

# **Production and Market of Glycine in China**

**The Sixth Edition**

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**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 2017 to 2021.

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
- 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

Four grades of glycine are produced in China, namely tech-grade, food-grade, feed-grade and pharmaceutical-grade. Among them, tech-grade glycine has kept the dominate role, and less than XXX% of tech-grade glycine was consumed to produce the other three grades of glycine in 2010–2016.

China's glycine industry has developed fast since 2010, driven by the fast development of its key downstream products—glyphosate technical. The national tech-grade glycine capacity increased from XXX t/a in 2010 to XXX t/a in 2016, and the national tech-grade glycine output increased from XXX tonnes in 2010 to XXX tonnes in 2016.

Hebei Donghua Chemical Group (Hebei Donghua) has kept being the top glycine producer in China and even in Asia, with a tech-grade glycine capacity of XXX t/a in 2016, and it still has a XXX t/a tech-grade glycine expansion plan.

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

- Yichang Jinxin Chemical Co., Ltd. (Yichang Jinxin)'s XXX t/a glycine is firstly supplied to Hubei Trisun Chemical Co., Ltd. (Hubei Trisun), one of the brother companies of the former.
- Sichuan Leshan Fuhua Tongda Agro-chemical Technology Co., Ltd. (Fuhua Tongda)'s XXX t/a glycine is mainly consumed by itself.
- Inner Mongolia Tenglong Fine Chemical Co., Ltd. (Inner Mongolia Tenglong)'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.
- Hebi Nonglin Pharmaceutical Co., Ltd. (Hebi Nonglin) plans to construct a glycine production line with a capacity of XXX t/a.

Almost all Chinese glycine producers adopt a lagging technology called chloroacetic acid ammonolysis process. 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 hydantion process.

Chinese glycine production is highly concentrated, while its upstream industries including both chloroacetic acid and urotropine are scattered.

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 H1 2016, due to sluggish glyphosate market and slowing-down growth of glycine demand, the price of glycine decreased and glycine producers have witnessed poor profits or even suffered loss. By Q3 2016, Chinese glyphosate and glycine markets recovered thanks to the decrease in the inventory of glyphosate and the ban on paraquat AS.

Quite different from the overseas consumption structure, the largest end use segment of glycine in China is glyphosate, followed by pharmaceutical, dyeing, carboxymethyl cellulose (CMC), carboxymethyl starch, etc. The output of glycine route glyphosate reached XXX tonnes in 2016, consuming about XXX tonnes of glycine totally.

China's glycine industry tends to develop stably in the coming five years (2017–2021), along with the promotion of GM crops especially GM soybean and corn, and sustained demand for glyphosate. China's tech-grade glycine capacity will increase to about XXX t/a in 2021 if all potential glycine projects are launched in the coming few years.

#### **4. What's in this report?**

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

...

### **1 Overview of glycine in China**

#### **1.1 Introduction of glycine in China**

...



**Table 1.1-1 Supply and demand of glycine in China, 2010–2016**

Year	Capacity, t/a		Output, tonne		Export (others), tonne	Consumption, tonne	
	Tech-grade	Others	Tech-grade	Others		Tech-grade	Others
2010	■	■	■	■	■	■	■
2011	■	■	■	■	■	■	■
2012	■	■	■	■	■	■	■
2013	■	■	■	■	■	■	■
2014	■	■	■	■	■	■	■
2015	■	■	■	■	■	■	■
2016	■	■	■	■	■	■	■

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: CCM

**Table 1.1-2 Supply and demand of glycine except tech-grade in China, 2010–2016, tonne**

Year	Output			Export			Apparent consumption		
	Food -grade	Feed -grade	Pharmaceutical -grade	Food -grade	Feed -grade	Pharmaceutical -grade	Food -grade	Feed -grade	Pharmaceutical -grade
2010	■	■	■	■	■	■	■	■	■
2011	■	■	■	■	■	■	■	■	■
2012	■	■	■	■	■	■	■	■	■
2013	■	■	■	■	■	■	■	■	■
2014	■	■	■	■	■	■	■	■	■
2015	■	■	■	■	■	■	■	■	■
2016	■	■	■	■	■	■	■	■	■

Note: 1. The year-end inventory is not taken into account.

Source: CCM

## 2 Supply of glycine in China

### 2.1 Production of glycine in China

#### 2.1.1 Capacity and output of glycine in China, 2010–2016

Table 2.1.1-1 Capacity and output of glycine in China, 2010–2016

Year	Capacity, t/a		Output, tonne			
	Tech-grade	Others	Tech-grade	Food-grade	Feed-grade	Pharmaceutical-grade
2010	■	■	■	■	■	■
2011	■	■	■	■	■	■
2012	■	■	■	■	■	■
2013	■	■	■	■	■	■
2014	■	■	■	■	■	■
2015	■	■	■	■	■	■
2016	■	■	■	■	■	■

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

Source: CCM

#### 2.1.2 Key glycine producers in China

##### 2.1.2.1 Producers' production situation for various grades glycine

Table 2.1.2.1-1 Production for various grades glycine in China by producer, 2016

No.	Producer	Abbreviation	Status '15	Production situation '15			
				Tech-grade	Food-grade	Feed-grade	Pharmaceutical-grade
1	Hebei Donghua Chemical Group	Hebei Donghua	Active	√	√	√	√
2	■	■	Active	■	■	■	■
3	■	■	Active	■	■	■	■
4	■	■	Active	■	■	■	■
5	■	■	Active	■	■	■	■
...	■	■	Active	■	■	■	■
...	■	■	Active	■	■	■	■
...	■	■	Active	■	■	■	■
...	■	■	Active	■	■	■	■
...	■	■	Active	■	■	■	■
...	■	■	Active	■	■	■	■
...	■	■	Active	■	■	■	■

