



GEVACRIL®

Sales Handbook
2019

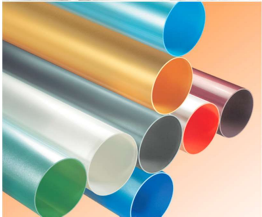
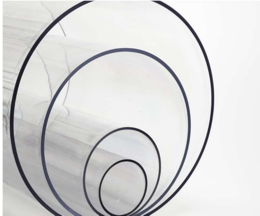
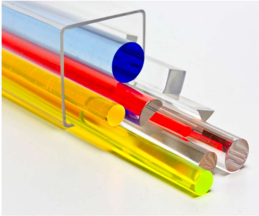
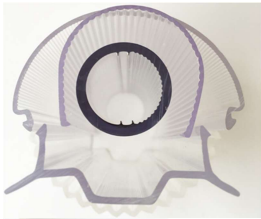


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B) QUALITY& STANDARDS

1 Quality Standards

1.1 Quality Management System

Since our management philosophy is to satisfy 100% the customer's needs, we have been striving for constantly improving our high quality standards.

DIN and ASTM are the most famous international renowned institutes of standardization that set a series of standard norms on experience and tests base, which products have to meet in order to reach a good market quality.

We know that all our products meet the severe standard norms given by these two institutes, but in order to show you the processes that lead to our excellent quality we decided to put them down: the result is the

QUALITY DESCRIPTION SYSTEM (QS)

which we wrote also in conformity with the DIN EN ISO 9001: every product has to respect all control criteria of the QS before its quality is approved. Find our quality description documents in this chapter starting from § 3.

2 Approvals

2.1 Food Contact: Declaration of Compliance

Our acrylic semi-finished products in PMMA comply with the appropriate regulation, Commission Regulation 10/2011 (and following amendments 1282/2011 and 1183/2012)¹, and FDA REGULATION 21 CFR § 177.1010, and are manufactured according to the plastic supplier's specifications. Complying with these regulations they do not transfer or migrate their constituents to quantities which could endanger human health or bring about an unacceptable change in the composition of the foodstuffs².

Approvalor Regulation	Title/Institute	Description	Products	Validity
Commission Regulation 10/2011	The composition of the products complies with the appropriate regulation	Valid in all the European Community	GEVACRIL® XT TUBES PMMA GEVACRIL® XT SATIN TUBES GEVACRIL® CAST- CONTINUED® TUBES GEVACRIL® CAST TUBES GEVACRIL® XT RODS, HALF-ROUND RODS, BARS, TRIANGLE BARS GEVACRIL® CAST RODS GEVACRIL® CAST BARS GEVACRIL® CAST DOMES GEVACRIL® CAST BALLS	Until revoked
FDA Regulation 21 CFR § 177.101	The composition of the products complies with the appropriate regulation	Valid for the USA	GEVACRIL® XT TUBES PMMA GEVACRIL® XT SATIN TUBES GEVACRIL® CAST- CONTINUED® TUBES GEVACRIL® CAST TUBES GEVACRIL® XT RODS, HALF-ROUND RODS, BARS, TRIANGLE BARS GEVACRIL® CAST RODS GEVACRIL® CAST BARS GEVACRIL® CAST DOMES GEVACRIL® CAST BALLS	Until revoked

¹This regulation, which is a specific measure within the Regulation EC 1935/2004, substitutes and updates previous regulations like DIRECTIVE 90/128/EEC, COMMISSION BASIS DIRECTICE 76/769/EWG, COMMISSION DIRECTIVE 2002/95/EG, COMMISSION DIRECTIVE 2003/11/EG, ILRS-list (former VD-list 232-101)

²General migration tests were performed on the products listed in the table. The products mentioned meet the requirements for total migration to: 10% ethanol, 3% acetic acid and olive oil for 10 days at 20 °C. They are therefore classified as harmless. This Declaration of Compliance applies to all our products mentioned here and delivered in their standard semi-finished form. It does not apply to finished or transformed articles. Should any of our semi-finished products in any way be processed, glued, heat-formed, assembled or moulded it is responsibility of the fabricator (or of those who have transformed them) to ensure observation of the existing laws. The information in this Declaration of Compliance is based on our knowledge and experience. It does not release the user from the obligation of carrying out tests and trials, in view of the many factors that may affect processing and application; neither do they imply any legally binding assurance of certain properties or of suitability for a specific purpose. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed.

2.2 Fire Ratings

Country/ Certificate	Class	Extruded PMMA	Extruded PC	Cast PMMA
Austria B3800	B1			
	B2	all	all	all
France NF P 92 501& P 92 505	M1			
	M2			
	M3			
	M4	all	all	all
Germany DIN 4102	B1			
	B2	all	all	all
	B3			
Italy CSE/RF 2/75A and 3/77	Class 1			
	Class 2			
	Class 3			
	Class 4			
	Class 5	all	all	all
Switzerland BKZ	V			
	IV.3	all	all	all
	III			
The Netherlands NEN 3883	Class 1			
	Class 2			
	Class 3			
	Class 4	all	all	all
United Kingdom BS 476, Part 6,7	Class 0			
	Class 1			
	Class 2			
	Class 3			
	Class 4	all	all	all
USA UL 94	V-0			
	V-1			
	V-2			
	HB	all	all	all
Europe DIN EN 13501	E	all	all	all

2.3 Statement on Compliance to RoHS Directives (2011/65/EU and (EU) 2015/863)³

Directive 2011/65/EU and amendment (EU) 2015/863 restrict the use of certain hazardous substances in electrical and electronic equipment above specific thresholds.

We are glad to confirm that the following products of GEVACRIL® srl comply with the requirements of Directive 2011/65/EU and amendment (EU) 2015/863 regarding substance restriction⁴.

Approvalor Regulation	Title/ InSTITUTE	Description	Products	Validity
RoHS Directives (2011/65/EU and (EU) 2015/863)	The composition of the products complies with the appropriate regulation	Valid in all the European Community	GEVACRIL® XT TUBES PMMA GEVACRIL® CAST- CONTINUED® TUBES PMMA GEVACRIL® CAST TUBES PMMA GEVACRIL® XT RODS AND BARS PMMA GEVACRIL® CAST RODS AND BARS PMMA GEVACRIL® PC CLEAR TUBES	until revoked

The following substances or compounds containing these substances

- Cadmium (threshold 0.01%)
 - Lead (threshold 0.1%)
 - Mercury (threshold 0.1%)
 - Hexavalent chromium (threshold 0.1%)
 - Flame retardants PBB and PBDE including pentabromodiphenyl ether (CAS-No. 32534-81-9), octabromodiphenyl ether (CAS-No. 32536-52-0) and decabromodiphenyl ether (CAS-No. 1163-19-5) threshold (0.1%)
 - Bis(2-ethylhexyl) phthalate (DEHP) (threshold 0.1%)
 - Butyl benzyl phthalate (BBP) (threshold 0.1%)
 - Dibutyl phthalate (DBP) (threshold 0.1%)
 - Diisobutyl phthalate (DIBP) (threshold 0.1%)
- have not been intentionally added for the production of all these raw material grades or semi-finished products mentioned above and therefore these substances are not expected to be present above the regulated thresholds.

The presence of analytically detectable traces far below the limits of the above mentioned substances or compounds containing these substances cannot be excluded.

³This product safety and regulatory related information (“Information”) – whether verbal, in writing or by ways of trial – is given in good faith but without warranty, express or implied. The Information is provided by GEVACRIL® without assumption of any liability. If any of the above mentioned regulations change after the date of declaration, this declaration is no longer valid. GEVACRIL® reserves the right to withdraw or modify the statement at any time without notice. Our publication of revised product statements on the internet portal or elsewhere renders the superseded statements void.

Our Information does not release you from the obligation to verify the Information provided (especially that contained in our safety data and technical data sheets), to check for updates of any Information provided by us and to test our products as to their suitability for the intended processes and uses. The application, use and processing of our products and the products manufactured by you on the basis of Information are beyond our control and, therefore, entirely your own responsibility. Our products are sold in accordance with the current version of our standard Conditions of Sale.

⁴This Statement of Compliance applies to all our products mentioned here and delivered in their standard semi-finished form. It does only apply if combined with an original invoice proving the purchase and use of our products; this approval is only valid for GEVACRIL® branded products. Should any party use this approval for items that are have not been produced by GEVACRIL® or are not GEVACRIL® branded, it is responsibility of this party to face any legal consequences that may happen. This statement is exclusively for our customers and respective competent authorities. It is not intended for reproduction either in printed or electronic form (e.g. via internet) by others. Thus, neither partial nor full reproduction is allowed without written permission from GEVACRIL®. This Statement does not apply to finished or transformed articles: Should any of our semi-finished products in any way be processed, glued, heat-formed, assembled, moulded or altered, it is responsibility of the fabricator (or of those who have transformed them) to ensure observation of the existing laws. The information in this Statement of Compliance is based on our knowledge and experience. It does not release the user from the obligation of carrying out tests and trials, in view of the many factors that may affect processing and application; neither do they imply any legally binding assurance of certain properties or of suitability for a specific purpose. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed.

