SYMAGA
SILOS

industrial silos

www.symaga.com

INDEX

RUSSIA, 58.244 m³

silos

SYMAGA SILOS

01

KEY FACTS

Symaga is a Spanish company specialized in designing, manufacturing and marketing galvanized steel silos for the storage of seeds, grains, malt, oilseeds, pellets, rice, and, in general, agriculture, agroindustry, bio-fuels and biomass.

EXPERIENCE OF

35

YEARS

Backed by an **experience of 35 years and more than 42 million m³ of storage built worldwide**, Symaga ensures the optimal execution of any project. We have **performed projects in more than 145 countries.**

CONSTRUCTED STORAGE

42

M m3

PRODUCTION CAPACITY

30

ROBOTS

WORLD LEADERS

RELIABILITY AND QUALITY

The constant investment in updated technology has achieved the total automation, reaching **maximum quality standards**.

Integral traceability system has its own **quality control system**, allowing us to control all manufactured product at real-time. Furthermore, al machines count with **Computer Numercial Control**. Besides, Symaga obtained **CE certificate** in manufacturing process.

Our products are renowned for their durability and easy-assemble. Silos are manufactured in ondulated galvanized steel. Raw material used in the process is certied, wih maximum quality, and European origin.

references in more than 145 countries

R & D

Symaga has constantly invested in R & D. This innovating work is developed in conjunction with clients and suppliers, thereby improving our products and services and thus giving better value and eficiency to our customers.

MORE THAN

200

EMPLOYEES

Our Technical and Engineering Department, and After-sales Service Department, are always available for our customers: since the initial layout conguration until the assembly nalization. Moreover, our multi-lingual Commercial Department facilitates communication.

MORE THAN

12.000 T

OF GALVANIZED STEEL IN STOCK

Symaga features more than **12.000 tons of galvanized steel of average standing stock**, giving us the ability to deliver on the agreed date.

02

GENERAL HISTORY

Symaga was founded in 1985 by Alfonso Garrido Muñoz, basing the business in manufacturing and marketing of farm silos and livestock equipment.

Symaga began in the heart of La Mancha, in Villarta de San Juan, in a small craft of 200 metres. Nowadays Symaga has a factory located on a plot of 400.000 sqm of land with **100.000 sqm of buildings**.

More than 90% export rate.

Symaga international presence has an exponential growth year after year. We are currently present in over **145 countries worldwide**.

PLOT OF LAND:

400.000 sqm

BUILDINGS:

100.000 sqm

1985

200 sqm

2020

CRAFT:

THE COMPANY IS STRUCTURED INTO:

3

DIVISIONS

SYMAGA GROUP

SYMAGA SILOS

GROWKET SYMAGA GROUP

AGRAVID SYMAGA GROUP

founded in 1985

quality commitment

ROMANIA, 49.705 m³

Our products are recognized worldwide for their strength, durability, reliability and easy assembly. Silos are made of galvanized corrugated steel, with **a 600 gr/m² coating**, ensuring **a double service life more than other suppliers**. All used material raw are certied and of the highest quality.

We also have a growing line of accessories and options allowing us to offer a product that completely meets your needs.

Our commitment to quality is not limited to the product, but to a technical and commercial service.

03

EXPERIENCE, RELIABILITY AND QUALITY

capacity of production

Several quality controls are applied to the material upon receipt and in all phases of the manufacturing process in order to allow us to ensure the quality until delivered.

Symaga has a quality management program to control its manufacturing process at real time.

All machines involved in production processes include CNC system, “Computer Numeric Control”, to ensure accuracy and standardize the quality.

RUSSIA, 139.778 m³

04

MAIN REFERENCES

REFERENCES IN MORE THAN

145

COUNTRIES

GERMANY 12.248 m³

GERMANY 126.735 m³

SPAIN 69.954 m³

SPAIN 20.241 m³

SPAIN 27.370 m³

SWITZERLAND 2.049 m³

GERMANY 23.696 m³

LATIN AMERICA , SPAIN & PORTUGAL

GERMANY, AUSTRIA & SWITZERLAND

LATIN AMERICA , SPAIN & PORTUGAL

AFRICA & MIDDLE EAST

MEXICO 7.960 m³

MEXICO 9.683 m³

BOLIVIA 18.004 m³

SOUTH AFRICA 1.232 m³

ETHIOPIA 28.109 m³

EGYPTO 38.526 m³

COLOMBIA 28.965 m³

CHILE 52.316 m³

URUGUAY 35.643 m³

ARGENTINA 26.382 m³

IRAN 30.618 m³

LIBYA 9.672 m³

SAUDI ARABIA 77.172 m³

HUNGARY 3.343 m³

NORWAY 11.529 m³

CZECH REP. 15.128 m³

ROMANIA 150.608 m³

SERBIA 12.728 m³

SWEDEN 13.497 m³

GREECE 33.600 m³

CYPRUS 1.110 m³

ITALY 24.549 m³

EUROPE

CIS COUNTRIES

RUSSIA 58.244 m³

RUSSIA 78.977 m³

RUSSIA 13.616 m³

RUSSIA 9.917 m³

RUSSIA 28.878 m³

LATVIA 79.168 m³

RUSSIA 139.778 m³

RUSSIA 55.975 m³

RUSSIA 25.100 m³

KAZAJSTAN 65.890 m³

KAZAJSTAN 65.890 m³

UZBEKISTAN 1.689 m³

UKRAINE 704.887 m³

UKRAINE 126.290 m³

UKRAINE 212.220 m³

UKRAINE 12.880 m³

UKRAINE 316.386 m³

LITHUANIA 39.096 m³

INDIA, NEPAL & SRI LANKA

INDIA 15.870 m³

INDIA 57.402 m³

NEPAL 6.426 m³

SRI LANKA 6.952 m³

ASIA & OCEANIA

INDONESIA 101.900 m³

PHILIPPINES 28.688 m³

MALAYSIA 7.960 m³

NEW ZEALAND 1.925 m³

KOREA 12.945 m³

THAILAND 55.004 m³

AUSTRALIA 224 m³

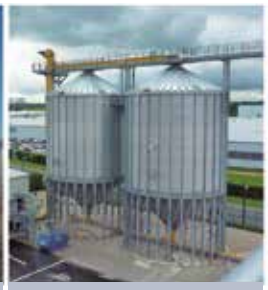
VIETNAM 5.888 m³

05

SYMAGA SILOS

Symaga offers a wide range of silos that can be classied into the following types:

FLAT BOTTOM SILOS (OR WITH CONICAL CONCRETE FOUNDATION) FOR LONG TERM STORAGE OF LARGE QUANTITIES OF GRAIN, SEEDS...



SILOS WITH LOWER STEEL HOPPER, WITH 45° OR 60° DEGREES DEPENDING ON THE FLOWING OF THE PRODUCT STORED. DISCHARGE BY GRAVITY

HOPPER SILOS FOR ELEVATED STRUCTURE, UNLOADING TO TRUCK OR TRAIN

INDOOR SILOS DIAMETERS FROM 4.60 TO 12.23M, MAXIMUM HEIGHT 11.45M

MASS DISCHARGE SILOS

SMALL CAPACITY FEED SILOS SUITABLE FOR LIVESTOCK

GERMANY, 23.696 m³

GREECE, 33.600 m³

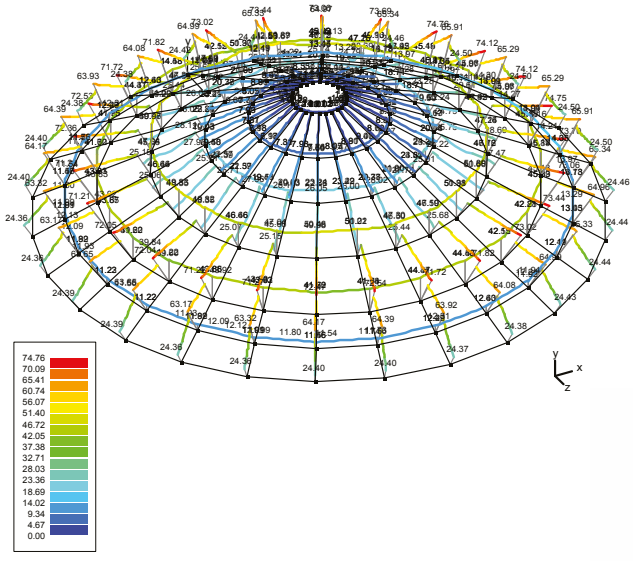
06

COMPONENTS

COVERING ROOF

GALVANIZATION
ZM 310

- **30º degrees roof** to optimize storing capacity, and adapted to the natural slope of the grain.
- **Supplied with or without structure** depending on the diameter of the silo and roof loads.
- **They are composed by trapezoidal sectors** of special conguration, which gives a better sealing and waterproof.
- **Roof has a special geometry**, due to the wave of the roof and longitudinal folds, which gives high strength and stiffness.
- **Different design depending of snow load** location of the installation.
- **Manufactured with structural steel**, with optimized special galvanized coating, ZM310, for best results in terms of resistance to corrosion (zinc, aluminum and magnesium).



