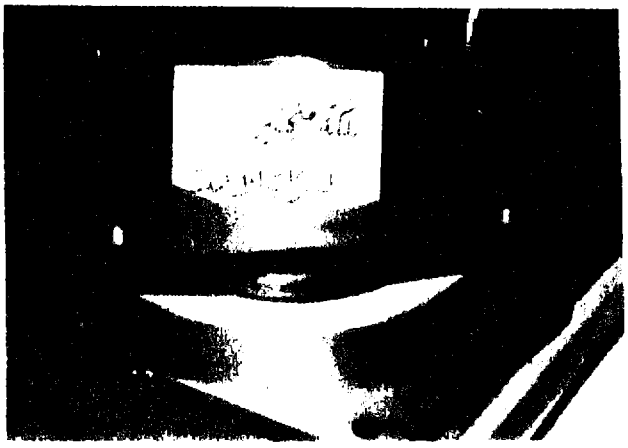
Grade	C	Si	Mn	S max	P max	Mo
CS △ 14 Mn (H. T*)	1.1 - 1. 3	0. 4 - 0. 8	11 - 14	0. 05	0. 05	--
CS △ 14 Mn	1. 1 - 1. 3	0. 4 - 0. 8	11 - 14	0. 05	0 . 05	1
CS △ 18 Mn	0 .40 - 0. 55	0. 80	17 - 19	0. 03	0. 10	--

*** Heat Treatment :**

Water quenching at 1000 °C

2 - Typical Uses :

High abrasion resistant castings for jaw crushers, ball mills excavater buckets, etc.



Nickel Chromium Steel Castings (CS 5)

Designation | CS △ Ni 3 Cr 13 | CS△ Ni 8 Cr 18 | CS △1 Ni 20 Cr 25

Technical Data :

1 - Chemical Composition : % (average)

Grade	C_{max}	Si_{max}	Mn_{max}	Ni	Cr	S_{max}	p_{max}
CS △ Ni3 Cr 13	0. 15	1. 0	0.6	25 - 35	12 - 14	0. 03	0. 03
CS△ Ni 8 Cr 18	0. 15	2. 00	2. 00	8 - 11	18 - 20	0. 03	0. 03
CS△1 Ni 20 Cr 25	0. 20	1. 5	1. 5	18 - 22	23 - 27	0. 03	0. 03

2 - Typical Uses :

These types are produced for cement, petroleum and metallurgical industries .

Alloy Steel Castings (CS 6)

Designation

CS △ Ni 2 Cr 25	CS△ 56 Cr Ni Mo 7	CS△ Ni 8 Cr 25

Technical Data :

1 - Chemical Composition : %

Grade	C	Si	Mn	S max	P max	Cr	Ni	Mo	V
CS △ Ni 2 Cr 25	.40 - .60	1. 2	.40 - .70	0. 05	0. 05	24 - 26	1. 5 - 2. 0		-
CS△ 56 Cr Ni Mov7	.50 - .60	10- .40	.65-.95	0. 035	0. 035	1 - 1. 2	1. 5 - 1. 8	0. 45 -0.55	.07 - .12
CS △ Ni 8 Cr 25	0. 25	1. 2	0. 50	0. 035	0. 035	25	8	..	-

2- Typical Uses :

Screens for iron and steel industry .

Cast Steel Gate Valves For Petroleum Industry (CS7)

Designation Valves

1 -Materials Specifications :

Trimmings	Part Name	Body And Bonnet	Disk	Seat Rings	Stem	Gland
Chrome Trim	Material	Carbon Steel	13 % Cr Steel	13 % Cr Steel	13 % Cr Steel	13 % Cr Steel
	Specifi - Cation	CS△ 50	CS△15 Cr 13	CS △15 Cr 13	HR △15 Cr 13	CS△ 15 Cr 13

2 - Chemical Composition ; %

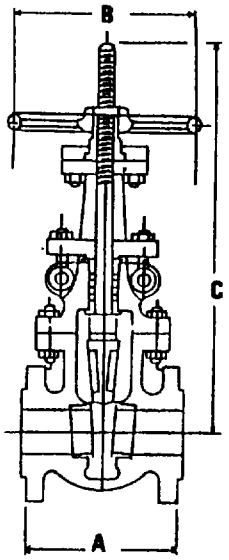
Grade	C	Si	Mn	Cr	S_{max}	P_{max}
CS △50	. 25 - . 30	0. 2 - 0. 35	0. 5 - 0. 8	--	0. 05	0. 05
CS △ 15 Cr 13	≤0. 15	0. 4 - 1.5	0. 6 - 1. 8	12 - 14	0. 04	0. 04
HR△ 15 Cr 13	≤0. 15	0. 4 - 1.0	0. 6 - 1. 0	12 - 14	0. 04	0. 04

