

# IMPROVE YOUR PRODUCTIVITY WITH OUR CUSTOMIZED SERVICES AND CAPABILITIES

ANGUS Life Sciences, a business of the ANGUS Chemical Company, provides dedicated support for bioprocessing, pharmaceutical and diagnostic applications. Through specialized testing, custom blending, or dosage-specific package quantities, ANGUS can help optimize the cost and efficiency of your operations.



## PACKAGING

- Custom packaging
- Multiple container options
- IPEC-PQG compliance



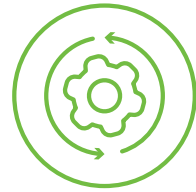
## ANALYTICAL

- ISO 9001:2015 certified
- Customized in-house testing and advanced instrumentation (ICP-MS, GC)
- Adherence with IPEC and select cGLP principles



## WAREHOUSING

- Temperature monitored warehousing
- Adherence with IPEC and select cGDP principles



## PURCHASING

- Global sourcing capabilities
- Formalized supplier lifecycle management program
- Non-animal origin

## PRODUCT STEWARDSHIP

ANGUS encourages its customers to review their applications of ANGUS products from the standpoint of human health and environmental quality. To help ensure that ANGUS products are not used in ways for which they are not intended, ANGUS personnel will assist customers in dealing with environmental and product safety considerations. For assistance, product Safety Data Sheets, or other information, please visit [angus.com](http://angus.com) or contact us at [info@angus.com](mailto:info@angus.com).



DISCOVER A **BETTER WAY**™

[angus.com](http://angus.com)

®/™Trademark of ANGUS Chemical Company Notice: No freedom from infringement of any patent owned by ANGUS or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where ANGUS is represented. The claims made may not have been approved for use in all countries. ANGUS assumes no obligation or liability for the information in the document. References to "ANGUS" or the "Company" mean the ANGUS Chemical Company legal entity selling the products to Customer unless expressly noted. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED. Published July 2021.

GS\_6455\_13\_1

**ANGUS**<sup>®</sup>  
LIFE SCIENCES

**NEW!**  
**ANGUS-**  
**manufactured**  
**TRIS AMINO**<sup>™</sup>  
**Hydrochloride**

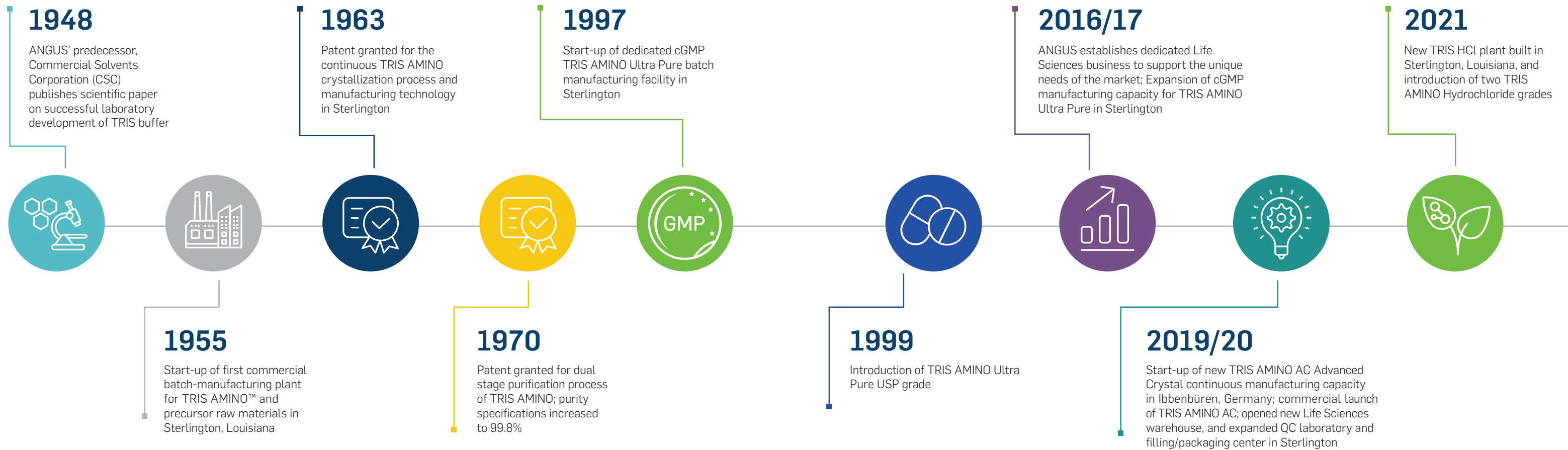
# TRIS AMINO<sup>™</sup> SELECTION GUIDE