3 Quality Descriptions

3.1 Cast Acrylic Tubes

Quality Description for Cast Acrylic Tubes⁵

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⁵In the whole text as QS. Our QS is written in conformity with the norms ISO 9001

Preface

Our QS has been valid since 1994. Purpose of this certification is to guarantee an excellent quality of every single tube.

The strict quality control during the production process and a constant improvement of the production technologies allowed the standardisation of the quality of cast acrylic tubes.

1 Material features

Cast acrylic tubes are polymerized plastic semi-finished products. They went through casting and centrifugation and they are known as cast acrylic tubes. After the production process they are clear and bright, both on the internal and the external wall. High purity, brightness and transparency are their most important characteristics; besides they are very resistant against weather conditions: the above mentioned features remain unalterable over years⁶.

2 Quality description

The QS - quality description - includes following contents: optical quality; thermic features; weather resistance; tolerances; delivery condition.

2.1 Optical quality

Cast acrylic tubes are transparent and have a clear bright internal and external wall. They are free of any kind of tracks or deep scratches. In spite of this some optical defects are not to avoid while looking sidelong through the tubes. Following defects are admitted:

- orange peel effect⁷;
- see table 1:

⁶ See 2.3 on weather resistance

⁷ So long these defects do not alter the optical qualities of brightness and transparency on the whole tube

Table 1: Admitted defects

Defect group	Superficial scratch mm	Rings on the internal wall	Bubbles, foreign bodies, filaments mm ²	max. number of defects admitted on 300 mm of tube
A	≤ 1,0	many ⁸	≤ 1,0	many ⁹
B	> 1,0 – 2,0	*	> 1,0 – 2,0	5 LD (B)
C	> 2,0 – 5,0	*	> 2,0 – 5,0	1 MD (C) + 2 LD (B) ¹⁰
D	> 5,0 – 25,0	*	> 5,0 – 25,0	1 BD (D) ¹¹

Table I: A = negligible defect; B = little defect (LD); C = medium defect (MD); D: big defect (BD)¹².

Following defects are not admitted:

- deep scratches;
- unpolymerizedstuff in the material bigger than 10 mm.²;
- rests of polishing material.

2.2 Thermic features

As acrylic glass is characterised by particularly long molecules, the cast acrylic tubes remain in a solid state until 110 °C. Above this temperature they get softer and softer and can be formed at about 150-200 °C.

After warming them as indicated in table 2, following defects do not have to appear:

- internal bubbles;
- orange peel effect;
- ice effect (internal cracks) ¹³;
- rings or yellowing effect.

⁸So long these defects do not alter the optical qualities of brightness and transparency on the whole tube.

⁹So long these defects do not alter the optical qualities of brightness and transparency on the whole tube.

¹⁰ Minimal distance: MD to LD = > 100 mm.

¹¹On the entire tube (2.000 mm.).

¹²The data on the admitted defects are based on internal tests made by Gevacrilsrl.

¹³ Generally speaking the effect is called "crazing"

Table 2: Warming of cast acrylic tubes

Thickness Mm	Time Min.	Temperature °C
till 6	30	160
8	40	160
10 to 15	50	160

Besides, after warming the tubes as indicated in the table 2 following results are expected:

- disfigurement on the heads of the tube: < 2%;
- yellowing effect on the heads of the tube: $\leq 1,2\%$ (Method AP2-MP/PA92:002);
- minimal monoaxial deformation at 160 °C: 300%;
- minimal biaxial extension at 160 °C:100%.

2.3 Weather resistance

Weather resistance after 10 years open air in Melzo (Milan)

- minimal resistance: 60 MPA;
- light absorbtion: $\leq 2\%$;
- yellowing effect: $\leq 1\%$.

2.4 Tolerances

In order to guarantee an excellent standard quality the cast acrylic tubes are controlled many times during the production process. Tubes that show worse values than those indicated in the table 3 do not get through the quality control and are systematically rejected.

Table 3: Tolerances Cast Tubes¹⁴

Ext. Ø mm	Standard Length mm	Thickness mm	Tolerance External Ø mm	Tolerance Thickness 3-10mm**	Tolerance Thickness 12-15mm**	Length	Coni-city mm/m	Oval shape OD	Oval shape ID
40	2000	3;4	+1%,-0,5%	± 1	/	±0.1%	max 0,6	0,3%	0,1%
44	2000	3;4;5	+1%,-0,5%	± 1	/	±0.1%	max 0,6	0,3%	0,1%
50	2000	3;4;5;6	+1%,-0,5%	± 1	/	±0.1%	max 0,6	0,3%	0,1%
60	2000/2100	3;4;5;6;7;8;10	+1%,-0,5%	± 1	/	±0.1%	max 0,6	0,3%	0,1%
64	2000/2100	3;4;5;6;7;8;10	+1%,-0,5%	± 1	/	±0.1%	max 0,6	0,3%	0,1%
70	2000/2100	3;4;5;6;7;8;10;12-15	+1%,-0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
76	2000	3;4;5;6;7;8;10;12-15	+1%,-0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
80	2000	3;4;5;6;7;8;10;12-15	+1%,-0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
90	2000	3;4;5;6;7;8;10;12-15	+1%,-0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
100	2000	3;4;5;6;7;8;10;12-15	+1%,-0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
102	2000	3;4;5;6;7;8;10	+1%,-0,5%	± 1	/	±0.1%	max 0,6	0,3%	0,1%
110	2000	3;4;5;6;7;8;10;12-15	± 0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
115	2000/2100	3;4;5;6;7;8;10;12-15	± 0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
120	2000/2100	3;4;5;6;7;8;10;12-15	± 0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
125	2000/2100	3;4;5;6;7;8;10;12-15	± 0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
127	2000/2100	3;4;5;6;7;8;10	± 0,5%	± 1	/	±0.1%	max 0,6	0,3%	0,1%
134	2000/2100	3;4;5;6;7;8;10;12-15	± 0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
139	2000/2100	3;4;5;6;7;8;10;12-15	± 0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
150	2000/2100	3;4;5;6;7;8;10;12-15	± 0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
153	2000	3;4;5;6;8;10	± 0,5%	± 1	/	±0.1%	max 0,6	0,3%	0,1%
160	2000	3;4;5;6;7;8;10;12-15	± 0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
164	2000/2100	3;4;5;6;7;8;10;12-15	± 0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
170	2000	3;4;5;6;7;8;10;12-15	± 0,5%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
185	2000	3;4;5;6;7;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
200	2000/2100	3;4;5;6;7;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
215	2000	3;4;5;6;7;8;10	± 0,5%	± 1	/	±0.1%	max 0,6	0,3%	0,1%
220	2000	3;4;5;6;7;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
230	2000/2100	3;4;5;6;7;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
240	2000/2100	3;4;5;6;7;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
250	2000/2100	3;4;5;6;7;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
260	2000	3;4;5;6;7;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
270	2000/2100	3;4;5;6;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
300	2000/2100	3;4;5;6;7;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
300	3100	4;5;6	± 0,3%	± 1	/	±0.1%	max 0,6	0,3%	0,1%

¹⁴ The tolerances listed here only apply to items with standard length (2000 / 2100mm); in compliance with our delivery terms no claims are accepted for items that have been already processed.

300	4100	5	± 0,3%	± 1	/	±0.1%	max 0,6	0,3%	0,1%
350	2100	3;4;5;6;7;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
400	2050	4;5;6;7;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
450	2100	4;5;6;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
457	2100	4;5;6;8;10	± 0,3%	± 1	/	±0.1%	max 0,6	0,3%	0,1%
500	2050	5;6;7;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
550	2100	4;5;6;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%
610	2100	5;6;8;10;12-15	± 0,3%	± 1	± 1,5	±0.1%	max 0,6	0,3%	0,1%

**= Please, note that thick tubes are produced with the so called „two-layer casting process“. This is the list of the “two-layer cast tubes”:

OD 60 to 100 mm = all 8, 10, 12 and 15 mm thickness tubes

OD 110 to 610 mm = all 12 and 15 mm thickness tubes

For these tubes the given tolerances represent only an indication. We strongly advice to forward our “two-layer system” document – which you find here - to your customer.