CYLINDRICAL BODY

GALVANIZATION Z600

BODYSHEETS

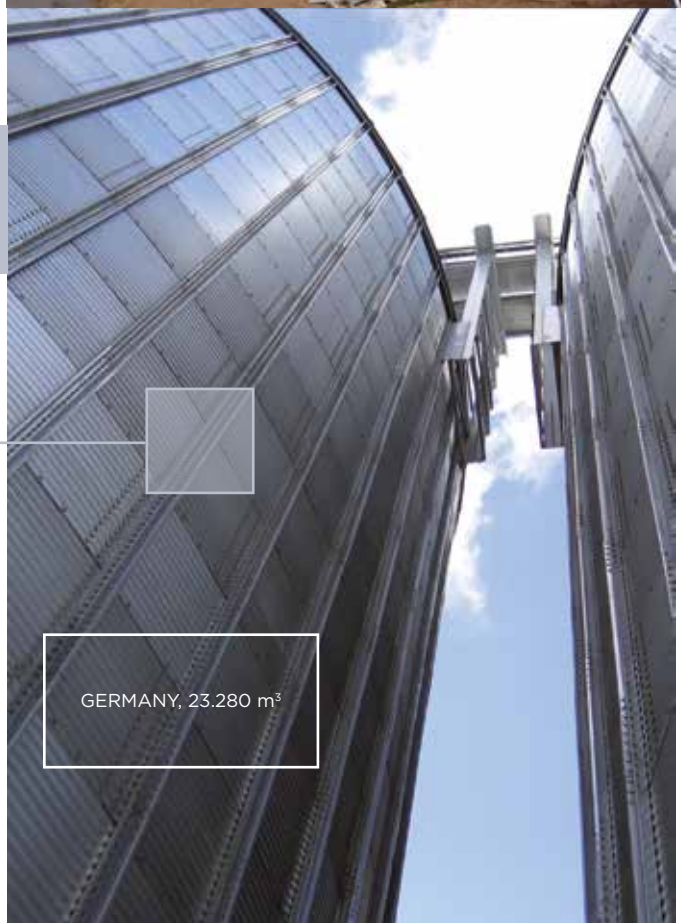
STIFFENERS

Bodysheets:

• They are manufactured from a **structural steel S 350 GD Z600.**

• Our modern machinery guarantees perfect shaping of the bodysheets, avoiding assembling difficulties.

• Our bodysheet's pitch with 76 mm width and 14 mm depth improves and optimizes the perfect flowing of the grain as well as silo strength.



Stiffeners:

• Symaga uses **2 or 3 stiffeners per bodysheets**, depending on the silo model.

• Both bodysheets and stiffeners **are marked with its thickness and type of joint in each piece**, facilitating pieces identification, so that minimizing assembly mistakes.

HOPPER

Hopper is made up of sector of structural **steel S 350 GD – Z600**, and can be performed with **45°, 60° or 66°** degrees, depending on the owing of the stored material.

GALVANIZATION
Z600

LEGS AND BRACES

Legs and bracing of our **structural steel silos are hot-dip galvanized**. Symaga has wide experience in the design of these critical elements, depending on the seismic zone in which the project will be performed.

HOT DIP GALVANIZATION

COMPRESSION RING

From certain height and volume, our metal hopper silos have hot dip galvanized compression ring welded on both sides which gives the silo a **higher quality and faster structural assembly**.

BOLTING

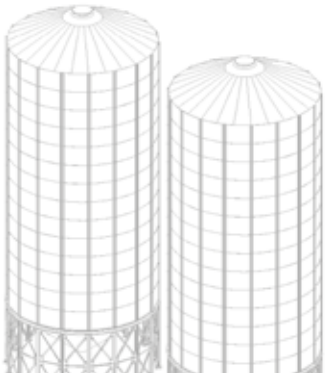
Quality 8.8 and 10.9 (ISO 898 -1:2009 and 898 - 2:2003). Supplied preassembled bolting is hot dip galvanized with a coating of 70-85 microns (UNE – EN ISO 10684:2006).

Nuts are of **category 8**.

Neoprene EPDM washers guarantee sealing.

BUTTYL RUBBER COMPOUND

It is supplied in a preformed way to ensure optimal sealing.



INSPECTION DOOR

Inspectioning the content and condition of the grain and treatments.

ROOF STEPS

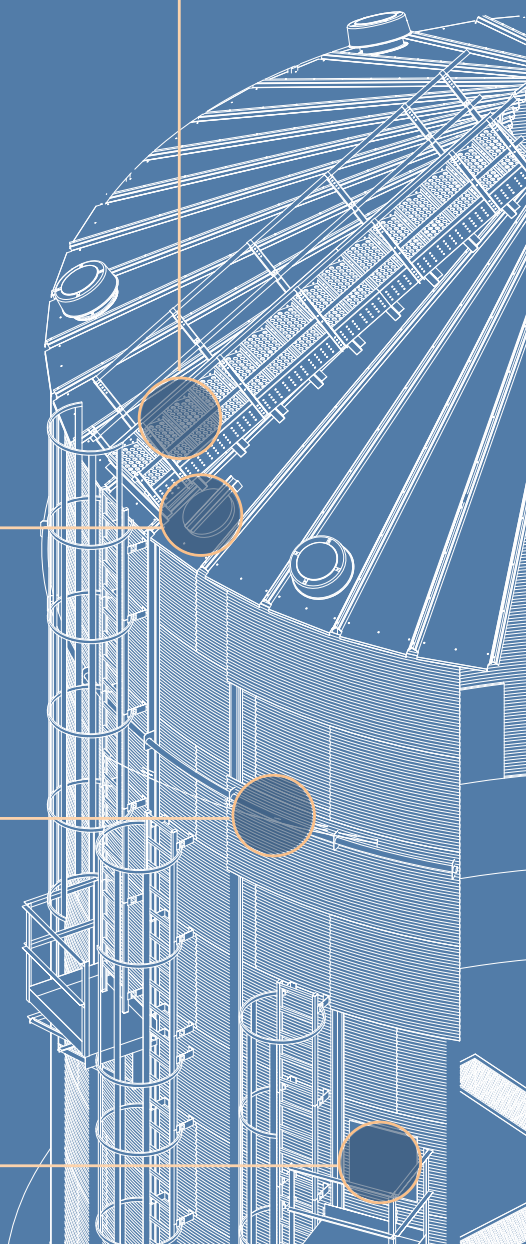
Roof scale with universal rungs.

WIND RINGS

Are provided in order to resist the wind forces and to prevent deformation of the silo.

ACCESS DOOR

Placed in the second ring. The bodysheet is supplied with the door already implemented.



07

OPTIONAL ACCESORIES

LADDERS

• **With a safety ring and rest platforms**, handrails and non-slip steps. They are according to all current safety regulations. (UNE EN ISO 14122-1/2/3/4: 2002).

