



# RECYCLING TECHNOLOGY



# WELCOME

Sustainability is everybody's task – and needs leaders with a vision. Join us for a look at our business unit 'recycling technology', connecting ecological necessity with economic opportunity through innovative technology.



MISSION

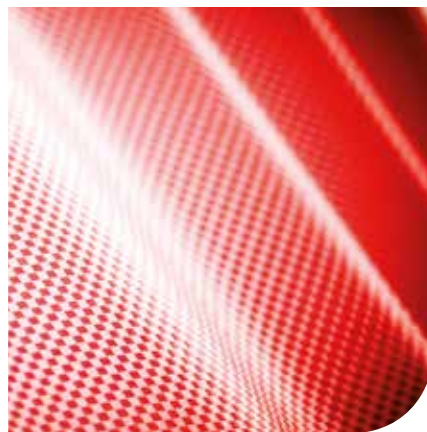
VALUES

## *European competence solution-oriented*

Being an innovative European industrial company for mechanical engineering and process technology, we owe our technological leadership status to our focus on application-oriented solutions. As a business unit of Starlinger, we set standards in the field of recycling machines for thermoplastics and specialise in applications such as film, PET flakes, fibre and nonwoven, woven bags, and numerous specialities.







As a manufacturer of turnkey plants for woven plastic sacks, Starlinger textile packaging soon was confronted with the issue of production scrap and its reuse. By developing and marketing recycling lines, we at Starlinger recycling technology enhance the ecological and economic sustainability of our customers. Innovation has become a way of life, as close touch with the market drives the development of high-quality products and new technologies that further our customers' success. We support customers with comprehensive knowledge and experience, both technological and with regard to markets and applications. As a

result, we are able to develop, finance, implement and service complete projects.

In keeping with our emphasis on research and development, we foster and challenge our highly motivated and internationally active employees, whom we consider our company's finest assets. Transparency and confidence characterise our relations with suppliers and other partners. As a family-owned enterprise established in 1835, we place a high value on long-term success for our company and those with whom we do business.

## TIMELINE

**RECYCLING LINE 'Indumat'** for woven PP sacks developed

1987

**PRODUCT GROUP** expanded; vented extruder introduced

1991

**TYPE 'UNIVERSAL'** developed and launched with cold extruder feeding

1997

**POST-CONSUMER** scrap-to-product recycling line 'Intrustar' developed

1999

**PRODUCT GROUP** 'recoSTAR' for all thermoplasts and scrap types launched

2001

**REORGANISATION** as business unit 'recycling technology'; **FIRST recoSTAR** supplied for in-line edge trim recycling

2002

**INSTALLATION** of recoSTAR basic for PET multifilament production scrap, recoSTAR universal for non-woven production scrap, recoSTAR PET for preforms

2003

**FDA LETTER** of non-objection; first recoSTAR PET 125 iV+ for food-contact rPET installed

2004

**ASSEMBLY HALL** for all recoSTAR lines completed

2006

**FIRST COMPLETE PROJECT** including washing line engineered and installed

2010

**GLOBAL REFERENCES** for a multitude of applications; 25 years of Starlinger recycling lines

2012

**LAUNCH OF C-VAC** modul for excellent degassing

2013

**HIGH AUTOMATION** & wider range of applications with recoSTAR dynamic; introduction of **recoDESIGN** for improved energy efficiency