2.4.1 Specifications for two-layer cast tubes

We would like to stress the attention on the fact that some thick tubes are cast in a so called „two-layer process“. This means that for some items we cast a tube of 6, 8 or 10 mm. thickness and, in a second time, we cast a second tube in the formerly manufactured tube in order to reach the requested thickness. This process allows us to maintain the same excellent physical properties of normal cast tubes. On the other hand this production process can cause sometimes an optical distortion and problems on the tolerance values. Please, make this clear to your customer in order to avoid misunderstandings and future complaints: since optical distortion and tolerance variation is a normal consequence of the manufacturing process Gevacril® does not accept complaints of cast tubes manufactured with the „two-layer process“.

These below are the tubes produced with the „two-layer casting process“:

OD 60 to 100 mm. = all 8, 10, 12 and 15 mm. thickness tubes

OD 110 to 610 mm. = all 12 and 15 mm. thickness tubes

2.5 Delivery conditions

2.5.1 Packing

Every single tube is packed as follows:

- from Ø 40 to Ø 300 in PE film
- from Ø 350 to Ø610 in PE bubble film

2.5.2 Delivery packing

Cast acrylic tubes are set on wooden pallets and packed in cardboard boxes. The standard delivery packing includes:

- wood base (Palette);
- cardboard box; the tubes – packed as in 2.5.1 - are wrapped up in PE film and sealed with plastic tape.

The tubes are delivered in standard cardboard boxes which measures are adapted to the volume of the tubes.

2.6 Identification

2.6.1 Product identification

A label on every acrylic tube - as in 2.4.1 - indicates:

- product;
- external diameter;
- internal diameter;
- length;
- day, month, year of production;
- quality control approval.

2.6.2 Identification of the delivery crates

A label on every delivery case – as in 2.4.2 – indicates:

- destination address;
- case number;
- detailed case content.

Ask for more information by fax at 0039 02 95737357 or by mail at info@gevacril.com¹⁵

¹⁵The information given refers only to the specific products indicated in the QS. Gevacril considers this information right, reliable and in conformity to the specific technical information available on the market at the moment of their printing, but do not give any guaranty for them and for any kind of application or processing of the above mentioned products.

3.1.1 Cast Acrylic Metallic Tubes

Quality Description for Cast Acrylic Metallic Tubes¹⁶

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¹⁶In the whole text as QS. Our QS is written in conformity with the norms ISO 9001.

Preface

Our QS has been valid since 2005. Purpose of this certification is to guarantee the excellent quality of every single Acrylic MetallicTube.

The strict quality control during the production process and a constant improvement of the production technologies allowed the standardisation of the high quality ofourAcrylicMetallicTubes.

1 Material features

Acrylic MetallicTubesare polymerized plastic semi-finished products. They went through casting and centrifugation and they are known as Acrylic MetallicTubes. After the production process they have a shimmering metallic outer wall and have a perfectly smooth surface. High purity and brightness are their most important characteristics.

2 Quality description

The QS - quality description - includes following contents: optical quality; thermic features; weather resistance; tolerances; delivery condition.

2.1 Optical quality

Acrylic MetallicTubeshave a metallic shimmering surface and are produced in different colours. They are free of any kind of tracks or deep scratches. In spite of this some optical defects are not to avoid while looking sidelong through the tubes. Following defects are admitted:

- some optical pigment alterations¹⁷;
- see table 1:

¹⁷This effect is due to the centrifugation. Some pigment alteration in form of a ring may occur on the surface. This should not alter the optical quality of the entire tube.

Table 1: Admitted defects

Defect group	Superficial scratch mm	Rings or spots on the external wall	Bubbles, foreign bodies, filaments mm ²	max. number of defects admitted on 300 mm of tube
A	≤ 1,0	many ¹⁸	≤ 1,0	many ¹⁹
B	> 1,0 – 2,0	some	> 1,0 – 2,0	5 LD (B)
C	> 2,0 – 5,0	some	> 2,0 – 5,0	1 MD (C) + 2 LD (B) ²⁰
D	> 5,0 – 25,0	*	> 5,0 – 25,0	1 BD (D) ²¹

Table I: A = negligible defect; B = little defect (LD); C = medium defect (MD); D: big defect (BD)²².

Following defects are not admitted:

- deep scratches;
- unpolymerizedstuff in the material bigger than 10 mm.²;
- rests of polishing material.

2.2 Thermicfeatures

As acrylic glass is characterised by particularly long molecules, the cast acrylic tubes remain in a solid state until 110 °C. Due to the pigments, we advise to use the Acrylic MetallicTubesonly by a service temperatures < 80 C.

2.3 Weather resistance

Acrylic MetallicTubescan be used either indoor or outdoor. They have a good weather resistance and are UV stabilized. In spite of this the presence of the pigments into the chemical composition could have a limited resistance in time and may cause some colour changes.

¹⁸So long these defects do not alter the optical qualities of brightness and transparency on the whole tube.

¹⁹So long these defects do not alter the optical qualities of brightness and transparency on the whole tube.

²⁰ Minimal distance: MD to LD = > 100 mm.

²¹On the entire tube (2.000 mm.).

²²The data on the admitted defects are based on internal tests made by Gevacril srl.

2.4 Tolerances

In order to guarantee an excellent standard quality the acrylic metallic tubes are controlled many times during the production process. Tubes that show worse values than those indicated in table 3 do not get through the quality control and are systematically rejected.

Table 2: Tolerances Metallic Tubes²³

Ext. Ø mm	Standard Length mm	Thickness mm	Tolerance External Ø mm	Tolerance Thickness 3-5 mm	Length	Coni-city mm/m	Oval shape OD	Oval shape ID
50	2000	3	±1%, -0,5%	± 1	-0/+20mm	max 0,6	0,3%	0,1%
70	2000	3	±1%, -0,5%	± 1	-0/+20mm	max 0,6	0,3%	0,1%
100	2000	3	±1%, -0,5%	± 1	-0/+20mm	max 0,6	0,3%	0,1%
150	2000	3	± 0,5%	± 1	-0/+20mm	max 0,6	0,3%	0,1%
215	2000	3	± 0,5%	± 1	-0/+20mm	max 0,6	0,3%	0,1%

2.5 Deliveryconditions

2.5.1 Packing

Every single tube is packed as follows:

- from Ø 50 to Ø610 in PE film

2.5.2 Deliverypacking

Acrylic metallic tubes are set on wooden pallets and packed in cardboard boxes. The standard delivery packing includes:

- wood base (Palette);
- cardboard box;
- the tubes – packed as in 2.5.1 - are wrapped up in PE film and sealed with plastic tape.

The tubes are delivered in standard cardboard boxes which measures are adapted to the volume of the tubes.

²³ The tolerances listed here only apply to items with standard length (2000 mm); in compliance with our delivery terms no claims are accepted for items that have been already processed

2.6 Identification

2.6.1 Product identification

A label on every acrylic tube - as in 2.4.1 - indicates:

- product;
- external diameter;
- internal diameter;
- length;
- day, month, year of production;
- quality control approval.

2.6.2 Identification of the delivery crates

A label on every delivery case – as in 2.4.2 – indicates:

- destination address;
- case number;
- detailed case content.

Ask for more information by fax at 0039 02 95737357 or by mail at info@gevacril.com²⁴

²⁴ The information given refers only to the specific products indicated in the QS. Gevacril considers this information right, reliable and in conformity to the specific technical information available on the market at the moment of their printing, but do not give any guaranty for them and for any kind of application or processing of the above mentioned products.

3.2 CAST CONTINUED[®] Tubes

**Quality Description
for CAST CONTINUED[®] Tubes²⁵**

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²⁵In the whole text as QS. Our QS is written in conformity with the norms ISO 9001

Preface

Our QS has been valid since January 2004. Purpose of this certification is to guarantee the excellent quality of every single tube.

The strict quality control during the production process and a constant improvement of the manufacturing and controlling technologies allowed the standardisation of the quality of the CAST CONTINUED® tubes.

1 Material features

CAST CONTINUED® acrylic tubes are polymerized plastic semi-finished products. They are got through casting and they are known as CAST CONTINUED® acrylic tubes. After the production process they are clear and bright both on the internal and the external wall. High purity, brightness and transparency are their most important characteristics; besides they are very resistant against weather conditions: the above mentioned features remain unalterable over years²⁶.

2 Quality description

The QS - quality description - includes following contents: optical quality; thermic features; weather resistance; tolerances; delivery condition.

2.1 Optical quality

CAST CONTINUED® acrylic tubes are transparent and have a clear bright internal and external wall. They are free of any kind of tracks or deep scratches. In spite of this some optical defects are not to avoid while looking sidelong through the tubes. Following defects are admitted:

- orange peel effect²⁷;
- see table 1:

²⁶ See 2.3 on weather resistance.

²⁷ So long these defects do not alter the optical qualities of brightness and transparency on the whole tube.