• **Galvanized**, increasing its service life of the tting. In addition, our ladders are modular, which speeds installation and allows greater flexibility.

LADDER TO ROOF

To get the roof of the silo by climbing up the cylinder wall. With a safety cage and intermediate rest platforms, according to the UNE EN ISO 14222-1/2/3/4: 2002.

LADDER TO ACCESS DOOR

Includes a support platform.

ROOF STAIRWAY
Easy and safe access, with handrail roof ladder.

SPIRAL LADDER
Distributed spirally around the silo.

ZIGZAG STAIRS

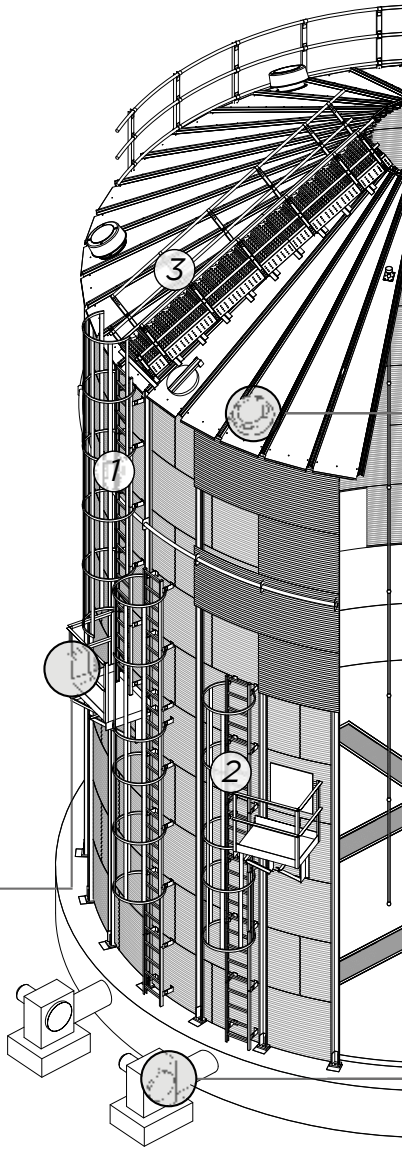
We provide this stair in zigzag patterns facilitating the access to the top of the silo, to an elevator tower or to a work tower.

INSIDE LADDER

a) It connects access door on the slope to the ground.

b) As an option, it may connect the inspection door to the ground.

REST PLATFORM



AERATION SYSTEM

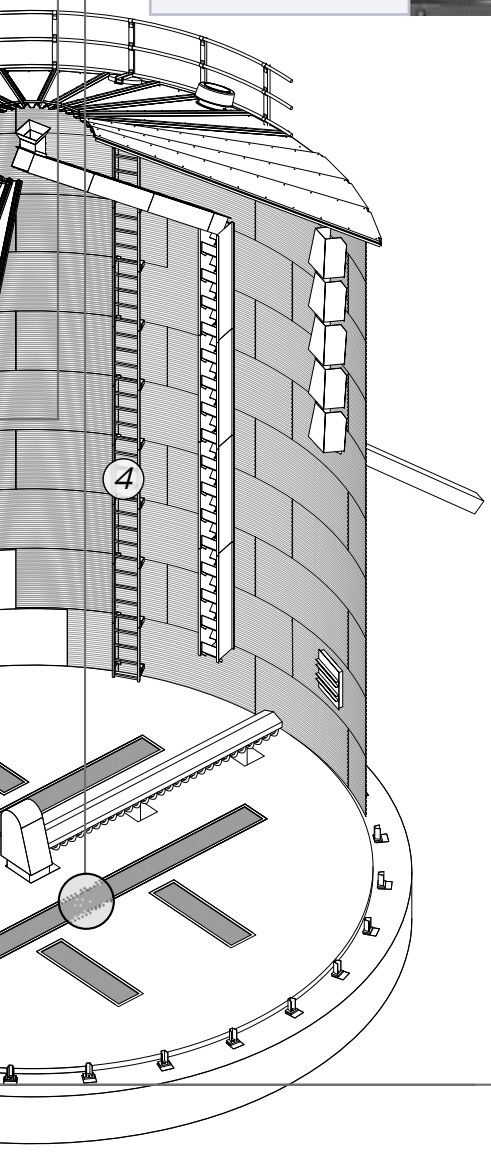
ROOF VENT

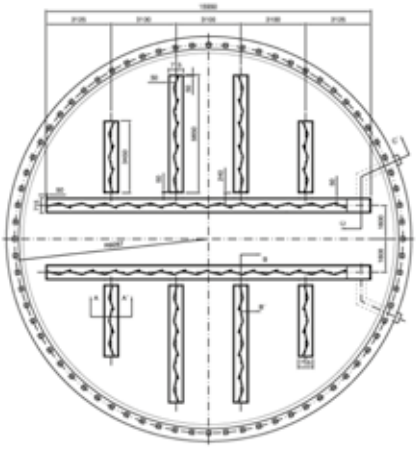
- **With circular design preventing the accumulation of water, snow and rubbish and opposes less air resistance**.
- It is easy-assembly, embossed, perfect-sealed with the roof section, and it comes with anti-bird net.
- It is prepared with a special sealing system for fumigation, and ready for the installation of an exhaust fan coil to avoid condensation.

AERATION GUTTERS SYSTEM

Aeration channels

- Designed **to cover 12.5%** of the total area of the base of the silo.
- They are made up of foundation channels that are covered **with special galvanized boxes, corrugated and multi-perforated of diameter 1 or 1.5 mm**. The channels may have shape of “Y” or “H”, depending mainly on the volume of storing product.





EXTRACTOR FANS

- **Helicoidal fan** on the roof as part of an aeration roof vent.

FANS

- **Avaliable supply air fan, or exhaust fan**. IE3 certification, ensuring energy efficiency.

07

OPTIONALS ACCESORIES

AERATION SYSTEM

FULL PERFORATED FLOOR

The fully perforated floor is supported by a floor galvanized steel structure. Perforations are of a diameter of 1 or 1.5 mm, depending on the stored grain. Brackets are made of hot dip galvanized steel, which allows a better airflow and therefore a better ventilation.

PREFABRICATED GUTTERS

Gutters are installed in silo foundation. This element is manufactured in 3 mm thickness galvanized steel, depending on installation characteristics (size, width and depth of the silo and foundation, and the total volume of the stored grain). “Y”, “H” and “C” types available.

HOPPER AERATION SYSTEM

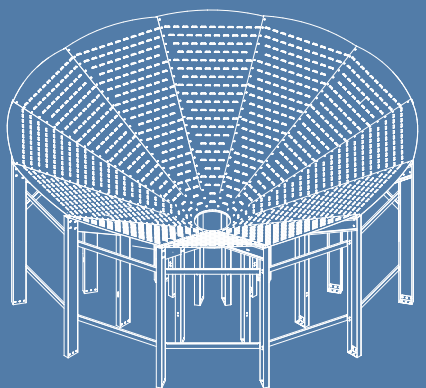
Aeration channel system with drillings, fixed to a hopper sector and prepared for the connexion with the fan.