ANGUS Portfolio of TRIS AMINO and TRIS Derivatives

DISCOVER A **BETTER WAY**™

## WE INVENT ... IT'S IN OUR DNA

As the original inventor of the Tromethamine molecule more than 70 years ago, ANGUS Chemical Company has proudly built our TRIS AMINO brand, representing a strong history of quality, reliability and innovation in the TRIS buffer product space. Developing the right products for R&D, scale-up, and production is not only an ongoing commitment ... **It's what we do.**



## WE INNOVATE ... TO ADDRESS INDUSTRY CHALLENGES WITH OUR NEW TRIS AMINO™ AC ADVANCED CRYSTAL

ANGUS continues to enhance its capabilities through new innovations in process manufacturing. Our next generation TRIS AMINO Advanced Crystals (AC) are less prone to clumping and hardness – without any change to the molecule itself – and may provide critical operational benefits when it comes to handling and preparation. Come see for yourself and Discover A Better Way™ with ANGUS.

## WE INVEST ... TO PROVIDE A SECURE, SUSTAINABLE SUPPLY OF IMPORTANT BUFFERS – WHICH NOW INCLUDES TRIS AMINO HYDROCHLORIDE

As the world's leading global manufacturer of Tromethamine, ANGUS is proud to introduce the newest addition to its TRIS AMINO family of products – TRIS AMINO Hydrochloride (HCl). Today, ANGUS is the world's only fully integrated manufacturer of this critical buffer, which is produced using ANGUS' TRIS AMINO Tromethamine as a starter material to ensure we can meet the demanding quality and compliance standards of the Life Sciences markets we serve.

We understand the importance of our role in delivering supply chain continuity for these and other critical chemistries we safely provide to the market. That is why we have made significant investments in capacity expansion, new manufacturing capabilities and regulatory support. This includes the recent completion of a second TRIS AMINO manufacturing plant in Ibbenbüren, Germany, as well as our new TRIS AMINO HCl plant in Sterlington, Louisiana. Both manufacturing facilities operate under our single Global Quality Management System, and are strategically located in the U.S. and Europe, to provide efficient distribution of ANGUS products to all regions of the globe.

[angus.com](http://angus.com)

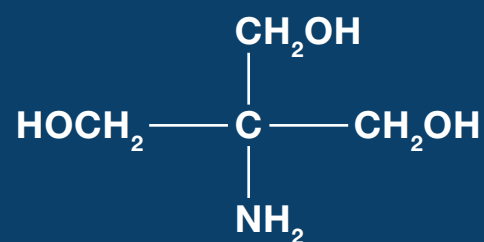
## DESIGNED WITH THE HIGHEST STANDARDS IN MIND, OUR TWO MANUFACTURING FACILITIES ARE AUDIT-READY AND OFFER:

- Adheres to current IPEC guidelines for cGMP compliant manufacturing of excipients
- ISO 9001: 2015 certification
- Automated in-process monitoring and facility control system
- In-house testing utilizing validated analytical methods
- Elemental impurity risk assessment using ICP-MS technology
- Comprehensive validation documentation
- State-of-the-art filling and packaging suites for Life Sciences products

DISCOVER A **BETTER WAY**™

# TRIS AMINO™

(tromethamine, trometamol) is a widely known excipient and processing buffer used in the purification of biological molecules. In addition to providing mild alkalinity for buffering at physiological pH levels, TRIS AMINO offers a number of advantages to bioprocessors, including aiding in chemical stabilization in aqueous formulations and exhibiting minimal salt effects. All grades of TRIS AMINO are GMO-free and BSE/TSE-free.