Table 1: Admitted defects

Defect group	Superficial scratch mm	Rings on the internal wall	Bubbles, foreignbodies, filaments mm ²	max. number of defects admitted on 300 mm of tube
A	≤ 1,0	many ²⁸	≤ 1,0	many ²⁹
B	> 1,0 – 2,0	some	> 1,0 – 2,0	5 LD (B)
C	> 2,0 – 5,0	some	> 2,0 – 5,0	1 MD (C) + 2 LD (B) ³⁰
D	> 5,0 – 25,0	*	> 5,0 – 25,0	1 BD (D) ³¹

Table 1: A = negligible defect; B = little defect (LD); C = medium defect (MD); D: big defect (BD)³².

Following defects are not admitted:

- Deep scratches;
- Unpolymerized stuff in the material bigger than 10 mm.²;
- rests of polishing material which alter the optical quality of the tube.

2.2 Thermic features

As acrylic glass is characterised by particularly long molecules, the cast continued[®] tubes remain in a solid state until 100°C. Above this temperature they get softer and softer and can be formed at about 150-200 °C.

After warming them as indicated in the table 2 following defects do not have to appear:

- internal bubbles;
- yellowing effect.

Table 2: Warming of cast acrylic tubes

Thickness mm	Time Min.	Temperature °C
till 5 mm	20	150

Besides, after warming the tubes as indicated in the table 2 following results are expected:

- disfigurement on the heads of the tube: < 5%;
- yellowing effect on the heads of the tube: ≤ 3,2% (Method AP2-MP/PA92:002).

²⁸ So long these defects do not alter the optical qualities of brightness and transparency on the whole tube.

²⁹ So long these defects do not alter the optical qualities of brightness and transparency on the whole tube.

³⁰ Minimal distance: MD to LD = > 100 mm.

³¹ On the entire tube (2.000 mm.).

³² The data on the admitted defects are based on internal tests made by Gevacrilsrl.

2.3 Weather resistance

Weather resistance after 5 years open air in Melzo (Milan)

- minimal resistance: 60 MPA;
- light absorption: $\leq 2\%$;
- yellowing effect: $\leq 1\%$.

2.4 Tolerances³³

In order to guarantee an excellent standard quality the CAST CONTINUED® acrylic tubes are controlled many times during the production process. Tubes that show worse values than those indicated in the table 3 do not get through the quality control and are systematically rejected.

Table 3: Tolerances CAST CONTINUED® Tubes

Ext. Ø mm	Standard Length mm	Thickness mm	Tolerance External Ø mm	Tolerance Thickness 3-5 mm	Length	Conicity mm/m	Oval shape OD	Oval shape ID
150	2000	3/5	$\pm 0,5\%$	± 1	-0/+20mm	max 0,6	0,3%	0,1%
200	2000	3/5	$\pm 0,5\%$	± 1	-0/+20mm	max 0,6	0,3%	0,1%
220	2000	3/5	$\pm 0,5\%$	± 1	-0/+20mm	max 0,6	0,3%	0,1%
230	2000	3/5	$\pm 0,5\%$	± 1	-0/+20mm	max 0,6	0,3%	0,1%
240	2000	3/5	$\pm 0,5\%$	± 1	-0/+20mm	max 0,6	0,3%	0,1%
250	2000	3/4/5	$\pm 0,5\%$	± 1	-0/+20mm	max 0,6	0,3%	0,1%
260	2000	3/5	$\pm 0,5\%$	± 1	-0/+20mm	max 0,6	0,3%	0,1%
270	2000	3/5	$\pm 0,5\%$	± 1	-0/+20mm	max 0,6	0,3%	0,1%
300	2000	3/4/5	$\pm 0,5\%$	± 1	-0/+20mm	max 0,6	0,3%	0,1%
350	2100	4/5	$\pm 0,5\%$	± 1	-0/+20mm	max 0,6	0,3%	0,1%

³³ The tolerances listed here only apply to items with standard length (2000 mm); in compliance with our delivery terms no claims are accepted for items that have been already processed

2.5 Delivery conditions

2.5.1 Packing

Every single tube is packed as follows:

- from \varnothing 150 to \varnothing 300: PE film.

2.5.2 Delivery packing

Cast continued[®] acrylic tubes are set on wooden pallets and packed in cardboard boxes. The standard delivery packing includes:

- wood base (Palette);
- cardboard box for different tubes;
- the tubes – packed as in 2.5.1 - are wrapped up in PE film and sealed with plastic tape.

The tubes are delivered in standard cardboard boxes which measures are adapted to the volume of the tubes.

2.6 Identification

2.6.1 Product identification

A yellow label on every acrylic tube - as in 2.4.1 - indicates:

- product;
- external diameter;
- internal diameter;
- length;
- production charge;
- quality control approval.

2.6.2 Identification of the delivery pallets

A label on every delivery case – as in 2.4.2 – indicates:

- destination address;
- case number;
- detailed case content.

Ask for more information by fax at 0039 02 95737357 or by mail at info@gevacril.com³⁴.

³⁴The information given refers only to the specific products indicated in the QS. Gevacril considers this information right, reliable and in conformity to the specific technical information available on the market at the moment of their printing, but do not give any guaranty for them and for any kind of application or processing of the above mentioned products.

3.3 Extruded Acrylic Tubes

Quality Description for Extruded Acrylic Tubes³⁵

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³⁵In the whole text as QS. Our QS is written in conformity with the norms ISO 9001.

Preface

Our QS for extruded acrylic tubes in PMMA has been valid since the year 2000. Purpose of this certification is to guarantee the excellent quality of every single tube.

The strict quality control during the production process and a constant improvement of the production technologies allowed the standardisation of the quality of the extruded (xt) acrylic tubes.

1 Material features

Extruded acrylic tubes in PMMA are polymerized plastic semi-finished products. They are manufactured through the process of extrusion. After the production process they are clear and bright both on the internal and the external wall³⁶. High purity, brightness and transparency are their most important characteristics; besides they are very resistant against weather conditions and ageing, since the optical quality and the light transmittance remain unchanged over years.

2 Quality description

2.1 Optical quality

Extruded acrylic tubes are absolutely colourless and have a clear internal and external wall. They are free of bubbles, filaments, foreign bodies. In spite of this, the manufacturing process of extrusion causes some light stripes which are visible from a short distance. These stripes are admitted but should not condition the optical quality and the transparency of the entire tube.

Following defects are not admitted:

- Deep scratches;
- Bubbles, inclusions or foreign bodies, unpolymerized stuff in the material bigger than 2 mm²/meter;
- crazing effect.

2.2 Tolerances

In order to guarantee an excellent standard quality the extruded acrylic tubes are controlled many times during the production process. Tubes that show worse values than those indicated in the table 1 do not get through the quality control and are systematically rejected.

³⁶This information refers only to the extruded acrylic clear tubes.

Table 1: Tolerances for XT Tubes

External Ø mm	Standard Length mm	Units per Batch	Thickness mm	Tolerance on External Ø	Tolerance in Thickness mm
5	2000	50	1	± 0,3	± 0,20
7	2000	50	1	± 0,3	± 0,20
8	2000	25	2	± 0,3	± 0,20
10 Ø	2000	25	1,5/2/3	± 0,3	± 0,20/0,25/0,30
12 Ø	2000	25	1/2/3	± 0,3	± 0,20/0,25/0,30
13	2000	25	1,5/2/3	± 0,3	± 0,20/0,25/0,30
15 Ø	2000	25	1/2/2,5/3	± 0,3	± 0,20/0,25/0,30/0,35
16	2000	25	2	± 0,3	± 0,25
18	2000	25	2/3	± 0,3	± 0,25/0,30
19	2000	25	2	± 0,3	± 0,25
20 Ø	2000	5	1/2/3	± 0,3	± 0,20/0,25/0,30
22	2000	5	2/3	± 0,3	± 0,25/0,30
24	2000	5	2/3	± 0,5	± 0,25/0,30
25 Ø	2000	5	2/3	± 0,5	± 0,25/0,30
26	2000	5	2/3	± 0,5	± 0,25/0,30
28	2000	5	2/3	± 0,5	± 0,25/0,30
30 Ø	2000	5	2/3/4/5	± 0,5	± 0,25/0,30/0,35/0,40
32	2000	5	2/3/4/5	± 0,5	± 0,25/0,30/0,35/0,40
34	2000	5	2/3/4/5	± 0,5	± 0,25/0,30/0,35/0,40
36	2000	5	2/3/4/5	± 0,5	± 0,25/0,30/0,35/0,40
38 Ø	2000	5	3	± 0,5	± 0,30
40 Ø	2000	1	2/3/4/5	± 0,8	± 0,25/0,30/0,35/0,40
44	2000	1	2/3/4/5	± 0,8	± 0,25/0,30/0,35/0,40
45	2000	1	2/3	± 0,8	± 0,25/0,30
50 Ø	2000	1	2/3/4/5	± 0,8	± 0,25/0,30/0,35/0,40
56	2000	1	2/3/4/5	± 0,8	± 0,25/0,30/0,35/0,40
60 Ø	2000	1	2/3/4/5	± 0,8	± 0,25/0,35/0,35/0,40
64	2000	1	2/3/4/5	± 0,8	± 0,25/0,35/0,35/0,40
70 Ø	2000	1	2/3/4/5	± 0,8	± 0,30/0,35/0,40/0,45
76 Ø	2000	1	3/4/5	± 0,9	± 0,35/0,40/0,45
80 Ø	2000	1	2/3/4/5	± 0,9	± 0,30/0,35/0,40/0,45
90 Ø	2000	1	2/3/4/5	± 0,9	± 0,30/0,35/0,40/0,45
100 Ø	2000	1	2/3/4/5	± 1,2	± 0,30/0,35/0,40/0,45
110 Ø	2000	1	3/4/5	± 1,2	± 0,35/0,40/0,45
120 Ø	2000	1	3/4/5	± 1,2	± 0,35/0,40/0,45
125	2000	1	3/4/5	± 1,3	± 0,35/0,40/0,45
130	2000	1	3/4/5	± 1,3	± 0,35/0,40/0,50
133 Ø	2000	1	3/5	± 1,3	± 0,35/0,50
134	2000	1	3/4/5	± 1,3	± 0,35/0,40/0,50
140	2000	1	3/4/5	± 1,4	± 0,40/0,45/0,50
150 Ø	2000	1	3/4/5	± 1,5	± 0,40/0,45/0,50
160 Ø	2000	1	3/4/5	± 1,5	± 0,40/0,45/0,50
170	2000	1	3/4/5	± 1,5	± 0,40/0,45/0,50