3 - Specifications :

- Carbon Steel : ASTM A 216 WCB
- 13 % Cr Steel : AISI 410

ASTM A 217 CA 15

4 - Main Dimensions



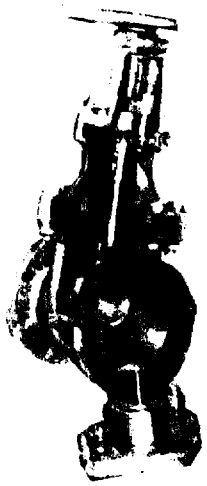
Nominal Size			A	B DT	C	
(in .)	mm	Pressure P. S. I	Length	Length	Minimum Closed	Maximum Open
2	50	150	178	203	354	415
		300	216	203	406	470
3	75	150	203	229	420	510
		300	282	229	485	575
4	100	150	229	254	524	650
		300	305	254	580	705
6	150	150	267	356	684	860
		300	403	356	749	919
8	200	150	292	406	850	1060
		300	419	406	919	1149
10	250	150	330	457	1020	1309
		300	457	457	1100	1379
12	300	150	356	508	1180	1520
		300	--	--	--	--
14	350	150	381	610	1400	1760
		300	--	--	--	--
16	400	150	406	610	1560	1990
		300	--	--	--	--
18	450	150	432	686	1600	2080
		300	--	--	--	--

5 - Hydrostatic Pressure Tests :

Pressure	Body	Seats
P. S. I	450	300
Kg / cm ^{2}	30	20

6 - Typical Uses :

It is used in petroleum pipelines under aworking pressure of 150 lb / in^2 and 300 lb in^2



Castings for Cement Industries (CS 8)

Technical Data :

1 - Chemical Composition and Mechanical Properties: (average)

Grade	C %	Si %	Mn %	S % max	P % max	Cr %	Ni %	Mo %	R_c
Plates 2 - 3 % Cr (H. T)	.45 -.50	. 5 - .7	. 5 -. 8	0. 04	0 .04	2 - 3		.4 - . 6	40 - 45
CSΔ 2Ni 20 Cr 25	0. 45	2	2	0 .03	0 .03	23 - 26	18 - 21		
CSΔ Cr 13 (H. T)	0.55	0. 30	0. 8	0 .05	0. 05	12-13			

- Grinding balls and cylpebs :

14 - 17 % Cr Heat Treated , min R_c 63

- Ball mill lining Plates :

11 - 13 % Cr Heat Treated and R_c 43 - 55

Grey Cast Iron Castings for General Engineering Purposes (Cl 1)

Designation

Cl △ 14	Cl △ 18	Cl △ 22	Cl △ 26

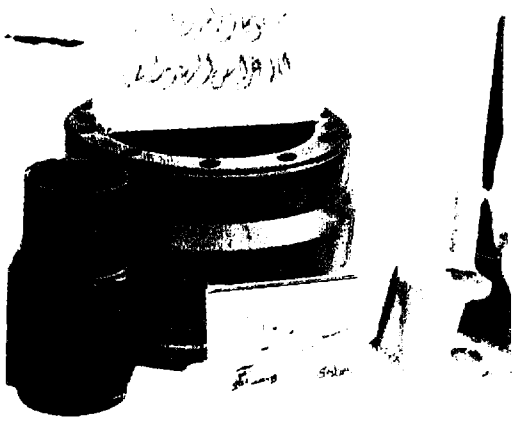
Technical Data

1 - Chemical Composition : (average)

Grade	C%	Si%	Mn%	S % max	P % max
Cl △ 14	3.8	2.4	0.5	0.1	0.3
Cl △ 18	3.6	2.0	0.6	0.1	0.25
Cl △ 22	3.45	1.9	0.7	0.1	0.2
Cl △ 26	3.40	1.75	0.8	0.1	0.2

2 - Mechanical Properties : (min)

Grade	U .T. S Kg / mm2
Cl △ 14	14
Cl △ 18	18
Cl △ 22	22
Cl △ 26	26



3 - Typical Uses :

Cl castings for general engineering purposes.