2015

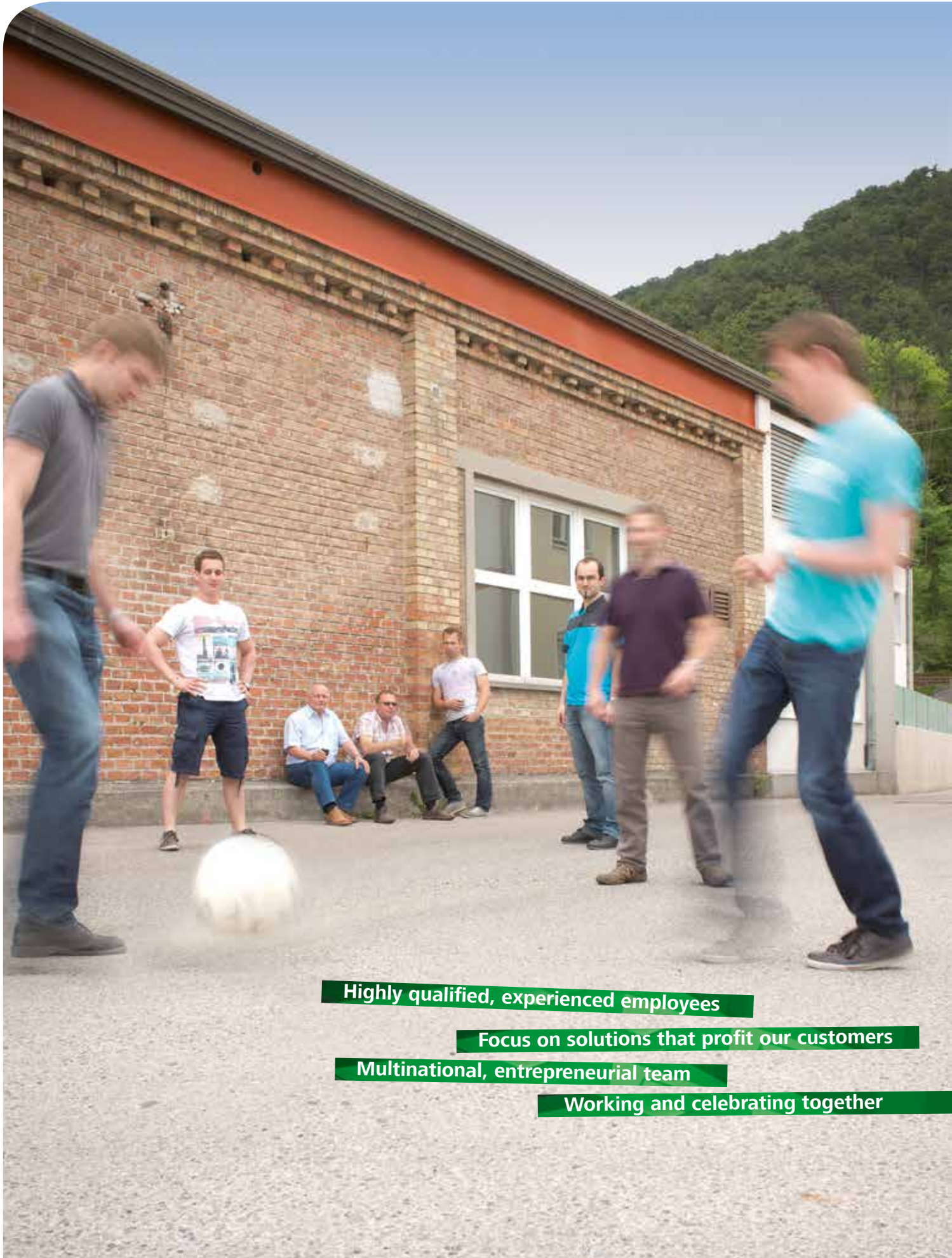
TEAM SPIRIT  
EXPERTISE

## *The people factor faces of success*

As a family enterprise with many decades of tradition in mechanical engineering, we understand the importance of the human factor for success. Members of our multinational team combine outstanding knowledge and experience in their fields with excellent people skills. Our growing business unit relies on the entrepreneurial spirit of each individual team member, regardless of position, assignment or location.







**Highly qualified, experienced employees**

**Focus on solutions that profit our customers**

**Multinational, entrepreneurial team**

**Working and celebrating together**



Behind every solution, every achievement, stands a team of people dedicated to seeking common ground. This perspective carries over into our customer relations: together, through personal contact and shared responsibility, ambitious goals become attainable.

Our customers are as diverse as their recycling requirements are varied. And the global market hands us changing, growing challenges that only a competent and highly motivated team can meet. The accessibility of our management and proprietors makes it possible to arrive at decisions quickly and without complication.

Our technically skilled sales team maintains close contact with customers and takes on the role of partner in joint solution-finding. Innovative techniques and individual solutions are our keys to success. Our technical departments bring together experts from fields such

as engineering, design and development, process technology, electrical engineering and software. For the customer, what counts most is system availability and production efficiency. These are the responsibility of our globally active service team, which also commissions newly delivered lines and trains customers' operators.

As a multinational and multilingual team, we keep in touch directly in our customers' own languages.





# NEARBY WORLDWIDE

## *Serving the global neighbourhood*

We at Starlinger recycling technology have been globally oriented from the start. Plastics are processed everywhere, and many countries have collection and reuse programs for production and post-consumer scrap. The concern is universal, the needs of each recycler absolutely individual. Proximity to customers and their markets, comprehensive process know-how, modular equipment design and the ability to offer special solutions have made us the worldwide 'partner of choice' in recycling.





Due to global networking price pressure increases; here, recycling in-house scrap or collected post-consumer waste helps improve efficiency and reduce costs. A recycling line must meet a wide range of demands, present and future: properties of thermoplasts, additives, end products and other factors remain in a state of flux, and the installed line must be modular and adaptable in order to enable the recycling plant to react to the changing market.

