



Raca International

Technical Brochure

Your partner in
Spray Drying Solutions

spraydryingnozzles.com



Your partner in Spray Drying Solutions

With over 35 years of global experience, Raca International is a trusted partner in spray drying technology. We supply durable, high-quality nozzles for industries such as food, dairy, and pharmaceuticals.

Our strength lies in technical expertise, service, and custom solutions. Under the Fyrtext® brand, we offer reliable and flexible components that support uptime and consistent product quality.

All our nozzles are compatible with major brands. Whether you need replacements or expert advice, our team is here to support you.

Raca International is ISO 9001 certified, ensuring consistent quality and full traceability from design to delivery.

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Our Products

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Technical Overview

Fyrtex 1

Fyrtex 1 is designed for high-pressure, abrasive, and high-temperature environments. The main wear parts are orifice discs and swirl chambers. These are easy to replace without tools. Fyrtex 1 is fully compatible with Delavan SDX®. All parts are made from durable tungsten carbide. Most types are available directly from stock.



Technical Specifications

Construction	Body, Adapter, Orifice Disc, Swirl Chamber, End Plate (or combined), Gasket, Seal, Screw Pin
Max. Operation Pressure	500 bar / 7250 PSI
Max. Temperature	540°C (metal seals) / 150°C (polymer seals)
Materials	Tungsten carbide (wear parts), Stainless Steel 316L (housing)
Compatibility	Fyrtex 3 components, Delavan SDX®
Configuration	Swirl Chamber + endplate (separate) or combined
Applications	Milk powder, whey protein, coffee extracts, pharmaceutical APIs, enzymes, chemicals and more

Swirl Chamber Chart: Without Endplate

Part no.	Description
SB	Fyrtex Swirl Chamber SB / P2 without endplate
SC	Fyrtex Swirl Chamber SC / P3 without endplate
SD	Fyrtex Swirl Chamber SD / P4 without endplate
SE	Fyrtex Swirl Chamber SE / P5 without endplate
SF	Fyrtex Swirl Chamber SF / P6 without endplate
SG	Fyrtex Swirl Chamber SG / P7 without endplate
SH	Fyrtex Swirl Chamber SH / P8 without endplate

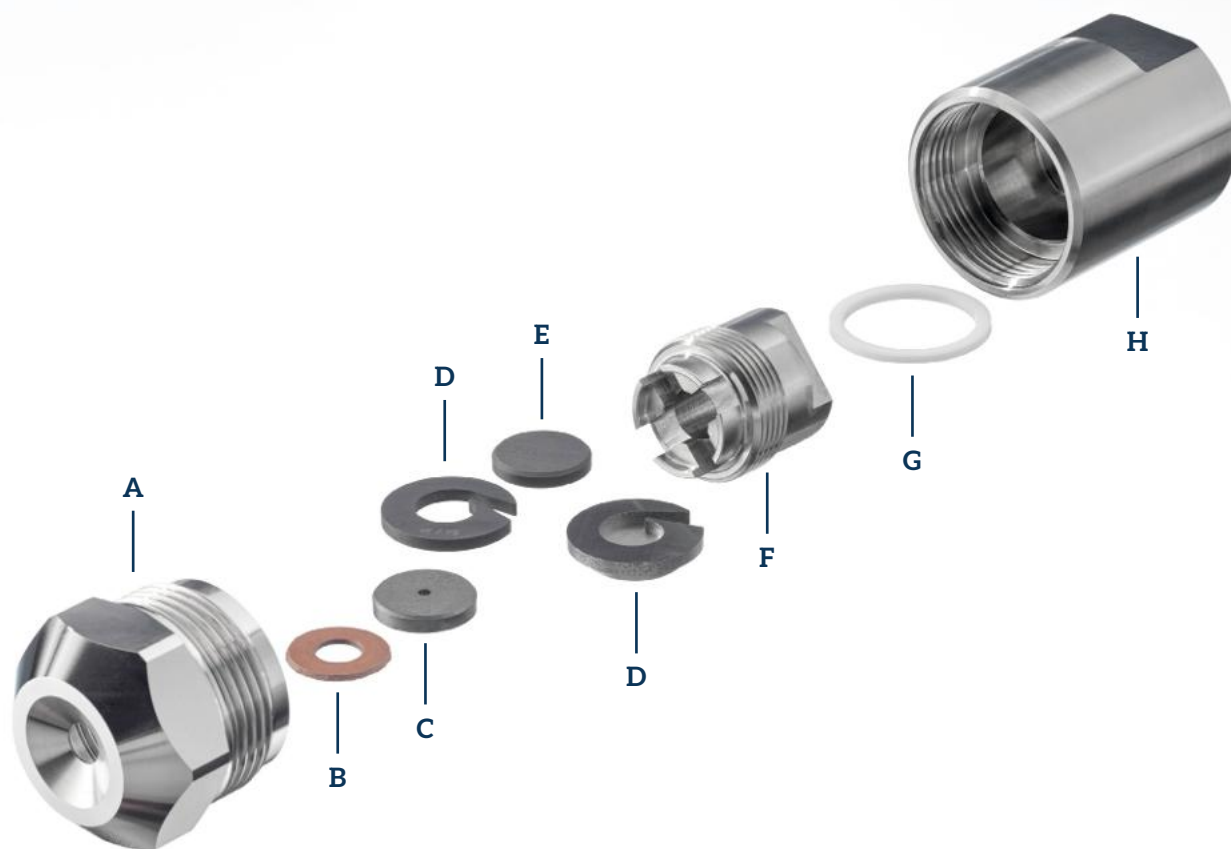
**All parts are made from durable tungsten carbide*