180 Ø	2000	1	3/4/5	± 1,5	± 0,40/0,50/0,55
200 Ø	2000	1	3/4/5	± 2,0	± 0,40/0,50/0,55
220	2000	1	3/4/5	± 2,0	± 0,40/0,50/0,55
230	2000	1	3/4/5	± 2,0	± 0,40/0,50/0,55
250 Ø	2000	1	3/4/5	± 2,0	± 0,40/0,50/0,55

2.3 Delivery conditions

2.3.1 Packing

Type of packing:

- PE stretch-film.

Packing unit:

The tubes are packed in bundles until an O.D. of 38 mm.; every tube is single packed starting from an O.D. of 40 mm.

2.3.2 Delivery packing

Extruded acrylic tubes are set on wooded pallets. The standard delivery packing include:

- wooden base (Palette);
- the tubes – packed as in 2.3.1 - are wrapped up in PE film and sealed with plastic tape.

The tubes are delivered in standard wooden pallets which are adapted and optimised to the volume of the goods ordered.

2.4 Identification

2.4.1 Product identification

A label on every acrylic tube indicates:

- product;
- external diameter;
- internal diameter;
- length;
- day, month, year of production;
- quality control approval.

2.4.2 Identification of the delivery crates/boxes

A label on every delivery case – as in 2.3.2 – indicates:

- destination address
- detailed case content.

For more information contact us at info@gevacril.com³⁷

³⁷ The information given refers only to the specific products indicated in the QS. Gevacril considers this information right, reliable and in conformity to the specific technical information available on the market at the moment of their printing, but do not give any guaranty for them and for any kind of application or processing of the above mentioned products.

3.4 Extruded Acrylic Satin, Opal Tubes

Quality description for Extruded Acrylic Satin & Opal Tubes³⁸

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³⁸ In the whole text as QS. Our QS is written in conformity with the norms ISO 9001.

Preface

Our QS for extruded acrylic satin & opal tubes has been valid since the year 2000. Purpose of this certification is to guarantee the excellent quality of every single tube.

The strict quality control during the production process and a constant improvement of the production technologies allowed the standardisation of the quality of every extruded acrylic satin & opal tubes.

1 Material features

Extruded acrylic satin & opal tubes are polymerized plastic semi-finished products. Satin Tubes are manufactured through the process of extrusion of special diffuser beads. After the production the material has a satin surface both on the internal and the external wall³⁹. Opal Tubes are manufactured through extrusion of opal PMMA granulate. The optimal diffusion of light, translucency and a lower grade of scratching are their most important characteristics; besides they are very resistant against weather conditions and ageing, since the optical quality and the light transmittance remain unchanged over years.

2 Quality description

2.1 Optical quality

Extruded acrylic satin & opal tubes have a frosted or a glossy opal surface and an intensive translucency, both on the internal and external wall. They are free of bubbles, filaments and foreign bodies. In spite of this, the manufacturing process of extrusion causes some light stripes which are visible from a short distance. These stripes are admitted but should not condition the optical quality and the transparency of the entire tube.

Following defects are not admitted:

- Deep scratches;
- Bubbles, inclusions or foreign bodies, unpolymerized stuff in the material bigger than 2 mm²/meter;
- crazing effect.

³⁹ This information refers only to the extruded acrylic satin & opal tubes.

2.2 Tolerances

In order to guarantee an excellent standard quality the extruded acrylic tubes are controlled many times during the production process. Tubes that show worse values than those indicated in table 1 do not get through the quality control and are systematically rejected.

Table 1: Tolerances XT acrylic satin & opal tubes

External Ø mm	Strd. length mm	Units per batch	Thickn. mm	Min. Qty.	satin	opal	Tolerance External Ø mm	Tolerance Thickness mm
20 Ø	2000	1	3	5	-	x	± 0,3 mm	± 0,30 mm
30 Ø	2000	1	3	5	-	x	± 0,5 mm	± 0,30 mm
40 Ø	2000	1	3	5	x	x	± 0,8 mm	± 0,30 mm
50 Ø	2000	1	3	5	x	x	± 0,8 mm	± 0,30 mm
60 Ø	2000	1	3	5	x	x	± 0,8 mm	± 0,35 mm
70 Ø	2000	1	3	5	x	x	± 0,8 mm	± 0,35 mm
80 Ø	2000	1	3	5	x	x	± 0,9 mm	± 0,35 mm
90 Ø	2000	1	3	5	x	x	± 0,9 mm	± 0,35 mm
100Ø	2000	1	3	5	x	x	± 1,2 mm	± 0,35 mm
120Ø	2000	1	3	5	x	x	± 1,2 mm	± 0,35 mm
150Ø	2000	1	3	5	x	x	± 1,5 mm	± 0,40 mm
160Ø	2000	1	3	5	x	x	± 1,5 mm	± 0,40 mm
200Ø	2000	1	3	5	x	x	± 2,0 mm	± 0,40 mm
250Ø	2000	1	3	5	x	x	± 2,0 mm	± 0,40 mm

2.3 Delivery conditions

2.3.1 Packing

Type of packaging film:

- PE stretch-film.

Packing unit:

- The tubes are single packed. The minimal order quantity per unit is 5 tubes.

2.3.2 Delivery packing

Extruded acrylic tubes are set on wooded pallets. The standard delivery packing includes:

- wooden base (Pallet);
- the tubes – packed as in 2.3.1 - are wrapped up in PE film and sealed with plastic tape.

The tubes are delivered on standard pallets which are adapted and optimised to the volume of the goods ordered.

2.4 Identification

2.4.1 Product identification

A label on every acrylic tube indicates:

- product;
- external diameter;
- internal diameter;
- length;
- day, month, year of production;
- quality control approval.

2.4.2 Identification of the delivery crates/boxes

A label on every delivery case – as in 2.3.2 – indicates:

- destination address;
- detailed case content.

For more information contact us at info@gevacril.com.⁴⁰

⁴⁰ The information given refers only to the specific products indicated in the QS. Gevacril considers this information right, reliable and in conformity to the specific technical information available on the market at the moment of their printing, but do not give any guaranty for them and for any kind of application or processing of the above mentioned products.

3.5 Extruded Polycarbonate Tubes

Quality Description for Polycarbonate Tubes⁴¹

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⁴¹ In the whole text as QS. Our QS is written in conformity with the norms ISO 9001.

Preface

Our QS for extruded polycarbonate tubes has been valid since the year 2002. Purpose of this certification is to guarantee the excellent quality of every single tube.

The strict quality control during the production process and a constant improvement of the production technologies allowed the standardisation of the quality of the extruded polycarbonate tubes.

1 Material features

Extruded polycarbonate tubes are polymerized plastic semi-finished products. They are manufactured through the process of extrusion. After the production process they are clear and bright, both on the internal and the external wall. High purity and transparency are their most important characteristics; besides they are very high impact resistance and have an uncomparable resistance against weather conditions and aging, since the optical quality and the light transmittance remain unchanged over years.