Note: √: produce, X: not produce

Source: CCM

**Table 2.1.2.1-2 Glycine capacity in China by producer, 2010–2016, t/a**

No.	Producer	Capacity '16		Capacity '15		Capacity '14		Capacity '13		Capacity '12		Capacity '11		Capacity '10	
		Tech-grade	Others	Tech-grade	Others	Tech-grade	Others	Tech-grade	Others	Tech-grade	Others	Tech-grade	Others	Tech-grade	Others
1	Hebei Donghua	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
4	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
...	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Others	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	<b>Total</b>	■	■	■	■	■	■	■	■	■	■	■	■	■	■

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

Source: CCM

### 2.1.2.2 Producers' distribution and market share of glycine producers in China, 2016

**Table 2.1.2.2-1 Industrial concentration of tech-grade glycine in terms of output in China, 2010–2016**

No.	Item	Value						
		2016	2015	2014	2013	2012	2011	2010
1	Top one concentration ratio	■	■	■	■	■	■	■
2	Top five concentration ratio	■	■	■	■	■	■	■
3	Top ten concentration ratio	■	■	■	■	■	■	■
4	Herfindahl-Hirschman Index (HHI)	■	■	■	■	■	■	■

Source: CCM

### 2.1.2.4 Producers' output of glycine in China

**Table 2.1.2.4-1 Output of glycine in China by producer, 2010–2016, tonne**

No.	Producer	Output '16		Output '15		Output '14		Output '13		Output '12		Output '11		Output '10	
		Tech-grade	Others	Tech-grade	Others	Tech-grade	Others	Tech-grade	Others	Tech-grade	Others	Tech-grade	Others	Tech-grade	Others
1	Hebei Donghua	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
4	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
...	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Others	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	<b>Total</b>	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Source: CCM

### 2.1.2.5 Producers' inventory of glycine in China

Table 2.1.2.5-1 Inventory of glycine in China by producer, 2010–2016, tonne

No.	Producer	Inventory '16	Inventory '15	Inventory '14	Inventory '13	Inventory '12	Inventory '11	Inventory '10
1	Hebei Donghua	█	█	█	█	█	█	█
2	█	█	█	█	█	█	█	█
3	█	█	█	█	█	█	█	█
4	█	█	█	█	█	█	█	█
...	█	█	█	█	█	█	█	█
	Others	█	█	█	█	█	█	█
	<b>Total</b>	█	█	█	█	█	█	█

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

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 2016

Classification	Company	Designed capacity, t/a	Planned commissioning date	Details
Expansion	█	█ tech-grade	█	█
	█	█ tech-grade	█	█
	█	█ tech-grade, █ feed-grade, █ t/a food-grade	█	█
Remove	█	█ tech-grade	█	█
New	█	█ tech-grade	█	█
	█	1 <sup>st</sup> phase █ tech-grade	█	█
		█ food-grade		
	█	2 <sup>nd</sup> phase █ tech-grade	█	█
		█ food-grade		
	█	█ tech-grade	█	█
█	█ tech-grade	█	█	
█	█ food-grade, feed-grade, pharmaceutical-grade	█	█	

Source: CCM

## 2.3 Export of glycine in China

### 2.3.3 Export destination of glycine in China, 2010–2016

Table 2.3.3-7 China's exports of glycine by destination, 2016

No.	Country/region	Food-grade		Feed-grade		Pharmaceutical-grade	
		Volume, tonne	Price, USD/t	Volume, tonne	Price, USD/t	Volume, tonne	Price, USD/t
1							
2							
3							
4							
5							
...							
...							
...							
Others							
<b>Total</b>							

Source: China Customs & CCM

### 2.3.4 Exporter of glycine in China, 2010–2016

Table 2.3.4-7 China's exports of glycine by exporter, 2016

No.	Exporter	Food-grade		Feed-grade		Pharmaceutical-grade	
		Volume, tonne	Price, USD/t	Volume, tonne	Price, USD/t	Volume, tonne	Price, USD/t
1	*						
2	*						
3							
4							
5							
...							
...	*						
...							
Others							
<b>Total</b>							

Note: 1. \* Glycine producers or their related companies

2. For No. 1 and No. 4, their export volume of pharmaceutical-grade in 2016 were very little, less than 1 tonne, and rounded to 0.

Source: China Customs & CCM

### 3 Demand of glycine in China

#### 3.2 Major application segments of glycine in China, 2010–2016

##### 3.2.1 Glyphosate

Table 3.2.1-1 Consumption of glycine in glyphosate in China, 2010–2016, tonne

Year	2010	2011	2012	2013	2014	2015	2016
Output of glyphosate (glycine route)	■	■	■	■	■	■	■
Consumption of glycine	■	■	■	■	■	■	■

Source: CCM

Table 3.2.1-2 Major glyphosate producers adopting glycine route in China, as of Dec. 2016

No.	Producer	Abbreviation	Status 2016	Capacity 2016, t/a	Output, tonne			
					2016	2015	2014	2013
1	■	■	Active	■	■	■	■	■
2	■	■	Active	■	■	■	■	■
3	■	■	Active	■	■	■	■	■
4	■	■	Active	■	■	■	■	■
5	■	■	Active	■	■	■	■	■
...	■	■	Active	■	■	■	■	■
...	■	■	Active	■	■	■	■	■
...	■	■	Active	■	■	■	■	■
...	■	■	Active	■	■	■	■	■
Others				■	■	■	■	■
<b>Total</b>				■	■	■	■	■

Note: Companies with \* have two production routes, and in the above table only the capacity and output of glycine route are presented.

Source: CCM

...

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