Cast Iron Castings for Automotive Industry (Cl 2)

Designation

Cl △ 26

Technical Data :

1 - Chemical Composition and Mechanical Properties:- (average)

Grade	C%	Si%	Mn%	S % max	P % max	U. T.S Kg / mm^2	B. H.N
Cl △ 26	3.4	1.75	0.8	0.1	0.2	26	190- 210

2 - Specification : According to German Specification DIN 1691 GG 26

Abrasion and Heat Resistant Cast Iron (Cl 3)

Designation

Cl △ Cr 27

Technical Data :

1 - Chemical Composition and Mechanical Properties: (average)

C %	Si%	Mn %	Cr%	S % max	P % max	U. T.S Kg / mm2	B. H.N
2 . 1	1. 5	1	27	0 . 1	0 . 7	25-60	350- 500

2 - Typical Uses :

For heat and abrasion resisting up to 1000 C as entry guides for rolling mills,for corrosion resistance in oxidizing conditions as nitric acid pipelines in fertilizer industries

Hematite Cast Iron Ingot Moulds (Cl 4)

Designation

Cl △ 14 H

To be produced in different weights according to different designs to satisfy factory requirements .

Technical Data

- Chemical Composition and Mechanical Properties : (aver. ge)

C%	Si %	Mn%	S % max	P % max	U. T.S Kg / mm2 (min)
3 . 6	1 . 8	0 . 8	0 . 1	0 . 1	14

Nodular Iron Castings (Cl5)

Designation

Cl △ 40	Cl △ 50	Cl △ 60

Nodular iron casting could be used in producing chain links and other mechanical parts such as for automotive industry.

- Mechanical Properties : (average)

U .T . S Kg / mm2	Yield Stress Kg / mm2	Elongation %
40	26	15
50	32	7
60	40	2

using ingot mould from that type of nodular cast iron led to achieve lower consumption figures of about 20 kg Cl / ton of ingot steel in the steel melting shop .

Alloy Cast Iron Castings (Cl 6)
(equivalent to Ni - Hard)

Agroup of nickel chromium alloyed white cast irons possessing outstanding resistance to abrasion proved to be an economic replacment for other materials under most conditions of wear-resisting service .

Technical Data :

1 - Chemical Composition and Mechanical Properties:

C%	Si%	Mn %	S % max	P % max	Ni %	Cr%	B.H. N
2. 8 - 3. 2	0. 3 - 0. 5	0. 3 - 0. 7	0. 15	0. 30	3. 5 - 4. 5	1. 5 - 2. 5	550 - 690

2 - Typical Uses :

In the metal - working mining, cement, ceramic, paper, paint, dredging coal and coke, foundry, construction and other industries

Metal Spun Cast Iron Waste Pipes (CI 7)

Designation

CI △ pipes

These pipes are produced from the highest -grade synthetic cast iron by induction furnaces and casted in metal moulds on fully automatic centrifugal casting machine of swedish design thus ensuring absolute uniformity of production .

Technical Data

1 - Chemical Composition : % (Average)

C	Si	Mn	S max	P max
3 . 6	2	0 . 5	0 . 10	0 . 4

2 - Nominal Sizes :

Inch	2	3	4	5	6
Millimeters	50	75	100	125	150

3 - Standard lengths :

1800 mm & 2000 mm

Social Affair :

The compny is always concerned to raise the social and environmental levels of its workers in coordination with the technological level of the iron and steel industry in addition to inaugrate on the Workers Day Festival tne distinguished employees and those retired to pension .

Housing Facilities :

The company has constructed a complete city just beside the factories and provided with all facilities and services as traffic, schools, markets, club and cultural and religous centers .

Medical Care :

The company provides its workers free medical treatment including highly qualified specialists and professors and hospitals .

Workers Transportation :

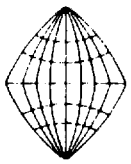
The company provides free transportation for its workers by buses, microbuses and also private cars from collecting centers all around the capital and its suburbs to the plants, these facilities are available day and night.

The Supplemental Insurance Box :

On the trust of the company administration on the necessity of increasing the Insurance care for its employee to consolidate the belonging between the employee and the company and consequently maintain the experience and effectiveness of the employee,a supplemental insurance system has been set up aiming at providing saving and insurance services for its participants which could support & consolidate the general system of the social insurance which will strengthen the relation between the employee and company which consequently would lead to increase of production.