Swirl Chamber Chart: Combined

Part no.	Description
TCSA	Fyrtex Swirl Chamber combined TCSA / P1
TCSB	Fyrtex Swirl Chamber combined TCSB / P2
TCSC	Fyrtex Swirl Chamber combined TCSC / P3
TCSD	Fyrtex Swirl Chamber combined TCSD / P4
TCSE	Fyrtex Swirl Chamber combined TCSE / P5
TCSF	Fyrtex Swirl Chamber combined TCSF / P6
TCSG	Fyrtex Swirl Chamber combined TCSG / P7
TCSH	Fyrtex Swirl Chamber combined TCSH / P8
TCSI	Fyrtex Swirl Chamber combined TCSI / P9
TCSJ	Fyrtex Swirl Chamber combined TCSJ / P10
TCSK	Fyrtex Swirl Chamber combined TCSK / P11
TCSM	Fyrtex Swirl Chamber combined TCSM / P13

**All parts are made from durable tungsten carbide*





Fyrtext 1 Assembly Description and Part Numbers

Description	Part Number	Material
(A) Body (original)	A297760017	Stainless steel
(B) O-ring, orifice disc	G00018081	Gylon
(C) Fyrtext orifice disc	xxx*	Tungsten carbide
(D) Swirl chamber	See swirl chamber chart	Tungsten carbide
(E) Fyrtext round endplate	ENDRO	Tungsten carbide
(F) Screw pin (Original)	A297770016	Stainless steel
(G) O-Ring, Adapter	G00036291	Gylon
(H) 1/4 Adapter BSPT (Original)	A297750091	Stainless steel
(H) 3/8 Adapter BSPT (Original)	A297750117	Stainless steel
(H) 1/2 Adapter BSPT (Original)	A297750133	Stainless steel
(H) 3/4 Adapter BSPT (Original)	A297750158	Stainless steel

*All sizes available: contact our sales team

Technical Overview

Fyrtex 3

Fyrtex 3 uses two or three tungsten carbide wear parts. These include an orifice disc, a swirl chamber without end plate, and optionally a separate square end plate. The wear parts are identical to those of Fyrtex 1 and fully interchangeable. The only difference is the shape of the end plate: square instead of round. Fyrtex 3 is available in multiple configurations and materials. Most types are in stock for fast replacement.



Technical Specifications

Construction	Body, Adapter, Orifice Disc, Swirl Chamber, Gasket, Seal and optional Square End Plate
Max. Operation Pressure	345 bar (5000 PSI) variants capable of handling higher pressure
Max. Temperature	150°C (polymer seals)
Tool-free installation	Hand-tight assembly without the need for tools, making maintenance quick and easy
Compatibility	Shares all tungsten carbide wear components with Fyrtex 1 (except end plate shape)
Configuration	Separate swirl chamber and end plate, or combined swirl chambers
Applications	Milk and dairy powders, instant beverages, enzymes, food additives, chemicals and more

Swirl Chamber Chart: Without Endplate

Part no.	Description
SB	Fyrtex Swirl Chamber SB / P2 without endplate
SC	Fyrtex Swirl Chamber SC / P3 without endplate
SD	Fyrtex Swirl Chamber SD / P4 without endplate
SE	Fyrtex Swirl Chamber SE / P5 without endplate
SF	Fyrtex Swirl Chamber SF / P6 without endplate
SG	Fyrtex Swirl Chamber SG / P7 without endplate
SH	Fyrtex Swirl Chamber SH / P8 without endplate