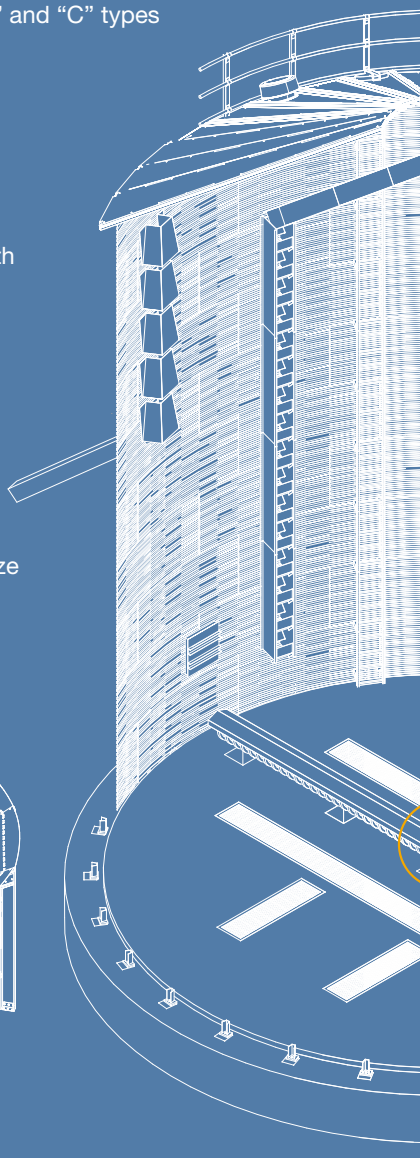
GRAIN CHILLER

Improve grain preservation, avoiding fumigation. Minimize weight loss. Allows cooling regardless of environmental conditions.

VENTILATED CONE

Elevated cone made of galvanized steel inside the silo. The system avoids contact between the ground and grain, making civil works cheaper.





ADDITIONAL SYSTEMS

TEMPERATURE MONITORING SYSTEM

Symaga offers 3 types of temperature control systems: Manual, Auto (centralized to a computer) and Portable (connected to a PDA).

Robust analog or digital sensors are offered, ensuring uninterrupted operation. It is a passive system which requires no maintenance.

The probes are supported on two beams, so their weight is not supported by roof sector. The probes can be replaced without emptying the silo.

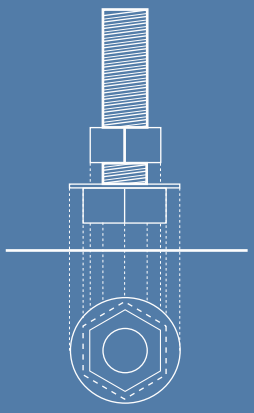
ATEX certified.

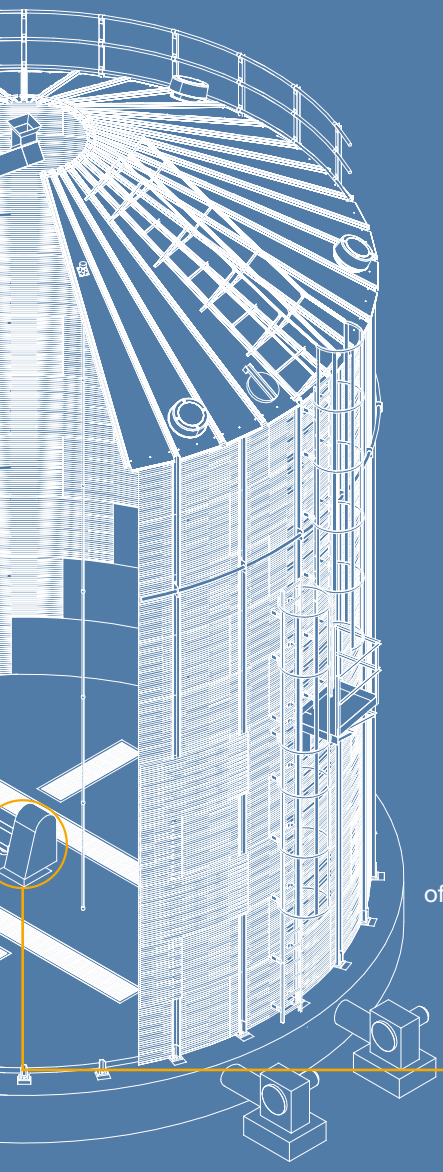
MAXIMUM AND MINIMUM LEVEL SENSORS

They are used to indicate when the silo is full, and when it is empty. They may be supplied rotating, capacitive or membrane type.

VENTING SYSTEM

Venting system is based on polyamide bolt-nut system in sector joints which gives rise to a venting anti-explosions surface according to EN 14491 2012 norm and anti-explosions ATEX norm.





ERECTION TOOLS

Complete set of tools for silo mounting.

It is used to empty completely the flat bottom silo. Symaga offers industrial sweep augers with ATEX certification.

SWEEP AUGER

07

OPTIONAL ACCESORIES

ROOF

METALLIC EAVE SKIRT

Metallic eave skirt avoiding water and snow entrance, made in galvanized steel.

EAVE CATWALK

Perimetral catwalk around eave, allowing the path around the eave. Exterior and interior.

FOAM EAVE CLOSE

Symaga proposes a system for closing eave between silo cylinder and roof, to prevent water and snow entry into the silo and to guarantee the tightness of the silo. This eave close is made of FOAM.

ANTI-AVALANCHE

Galvanized rail on the roof avoiding snow avalanches.

EAVE HANDRAIL

It consists of a perimeter handrail and upper stiffeners support it. This item increases operator safety.

ROOF ACCESS DOOR

Entrance to the silo from roof.

ROOF HANDRAIL

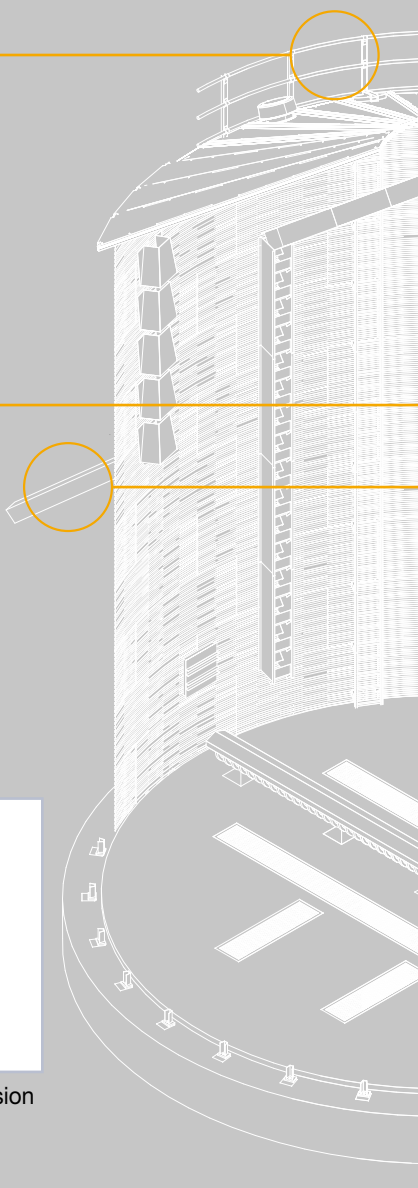
Ensuring the transit from roof inlet until the inspection door.

SEMIAUTOMATIC GATE

Allow opening from the ground.

PNEUMATIC CHARGE FILLING

Channel system with charge and decompression pipe to fill the silos with air pressure.



07

OPTIONAL ACCESORIES

CYLINDER

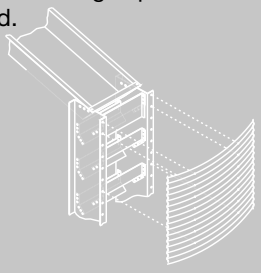
Sizes 400x400 and 250x250. Different activation: manual, electric, pneumatic and double.

SLIDE GATE FOR HOPPER SILOS OUTLET

Allow the entry of machinery inside the silo.
Anchor plate to the floor and reinforcements.
Lock system included.
Galvanized finishing.