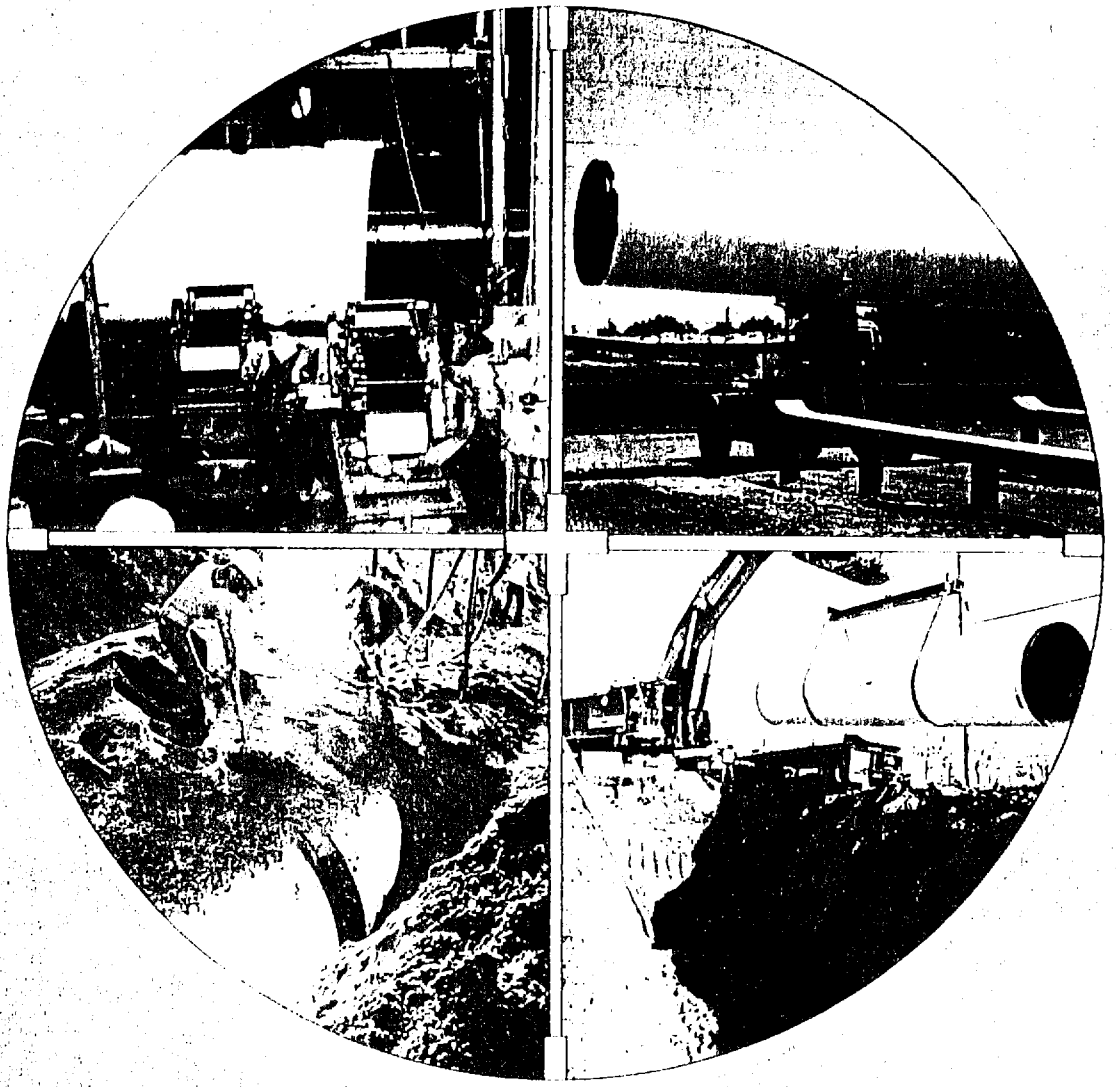
Adm. Works : Ein Helwan
Cables : TUBNSR
P.O. Box : 6 Les Bains Helwan
Telex : 92590 TUBNSR UN
Tel. : 781600 – 781966

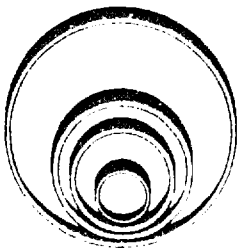
Cairo Office : 17, Gomhouria st.,
Tel. : 915229



AL NASR EXPORT & IMPORT . CO.