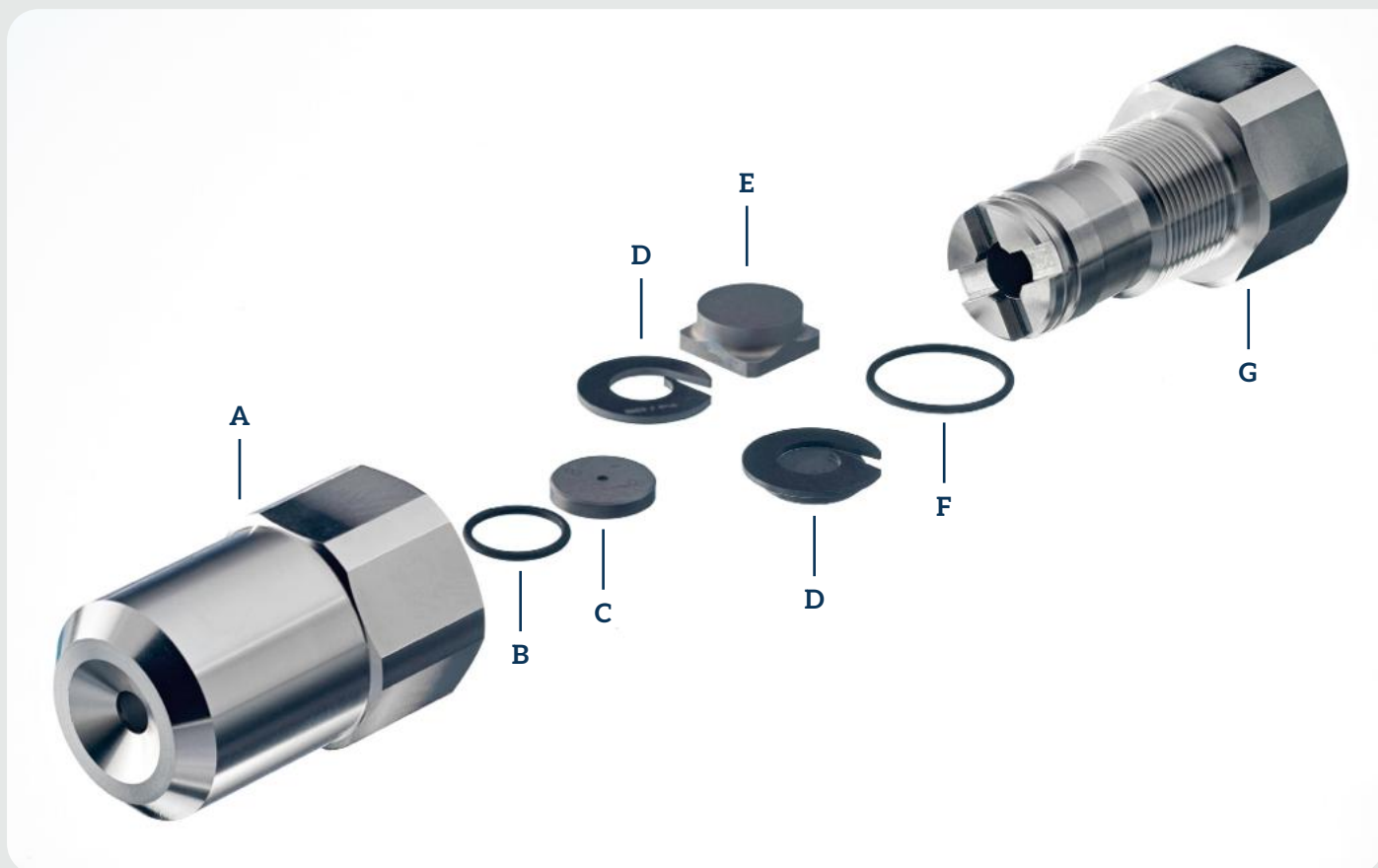
**All parts are made from durable tungsten carbide*

Swirl Chamber Chart: Combined

Part no.	Description
TCSA	Fyrtex Swirl Chamber combined TCSA / P1
TCSB	Fyrtex Swirl Chamber combined TCSB / P2
TCSC	Fyrtex Swirl Chamber combined TCSC / P3
TCSD	Fyrtex Swirl Chamber combined TCSD / P4
TCSE	Fyrtex Swirl Chamber combined TCSE / P5
TCSF	Fyrtex Swirl Chamber combined TCSF / P6
TCSG	Fyrtex Swirl Chamber combined TCSG / P7
TCSH	Fyrtex Swirl Chamber combined TCSH / P8
TCSI	Fyrtex Swirl Chamber combined TCSI / P9
TCSJ	Fyrtex Swirl Chamber combined TCSJ / P10
TCSK	Fyrtex Swirl Chamber combined TCSK / P11
TCSM	Fyrtex Swirl Chamber combined TCSM / P13

**All parts are made from durable tungsten carbide*





Fyrtext 3 Assembly Description and Part Numbers

Description	Part Number	Material
(A) Body (original)	W11300000	Stainless steel
(B) O-ring, orifice disc	11269381	Viton, EC/FDA
(C) Fyrtext orifice disc	xxx*	Tungsten carbide
(D) Swirl chamber	See swirl chamber chart	Tungsten carbide
(E) Fyrtext square endplate	ENDSQ	Tungsten carbide
(F) O-Ring	12193517	Viton, EC/FDA
(G) 1/4 Adapter BSPT (Original)	W113011339	Stainless steel
(G) 3/8 Adapter BSPT (Original)	W113012337	Stainless steel
(G) 1/2 Adapter BSPT (Original)	W113013335	Stainless steel
(G) 3/4 Adapter BSPT (Original)	W113014333	Stainless steel
Removal/Assembly tool (Original)	W153070005	Aluminium

*All sizes available: contact our sales team

Technical Overview

Fyrtex 5

Fyrtex 5 consists of two tungsten carbide wear parts: an orifice disc and a standard or flat back swirl chamber. The orifice disc can be combined with different swirl chamber styles, depending on the retainer disc. This setup reduces the number of critical components. It simplifies maintenance without reducing performance. Most variants are available directly from stock.