GRAIN FALL SPEED REDUCER

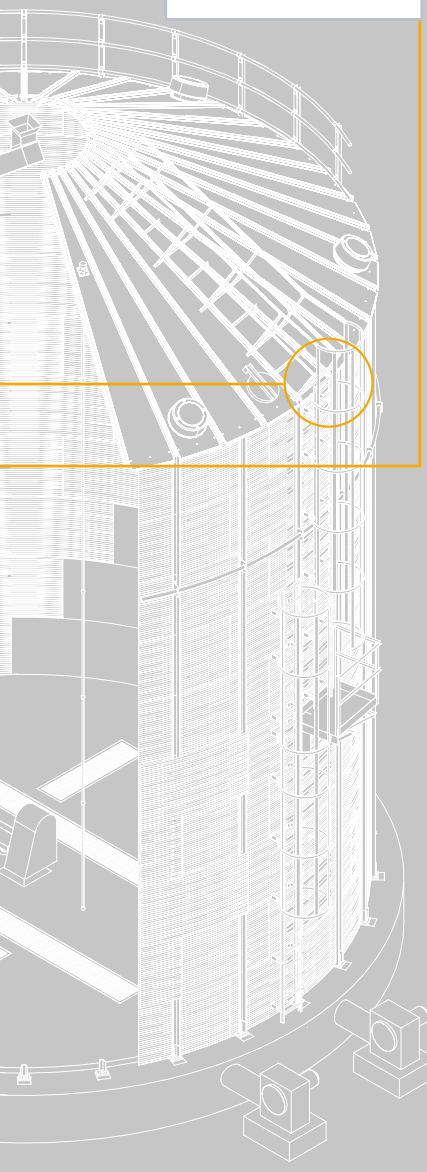
This accessory avoid grain damage and breakage with deflector plates, as well grain disaggregation by weight or dust creation, thus minimizing explosion hazard.



ACCESS DOOR FOR HEAVY MACHINERY

SIDE DISCHARGE SYSTEM

It empties the silo down to 70% of the capacity without energy spending or maintenance. Unloading could be performed to truck, train or conveyor.



DOUBLE BODYSHEET ACCESS DOOR

Double door for easier access into the silo. Placed in the first and second rings. The inner door is divided into 3 sections to avoid grain leak.

INNER FLAT LINING

The inner flat sheets are a smooth lining to improve the flowing of the material and the cleanliness of the silo.

ANCHORAGE SYSTEM

We provide standard, mechanical and chemical anchor bolts.

CLOSING ANGLE

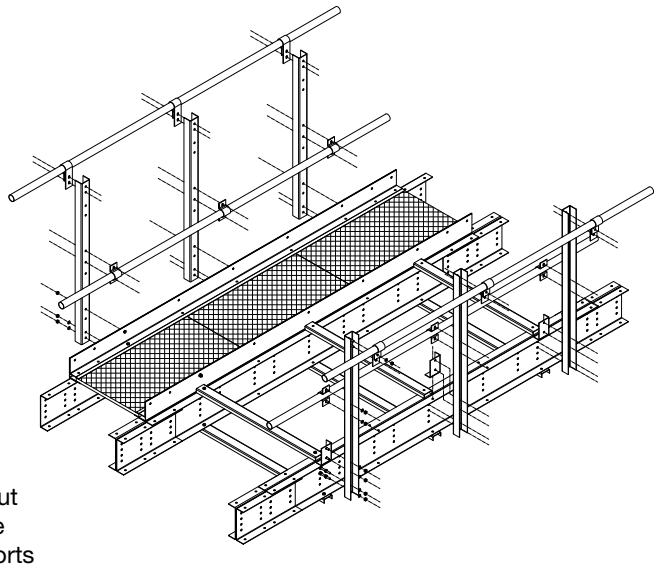
Perimetral closing for silo with non-elevated inner slab.

FOUNDATION SEALING

Butylic paint and compound sealing the foundation.

07 OPTIONAL ACCESORIES

SUPPLEMENTARY STRUCTURES



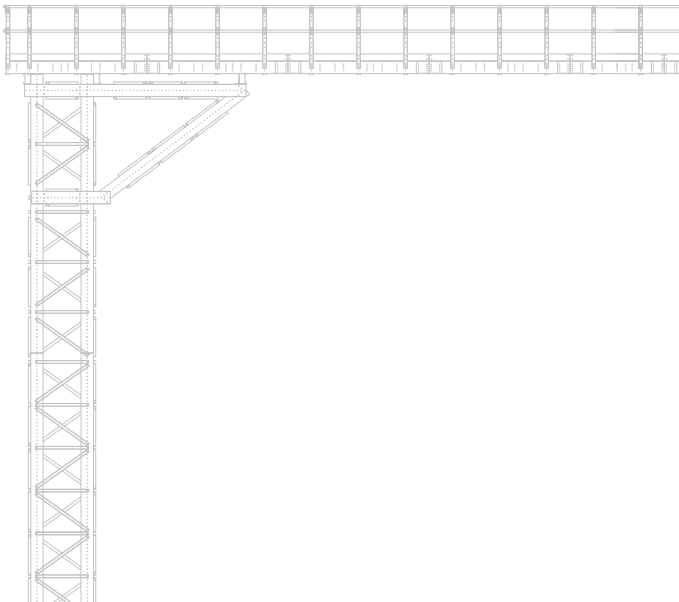
COLUMNS AND SUPPORTS

We design supports according to the load out conveyor, snow load and the diameter of the silos. Symaga engineers columns and supports according to installation configuration, according to UNE EN ISO 1993 norm.

CATWALKS

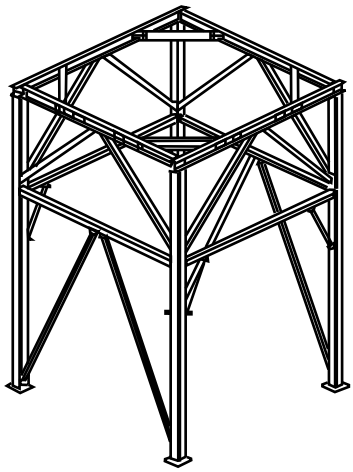
Our catwalks are modular, consequently adjustable to each project. Design is made according to UNE EN ISO 14122. Closed catwalk is available.

ROOF SUPPORT



Galvanized supports on silo dome for conveyor.

SUPPORT STRUCTURE FOR DELIVERY SILO



Support structure for delivery silo with free total height of 5 metres for truck or train transit.

REDLER SUPPORT

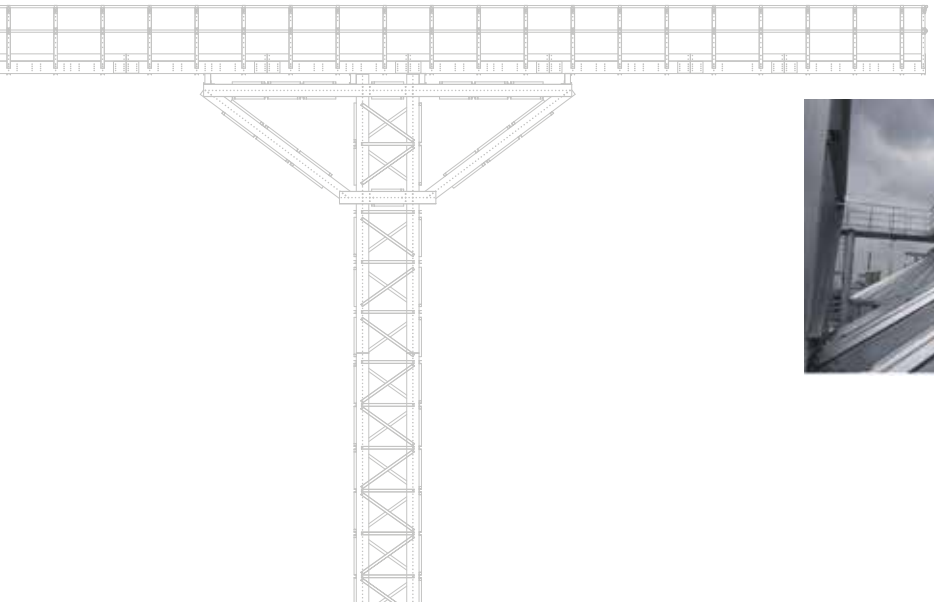
Hot dip galvanized conveyor supports, with adjustable height.

PLATFORM BETWEEN SILOS

To give access to the inspection door.

ELEVATOR TOWER

Easy-access elevator tower.



