

# igus<sup>®</sup> E-Chain<sup>®</sup> ESD & ATEX Manual

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- igus<sup>®</sup> worldwide service

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# Permanently conductive

The igus® ESD E-Chain® offers protection against electrostatic charges in applications on automatic component insertion machines, in the clean-room sector, in storage/retrieval units and in toxin stores, sewage-treatment plants or painting systems and painting lines for instance.

Up until late 1975, the individual states in Europe had only national Directives on Explosion Protection. These Directives were amended time and time again through to 1990.

The igus® GmbH company in Cologne, Germany, conducted measurements of the electrical surface leakage resistance for igus® E-Chains® with the special material igumid GC successfully for the explosion-hazard protection zones 0, 1 and 2 as early as 1992 in cooperation with the PTB in Braunschweig, Germany. Further certifications by the PTB followed in 1998 and 1999 in accordance with DIN 53482 and Static Electricity Directives, ZH1/200, of the Main Association of Commercial and Trade Employers' Liability Insurance Associations.

In the year 2000, the igus® research organization in Cologne, Germany, started development of a new material in accordance with ESD (elec-

trostatic discharge). This new material, igumid ESD, was approved by the PTB in May 2002 after many tests at the igus® laboratory.

After the European Union had passed the General Directive 94/4/EC of the European Parliament on Harmonization of Legislation of the Member States in Relation to Equipment in Explosion-Hazard Areas and, with the new version, had created Atex (French for: Explosive Atmosphere), igus® began further development of these materials to meet these challenges well.

In June 2002, the manufacturer in Cologne, Germany, started research into 94/9/EC, assisted by renowned institutes.

The material igumid ESD which was developed, with special additives, even ex-

ceeds the standard material in relation to many requirements and was tested with over 100 million cycles. Unlike temporarily acting, applied conductive platings or coatings or volatile incorporated antistatics, the additives used provide durable and maintenance-free conductivity. One other positive aspect is the material's resistance to aggressive chemicals and temperature etc.

The hue of igumid ESD corresponds to RAL 7015, slate gray. These E-Chains® have been delivered in this form for approx. 1.5 years now in order to visually distinguish them from the standard material and in order to avoid confusion in application.

An Atex certificate is available on request from the manufacturer.

On request with  
"Atex/94/4/EG-Certifikate":  
ESD-Energy-Supplies of igus®

Source (German version): KONSTRUKTION & ENTWICKLUNG 4/2003

# ESD- & ATEX- Applications

The material igumid ESD in color gray has offered explosion-protection safety and protection against electrostatic charges since June 2002. This material is based on the GC material which was developed as early as 1992, modified in 2002 and issued certifications by the PTB as early as eleven years ago.

A Declaration of Conformity can be found on Page 5 of this ATEX brochure.

- igumid ESD with PTB certificate
- Standardized product
- Tested and successfully time-proven for many years in explosion-protection areas
- Color: Slate gray (similar to RAL 7015) for easy differentiation

## ESD- & ATEX Products – your benefits:

- ESD and ATEX material tested with over 100 million cycles for most stringent requirements, even for long travels
- Snap-open chains, snap-open tubes, three-dimensional chains with mounting brackets and interior separation available in ESD and ATEX version
- Short delivery times; ordering and delivery service from 8 am to 8 pm in Germany



Information available at:  
[atexinfo@igus.de](mailto:atexinfo@igus.de) or  
<http://atex-info.igus.de>

# Operating Instructions for igus® ESD-E-Chains®

Supplement to installation instructions and catalog  
for igus® ESD E-Chains® – classification: **Ex II 2 G**

## 1. Technical data

See catalog information

## 2. General safety information

These additional Operating Instructions apply to the explosion-protected versions of our E-Chains® of Type "ESD" in color gray (similar to RAL 7015). They supplement the Installation Instructions for the standard E-Chains® and the catalog information. The information in these

instructions relates only to data impacting on explosion protection. The technical information in the Installation Instructions for the standard E-Chains® and the category information still apply unchanged unless these Instructions explicitly exclude or replace the relevant information. Required documentation and other documents are filed with the following institute pursuant to the ATEX Directive:

**Physikalisch-Technische  
Bundesanstalt (PTB)  
Braunschweig und Berlin  
Bundesallee 100  
D-38116 Braunschweig  
Germany**

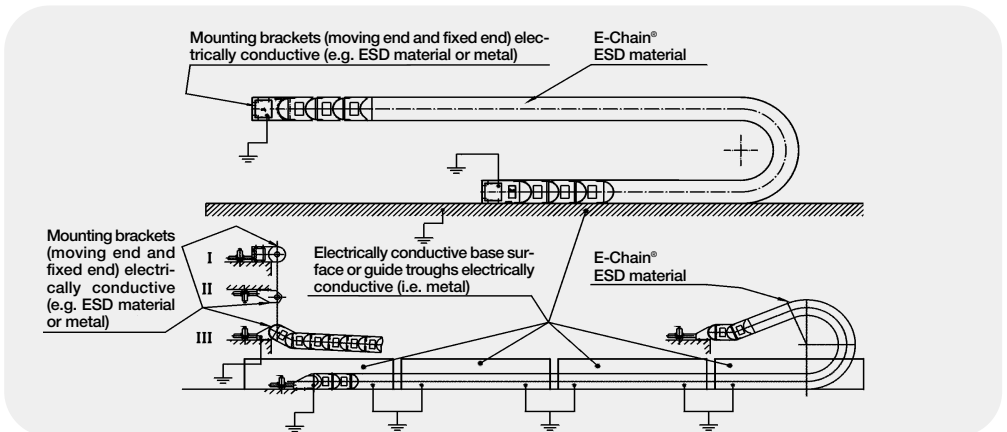
## 3. Assembly, removal and installation

Please follow the information in the Installation Instructions for the standard E-Chains® and the catalog information on assembly, removal and installation for trouble-free

operation. igus® ESD E-Chains® must be grounded with appropriate measures in accordance with drawing number: 18392.2 in order to discharge any electrostatic charges occurring.

**Assembly, installation, commissioning and maintenance may be performed only by "personnel trained in explosion protection"!**

Please also note the corresponding national safety



Connection of an E-Chain® in accordance with ATEX Directive 94/9/EC

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regulations and the relevant national regulations in respect of explosion protection during assembly and operation.

#### 4. Commissioning

Before commissioning the system, check that the system has been installed correctly in accordance with the Installation Instructions for the standard E-Chains® and the catalog information.

Correct grounding must be checked in particular in the case of ESD E-Chains®.

#### 5. Maintenance

igus® E-Chains® are maintenance-free. Correct grounding of the E-Chains® must be inspected at regular intervals.


# EC-Declaration of Conformity


**Dokument-Nr.:** QM-0-419-A  
**Manufacturer:** igus® GmbH • Spicher Str. 1a • D-51147 Köln, Germany  
**Description of product:** igus® ESD Energy chains®

#### Description of product:

ESD E-Chains® (non-electrical components) used for dynamic guidance of energy conductors such as lines and hoses with defined bending radii and travel parameters. The conformity rating was performed on the basis of ATEX Directive 94/9/EC according to Art. No. 8 (1) b) ii). The corresponding documents are filed at the following institute in compliance with the ATEX Directive:

**Physikalisch-Technische Bundesanstalt**  
**Braunschweig und Berlin • Bundesallee 100**  
**D-38116 Braunschweig, Germany**

Investigations required after classification  II 2 GD in accordance with the standards and regulations listed below were conducted and verified by the PTB: **Cenelec TR 50404:2003** previously: DIN 53482/VDE0303/Part 3, verified by the PTB), **BGR 132:2003 and ZH1/200**

**Marking:**  II 2 GD - Special color of the ESD E-Chain® color: gray (similar to RAL 7015)

The Declaration of Conformity refers only to conception and manufacture of the devices described above according to ATEX Directive 94/9/EC in compliance with the Harmonized Standard DIN EN 13463 – 1 (2002).

The related Operating Instructions contain important safety instructions for positioning and commissioning of igus® ESD E-Chains® according to the ATEX Directive.