Technical Specifications

Construction	Body, Adapter, Orifice Disc, Swirl Chamber, Gasket, Seal, Retainer Disc
Max. Operation Pressure	345 bar (5000 PSI), with system variants reaching up to 690 bar (10,000 PSI)
Max. Temperature	150°C (polymer seals)
Maintenance	Easy-to-replace wear parts: universal swirl chamber and orifice disc
Compatibility	Fully interchangeable with Delavan SDX® V components; identical in dimensions and function
Applications	Infant formula, pharmaceuticals, plant-based proteins, specialty chemicals, food extracts and more

Swirl Chamber Chart: Standard

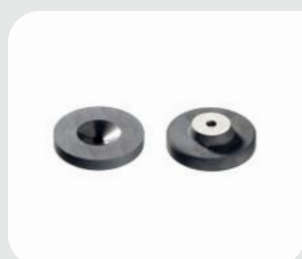
Part no.	Description
TCSB-R	Fyrtex 5 Swirl Chamber SB / standard
TCSC-R	Fyrtex 5 Swirl Chamber SC / standard
TCSD-R	Fyrtex 5 Swirl Chamber SD / standard
TCSE-R	Fyrtex 5 Swirl Chamber SE / standard
TCSF-R	Fyrtex 5 Swirl Chamber SF / standard
TCSG-R	Fyrtex 5 Swirl Chamber SG / standard
TCSH-R	Fyrtex 5 Swirl Chamber SH / standard
TCSI-R	Fyrtex 5 Swirl Chamber SI / standard

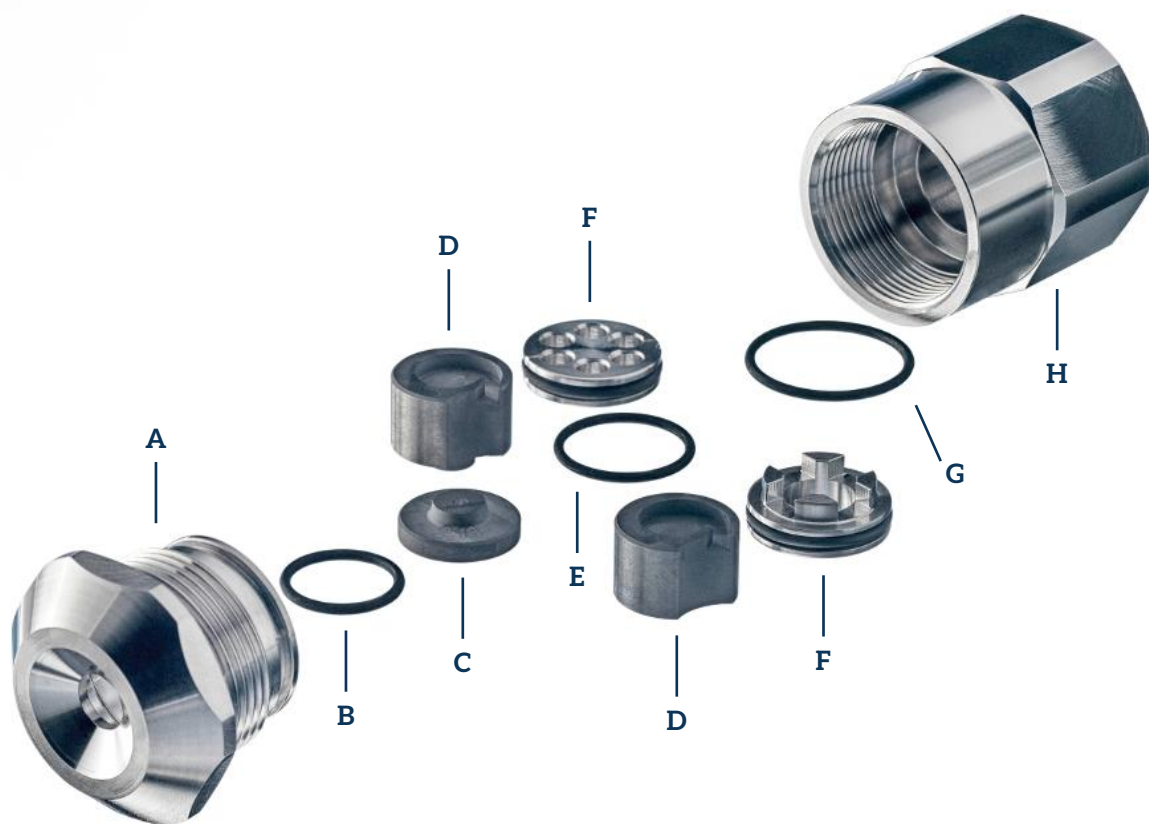
**All parts are made from durable tungsten carbide*