2 Quality description

2.1 Optical quality

Extruded polycarbonate tubes are absolutely colourless and have a clear internal and external wall. They are free of bubbles, filaments, foreign bodies and rings. In spite of this, the manufacturing process of extrusion causes some light stripes which are visible from a short distance. These stripes are admitted but should not condition the optical quality and the transparency of the entire tube.

Following defects are not admitted:

- deep scratches;
- bubbles, inclusions or foreign bodies, unpolymerized stuff in the material bigger than
- 2 mm²/meter;
- orange peel effect;
- crazing effect.

2.2 Tolerances

In order to guarantee an excellent standard quality the extruded acrylic tubes are controlled many times during the production process. Tubes that show worse values than those indicated in the table 1 do not get through the quality control and are systematically rejected.

Table 1: Tolerances for XT Polycarbonate Tubes

External Ø mm	Standard Length mm	Units per Batch	Thickness mm	Tolerance on External Ø mm	Tolerance in Thickness mm
10	2000	25	1,5 Ø / 2 Ø / 3	± 0,3	± 0,20/0,25/0,30
12	2000	25	1,5Ø/ 2 Ø / 3	± 0,3	± 0,20/0,25/0,30
13	2000	25	1,5 Ø / 2	± 0,3	± 0,20/0,25
15	2000	25	2 Ø / 3	± 0,3	± 0,25/0,30
16	2000	25	2 Ø / 3	± 0,3	± 0,25/0,30
18	2000	25	2 Ø / 3	± 0,3	± 0,25/0,30
20	2000	5	2 Ø / 3	± 0,3	± 0,25/0,30
22	2000	5	2 Ø / 3	± 0,3	± 0,25/0,30
24	2000	5	2 Ø / 3	± 0,5	± 0,25/0,30
25	2000	5	2 Ø / 3	± 0,5	± 0,25/0,30
26	2000	5	2 Ø / 3	± 0,5	± 0,25/0,30
30	2000	5	1,5 Ø / 2 Ø / 3 Ø / 4/5 Ø	± 0,5	±0,20/0,25/0,30/0,35/0,40
32	2000	5	2 Ø / 3	± 0,5	± 0,25/0,30
36	2000	5	2 Ø / 3	± 0,5	± 0,25/0,30
38	2000	5	1,5 Ø/2/3	± 0,5	± 0,20/ 0,25/0,30
40	2000	1	2Ø/3Ø / 4/5Ø	± 0,8	± 0,25/0,30/0,35/0,40
44	2000	1	3Ø	± 0,8	± 0,30
50	2000	1	1,5 Ø/2 Ø / 3 Ø / 4/5Ø	± 0,8	± 0,20/0,25/0,30/0,35/0,40
60	2000	1	2 Ø / 3/4/5 Ø	± 0,8	± 0,25/0,35/0,35/0,40
64	2000	1	3 Ø	± 0,8	± 0,35
70	2000	1	2 Ø / 3/4/5 Ø	± 0,8	± 0,30/0,35/0,40/0,40
80	2000	1	2 Ø / 3/4/5 Ø	± 0,9	± 0,30/0,35/0,40/0,45
90	2000	1	2 Ø / 3/4/5 Ø	± 0,9	± 0,30/0,35/0,40/0,45
100	2000	1	2Ø/3Ø/4/5Ø	± 1,2	± 0,30/0,35/0,40/0,45
110	2000	1	/3 Ø / 4/5	± 1,2	± 0,35/0,40/0,45
120	2000	1	3 Ø/4/5 Ø	± 1,2	± 0,35/0,40/0,45
130	2000	1	3 Ø/4/5	± 1,3	± 0,35/0,40/0,50
134	2000	1	3	± 1,3	± 0,30
140	2000	1	3/4/5	± 1,3	± 0,40/0,45/0,50
150	2000	1	3 Ø/4/5 Ø	± 1,5	± 0,40/0,45/0,50
160	2000	1	3Ø	± 1,5	± 0,30
180	2000	1	3 Ø	± 1,5	± 0,30
200	2000	1	3 Ø / 4/5 Ø	± 1,5	± 0,40/0,45/0,50

2.3 Delivery conditions

2.3.1 Packing

Type of packing:

- PE stretch-film.

Packing unit:

The tubes are packed in bundles until an O.D. of 38mm.; every tube is single packed starting from an O.D. of 40 mm.

2.3.2 Delivery packing

Extruded polycarbonate tubes are set in wooden pallets. The standard delivery packing includes:

- wooden base (Pallet);
- the tubes – packed as in 2.3.1 - are wrapped up in PE film and sealed with plastic tape.

The tubes are delivered on standard wooden pallets which are adapted and optimised to the volume of the goods ordered.

2.4 Identification

2.4.1 Product identification

A label on every acrylic tube indicates:

- product;
- external diameter;
- internal diameter;
- length;
- day, month, year of production;
- quality control approval.

2.4.2 Identification of the delivery crates/boxes

A label on every delivery case – as in 2.3.2 – indicates:

- destination address;
- detailed case content.

For more information contact us at info@gevacril.com ⁴²

⁴² This information refer only to the specific products described in the QDS. Gevacril has verified this information as true and reliable in accordance with the specific technical information of the current market standards at the time of printing. Gevacril does not guarantee for this information and any further use or processing of the above-mentioned products.

3.6 Cast Acrylic Rods and Bars, FLUOR-ACRYL[®] Rods and Bars

Quality Description For Cast Acrylic Rods, Cast Acrylic Bars and FLUOR-ACRYL[®] Rods and Bars⁴³

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⁴³In the whole text as QS. Our QS is written in conformity with the norms ISO 9001.

Preface

Our QS has been valid since 1st January 1999. Purpose of this certification is to guarantee the excellent quality of every single rod and bar.

The strict quality control during the production process and a constant improvement of the production technologies allows the standardisation of the quality of these products.

1 Material features

Cast acrylic rods and bars and FLUOR-ACRYL® rods and bars are polymerized plastic semi-finished products. They are got through milling of cast acrylic sheets. After the polishing process they are characterised by high purity, brightness and transparency; besides they can be easily glued through a polymer-glue and are very resistant against weather conditions: the above mentioned features remain unalterable over years⁴⁴.

2 Quality description

The QS includes following contents: optical quality; thermic features; weather resistance; tolerances; delivery condition.

2.1 Optical quality

Cast acrylic round rods and square bars are transparent and have a clear bright wall. They are free of any kind of tracks or deep scratches. In spite of this some optical defects are not to avoid while looking sidelong through them. Following defects are admitted:

Table 1: Admitted defects

Defect group	Superficial scratch mm	Bubbles, foreign bodies, filaments mm ²	max. number of defects admitted on 1000 mm of rod/bar
A	≤ 1,0	≤ 1,0	many ⁴⁵
B	> 1,0 – 2,0	> 1,0 – 2,0	5 LD (B)
C	> 2,0 – 5,0	> 2,0 – 5,0	1 MD (C) + 2 LD (B) ⁴⁶
D	> 5,0 – 10,0	> 5,0 – 10,0	1 BD (D) ⁴⁷

Table I: A = negligible defect; B = little defect (LD); C = medium defect (MD); D: big defect (BD)⁴⁸.

⁴⁴ See 2.3 on weather resistance.

⁴⁵ So long these defects do not alter the optical qualities of brightness and transparency on the whole rod/bar.

⁴⁶ Minimal distance: MD to LD = > 100 mm.

⁴⁷ On the entire rod/bar (2.000 mm).

⁴⁸ The data on the admitted defects are based on internal tests made by Gevacril srl.

Following defects are not admitted:

- Deep scratches;
- Unpolymerized stuff in the material bigger than 10 mm²;
- rests of polishing material.

2.2 Thermic features

Cast acrylic rods and bars can be bent and formed at a temperature about 160-180 °C. After warming them as indicated in the table 2 following defects do not have to appear:

- internal bubbles;
- orange peel effect;
- ice effect (internal cracks);
- rings or yellowing effect.

Tabelle 2: Warming of cast acrylic rods and bars

Type of product	Time Min.	Temperature °C
Cast acrylic round rods	30	160
Cast acrylic square bars	30	160

Besides, after warming rods/bars as indicated in the table 2 following results can be also expected:

- disfigurement on the heads of rods and bars: < 2%;
- yellowing effect on the heads of rods and bars: ≤ 1,2% (Method AP2-MP/PA92:002)

2.3 Weather resistance

Weather resistance after 10 years open air in Melzo (Milan):

- minimal resistance: 60 MPA;
- light absorbtion: ≤ 2%;
- yellowing effect: ≤ 1%.

2.4 Tolerances

In the following tables are indicated the values of tolerance of cast acrylic rods and bars. Rods or bars that show worse values than those indicated in the table 3-7, do not get through the quality control and are systematically rejected.