MAINTENANCE PLATFORM

Modular metallic structures of 700, 900 or 1100 mm. wide that adapted to the installation to ease the maintenance. Options on standard or tramex floor.

07

OPTIONAL ACCESORIES

EXTERNAL FINISHES

SILO LINING

The outer lining adds extra protection against corrosion and provides extra insulation. It is available for roof, cylinder and hopper, in different colours (white, green and blue).

POWDER PAINTING

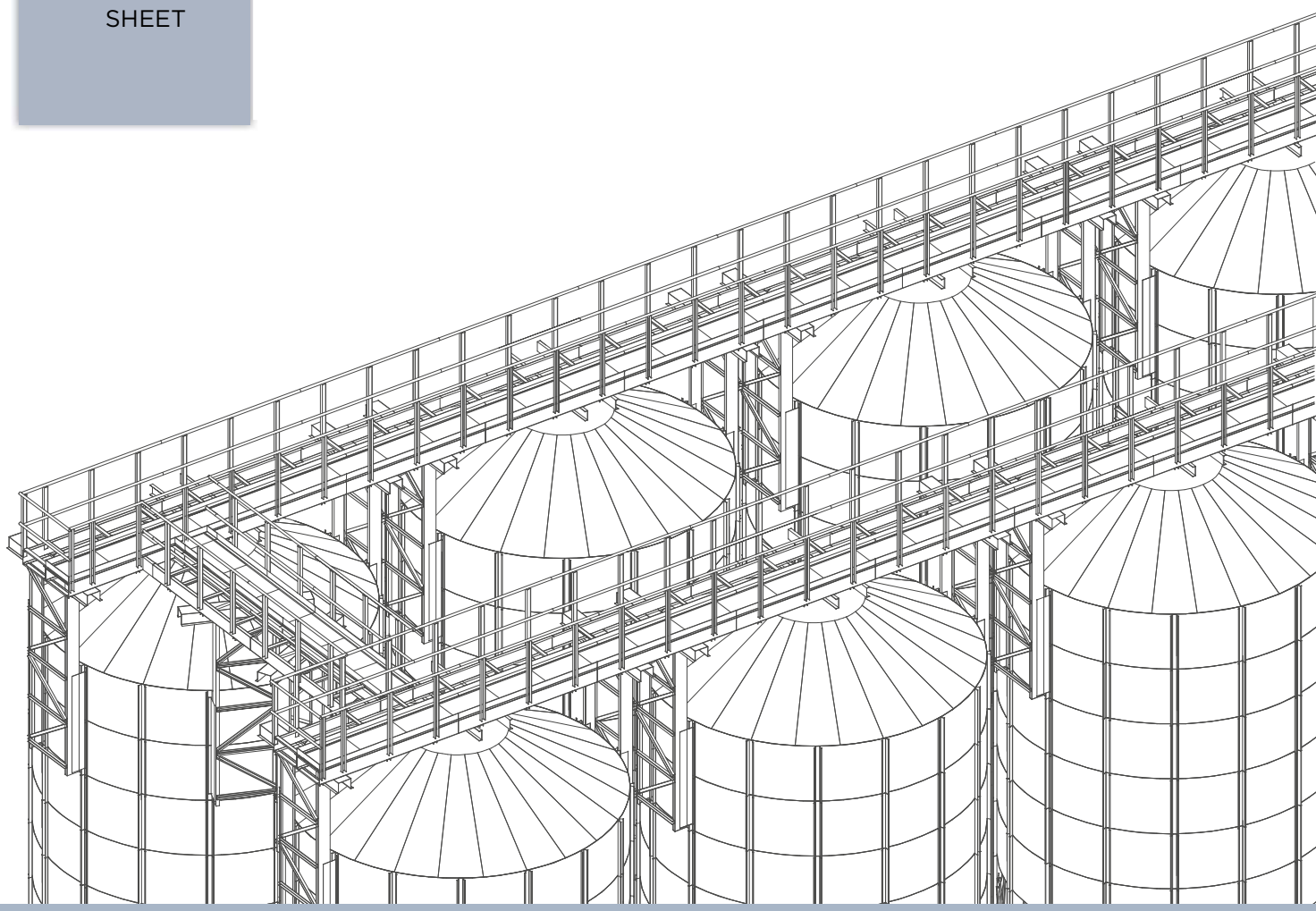
Coating with polyester resins. Minimum thickness applied 80 µm each side. Thickness and colour RAL on demand. Food use painting in option.

PRE-LACQUERED ROOF

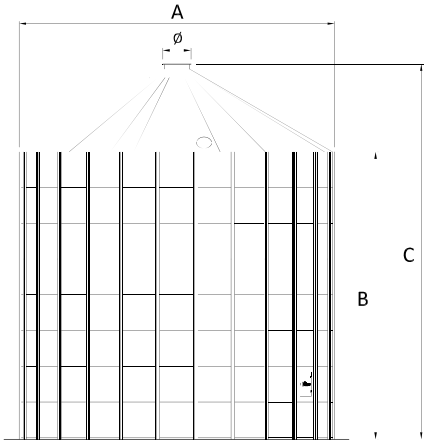
Roof galvanized steel S280GD+Z225 GS sector are previously pre-lacquered with 25/7 µm polyester. Available in white, green and blue.

