

Production and Market of Glycine in China

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Researched & Prepared by:

Kcomber Inc.

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1. Introduction

Objectives of this research are to present an in-depth and comprehensive view of Chinese glycine market. CCM's goal of this research is to determine the current status of Chinese glycine industry and assess its growth potential from 2020 to 2024.

Having accumulated profound understanding on industrial chains of glyphosate, the most important downstream industry of glycine, CCM will present an insight into glycine market and future trends, together with its industry structure, including upstream products, applications, etc. A review of glycine's competitiveness is also provided in the report.

All of the four grades of glycine, including tech-grade, food-grade, pharmaceutical-grade and feed-grade, will be investigated in this research.

This report will present industry insights from the following aspects.

- Supply (capacity, output, inventory)
- Key players (active producers, potential producers)
- Technology
- Raw materials
- Export
- Demand by volume
- Trade
- Price

2. Approach for this report

The report is based on data sourced by diverse methods, which are listed as follows:

- Telephone Interviews

The interviewees include:

- Producers
- Traders
- Researchers
- Raw material suppliers
- End users

- Data processing and presentation

The data collected and compiled were sourced from:

- Published articles from Chinese periodicals, magazines, journals, and third-party databases
- Government statistics & Customs statistics
- Telephone interviews with Chinese producers, traders, end users, etc.
- Comments from industrial experts
- CCM's database
- Professional database from other sources
- Information from the Internet

The data from various channels have been combined to make this report as precise and scientific as possible. Throughout the process, a series of internal discussions were held in order to analyse the data and draw conclusions from it.

- Information sources

Sources of desk research are various, including published magazines, journals, government statistics, industry statistics, customs statistics, association seminars as well as information on the internet. A lot of work has been done to compile and analyse the information obtained. When necessary, checks were made with Chinese market players regarding market information such as production, demand, consumption, competition, etc.

3. Executive summary

China is one of the major production countries of glycine in the world, and four grades of glycine are produced here, namely tech-grade, food-grade, feed-grade and pharmaceutical-grade.

Commercial production of glycine by the chloroacetic acid ammonolysis process hadn't been started until the late 1970s, and this pathway was accessible and the requirement for facilities was relatively low. Almost all Chinese glycine producers adopt chloroacetic acid ammonolysis process, which is a backward technology now. Guang'an Chengyang Bio-tech Co., Ltd. (Guang'an Chengyang), whose glycine production lines were built up in Nov. 2015, is the only company in China adopting the Hydantion process.

Both the capacity and output of glycine in China kept increasing during 2012–2019, along with the fast development of glyphosate (glycine's key end use segment) in China. Output of the tech, food and pharmaceutical-grade glycine increased, while that of feed-grade glycine witnessed a small decline in 2019.

The national capacity of tech-grade glycine increased from XXX t/a in 2012 to XXX t/a in 2019, and its output increased from less than XXX tonnes to XXX tonnes in this period. However, China's glycine industry has always witnessed overcapacity in the past few years, and this situation will not change much in the coming few years though some glycine producers may shift their glycine installations to produce other amino acids.

Hebei Donghua Chemical Group (Hebei Donghua) has kept being the top glycine producer in China and even in Asia. After its first phase of the XXX t/a tech-grade glycine project completed in July 2018, its tech-grade glycine capacity reached XXX t/a in 2019, and it still has a XXX t/a tech-grade glycine expansion plan. China's glycine production is highly concentrated, while its upstream industries including both chloroacetic acid and urotropine are not.

Some glyphosate producers have built up or planned to construct glycine production lines for their glyphosate technical production.

- Hubei Trisun Chemical Co., Ltd. (Hubei Trisun)'s XXX t/a glycine is firstly supplied to itself, and the rest sold to others.
- Sichuan Leshan Fuhua Tongda Agro-chemical Technology Co., Ltd. (Fuhua Tongda)'s XXX t/a glycine is mainly consumed by itself.
- Inner Mongolia Xingfa Technology Co., Ltd. (Inner Mongolia Xingfa)'s XXX t/a glycine is consumed by itself.
- Henan HDF Chemical Co., Ltd. (Henan HDF)'s XXX t/a glycine is mainly consumed by itself.

The price of glycine is closely linked with that of glyphosate (high-positive correlation), because of glycine's limited consumption fields and simple production technology. In 2019, the price stayed low, because of stable demand and output of glycine and decreasing price of www.cnchemicals.com



glyphosate technical. Affected by the COVID-19, the demand for glycine and glyphosate decreased, thus the price of glycine maintained at a low level till May 2020.

China's total export volume of glycine increased on the whole in 2012–2019, rising from XXX tonnes in 2012 to XXX tonnes in 2019. China started to export tech-grade glycine in 2018, with the export volume of XXX tonnes, accounting for XX% of total export volume. In 2019, the export volume of tech-grade glycine increased greatly to XXX tonnes, which took up XX% to the whole.