The use of thermoplasts in applications such as flexible and rigid packaging, fibres for fabric and nonwovens, injection-moulded parts etc. continues to grow. As raw material consumption increases, so does the amount of generated waste. Though some regions caught on earlier than others to the value of what is now known as 'secondary resources', recycling is now universally recognized as necessary for conserving both the environment and available resources.

We are backed by decades of worldwide experience in marketing, engineering and servicing recycling lines. This extra measure of customer-orientation enables us to develop our lines with varying regional requirements in mind – including differences in polymers, additives, production processes, throughput quantities and industries.



**Branches, partnerships, travel worldwide**

**Individually tailored, market-based solutions**

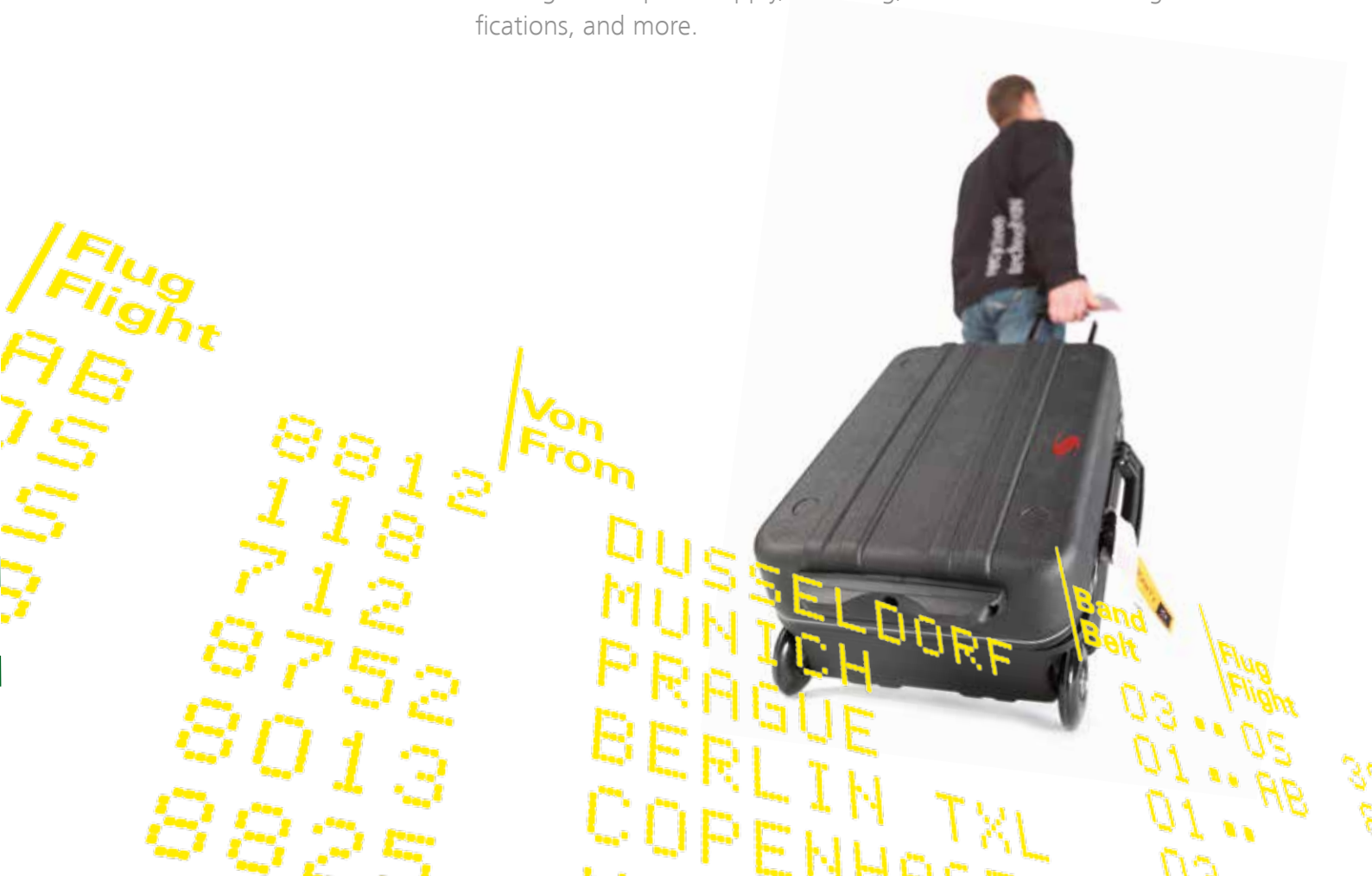
**Flexible, modular lines - meeting regional needs**