**We hereby declare that igus® ESD E-Chains® fulfill the requirements of the Directive specified above.**

igus® Cologne, Germany, 27 May 2003



Chief Executive Officer

# Product selection

## igus® ESD E-Chains® – at a glance

### Triflex® – for 3D movements, fully enclosed



- Cost-effective design for complex movements
- Combination of different directions of movement and bending radii
- Very good chip protection
- Can be installed/removed at "any" point

#### Triflex® installation dimensions (from - to)

Interior height hi [mm]	Inner width Bi [mm]	Unsupported length max. [mm]
25 - 75	25 - 75	on request

### TwisterChain® – for spiral and rotary movements



- Rotary movements up to 520°
- Circle radius and widths variable
- Double lock
- Can be opened along both radii
- Smooth interior to protect cables and hoses

#### TwisterChain® installation dimensions (from - to)

Interior height hi [mm]	Inner width Bi [mm]	Unsupported length max. [mm]
28 - 56	52 - 200	-

### System E2 – small and mid-size, 1 and 2-piece E-Chains®



- Smooth interior to protect cables and hoses
- Easy installation
- Broad range of accessories
- Giant range of applications
- Snap-open on the inside or outside
- Option for integrated strain relief

#### System E2 installation dimensions (from - to)

Interior height hi [mm]	Inner width Bi [mm]	Unsupported length max. [mm]
5 - 45	5 - 250	0,40 - 2,50

### E2 Energy Tube – fully enclosed, optimum protection of cables and hoses

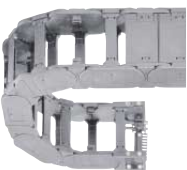


- Small pitch, smooth operation
- Universal mounting. KMA mounting brackets with integrated strain relief – inside
- Chip-repelling exterior contour
- Double stop, high stability and long unsupported lengths

#### E2 Energy Tube installation dimensions (from - to)

Interior height hi [mm]	Inner width Bi [mm]	Unsupported length max. [mm]
21 - 50	20 - 250	1,20 - 2,50

### System E4 – for tough applications



- Highest stability (in igus® range)
- Broadest diversity of interior separation and mounting options
- Easy-to-install
- Rugged stop system
- Can be opened along both radii

#### System E4 installation dimensions (from - to)

Interior height hi [mm]	Inner width Bi [mm]	Unsupported length max. [mm]
21 - 200	30 - 600	2,00 - 8,00

The detailed range of products can be found in the "Online Catalog" at [www.igus.de](http://www.igus.de)



# igus® worldwide service

More than 26 igus® subsidiaries and exclusive distributor partners

1600 staff in Germany and at 26 international subsidiaries and offices.

Advantage for you:

- We are right where you are
- Local experts can be on site, fast
- Fast worldwide delivery
- Full catalog range from stock



## igus® online

[www.igus.de](http://www.igus.de)

- Download 3-D models from the Internet – without registering!
- Over 20 CAD formats and product drawings
- Complete catalogs online, simple search engines
- Constantly changing, current new products and offers
- If you enter one or more parameters, you can quickly view an overview of all E-Chain® types suitable for you
- E-Chain® comparison – compare several E-Chain® series with only a few clicks of the mouse.



## Order tracking with igus® "i-net"

Track your order in real time with igus® i-net. Simply apply for a password, log in and you can then track your job status by webcam. You can also track the goods you have ordered from shipment by igus® to your door with igus® i-net Haulage Tracking.

- Numerous webcams
- More precise order data with an overview of target/actual dates
- Select whether you want order confirmation or invoice by letter, fax or e-mail.



# Fax-Reply

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catalog




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igus®  
Chainflex®  
catalog




igus® plain  
bearing-  
catalog




igus®  
xiglidur 4.0  
CD-ROM

The terms "igus", "ReadyChain", "Chainflex", "E-ChainSystems", "Energy Chain", "Energy Chain Systems", "E-Chain", "Flizz", "Easy Chain", "TwisterChain", "igubal", "iglidur", "DryLin" and "Polysorb" are legally protected igus® trademarks in the Federal Republic of Germany and in case also in foreign countries.

### Sender:

Company .....

Name .....

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