## TRIS AMINO Tromethamine

CAS No.: 77-86-1

Molecular weight: 121.14

Appearance: white solid or crystal

## TRIS AMINO BUFFERS AND REAGENTS

	INDUSTRIAL SERIES	BUFFER SERIES			ULTRA PURE SERIES	
	Ideal for industrial chemical applications and basic R&D.	Manufactured under ISO with process controls and monitoring in a non-cGMP environment. Buffer grades are ideal for applications where regulatory requirements are less stringent and don't require a monograph. Two purity levels available.			Highest purity product manufactured under GMP for use as a critical raw material in pharma or biopharmaceutical production. Meets monograph USP, EP, JPC, ChP testing specifications. Suitable for injectables.	
Product	Tech Grade	Standard TRIS AMINO Buffer	TRIS AMINO Buffer	TRIS AMINO AC Buffer	TRIS AMINO Ultra Pure	TRIS AMINO AC Ultra Pure
Main Differentiator	99.0% purity, industrial utility product with basic testing performed.	Cost effective buffer for lab and commercial applications requiring moderate purity.	Economical choice for biotech and diagnostic applications that want a high purity product but don't require full GMP documentation and monograph testing.	Identical purity and testing as buffer grade but with unique morphology that significantly reduces caking making it less prone to clumping and hardness.	Highest purity and testing requirements with strict process control compliant with cGMP. Change notification, and complete quality documentation available.	Identical to Ultra Pure quality and testing but with a unique morphology that significantly reduces caking making it less prone to clumping and hardness.
Purity	99.0 (titration)	99.3 (titration)	99.8 (GC)	99.8 (GC)	99.9 (titration and GC)	99.9 (titration and GC)
Shelf Life (Years)	3	3	3	3	3	3
CAS Number	77-86-1	77-86-1	77-86-1	77-86-1	77-86-1	77-86-1
Molecular Weight	121.14	121.14	121.14	121.14	121.14	121.14
Monograph	None	None	ACS	ACS	USP, EP, JPC, ChP	USP, EP, JPC, ChP
Quality Systems	ISO	ISO	ISO	ISO	ISO, IPEC, cGMP, select ICH Q7 principles*	ISO, IPEC, cGMP, select ICH Q7 principles*
APPLICATIONS						
Industrial	☑					
Basic Research	☑	☑	☑	☑		
Animal health		☑	☑	☑		
Diagnostics		☑	☑	☑	☑	☑
DNA/RNA extraction & Purification		☑	☑	☑	☑	☑
Electrophoresis / PCR		☑	☑	☑		
Analytical Chromatography		☑	☑	☑		
R&D protein purification		☑	☑	☑		
Commercial protein purification					☑	☑
Non-sterile excipient					☑	☑
API/Drug substance formulation					☑	☑
Molecular Biology (IVF, Cell line storage)					☑	☑
Blood Plasma Fractionation					☑	☑

\* TRIS AMINO™ Ultra Pure multi-compendial grade product has an excipient registration number with the Chinese Center for Drug Evaluation (CDE). This registration number, F20190000165, can be utilized by customers in order to list ANGUS' TRIS AMINO™ product in their regulatory filings with the CDE for new drug products or substances.

## TRIS DERIVATIVE BUFFERS AND REAGENTS

### TRIS DERIVATIVE SERIES

TRIS derivatives are often used in conjunction with TRIS AMINO to adjust pH. They can be used in both upstream and downstream processing applications.