EL NASR STEEL PIPES & FITTINGS CO.





EL NASR STEEL PIPES & FITTINGS CO.

STANDARD SPECIFICATIONS

El Nasr steel pipes & fittings co. accomodates several plants, each covers certain field of activity. Those various activities concern with different scopes of manufacturing pipes and fittings, e. g., method of manufacturing, grade of material used (steel or cast iron), type of product, and the applied standard specifications.

The whole scope of work of the company could be seen through the detailed description of the various activities, as follows :

1 – Production of longitudinally welded steel pipes.
2 – Galvanizing of steel pipes.
3 – Production of spirally welded steel pipes.
4 – Pipe protection.
5 – Foundries for production of fittings.
6 – Foundry of spare parts.
7 – Production of Kee Klamps.
8 – Fabrication of Green houses.
9 – Fabrication of lighting poles.

PRODUCTION OF LONGITUDINALLY WELDED STEEL PIPES

El Nasr steel pipes & fittings co. produced longitudinally welded steel pipes, for the purposes of conveying water and gases, and for constructional applications.

This production consists of a wide variety of pipes and tubulars (sections) with high quality ensures high performance according to the required specifications.

The company produces those products either black or galvanized. The welding process during manufacturing of pipes is done by use of high frequency power.

The production of the company of longitudinally welded pipes has the following advantages:

- High quality of weld.
- Uniformity of thickness.
- Complete roundness.
- Complete straightness.
- Good weldability.
- Ability for bending and forming.
- High performance life of galvanized products.

The size of longitudinally – welded pipes ranges from $^{1}/_{2}$ inch to 8 inches. The sizes of squared sections from

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2 inch × 2 inch until 6 inch × 6 inch.

The size of rectangular sections ranges from 2 inch × 4 inch until 4 inch × 8 inch.

The whole process is done according to the following standards :

1 – Pipes produced for oil pipelines, according to :

a – Specifications of American Petroleum Institute (A.P.I.) from steel grades : commercial and special until grade × – 65.

b – Egyptian Specification No. 402.

2 – Pipes produced for purpose of conveying water and gas according to :

a – Specification ISO R 65.

b – Specification B.S. 1387 (Light, Medium, and Heavy).

c – Specifications DIN 2439, DIN 2440, and DIN 2441.

d – Specification : ASTM A53

e – Egyptian Specification No. 350 (1969).

3 – Tubulars produced according to:

a – Specifications DIN 2458 and DIN 5941.

b – Specifications ASTM A500 Grade B, and ASTM A513.

4 – Screwing of pipes for conveying gas according to :

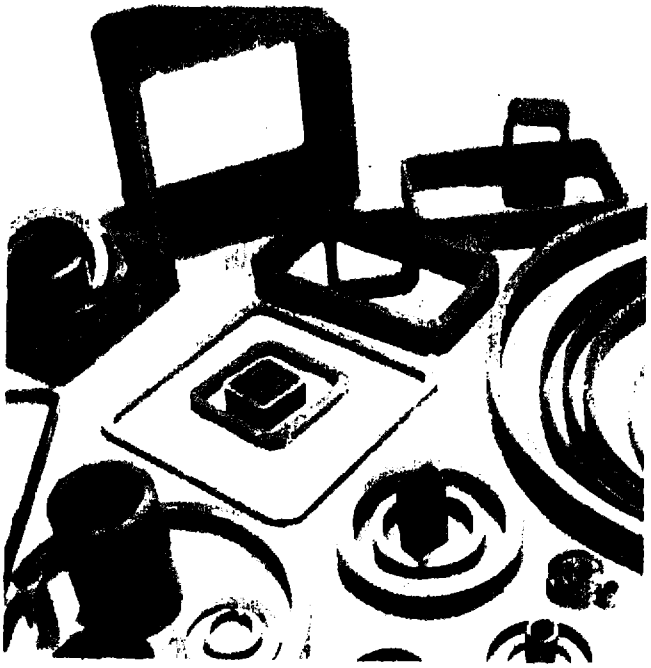
a – Specification ISO R7.