Swirl Chamber Chart: Flat Back

Part no.	Description
TCSB-R-T	Fyrtex Swirl Chamber SB / P2 without endplate
TCSC-R-T	Fyrtex Swirl Chamber SC / P3 without endplate
TCSD-R-T	Fyrtex Swirl Chamber SD / P4 without endplate
TCSE-R-T	Fyrtex Swirl Chamber SE / P5 without endplate
TCSF-R-T	Fyrtex Swirl Chamber SF / P6 without endplate
TCSG-R-T	Fyrtex Swirl Chamber SG / P7 without endplate
TCSH-R-T	Fyrtex Swirl Chamber SH / P8 without endplate
TCSI-R-T	Fyrtex 5 Swirl Chamber SI / Flat Back

**All parts are made from durable tungsten carbide*





Fyrtex 5 Assembly Description and Part Numbers

Description	Part Number	Material
(A) Body Original	W194990013	Stainless steel
(B) O-Ring, Orifice Disc	11269381	Viton, EC/FDA
(C) Fyrtex Orifice Disc	xxx-RS*	Tungsten carbide
(D) Swirl Chamber	See swirl chamber chart	Tungsten carbide
(E) O-Ring, Retaining Disc	11416637	Viton, EC/FDA
(F) Standard ret. (Original)	W195490013	Stainless steel
(F) Cross-Milled ret. (Original)	W198300003	Stainless steel
(G) O-Ring, Adapter	12193518	Viton, EC/FDA
(H) 1/4 Adapter BSPT (Original)	W195000010	Stainless steel
(H) 3/8 Adapter BSPT (Original)	W195000028	Stainless steel
(H) 1/2 Adapter BSPT (Original)	W195000036	Stainless steel
(H) 3/4 Adapter BSPT (Original)	W195000044	Stainless steel

*All sizes available: contact our sales team



Technical Overview

Fyrtex Mini

Fyrtex Mini includes two critical wear parts: an orifice disc and a swirl chamber. The orifice disc is interchangeable. The swirl chamber is available in tungsten carbide or ceramic. This offers options for chemical compatibility and thermal resistance. Both parts are designed for durability under high pressure and heat. Most versions are available directly from stock.



Technical Specifications*

Construction	Body, Adapter, Orifice Disc, Swirl Chamber and Viton® O-ring
Max. Operation Pressure	350 bar
Max. Temperature	150°C
Maintenance	Quick-change design using only a specialized assembly tool; no wrench required.
Compatibility	Single-inlet swirl chamber enables fine atomization at 10-20% lower pressure than standard nozzles
Applications	Pilot dryers, small batch processing, APIs, infant formula, pharmaceutical powders

**Based on the original Delevan SDX Mini design*

Swirl Chamber Chart: Tungsten Carbide

Part no.	Description
MINI-TC1	Fyrtex Mini Swirl Chamber type 1
MINI-TC2	Fyrtex Mini Swirl Chamber type 2
MINI-TC3	Fyrtex Mini Swirl Chamber type 3

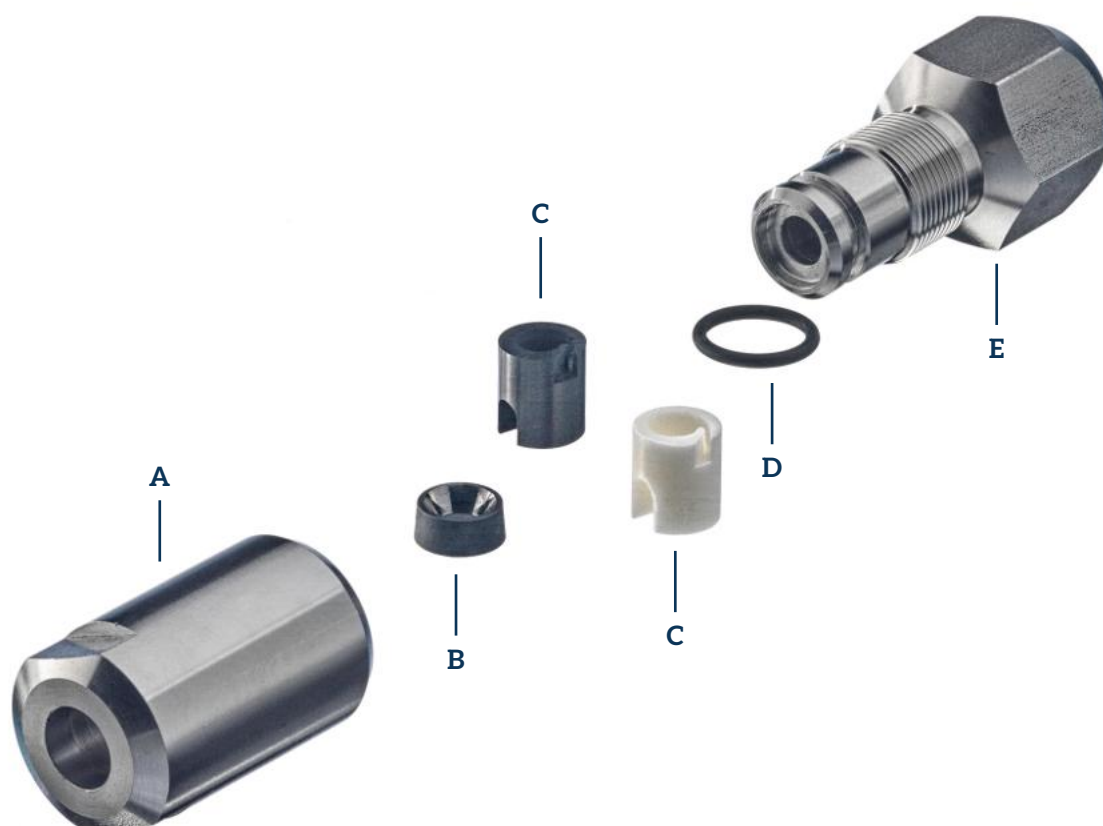
**All parts are made from durable tungsten carbide*