08

TECHNICAL SHEET



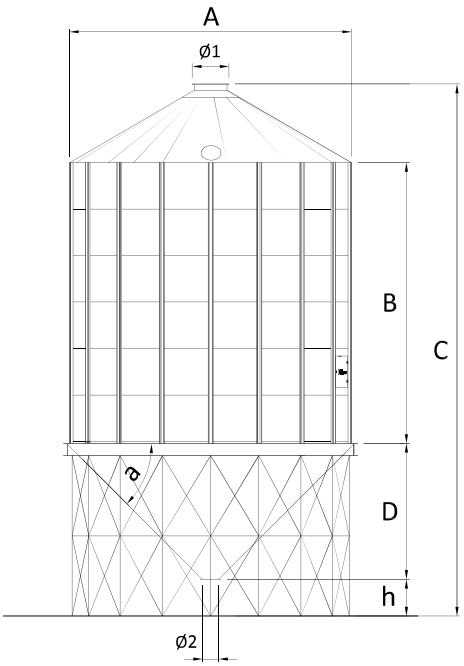
FLAT BOTTOM SILOS



SBH - FLAT BOTTOM SILO - VOLUME

FLAT BOTTOM SILOS	SILO Ø (m) A	3,00	3,50	4,60	5,35	6,10	6,87	7,60	8,40	9,20	9,93	10,70	11,45	12,23	12,98	13,75	14,51	15,28	16,80	17,57	18,34	19,86	21,39	22,15	22,92	23,68	24,44	25,98	27,50	32,08
	ROOF HEIGHT (m) C-B	0,69	0,79	1,26	1,48	1,69	1,92	2,14	2,36	2,59	2,81	3,03	3,25	3,47	3,70	3,90	4,13	4,35	4,79	5,10	5,30	5,77	6,21	6,41	6,65	6,87	7,09	7,53	7,65	8,96
RINGS NUMBER	CYLINDRICAL HEIGHT (M) B	VOLUME (m³)																												
4	4,61	35	47	83	115	152	195	244	299	361	430	505	587	677	774	878	991	1.111	1.377	1.530	1.684	2.024	2.401	2.601	2.816	3.040	3.273	3.773	4.252	6.143
5	5,75	44	58	102	140	185	237	296	363	437	518	608	705	811	925	1.047	1.179	1.320	1.630	1.807	1.985	2.377	2.810	3.040	3.287	3.542	3.808	4.377	4.930	7.064
6	6,89	52	69	121	166	219	280	349	426	512	606	710	823	944	1.076	1.216	1.368	1.529	1.883	2.083	2.286	2.731	3.220	3.480	3.757	4.044	4.343	4.981	5.607	7.986
7	8,03	60	80	140	192	252	322	401	489	587	695	812	940	1.078	1.227	1.386	1.557	1.738	2.135	2.359	2.587	3.084	3.630	3.919	4.227	4.547	4.878	5.585	6.284	8.908
8	9,17	69	91	158	217	286	364	453	552	662	783	915	1.058	1.212	1.378	1.555	1.745	1.947	2.388	2.636	2.888	3.437	4.040	4.359	4.698	5.049	5.413	6.189	6.961	9.830
9	10,31	77	102	177	243	319	407	505	616	738	871	1.017	1.175	1.346	1.529	1.724	1.934	2.156	2.641	2.912	3.189	3.790	4.449	4.798	5.168	5.551	5.948	6.794	7.639	10.751
10	11,45	85	113	196	268	353	449	558	679	813	960	1.120	1.293	1.480	1.680	1.894	2.123	2.365	2.894	3.189	3.490	4.144	4.859	5.238	5.638	6.053	6.483	7.398	8.316	11.673
11	12,59	94	124	215	294	386	491	610	742	888	1.048	1.222	1.410	1.613	1.832	2.063	2.311	2.574	3.147	3.465	3.791	4.497	5.269	5.677	6.109	6.555	7.018	8.002	8.993	12.595
12	13,73	102	135	234	320	419	534	662	805	963	1.136	1.325	1.528	1.747	1.983	2.232	2.500	2.783	3.400	3.742	4.092	4.850	5.678	6.117	6.579	7.058	7.553	8.606	9.670	13.517
13	14,87	110	146	252	345	453	576	714	869	1.039	1.225	1.427	1.646	1.881	2.134	2.402	2.688	2.929	3.653	4.018	4.393	5.203	6.088	6.556	7.049	7.560	8.089	9.210	10.347	14.439
14	16,01	119	157	271	371	486	618	767	932	1.114	1.313	1.529	1.763	2.015	2.285	2.571	2.877	3.201	3.906	4.294	4.694	5.557	6.498	6.996	7.520	8.062	8.624	9.814	11.025	15.360
15	17,15	127	168	290	396	520	661	819	995	1.189	1.401	1.632	1.881	2.149	2.436	2.740	3.066	3.410	4.159	4.571	4.995	5.910	6.907	7.435	7.990	8.564	9.159	10.418	11.702	16.282
16	18,29		179	309	422	553	703	871	1.058	1.264	1.490	1.734	1.998	2.282	2.587	2.909	3.254	3.619	4.412	4.847	5.296	6.263	7.317	7.875	8.460	9.066	9.694	11.022	12.379	17.204
17	19,43		190	328	448	587	745	923	1.122	1.340	1.578	1.837	2.116	2.416	2.738	3.079	3.443	3.828	4.665	5.124	5.597	6.616	7.727	8.314	8.931	9.569	10.229	11.626	13.056	18.126
18	20,57			347	473	620	788	976	1.185	1.415	1.666	1.939	2.234	2.550	2.889	3.248	3.632	4.037	4.918	5.400	5.898	6.970	8.136	8.754	9.401	10.071	10.764	12.230	13.733	19.047
19	21,71			365	499	654	830	1.028	1.248	1.490	1.755	2.042	2.351	2.684	3.040	3.417	3.820	4.246	5.170	5.677	6.199	7.323	8.546	9.193	9.871	10.573	11.299	12.834	14.411	19.969
20	22,85			384	524	687	872	1.080	1.311	1.565	1.843	2.144	2.469	2.817	3.191	3.587	4.009	4.455	5423	5.953	6.500	7.676	8.956	9.633	10.341	11.075	11.834	13.439	15.088	20.891
21	23,99			403	550	720	915	1.133	1.374	1.641	1.931	2.246	2.586	2.951	3.342	2.756	4.198	4.664	5.676	6.230	6.801	8.029	9.366	10.072	10.812	11.577	12.370	14.043	15.765	21.813
22	25,13			422	576	720	957	1.185	1.438	1.716	2.019	2.349	2.704	3.085	3.493	3.925	4.386	4.873	5.929	6.506	7.102	8.383	9.775	10.512	11.282	12.080	12.905	14.647	16.442	22.735
23	26,27			441	601	787	999	1.237	1.501	1.791	2.108	2.451	2.822	3.219	3.644	4.095	4.575	5.082	6.182	6.782	7.403	8.736	10.185	10.951	11.752	12.582	13.440	15.251	17.119	23.656
24	27,41				627	821	1.042	1.289	1.564	1.866	2.196	2.554	2.939	3.353	3.795	4.264	4.763	5.221	6.435	7.059	7.704	9.089	10.595	11.391	12.223	13.084	13.975	15.855	17.797	24.578
25	28,55				653	854	1.084	1.342	1.627	1.942	2.284	2.656	3.057	3.486	3.946	4.433	4.952	5.500	6.688	7.335	8.005	9.442	11.004	11.830	12.693	13.586	14.510	16.459	18.474	25.500
26	29,69				678	888	1.126	1.394	1.691	2.017	2.373	2.759	3.174	3.620	4.097	4.602	5.141	5.709	6.941	7.612	8.306	9.796	11.414	12.270	13.163	14.088	15.045	17.063	19.151	
27	30,83					921	1.169	1.446	1.754	2.092	2.461	2.861	3.292	3.754	4.248	4.772	5.329	5.918	7.194	7.888	8.607	10.149	11.824	12.709	13.634	14.590	15.580	17.667	19.828	
28	31,97					955	1.211	1.498	1.817	2.167	2.549	2.963	3.409	3.888	4.399	4.941	5.518	6.127	7.447	8.165	8.908	10.502	12.233	13.148	14.104	15.093				
29	33,11					988	1.253	1.551	1.880	2.243	2.638	3.066	3.527	4.022	4.550	5.110	5.707	6.336	7.700	8.441	9.209	10.855								
30	34,25					1.022	1.296	1.603	1.943	2.318	2.726	3.168	3.645	4.155	4.701	5.280	5.895	6.545	7.953	8.717										