Food-grade glycine is the main product in China's glycine export, with its export volume accounting for XX%, XX% and XX% of the total glycine export volume during 2017–2019 respectively.

Quite different from the overseas consumption structure, the largest end-use segment of glycine in China is glyphosate. The output of glycine route glyphosate reached XXX tonnes in 2019, consuming about XXX tonnes of glycine in total, which meant around XX% of tech-grade glycine was applied in the domestic glyphosate industry, and the rest was consumed to produce food-, feed- and pharmaceutical-grade glycine.

The consumption of food, feed and pharmaceutical-grade glycine all increased from 2012 to 2019. The consumption of food-grade glycine has grown at a CAGR of XX% during 2012–2019, the consumption of feed-grade glycine at a CAGR of XX% and the consumption of pharmaceutical-grade glycine at a CAGR of XX%.

China's glycine industry tends to develop stably in the coming five years (2020–2024), along with the promotion of GM crops especially GM soybean and corn, and sustained demand for glyphosate. Capacity of China's tech-grade glycine is estimated to be over XXX t/a in 2024 if all potential glycine projects are launched in the coming few years.

4. What is in the report?

Note: Key data/information in this sample page is hidden, while in the report it is not.

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1 Overview of glycine in China

1.1 Introduction of glycine in China

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Table 1.1-1 Supply and demand of glycine in China, 2012–2019

Year	Capacity, t/a		Output, tonne		Export, tonne	Apparent consumption, tonne	
	Tech-grade	Others	Tech-grade	Others		Tech-grade	Others
2012	XXX	XXX	XXX	XXX	XXX	XXX	XXX
2013	XXX	XXX	XXX	XXX	XXX	XXX	XXX
2014	XXX	XXX	XXX	XXX	XXX	XXX	XXX
2015	XXX	XXX	XXX	XXX	XXX	XXX	XXX
2016	XXX	XXX	XXX	XXX	XXX	XXX	XXX
2017	XXX	XXX	XXX	XXX	XXX	XXX	XXX
2018	XXX	XXX	XXX	XXX	XXX	XXX	XXX
2019	XXX	XXX	XXX	XXX	XXX	XXX	XXX

Note: 1. The year-end inventory of tech-grade glycine is taken into account, while that of others is not.

2. Others include feed-grade, food-grade and pharmaceutical-grade glycine.

Source: China Customs & CCM

...

2 Production of glycine in China

2.1 Supply of glycine in China

2.1.1 Capacity and output of glycine in China, 2012–2019

...

Table 2.1.1-1 Capacity and output of glycine in China, 2012–2019

Year	Capacity, t/a		Output, tonne			
	Tech-grade	Others	Tech-grade	Food-grade	Feed-grade	Pharmaceutical-grade
2012	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
2013	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
2014	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
2015	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
2016	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
2017	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
2018	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
2019	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX

Note: Others include food-grade, feed-grade and pharmaceutical-grade glycine.

Source: CCM

2.1.2 Key glycine producers in China

Table 2.1.2-1 Production for various grades of glycine in China by producers, 2019

Table 2.1.2-1 Production for various grades of glycine in China by producers, 2019

No.	Producer	Abbreviation	Status, 2019	Production situation			
				Tech-grade	Food-grade	Feed-grade	Pharmaceutical-grade
1	Hebei Donghua Chemical Group	Hebei Donghua	Active	√	√	√	√
2	XXX	XXX	Active	XXX	XXX	XXX	XXX
3	XXX	XXX	Active	XXX	XXX	XXX	XXX
4	XXX	XXX	Active	XXX	XXX	XXX	XXX
...

Note: √: produce, X: not produce

Source: CCM

Table 2.1.2-2 Capacity of glycine by producers in China, 2015–2019, t/a

No.	Producer	2019		2018		2017		2016		2015	
		Tech-grade	Others	Tech-grade	Others	Tech-grade	Others	Tech-grade	Others	Tech-grade	Others
1	Hebei Donghua Chemical Group	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
2	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
3	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
4	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
5	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
...	...	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX

Note: Others include food-grade, feed-grade and pharmaceutical-grade.

Source: CCM

...