Product	TRIS AMINO HCl	TRIS AMINO HCl Biologics Plus	TRIS HCl Prime	BIS-TRIS
Main Differentiator	99.0% pure product manufactured under ISO with standard testing available.	99.0% pure product manufactured under ISO with ICPMS elemental impurity testing, and comprehensive** molecular biology and biologics testing.	Highest purity TRIS HCl product manufactured under cGMP with the lowest levels of elemental impurities on the market.	Primarily used in protein and nucleic acid systems, BIS-TRIS is known to complex with various metals.
Purity	99.0	99.5	99.5	99.0
Shelf Life (Years)	2	2	3	3
CAS Number	1185-53-1	1185-53-1	1185-53-1	6976-37-0
Molecular Weight	157.60	157.60	157.60	209.24
Monograph	None	None	None	None
Quality Systems	ISO 9001:2015	ISO 9001:2015	ISO 9001:2015, cGMP, IPEC, Select ICH principles	ISO 9001:2015, Select ICH principles

\*\* Includes testing for biobuden, endotoxin, yeast and mold, DNase, Rnase, Protease

## DISCOVER PEACE OF MIND AND STREAMLINE QUALIFICATION FOR TRIS AMINO PRODUCTS

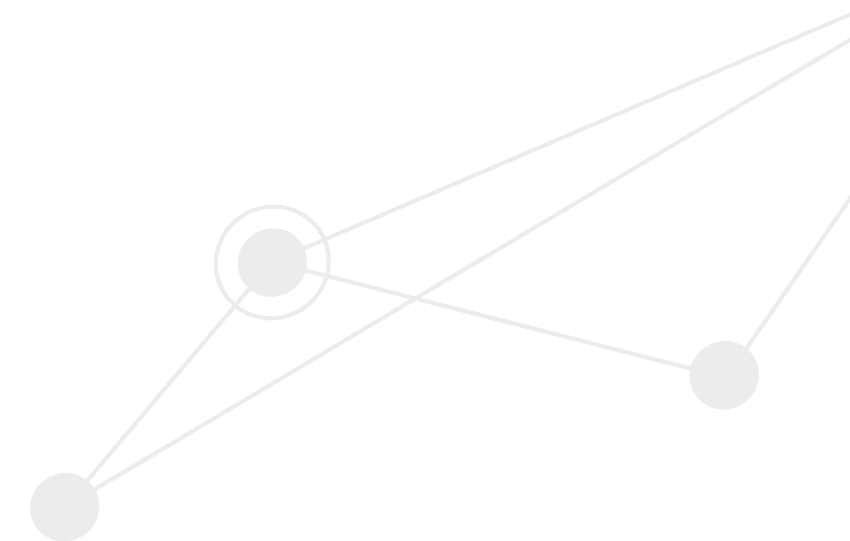
We understand in order to mitigate risk and meet regulatory guidelines for commercial manufacturing, you need a highly reliable supply chain, access to documentation, and a collaborative approach to understand and address your company's unique compliance requirements.

That's why, as the world's only fully integrated manufacturer for TRIS AMINO, ANGUS is uniquely positioned to offer a 100% traceable supply chain, with a clear line of sight back to raw materials — all of which are produced on-site to stringent specifications. This, combined with a single Global Quality Management System, means absolute confidence you can readily qualify material and have a secure, sustainable supply.

### STANDARD QUALIFICATION DOCUMENTS

- Safety Data Sheets (SDS)
- Product Sales Specifications
- Certificate of Analysis (CoA)
- ISO 9001:2015 Certificate
- High Level Manufacturing Process Flow
- Regulatory Data Sheets\*
- Product Stability Data\*
- cGMP Statement of Conformance\*
- Excipient Information Packages\*
- Precedence of Product Use\*

\*Available for select products



### DID YOU KNOW?

ANGUS Life Sciences also offers a comprehensive portfolio of high-quality chemistries from the world's leading producers through a qualified, traceable and integrated supply chain. Our single Quality Management System is applicable to all our biochemical, buffer and salt products, including:

- AMINO ACIDS AND DERIVATIVES
- VITAMINS AND NUCLEOTIDES
- BIOCHEMICALS AND BUFFERS
- INORGANIC SALTS