SILOS WITH HOPPER



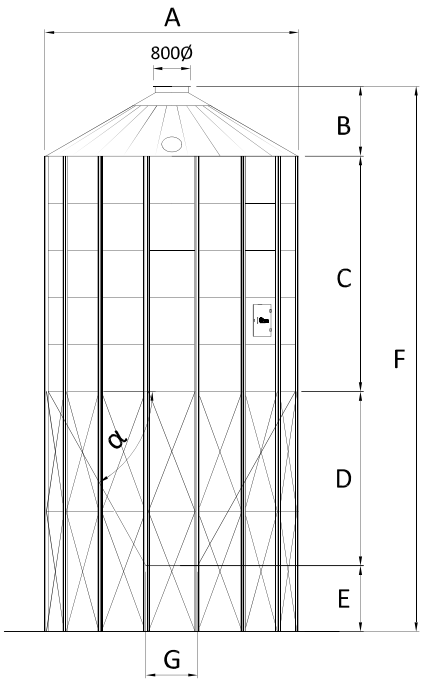
SCE - T45 - 400 - VOLUME - h = 900 mm

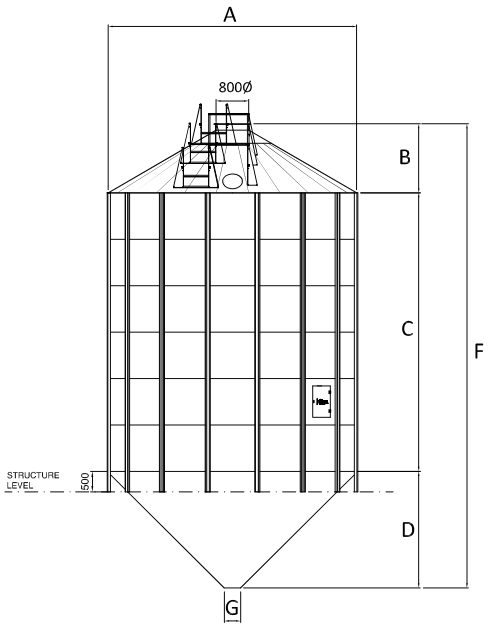
HOPPER SILOS T-45	SILO Ø (m) A	4,60	5,35	6,10	6,87	7,60	8,40	9,20	9,93	10,70	11,45	12,23
	OUTPUT Ø2 (mm)	400	400	400	400	400	400	400	400	400	400	400
	HOPPER HEIGHT (m) D	2,18	2,57	2,54	3,33	3,72	4,11	4,48	4,86	5,36	5,74	6,12
	ROOF HEIGHT (m)	1,26	1,48	1,69	1,92	2,14	2,36	2,59	2,81	3,03	3,25	3,47
RINGS NUMBER	CYLINDRICAL HEIGHT (M) B	VOLUME (m³)										
4	4,61	95	134	180	236	300	375	459	554	665	784	915
5	5,75	114	159	214	278	353	438	534	643	767	901	1.049
6	6,89	133	185	247	321	405	501	610	731	869	1.019	1.183
7	8,03	151	211	281	363	457	565	685	819	972	1.136	1.316
8	9,17	170	236	314	405	509	628	760	908	1.074	1.254	1.450
9	10,31	189	262	348	448	562	691	835	996	1.177	1.371	1.584
10	11,45	208	287	381	490	614	754	911	1.084	1.279	1.489	1.718
11	12,59	227	311	414	532	666	817	986	1.173	1.382	1.607	1.852
12	13,73	245	339	448	575	719	881	1.061	1.261	1.484	1.724	1.985
13	14,87	264	364	481	617	771	944	1.136	1.349	1.586	1.842	2.119
14	16,01	283	390	515	659	823	1.007	1.212	1.438	1.689	1.959	2.253
15	17,15	302	415	548	702	875	1.070	1.287	1.526	1.791	2.077	2.387
16	18,29	321	441	582	744	928	1.134	1.362	1.614	1.894	2.195	2.521
17	19,43	340	467	615	786	980	1.197	1.437	1.703	1.996	2.312	2.654
18	20,57	358	492	649	829	1.032	1.260	1.513	1.791	2.099	2.430	2.788
19	21,71	377	518	682	871	1.084	1.323	1.588	1.879	2.201	2.547	2.922
20	22,85	396	543	716	913	1.137	1.387	1.663	1.968	2.304	2.665	3.056
21	23,99	415	569	749	956	1.189	1.450	1.738	2.056	2.406	2.783	3.190
22	25,13	434	595	749	998	1.241	1.513	1.814	2.144	2.508	2.900	3.323
23	26,27	452	620	816	1.040	1.293	1.576	1.889	2.233	2.611	3.018	3.457
24	27,41		646	849	1.083	1.346	1.640	1.964	2.321	2.713	3.135	3.591
25	28,55		671	883	1.125	1.398	1.703	2.040	2.409	2.816	3.253	3.725
26	29,69		697	916	1.167	1.450	1.766	2.115	2.492	2.918	3.370	3.858
27	30,83			950	1.210	1.502	1.829	2.190	2.586	3.021	3.488	3.992
28	31,97			983	1.252	1.555	1.892	2.265	2.674	3.125	3.606	4.126
29	33,11			1.017	1.294	1.607	1.956	2.341	2.762	3.225	3.723	4.260
30	34,25			1.050	1.337	1.659	2.019	2.416	2.851	3.228	3.841	4.394

SCE - T60 - 1250 - VOLUME - h = 1650 mm

HOPPER SILOS T60	SILO Ø (m) A	4,60	5,35	6,10	6,87	7,60	8,40	9,20	9,93
	OUTPUT Ø2 (mm)	1250	1250	1250	1250	1250	1250	1250	1250
	HOPPER HEIGHT (m) D	2,98	3,62	4,28	4,93	5,63	6,30	6,96	7,62
	ROOF HEIGHT (m)	1,26	1,48	1,69	1,92	2,14	2,59	2,59	2,81
RINGS NUMBER	CYLINDRICAL HEIGHT (M) B	VOLUME (m³)							
4	4,61	99	142	193	256	330	415	514	626
5	5,75	118	167	227	298	382	479	589	714
6	6,89	137	193	260	340	434	542	664	802
7	8,03	156	218	294	383	486	605	739	891
8	9,17	175	244	327	425	539	668	815	979
9	10,31	193	270	361	467	591	732	890	1.067
10	11,45	212	295	394	510	643	795	965	1.156
11	12,59	231	321	428	552	695	858	1.040	1.244
12	13,73	250	346	461	594	748	921	1.116	1.332
13	14,87	269	372	494	637	800	985	1.191	1.421
14	16,01	287	398	528	679	852	1.048	1.266	1.509
15	17,15	306	423	561	721	905	1.111	1.342	1.597
16	18,29	325	449	595	764	957	1.174	1.417	1.686
17	19,43	344	474	628	806	1.009	1.237	1.492	1.774
18	20,57	363	500	662	848	1.061	1.301	1.567	1.862
19	21,71	382	526	695	891	1.114	1.364	1.643	1.951
20	22,85	400	551	729	933	1.166	1.427	1.718	2.039
21	23,99	419	577	762	975	1.218	1.490	1.793	2.127
22	25,13	438	603	796	1.018	1.270	1.554	1.868	2.216
23	26,27	457	628	829	1.060	1.323	1.617	1.944	2.304
24	27,41		654	862	1.102	1.375	1.680	2.019	2.392
25	28,55		679	896	1.145	1.427	1.743	2.094	2.480
26	29,69		705	929	1.187	1.479	1.807	2.169	2.569
27	30,83			963	1.229	1.532	1.870	2.245	2.657
28	31,97			996	1.272	1.584	1.933	2.320	2.745
29	33,11			1.030	1314	1.636	1.996	2.395	2.834
30	34,25			1.063	1.356	1.688	2.060	2.470	2.922

SILOS WITH HOPPER NO RING





SC - T45 - 400 - VOLUME - E = 900

HOPPER SILOS T45 - NO RING	SILO Ø (m) A	3,00	3,50	4,60	5,35	6,10
	OUTPUT Ø (mm) G	400	400	400	400	400
	HOPPER HEIGHT (m) D	1,33	1,52	2,10	2,48	2,86
	ROFF HEIGHT (m) B	0,69	0,79	1,26	1,48	1,69

RINGS NUMBER	CYLINDRICAL HEIGHT (M) C	VOLUME (m^3)				
1	1,14	13	18	37	55	78
2	2,28	22	29	56	81	111
3	3,42	30	40	75	107	145
4	4,61	38	51	94	132	178
5	5,75	47	62	113	158	212
6	6,89	55	73	131	183	245
7	8,03	63	84	150	209	
8	9,17	72	95	169		
9	10,31	80				

SC - T60 - 1250 - VOLUME - E = 1650

HOPPER SILOS T60 - NO RING	SILO Ø (m) A	4,60	5,35	6,10
	OUTPUT Ø (mm) G	1250	1250	1250
	HOPPER HEIGHT (m) D	2,98	3,62	4,28
	ROFF HEIGHT (m) B	1,26	1,48	1,69

RINGS NUMBER	CYLINDRICAL HEIGHT (M) C	VOLUME (m^3)		
1	1,14	42	63	91
2	2,28	61	89	125
3	3,42	79	115	158
4	4,56	98	140	192
5	5,7	117	166	225
6	6,84	136	191	259
7	7,98	155	217	
8	9,12	173		

SC - T66 - 1050 - VOLUME

HOPPER SILOS T66 - NO RING	SILO Ø (m)	3,00	3,50
	OUTPUT Ø (mm)	1050	1050
	HOPPER HEIGHT (m)	2,25	2,71
	ROFF HEIGHT (m)	0,69	0,79

RINGS NUMBER	CYLINDRICAL HEIGHT (M)	VOLUME (m^3)	
1	1,14	16	22
2	2,28	24	33
3	3,42	32	44
4	4,56	41	55
5	5,7	49	66
6	6,84	57	77
7	7,98	66	88
8	9,12	74	99

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