Distribution and market share of glycine producers in China

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Figure 2.1.2-1 Distribution of major glycine producers by capacity of tech-grade glycine in China, 2019



Table 2.1.2-3 Industrial concentration of tech-grade glycine in terms of output in China, 2015–2019

Item	Value				
	2019	2018	2017	2016	2015
Top one concentration ratio	XXXX	XXXX	XXXX	XXXX	XXXX
Top three concentration ratio	XXXX	XXXX	XXXX	XXXX	XXXX
Top five concentration ratio	XXXX	XXXX	XXXX	XXXX	XXXX
HHI	XXXX	XXXX	XXXX	XXXX	XXXX

Source: CCM

2.1.2.4 Output of glycine by producer in China

Table 2.1.2-5 Output of glycine in China by producer, 2015–2019, tonne

No.	Producer	2019		2018		2017		2016		2015	
		Tech-grade	Others	Tech-grade	Others	Tech-grade	Others	Tech-grade	Others	Tech-grade	Others
1	Hebei Donghua	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
2	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
3	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
4	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX

Note: Others include food-grade, feed-grade and pharmaceutical-grade glycine.

Source: CCM

...

2.1.3 Potential production lines of glycine in China

Table 2.1.3-1 Potential projects of glycine in China, as of May.2020

Classification	Company	Designed capacity, t/a	Planned commissioning date (estimated)	Details
Expansion	XXXX	XXXX tech-grade	XXX	XXX
	XXXX	XXXX tech-grade	XXX	XXX
	XXXX	2 nd phase: XXXX t/a glycine	XXX	XXX
	XXXX	2 nd phase: XXXX tech-grade, XXXX food-grade	XXX	XXX
	XXXX	XXXX tech-grade	XXX	XXX
	XXXX	XXXX tech-grade	XXX	XXX
New	XXXX	XXXX tech-grade	XXX	XXX
	XXXX	XXXX tech-grade	XXX	XXX
	XXXX	XXXX tech-grade	XXX	XXX
	XXXX	XXXX food-grade	XXX	XXX

Source: CCM

...

2.2 Price of glycine in China

2.2.1 Price of glycine in China, Jan. 2012–May 2020

Figure 2.2.1-1 Monthly ex-works price of tech-grade glycine in China, Jan. 2012–May 2020



Source: CCM

2.3 Export of glycine in China

2.3.1 Export volume of glycine in China

Figure 2.3.1-1 China's export volume of various grades glycine, 2012–2019



Source: China Customs & CCM

2.3.3 Export destination of glycine in China, 2017–2019

...

Table 2.3.3-1 China's exports of glycine by destinations, 2019

No.	Country/region	Tech-grade		Food-grade		Feed-grade		Pharmaceutical-grade	
		Volume, tonne	Price, USD/t	Volume, tonne	Price, USD/t	Volume, tonne	Price, USD/t	Volume, tonne	Price, USD/t
1	The Netherlands	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
2	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
3	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
4	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
5	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
6	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
7	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
	Others	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
	Total	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX

Note: The data has been rounded.

Source: China Customs & CCM

2.3.4 Exporter of glycine in China, 2017–2019

Table 2.3.4-1 China's exports of glycine by exporter, 2019

No.	Exporter	Tech-grade		Food-grade		Feed-grade		Pharmaceutical-grade	
		Volume, tonne	Price, USD/t	Volume, tonne	Price, USD/t	Volume, tonne	Price, USD/t	Volume, tonne	Price, USD/t
1	XXX *	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
2	XXX *	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
3	XXX *	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
4	XXX *	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
...	XXX *	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Others		XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Total		XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX