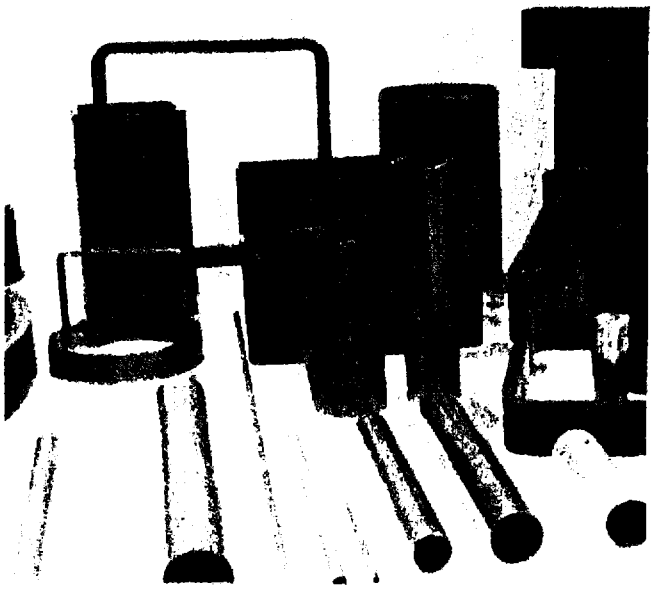
b – Specification DIN 2999.

c – Specification UNE 19009.

5 – Screwing of pipes for conveying oil according to :

- Specification API std. 5B.





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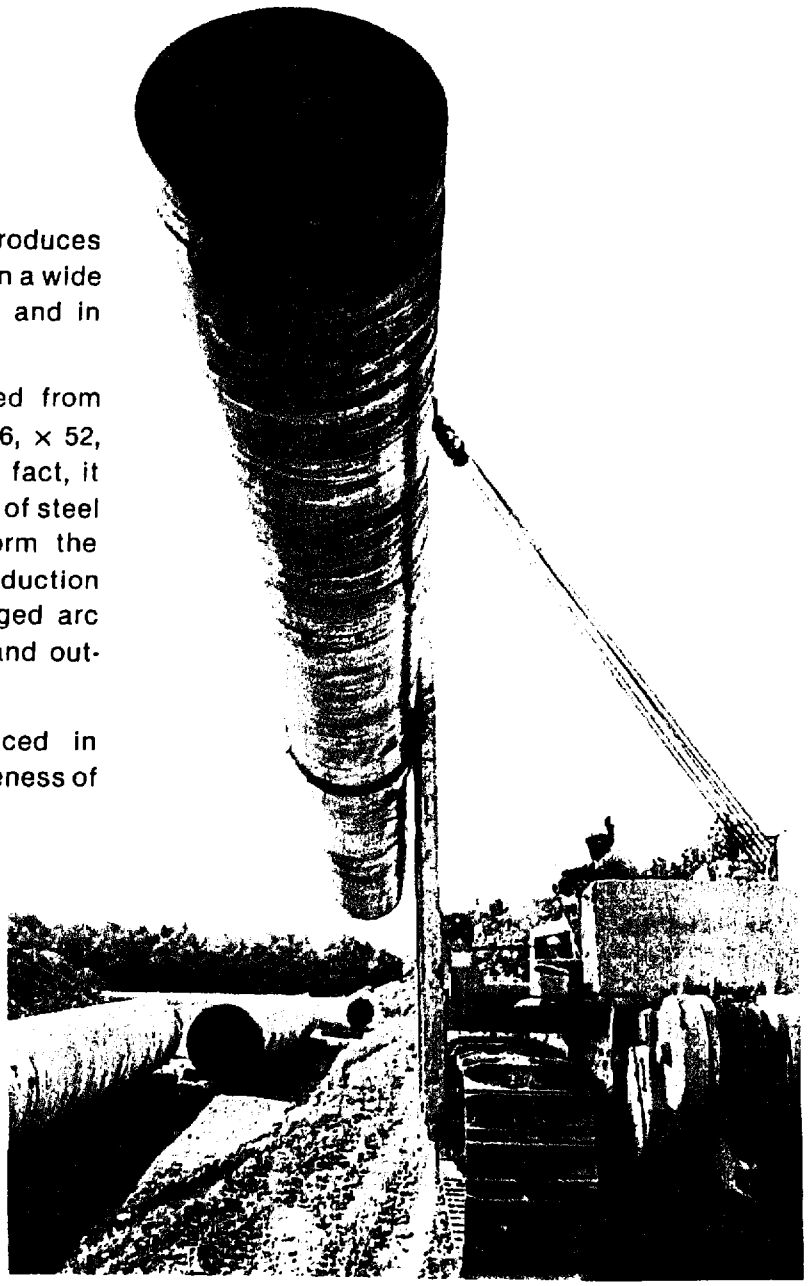
PRODUCTION OF SPIRALLY WELDED PIPES

El Nasr steel pipes & fittings co., produces spirally welded pipes which are used on a wide scale in pipelines of oil, gas, water, and in petroleum and natural gas industries.