Swirl Chamber Chart: Ceramic

Part no.	Description
MINI-CE1	Fyrtex Mini Swirl Chamber type 1
MINI-CE2	Fyrtex Mini Swirl Chamber type 2
MINI-CE3	Fyrtex Mini Swirl Chamber type 3

**All parts are made from ceramic*





Fyrtext Mini Assembly Description and Part Numbers

Description	Part Number	Material
(A) Body Original	A329320020	Stainless steel
(B) Orifice disc Mini	xxx-MINI */**	Tungsten carbide
(C) Swirl Chamber	See swirl chamber chart	Tungsten carbide / Ceramic
(D) O-Ring	11416634	Viton, EC/FDA
(E) 1/4 NPTF adapter (Original)	A329310013	Stainless steel
(E) 3/8 NPTF adapter (Original)	A329310021	Stainless steel
Assembly tool (Original)	A36360006	Aluminium

**All sizes available: contact our sales team*

***Orifice disc Mini available types 025 (0,64 mm) through 090 (2,29 mm)*

Technical Overview

Fyrtex TD

Fyrtex TD uses two tungsten carbide wear parts: an orifice disc and a swirl chamber. The orifice disc is interchangeable with Fyrtex 1 and 3. The swirl chamber has a one-piece design for extra durability and less risk of breakage.



Technical Specifications

Construction	Body, Adapter, Orifice Disc, Swirl Chamber, Gasket
Maintenance	Patented twist-lock design allows fast part swaps without tools
Spray Performance	Liquid flows along one axis, forming a centrifugal vortex that ejects fine droplets at the edges
Applications	Food ingredients, dairy products, enzymes, plant-based proteins, pharmaceuticals and chemical powders

Swirl Chamber Chart: Tungsten Carbide

Part no.	Description
TCSC-V	Fyrtex TD Swirl Chamber SC/03
TCSD-V	Fyrtex TD Swirl Chamber SD/04
TCSE-V	Fyrtex TD Swirl Chamber SE/05

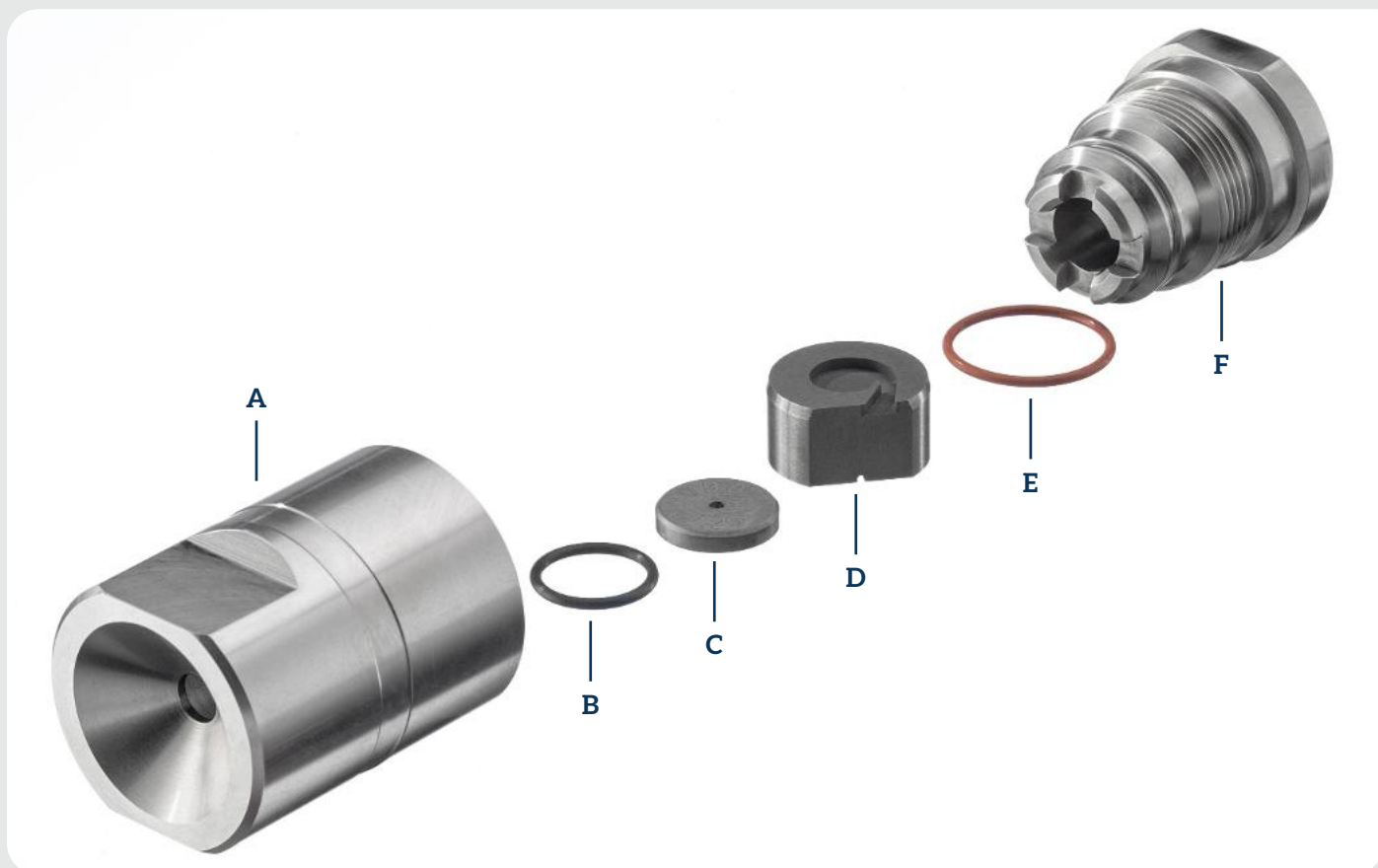
**All parts are made from durable tungsten carbide*