Note: 1. * Glycine producers or their related companies

2. The data has been rounded.

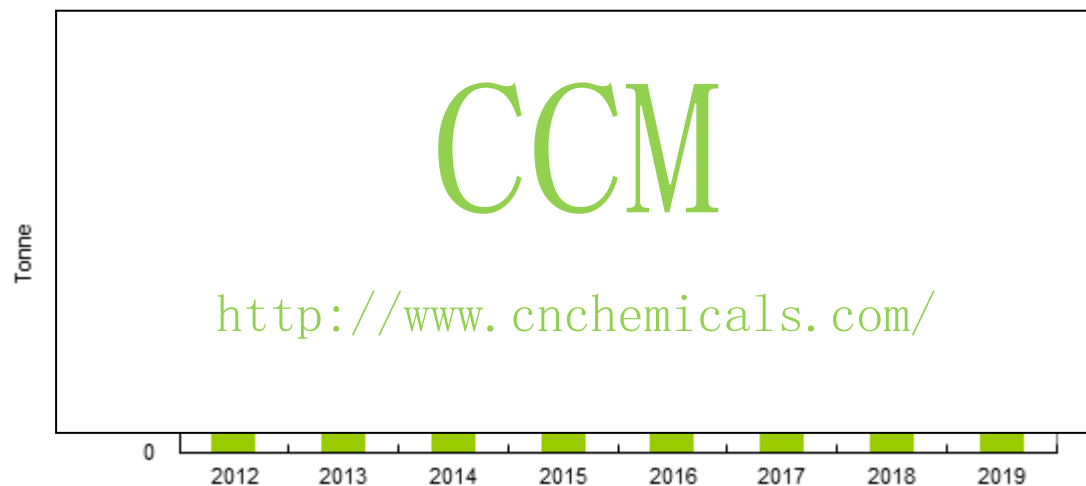
Source: China Customs & CCM

3 Demand for glycine in China

3.1 Consumption of glycine in China

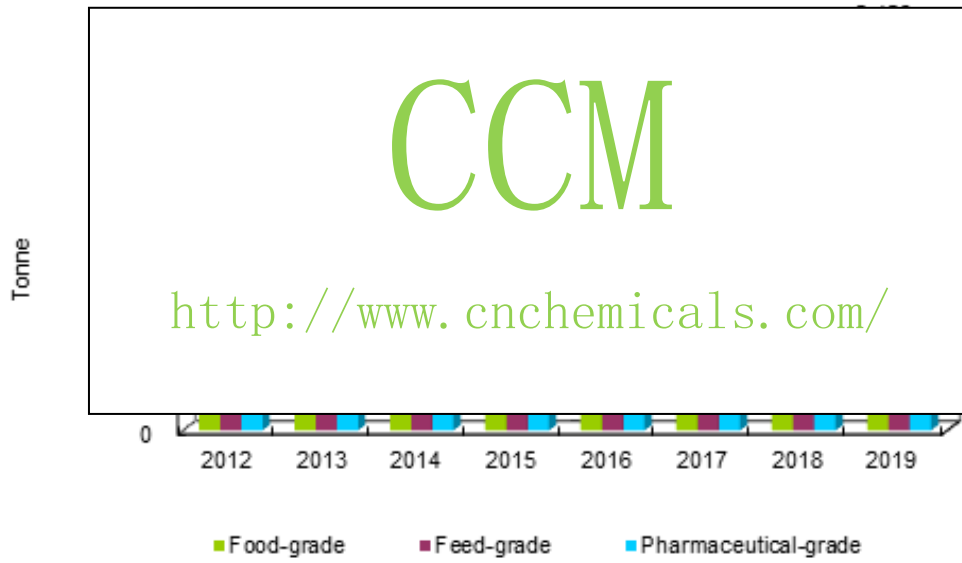
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Figure 3.1-1 Consumption of tech-grade glycine in China, 2012–2019



Source: CCM

Figure 3.1-2 Consumption of various grades glycine in China, 2012–2019



Source: CCM

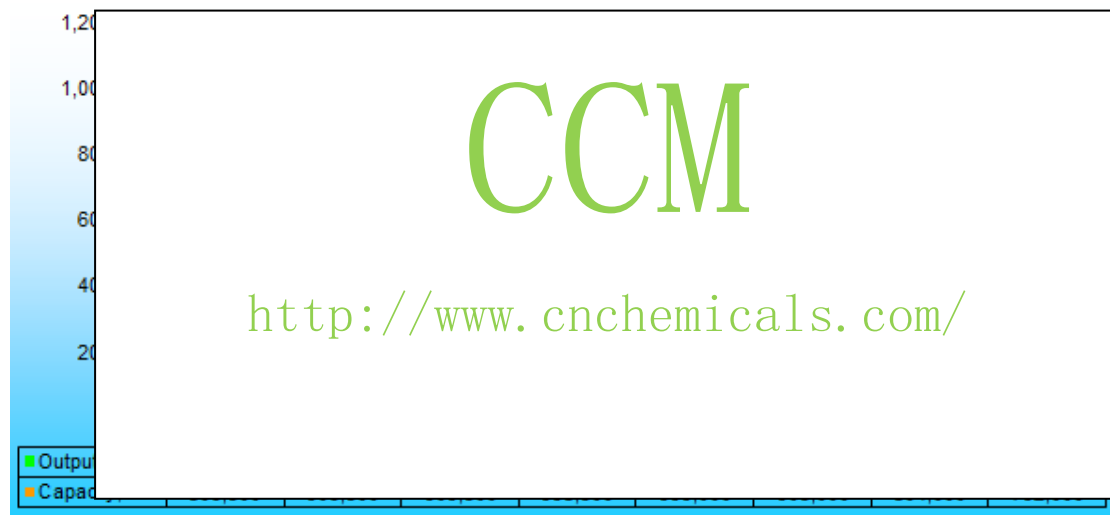
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3.2 Major application segments of glycine in China

3.2.1 Glyphosate

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Figure 3.2.1-1 Capacity and output of glyphosate technical in China, 2012–2019



Source: CCM

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Tel: +86-20-37616606 Fax: +86-20-37616968

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17th Floor, Huihua Commercial & Trade Building, No. 80 Xianlie Zhong Road Guangzhou,
510070, P.R.China

Website: <http://www.cnchemicals.com>

Tel: +86-20-37616606

Fax: +86-20-37616968

Email: econtact@cnchemicals.com