Spirally welded pipes are produced from strips of steel of grade A, B, × 42, × 46, × 52, × 56, × 60, or × 65. As a matter of fact, it could be produced from any other kind of steel showing good weldability and conform the requirements of the purchaser. The production operation is done by use of submerged arc welding process on both the Inside and outside surfaces.

Spirally welded pipes are produced in typical lengths of 7 – 12 meters, thickeness of



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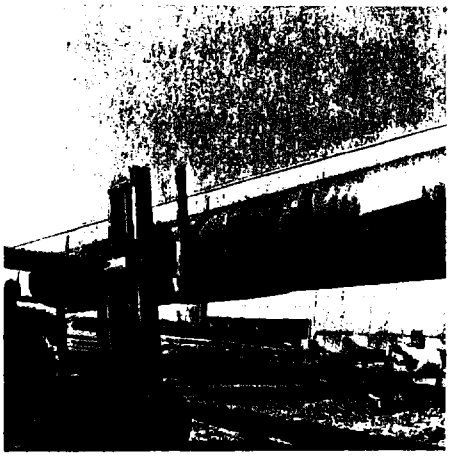
3.96 – 12.7 mm, and outside diameter of 6 $^{5}/_{8}$ – 48 inch. According to :

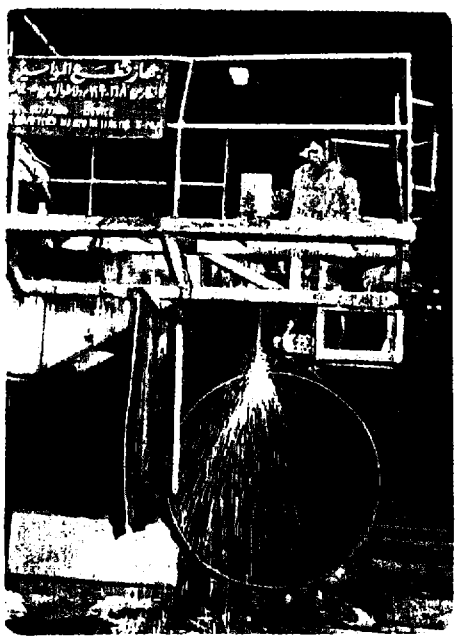
API Specification.

With the growing use of spirally welded pipes in construction of gas, oil, and water pipelines along various kinds of soil, it became a vital necessity to protect the pipelines against corrosion. It is obvious that corrosion causes great damage to the pipelines, with a high cost of : excharging the damaged part, loss of conveyed material, and shut down of the pipeline during the maintenance operation. Therefore the company established a protection unit to protect both the inside and outside surfaces of the pipe by use of bitumen and glasswool.

The protection process is done according to :

- American specification AWWA C 203 – 73.
- British specification PS / CP / CW 5.





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FOUNDRY PRODUCTION

El Nasr steel pipes & fittings co. produces castings through 3 foundries:

1 – Foundry of small fittings for the pipes, as castings of malleable iron, white – heart or black – heart. with diameters from $\frac{1}{2}$ inch to 2 inches.

2 – Foundry of big fittings for the pipes, as castings of malleable iron also. With diameters from $\frac{1}{2}$ inch to 4 inches.

3 – Foundry of spare parts, to produce castings of white – heart or black – heart malleable cast iron, Pearlitic cast iron, or nodular cast iron.

The production of castings done according to :

1 – Malleable white – heart cast iron:

a – Egyptian specification 888 (1969).

b – British specification B. S. 309 (1972) W410/4.

c – Spcification ISO 942.

2 – Malleable black – heart cast iron:

a – Egyptian specification 888 (1969).

b – British specification B. S. 310 (1972) B290/6.

c – Specification ISO 943.