Swirl Chamber Chart: Tungsten Carbide

Part no.	Description
TCSF-V	Fyrtex TD Swirl Chamber SF/06
TCSG-V	Fyrtex TD Swirl Chamber SG/07
TCSH-V	Fyrtex TD Swirl Chamber SH/08

**All parts are made from durable tungsten carbide*





Fyrtext TD Assembly Description and Part Numbers

Description	Part Number	Material
(A) Body BETE TD original	76360	SS 316
(B) O-ring original, Orifice disc	TD-OR-76144	Viton, FDA
(C) Fyrtext Orifice disc	xxx*	Tungsten carbide
(D) Swirl Chamber	See swirl chamber chart	Tungsten carbide
(E) O-ring original, Body	TD-OR-85574	Viton, FDA
(F) BETE Adapter original	76423	SS 316

**All sizes available: contact our sales team*



Technical Overview

Fyrtex SK

Fyrtex SK is the smallest model in the Fyrtex line, built for precise, low-flow spray drying of sensitive products. Its SK layout suits labs, box dryers, and applications like baby food and pharma powders. A tungsten carbide core and insert (M-, Y- or Z-grade) ensure long life and reliable performance, while the 316 stainless steel body and adapter add durability.



Technical Specifications*

Construction	Body, Adapter, Core, Insert, Gasket
Max. Operation Pressure	35 to 450 bar (7000 psi) with a slotted design for fine-tuning drop size and spray distribution
Compatibility	Spray Systems SK SprayDry® nozzle
Performance	Small droplets from low flow, high pressure. MFP option reduces clogging and extends runtime. Anti-bearding design minimizes build-up and contamination
Applications	Box/pilot dryers, infant formula, pharmaceuticals, enzymes and specialty chemical

Fyrtex SK Core Chart: Square

Part no.	Description
16-2	Fyrtex SK Core 16 square, 2 slides
17-4	Fyrtex SK Core 17 square, 4 slides
20-2	Fyrtex SK Core 20 square, 2 slides
21-4	Fyrtex SK Core 21 square, 4 slides
27-4	Fyrtex SK Core 27 square, 4 slides
28-6	Fyrtex SK Core 28 square, 6 slides

**All parts are made from Y/M/Z carbide*

Fyrtex SK Core Chart: Triangle

Part no.	Description
16-2	Fyrtex SK Core 16 triangle, 2 slides
17-2	Fyrtex SK Core 17 triangle, 2 slides
21-2	Fyrtex SK Core 21 triangle, 2 slides
28-4	Fyrtex SK Core 28 triangle, 4 slides

**All parts are made from Y/M/Z carbide*





Fyrtext SK Assembly Description and Part Numbers

Description	Part Number	Material
(A) Head Fyrtext SK	HEAD-RKA-SS	SS 316
(A) Head Fyrtext SK MFP	HEAD-RKAM-SS	SS 316
(B) Fyrtext SK Insert	RKI-xx	"Y" carbide
(B) Fyrtext SK Insert	RKIM-xx	"M" carbide
(B) Fyrtext SK Insert	RKIZ-xx	"Z" carbide
(C) Core	See Core charts	Tungsten carbide
(D) Fiberring RKA	10500200	Fiber
(E) Body Fyrtext SK 1/4	BODY-RKA-1	SS 316
(E) Body Fyrtext SK 3/8	BODY-RKA-SS3/8	SS 316

*Fyrtext SK Inserts available types 36 (2,72 mm) through 76 (0,50 mm)

Example article number Fyrtext: RKI-52 (1,61 mm) y-car

Example article number Fyrtext: RKIM-44 (2,18 mm) m-car



Technical Overview

Fyrtex SB

Fyrtex SB uses two tungsten carbide wear parts: a core and an insert. These are available in various sizes, configurations, and carbide grades (M, Z, or Y). The parts are designed to withstand high pressure, abrasion, and heat. They offer excellent wear resistance and a long service life. The outer components are made from stainless steel 316. Most variants are available directly from stock.