Table 3: Tolerances for cast acrylic rods

External Ø mm	Tolerance on Ext. Ø mm
8 Ø	± 0,2 mm
10 Ø	± 0,2 mm
12 Ø	± 0,2 mm
13	± 0,2 mm
14	± 0,2 mm
15 Ø	± 0,2 mm
16	± 0,2 mm
17	± 0,2 mm
18 Ø	± 0,2 mm
19	± 0,2 mm
20 Ø	± 0,2 mm
21	± 0,2 mm
22 Ø	± 0,2 mm
23	± 0,2 mm
24	± 0,2 mm
25 Ø	± 0,2 mm
26	± 0,2 mm
27	± 0,2 mm
28	± 0,2 mm
30 Ø	± 0,2 mm
32	± 0,2 mm
34	± 0,2 mm
35 Ø	± 0,2 mm
36	± 0,2 mm
38	± 0,2 mm
40 Ø	± 0,2 mm
45	± 0,2 mm
50 Ø	± 1,0 mm
55	± 1,0 mm
60 Ø	± 1,0 mm
65	± 1,0 mm
70 Ø	± 1,0 mm
75	± 1,0 mm
80 Ø	± 1,0 mm
85	± 1,0 mm
90 Ø	± 1,0 mm
95	± 1,0 mm
100 Ø	± 1,0 mm
110 Ø	± 1,0 mm
120 Ø	± 1,0 mm
130 Ø	± 1,0 mm
140 Ø	± 1,0 mm
150 Ø	± 1,0 mm

160 Ø	$\pm 1,0$ mm
170	$\pm 1,0$ mm
180 Ø	$\pm 1,0$ mm
190	$\pm 1,0$ mm
200 Ø	$\pm 1,0$ mm

Table 4: Tolerances for cast acrylic bars

Side Width mm	Tolerance on Profile
10x10 Ø	$\pm 0,4$ mm
12x12 Ø	$\pm 0,4$ mm
15x15 Ø	$\pm 0,4$ mm
18x18 Ø	$\pm 0,4$ mm
20x20 Ø	$\pm 0,4$ mm
22x22	$\pm 0,4$ mm
24x24	$\pm 0,4$ mm
25x25 Ø	$\pm 0,4$ mm
28x28	$\pm 0,4$ mm
30x30 Ø	$\pm 0,4$ mm
34x34	$\pm 0,4$ mm
35x35 Ø	$\pm 0,4$ mm
38x38	$\pm 0,4$ mm
40x40 Ø	$\pm 0,4$ mm
45x45	$\pm 0,4$ mm
50x50 Ø	$\pm 0,4$ mm
55x55	$\pm 1,0$ mm
60x60 Ø	$\pm 1,0$ mm
65x65	$\pm 1,0$ mm
70x70 Ø	$\pm 1,0$ mm
75x75	$\pm 1,0$ mm
80x80 Ø	$\pm 1,0$ mm
85x85	$\pm 1,0$ mm
90x90 Ø	$\pm 1,0$ mm
95x95	$\pm 1,0$ mm
100x100 Ø	$\pm 1,0$ mm
110x110	$\pm 1,0$ mm
120x120	$\pm 1,0$ mm

Table 5: CAST FLUOR – ACRYL® Rods

Ø mm	Units per Batch	Tolerance mm
20	5	± 0,5 mm
25	5	± 0,5 mm
30	1	± 0,5 mm
40	1	± 0,5 mm
50	1	± 0,5 mm

Table 6: CAST FLUOR – ACRYL® Bars

Ø mm	Tolerance mm	Min. Order Quantity
20x20	± 0,5 mm	10
30x30	± 0,5 mm	10
40x40	± 0,5 mm	5
50x50	± 0,5 mm	5

Table 7: Tolerance on length

Product	Tolerance mm
Rods andbars	- 0/ + max 200

2.5 Delivery conditions

2.5.1 Packing

Rods or bars are packed - single or in bundle – in a PE stretch film and sealed with plastic tape.

The quantity of the rods or bars in a bundle depends on the diameter/profile:

- a) cast acrylic rods:
 - from Ø8 to Ø 10 = 10/25/50;
 - from Ø 12 to Ø 20 = 1/5/10;
 - from Ø 22 to Ø 40 = 1/2/5;
 - from Ø 45 to Ø 200 = 1;
- b) cast acrylic bars:
 - from □ 10 to □ 12 = 10/15;
 - from □ 15 to □ 25 = 1/10;
 - from □ 28 to □ 50 = 1 / 2;
 - from □ 55 to □ 120 = 1

2.5.2 Delivery packing

Cast acrylic rods and bars are set on wooden pallets after having been packed. The standard delivery packing includes:

- a) wood base (Palette);
- b) the rods/bars - packed as in 2.5.1 - are wrapped in PE film and sealed with plastic tape for a safe transport;
- c) PE film.

Rods and bars are delivered in standard pallets cases which measures are:

Table 8: Standard woodcrates⁴⁹

Measures mm
2200x50/60/70/80/90/100/110/120

Max. height of the case: 115 cm

Max. weight of the case: 1000 Kg

2.6 Identification

2.6.1 Product identification

A label on every acrylic rod or bar - packed as in 2.4.1 - indicates:

- a) product type;
- b) diameter;
- c) length;
- d) day, month, year of production;
- e) quality control approval.

2.6.2 Identification of the delivery cases

A label on every delivery case – as in 2.6.1 – indicates:

- f) destination address;
- g) case number;
- h) detailed case content.

For more information contact us at info@gevacril.com.⁵⁰

⁴⁹ In order to guarantee a good delivery we usually send the acrylic rod/bar only when a standard case is completely full.

⁵⁰ The information given refers only to the specific products indicated in the QS. Gevacril considers this information right, reliable and in conformity to the specific technical information available on the market at the moment of their printing, but do not give any guaranty for them and for any kind of application or processing of the above mentioned products.

3.7 Extruded Acrylic Rods, Extruded FLUOR-ACRYL® Rods, extruded Half-round Rods, Bars, Triangle Bars

Quality Description For Extruded Acrylic Rods (Transparent, FLUOR-ACRYL®), Half-Round Rods, Bars and Triangle Bars⁵¹

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⁵¹ In the whole text as QS. Our QS is written in conformity with the norms ISO 9002

Preface

Our QS for extruded acrylic rods (transparent, FLUOR-ACRYL®), half-round rods, bars, triangle bars in PMMA has been valid since the year 2000. Purpose of this certification is to guarantee the excellent quality of every single item.

The strict quality control during the production process and a constant improvement of the production technologies allowed the standardisation of the quality of the extruded acrylic profiles.

1 Material features

Extruded acrylic rods (transparent, FLUOR-ACRYL®), half-round rods, bars and triangle bars in PMMA are polymerised plastic semi-finished products. They are manufactured through the process of extrusion. After the production process they are clear and bright on the external wall⁵². High purity, brightness and transparency are their most important characteristics; besides they are very resistant against weather conditions and aging, since the optical quality and the light transmittance remain unchanged over years.

2 Quality description

2.1 Optical quality

Extruded transparent acrylic rods, bars and triangle bars in PMMA are absolutely colourless and have a clear external wall. They are free of bubbles, filaments and foreign bodies. In spite of this, the manufacturing process of extrusion causes some light stripes which are visible from a short distance. These stripes are admitted but should not condition the optical quality and the transparency of the entire profile.

Following defects are not admitted:

- Deep scratches;
- Bubbles, inclusions or foreign bodies, unpolymerized stuff in the material bigger than 2 mm²/meter;
- crazing effect.

⁵² This information refers only to extruded acrylic clear material.

2.2 Tolerances

In order to guarantee an excellent standard quality the extruded acrylic rods are controlled many times during the production process. Rods that show worse values than those indicated in the table 1-6 do not get through the quality control and are systematically rejected.