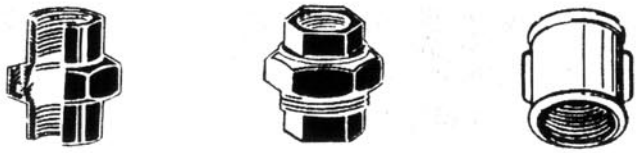
3 – Pearlitic cast iron:

a – British specification B. S. 3333 (1972) P440/7.

b – Specification ISO 944.

4 – Nodular cast iron:

• Birtish specification B. S. 2789 (1961) SNG 24/17.



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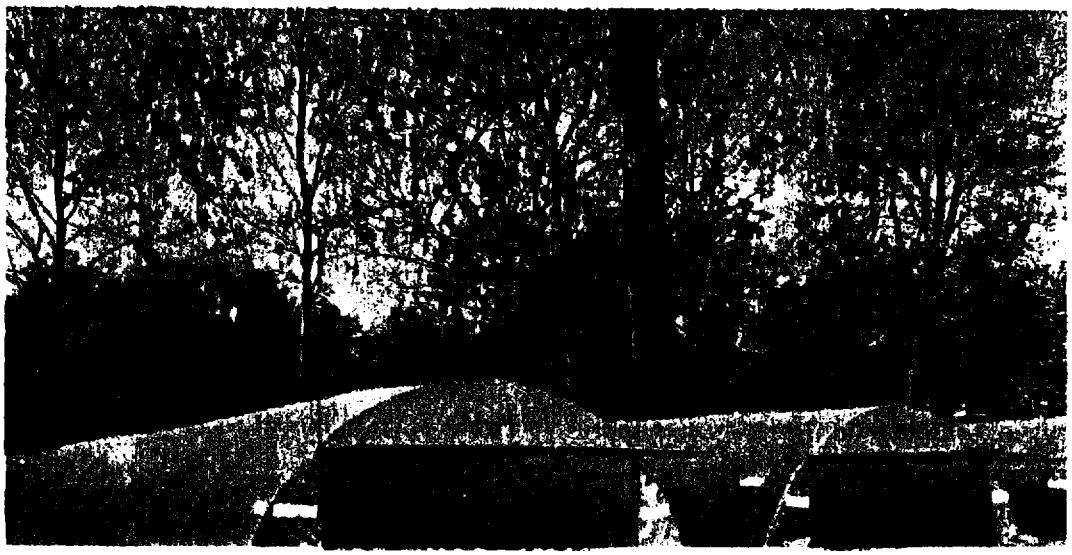


El Nasr steel pipes and fittings co., shares an important part in the progress of national economy, through the manufacturing of some products of the non – traditional type, e.g.

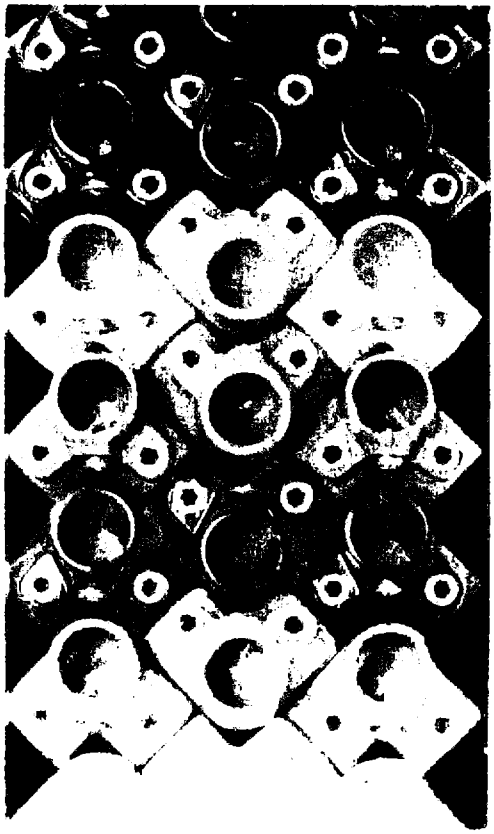
1 – Kee Klamps:

Made as castings of malleable cast iron, with surface hardening at the screw, and galvanized so as to be used under different working conditions. Kee klamps used in many shapes of constructions, e.g., railings, racks, panels of solar energy, frames of shades and trucks ... etc. It has the advantages of : low labourforce needed, no drilling, serewing, bolting, or welding needed. It is manufactured according to the : American specification ASTM A47 Grade 32510.

2 – Green houses :

Manufactured as truss constructed from pipes and Kee klamps to grow plants under controlled conditions of humidity and temperature.

3 – Lighting Poles:



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