Technical Specifications*

Construction	Head, Body, Core, Insert and Seal. Durable build: 316 SS Head and Body; tungsten carbide in M, Z or Y carbide
Max. Operation Pressure	450 bar (7000 psi)
Spray Pattern	Hollow-cone spray pattern with narrow droplet distribution for uniform product quality
Flow Capability	Medium-flow capabilities (208-2158 l/hr at 70 bar) with spray angles from -34° to 109°
Applications	Dairy powders, flavors, chemicals, pharmaceuticals, enzymes, etc.

Fyrtex Core Chart: Y/M/Z carbide

Art. no.	Description
27-4	Fyrtex SB Core Flat 27, 4 slides
28-3	Fyrtex SB Core Flat 28, 3 slides
29-6	Fyrtex SB Core Flat 29, 6 slides
32-6	Fyrtex SB Core Flat 32, 6 slides
40-6	Fyrtex SB Core Flat 40, 6 slides
45-6	Fyrtex SB Core Flat 45, 6 slides
50-6	Fyrtex SB Core Flat 50, 6 slides
425-4	Fyrtex SB Core Hollow 425, 4 slides
625-6	Fyrtex SB Core Hollow 625, 6 slides
632-6	Fyrtex SB Core Hollow 632, 6 slides
640-6	Fyrtex SB Core Hollow 640, 6 slides
645-6	Fyrtex SB Core Hollow 645, 6 slides
650-6	Fyrtex SB Core Hollow 650, 6 slides

*All parts are made from durable Y/M/Z carbide

Fyrtex Core Chart: Y/M/Z carbide

Art. no.	Description
27-2	Fyrtex SB Core Flat 27, 2 slides
28-3	Fyrtex SB Core Flat 28, 3 slides
32-3	Fyrtex SB Core Flat 32, 3 slides
40-3	Fyrtex SB Core Flat 40, 3 slides
45-3	Fyrtex SB Core Flat 45, 3 slides
50-3	Fyrtex SB Core Flat 50, 3 slides
425-2	Fyrtex SB Core Hollow 425, 2 slides
625-3	Fyrtex SB Core Hollow 625, 3 slides
632-3	Fyrtex SB Core Hollow 632, 3 slides
640-3	Fyrtex SB Core Hollow 640, 3 slides
645-3	Fyrtex SB Core Hollow 645, 3 slides
650-3	Fyrtex SB Core Hollow 650, 3 slides

*All parts are made from durable Y/M/Z carbide



Fyrtex SB Assembly Description and Part Numbers

Description	Part Number	Material
(A) Head Fyrtex SB	HEAD-RA-SS	SS 316
(A) Head Fyrtex SB MFP	HEAD-RAM-SS	SS 316
(B) Fyrtex SB Insert	RKI-xx*/**	"Y" carbide
(B) Fyrtex SB Insert	RKIM-xx*/**	"X" carbide
(B) Fyrtex SB Insert	RKIZ-xxzz*/**	"Z" carbide
(C) Core	See core charts	Tungsten carbide
(E) Body Fyrtex SB 1/4	BODY-RA-1	SS 316
(E) Body Fyrtex SB 3/8	BODY-RA-2	SS 316

*SB Inserts are available in types 20 (4.08 mm) to 60 (1.01 mm), e.g., RI-52 (1.61 mm) for y-car and RIM-44 (2.18 mm) for m-car.

**All sizes available: contact our sales team



Fire Safety Nozzles

The Fire Safety version is a specially designed pressure atomizing nozzle. It can handle pressures up to 700 bar. Its construction helps reduce the risk of fire or explosion by preventing product from dripping into the air disperser or drying chamber.

The nozzle is made entirely from Nitronic stainless steel. This material is up to five times harder than standard 316 stainless steel. As a result, the nozzle is highly durable and performs well under tough conditions.

An extra O-ring seal provides a nearly leak-proof connection. If a leak does occur, the design ensures that any droplet falls directly into the drying chamber. It never settles around the nozzle, which helps prevent dry buildup or cauliflowering.

This safety version is available for all Fyrtext models. It fits easily into existing spray dryer systems, improving safety without changing your process or final product.

Key Benefits

- Nitronic steel housing: harder and tougher than 316
- Leak-proof: extra O-ring and smart droplet control
- Reduce fire and explosion risk
- Limits leakage and clogging
- Fits all Fyrtext nozzle types
- Withstands up to 700 bar
- Tool-free, hand-tight assembly
- Fully welded; no threads
- USDA sanitary design
- FDA gasket; heat and chemical resistant

Available models:

- **Model 698:** for Fyrtext 3, 5, TD and SB nozzles
- **Model 697:** for Fyrtext Mini and SK nozzles

Contact Information

Talk to our experts

Do you have questions, need support, or want to discuss your spray drying process? We're here to help.

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