**Reaching goals in person-to-person teamwork**

# SUPPORT SERVICE

## *Availability and efficiency*

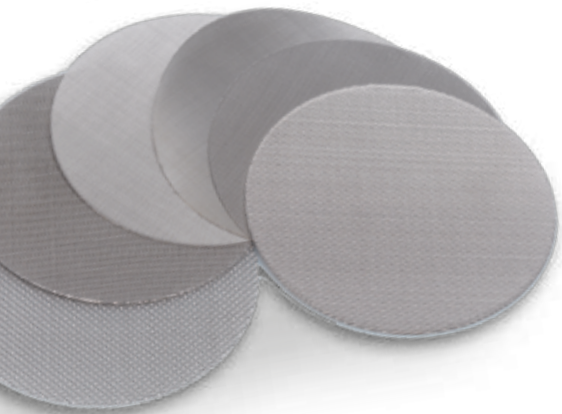
Service is our way of life – from the initial offer and the optional material test in our Technical Center through the project planning and order handling phase, to installation and commissioning of the line, operator training on site, and finally ‘lifetime’ after-sales-service by our Customer Service Center. We also offer engineering beyond our regular scope of supply, financing, assistance in obtaining certifications, and more.







We remain committed to our customers, long after the line has been supplied. Return on investment depends on line availability, efficiency and a high quality end product. Our team of experts is there to help customers achieve these goals. Quick reaction time, ensured by our Austrian headquarters and several regional branches, is the measure of good service.



Being suppliers of high-tech industrial plants and customer-specific solutions, we recognise the value of individual customer care from the moment of first contact until the line is in operation, and beyond. During on-site visits, we acquaint ourselves with local conditions and establish a bond of loyalty with our customer, based on a sense of personal responsibility for the success of the venture. Test runs in our Technical Center, the handling of the order in co-operation with our back office and project department, provide an opportunity to understand and respond to our customers' specific needs.

Outstanding after-sales-service from our Customer Service Center is an important part of our scope of supply. This means not only a well-stocked spare parts store, but above all staff with comprehensive expertise and high problem-solving capability. Our service back office has the advantage of close co-operation with colleagues in technology and process development, and our field service draws on a wealth of experience gleaned from assignments all over the world. Together we achieve the goals of efficient operation and high line availability for our customers' profit.

# TECHNOLOGY APPLICATION

## *Innovation and flexibility in step with the future*

Recycling of production and post-consumer scrap means adapting to continual changes in incoming materials. Engineering must also take into account potential uses of the recycled product. This poses challenges not only for the line itself, but above all for us as developers and suppliers of innovatively designed plants.





1)



2)



3)



4)



5)

## Applications

- 1) Film
- 2) PET flakes
- 3) Fibre and nonwoven
- 4) Woven bags
- 5) Specialities



### recoSTAR direct

for production and post-industrial scrap, preground materials with high bulk density, space and energy saving, cost-effective solution



### recoSTAR dynamic

for post-consumer and production scrap, wide range of applications, in-line and off-line, superior functionality with SMART feeder, high output and increased energy efficiency



### recoSTAR universal

for production and post-industrial scrap, integrated ACTIVE shredder for hard-to-grind materials, innovative process adaption, quick access for fast material change-over, easy maintenance



### recoSTAR PET

for production and post-consumer PET scrap, preforms, bottle and sheet flakes, integrated pre-drying, dust-free processing, optional inline solid staling, full automation



### recoSTAR SSP

solid state polycondensation SSP for PET pellets, inline IV increase, super-clean decontamination for direct food contact, reduction of acetaldehyde, continuous batch process

**Waste to secondary resource**

**With the right recycling line**

## Technology

How does a project start? Both production scrap and collected waste can be transformed into a valuable secondary resource. In decades of research and development, paired with process experience and closeness to the market, we have developed a comprehensive product range for processing all kinds of thermoplasts (such as PE and PP, PET, PA, PS, PLA, PMMA) and their mixtures, blends and compounds. Whether fluffy film or hard-to-grind start-up lumps, whether humid or contaminated with foreign particles – after recycling, the product should be usable up to 100 % in another production process.



Each recoSTAR line has specific characteristics, but the main features are common to all. Design is modular, so that based on the input material a line is configured from individual modules which are adaptable if necessary. As input materials and reapplication possibilities change, modules can be added and adaptations made in response to the market. Easy accessibility for maintenance, touch screen and visualisation, one-button start-stop, inline quality control tools, and other features help reduce operating costs. So does the energy-efficient design – another mark of our uncompromising commitment to sustainability.







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