Table 1: Tolerances of extruded acrylic rods

External Ø mm	Standard Length mm	Units per Batch	Min. Order Quantity	Tolerance on . Ø mm
2 Ø	2000	100	100	± 0,2 mm
3 Ø	2000	100	100	± 0,2 mm
4 Ø	2000	50	50	± 0,2 mm
5 Ø	2000	50	50	± 0,3 mm
6 Ø	2000	25	25	± 0,3 mm
8 Ø	2000	25	25	± 0,3 mm
10 Ø	2000	25	25	± 0,4 mm
12 Ø	2000	10	10	± 0,4 mm
15 Ø	2000	10	10	± 0,5 mm
18	2000	10	10	± 0,6 mm
20	2000	5	5	± 0,8 mm
25	2000	5	5	± 0,8 mm

Table 2: Tolerances of extruded FLUOR-ACRYL® acrylic rods

Ø mm	Units per Batch	Tolerance mm	Min. Order Quantity
5 Ø	50	± 0,3 mm	50
10 Ø	25	± 0,4 mm	25
15 Ø	10	± 0,5 mm	10

Table 3: Tolerances of extruded acrylic half-round rods

External Ø mm	Standard Length mm	Units per Batch	Min. Order Quantity	Tolerance on Ext. Ø mm
4	2000	50	50	± 0,2 mm
5	2000	50	50	± 0,3 mm
6	2000	25	25	± 0,3 mm
8	2000	25	25	± 0,3 mm
10 Ø	2000	25	25	± 0,4 mm
12	2000	10	10	± 0,4 mm
15	2000	10	10	± 0,5 mm
20	2000	5	5	± 0,8 mm
25 Ø	2000	5	5	± 0,8 mm

Table 4: Tolerances of extruded acrylic bars

Side Width mm	Standard Length mm	Units per Batch	Min. Order Quantity	Tolerance on Profile
4x4	2000	50	50	± 0,2 mm
5x5 Ø	2000	50	50	± 0,3 mm
6x6	2000	25	25	± 0,3 mm
8x8 Ø	2000	25	25	± 0,3 mm
10x10 Ø	2000	25	25	± 0,4 mm
12x12 Ø	2000	10	10	± 0,4 mm
15x15	2000	10	10	± 0,5 mm
20x20	2000	5	5	± 0,6 mm
25x25	2000	5	5	± 0,8 mm

Table 5: Tolerances of extruded acrylic triangle bars

Side Length mm	Standard Length mm	Units per Batch	Tolerance on Profile
5x5x5	2000	50	± 0,3 mm
8x8x8	2000	25	± 0,4 mm
10x10x10	2000	25	± 0,4 mm
15x15x15	2000	10	± 0,5 mm
20x20x20	2000	5	± 0,8 mm
25x25x25	2000	5	± 0,8 mm

2.3 Delivery conditions

2.3.1 Packing

Type of packing:

- PE film.

Packing unit:

- until []⁵³ 4 mm. : 100 bars/bundle;
- from [] 5 to []8 mm.: 50 bars/bundle;
- from [] 10 to []25 mm.: 25 bars/bundle.

2.3.2 Delivery packing

Extruded acrylic rods, bars, and triangle bars are set in wooden pallets. The standard delivery packing includes:

- wooden base (Palette) or PE-bubble film;
- the bars – packed as in 2.3.1 - are wrapped up in PE film and sealed with plastic tape.

The profiles are delivered on standard wooden pallets which are adapted and optimised to the volume of the goods ordered.

2.4 Identification

2.4.1 Product identification

A label on every acrylic tube indicates:

- product;
- external diameter/ side length;
- length;
- day, month, year of production;
- quality control approval.

2.4.2 Identification of the delivery crates/boxes

A label on every delivery case – as in 2.3.2 – indicates:

- destination address;
- detailed case content.

For more information contact us at info@gevacril.com.⁵⁴

⁵³ Indicates the side or the diameter of the profile

⁵⁴ The information given refers only to the specific products indicated in the QS. Gevacril considers this information right, reliable and in conformity to the specific technical information available on the market at the moment of their printing, but do not give any guaranty for them and for any kind of application or processing of the above mentioned products.

3.8 High Impact Acrylic Profiles

Quality description⁵⁵ for High Impact Acrylic Profiles (L-Profile, U-Profile, U-Grip Profile, H-Profile)

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⁵⁵ In the whole text as QS. Our QS is written in conformity with the norms ISO 9002

Preface

Our QS for HI acrylic profiles has been valid since the year 2006. Purpose of this certification is to guarantee the excellent quality of every single item.

The strict quality control during the production process and a constant improvement of the production technologies allowed the standardisation of the quality of the extruded acrylic profiles.

1 Material features

HI acrylic profiles are polymerised plastic semi-finished products. They are manufactured through the process of extrusion. After the production process they are matt and smooth on the external wall⁵⁶. High purity, brightness and material purity are their most important characteristics; besides they are very resistant against weather conditions and aging, since the optical quality and the light transmittance remain unchanged over years.

2 Quality description

2.1 Optical quality

HI acrylic profiles are absolutely colourless and have a matt external surface. They are free of bubbles, filaments and foreign bodies. In spite of this, the manufacturing process of extrusion causes some light stripes which are visible from a short distance. These stripes are admitted but should not condition the optical quality and the surface of the entire profile.

Following defects are not admitted:

- Deep scratches;
- Bubbles, inclusions or foreign bodies, unpolymerized stuff in the material bigger than 2 mm²/meter;
- crazing effect.

⁵⁶ This information refers only to the extruded acrylic HI profiles.

2.2 Tolerances

In order to guarantee an excellent standard quality the extruded acrylic profiles are controlled many times during the production process. Profiles that show worse values than those indicated in the table 1-6 do not get through the quality control and are systematically rejected.

Tolerances of L-Profiles

On request we can provide a work drawing with all specific tolerances for this profile.

Tolerances of U-Profiles

On request we can provide a work drawing with all specific tolerances for this profile.

Tolerances of U-Grip Profiles

On request we can provide a work drawing with all specific tolerances for this profile.

Tolerances of H-Profiles

On request we can provide a work drawing with all specific tolerances for this profile.

2.3 Delivery conditions

2.3.1 Packing

Type of packing:

- PE film.

Packing unit:

- 50 profiles/bundle.

2.3.2 Delivery packing

HI acrylic profiles are set on wooden pallets. The standard delivery packing includes:

- wooden pallet and PE film protection;
- the profiles – packed as in 2.3.1 - are wrapped up in PE film and sealed with plastic tape.

The profiles are delivered on standard wood pallets which are adapted and optimised to the volume of the goods ordered.

2.4 Identification

2.4.1 Product identification

A label on every profile indicates:

- product;
- external diameter/ side length;
- length;
- day, month, year of production;
- quality control approval.

2.4.2 Identification of the delivery crates/boxes

A label on every delivery case – as in 2.3.2 – indicates:

- destination address;
- detailed case content.

For more information contact us at info@gevacril.com.⁵⁷

⁵⁷ The information given refers only to the specific products indicated in the QS. Gevacril considers this information right, reliable and in conformity to the specific technical information available on the market at the moment of their printing, but do not give any guaranty for them and for any kind of application or processing of the above mentioned products.

3.9 Acrylic Injection Balls

Quality Description For Acrylic Injection Balls⁵⁸

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⁵⁸ In the whole text as QS. Our QS is written in conformity with the norms ISO 9002

Preface

Our QS for acrylic injection balls in PMMA has been valid since the year 2000. Purpose of this certification is to guarantee the excellent quality of every single ball.

The strict quality control during the production process and a constant improvement of the production technologies allowed the standardisation of the quality of the acrylic injection balls.

1 Material features

Acrylic injection balls are polymerised plastic semi-finished products. They are manufactured through the process of injection. After their production they are characterised by high purity, brightness and transparency; besides they are very resistant against weather conditions and ageing, since the optical quality and the light transmittance remain unchanged over years.⁵⁹

2 Quality description

2.1 Optical quality

Acrylic injection balls are transparent, are absolutely colourless and have a clear external wall. They are free of bubbles, filaments, foreign bodies. In spite of this, the manufacturing process could cause some light stripes which are visible from a short distance. These stripes are admitted but should not condition the optical quality and the transparency of the entire ball.

Following defects are not admitted:

- Deep scratches;
- Bubbles, inclusions or foreign bodies, unpolymerized stuff in the material bigger than 1 mm³/meter;
- crazing effect.

2.2 Tolerances

In order to guarantee an excellent standard quality the acrylic injectionballs are controlled many times during the production process. Balls that show worse values than those indicated in the table 1 do not get through the quality control and are systematically rejected.

⁵⁹ See 2.3 on weather resistance.

Table 1: Tolerances for Acrylic Injection Balls

Article Code	Ø mm	Tolerance on Profile	Min. Order Quantity
BALL 20	20	± 1,0 mm	50
BALL 30	30	± 1,0 mm	50
BALL 40	40	± 1,0 mm	10
BALL 50	50	± 1,0 mm	10
BALL 60	60	± 1,0 mm	5
BALL 70	70	± 1,0 mm	5
BALL 80	80	± 1,0 mm	5

2.3 Delivery conditions

2.3.1 Packing

Acrylic injection balls are all single packed in a PE stretch film and sealed with plastic tape.

2.3.2 Delivery packing

Acrylic injection balls are set in cardboard boxes of different measures after having been packed.

Ask for more information by fax at 0039 02 95737357 or by mail at info@gevacril.com.⁶⁰

⁶⁰ This information refer only to the specific products described in the QDS. Gevacril has verified this information as true and reliable in accordance with the specific technical information of the current market standards at the time of printing. Gevacril does not guarantee for this information and any further use or processing of the above-mentioned products.