

# Cleaning of fiber optic connectors standardized rules for Switzerland

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# Content

1. General guidelines	3
2. Cleaning of ODC connectors	4
3. Cleaning of Q-ODC-12 connectors	6
4. Cleaning of standard connectors	8
5. Cleaning of Q-XCO and FullAXS	10
6. Cleaning of Expanded Beam Connectors	11
7. Cleaning of MTP connectors	12
8. End face inspection of fiber-optic connectors	15
9. Ordering information from other supplier	17
10. Supplier information	17
11. General procedure for inspection and cleaning	18
12. Revision History	19

# 1 General guidelines

Fiber optic cables, assemblies, optical fiber connectors and equipment may only be installed and commissioned by qualified personnel. All local and national safety regulations must be accepted and adhered to.

The optical performance (optical insertion loss and return loss) of fiber-optic connectors is easily and adversely affected by contamination and scratching of the fiber end face surfaces. Particles of dust and smears of grease, caused by touching the ferrules end face, or the residue from cleaning agents, can cause increased insertion losses and, in extreme cases, can culminate in loss of signal. During an installation, it is therefore necessary to ensure that ferrule end face surfaces are clean, which means:

- Only store fiber optic assemblies in their original packaging
- Do not remove protective caps until immediately before mating
- Connectors should never be left lying around without protective caps in place
- Never touch the end surfaces or make preliminary contact with foreign surfaces
- Always work very carefully and maintain a clean working environment

LC connectors tend to be much more prone to contamination and scratching than, for example, robust ODC or Q-ODC connectors on which the ferrules are protected mechanically from physical contact. However, the cleaning of these connectors will require other mechanical solutions.

All HUBER+SUHNER fiber optic assemblies are 100 % manufactured in an industrial environment and are governed by standards which are implemented and controlled within the factory environment. The fiber optic cable assemblies, as well as the fiber optic systems, are inspected for insertion loss and the cleanliness of the ferrule end face. Factory-terminated fiber optic connectors supplied to the market are cleaned and ready for installation.

Despite our careful control, contamination of dust or microscopically small parts on the end faces cannot be 100 % excluded.



HUBER + SUHNER therefore recommends inspecting all connector end surfaces and, if necessary, cleaning them. Information and instruction concerning this topic is given in the last chapter of this document. It is also important that the corresponding opposite side is also inspected and, if necessary, cleaned and ready for mating.

Disregarding initial installation, field cleaning is however an important process and one that needs to be handled effectively and competently by the installation teams. Ferrules can get dirty during installation work (e.g. through physical contact) and, in such cases, visible inspection is urgently advised. During a network service or expansion, existing fiber optic connections are often disconnected and then get reconnected - here too, visible inspection is advisable prior to reconnection.

## 2 Cleaning of ODC connectors

Q-ODC-2 1.25 mm ferrule	ODC-2 1.25 mm ferrule	ODC-4 1.25 mm ferrule
		

Cleaning tools for ODC connectors	Item no.	Picture
IBC cleaner for 1.25 mm ferrules	84108852	

### Comments

- Same IBC cleaner of all types of ODC connectors
- Wet cleaning for ODC connectors not recommended

## Dry cleaning of end face

### ODC plug cleaning

- Remove the purple guide cap from the device.
- Extend the tip of the cleaner approx. 1 - 2 mm and insert it into the plug straight forward.
- Risk of tip breakage.



- Push device up to the stop twice.  
A "click" sound indicates the end of each cleaning cycle.



### ODC socket/extension cleaning

- Open the guide cap from the device.
- Insert the guide into the socket over the ferrule .
- Push the device up to the stop twice. A "click" sound indicates the end of each cleaning cycle.








### Identification of remaining cleaning yarn

- The window indicates if there is still cleaning yarn available. When the cleaning yarn is used up the indicator is completely red.
- Can be used for about 500 cleaning cycles.



### 3 Cleaning of Q-ODC-12 connectors

Q-ODC-12 plug plastic ferrule (PPS)	Q-ODC-12 socket plastic ferrule (PPS)	Q-ODC-12 extension plastic ferrule (PPS)
		

Cleaning tools for Q-ODC-12 connector	Item no.	Picture
IBC cleaner for MTP ferrule	85017030	
Swab – pins cleaning	84139207	
Cleaning brush – pin holes cleaning (plug)	85099339	
Plug Adapter to IBC cleaner	85025275	
Socket/extension/rear mount Adapter to IBC cleaner	85025276	

## Cleaning of end face

### Important notice

- If the Q-ODC-12 is connected to an active laser during cleaning, then the use of laser protection glasses is mandatory.
- The fibers must not point towards the eyes.



### Plug pin holes cleaning

- Wet the cleaning brush with isopropyl alcohol and dab it onto a cleaning tissue. Insert the cleaning brush into the pin hole and move it back and forward twice.
- The metal of the brush must not come into contact with the ferrule. Avoid any damage to the holes, ferrule and fibers.



### Socket/extension/rear mount pins cleaning

- Wet the cleaning brush with isopropyl alcohol and dab it onto a cleaning tissue.
- Clean the pins on all sides.
- Avoid any damage to the ferrule and fibers.








### Ferrule/fibers end face cleaning


- Note the key and the keyway orientation of the connector and the cleaning adapter.
- Insert the IBC cleaner with mounted Q-ODC-12 adapter into the connector.



## 4 Cleaning of standard connectors

LC 1.25 mm ferrule	SC 2.5 mm ferrule	E2000 2.5 mm ferrule
		

Cleaning tools for dry cleaning	Item no.	Picture
IBC cleaner for 1.25 mm ferrules	84108852	
IBC cleaner for 2.5 mm ferrules	84095170	

Optional tools for wet cleaning	Item no.	Picture
ITW Chemtronics QbE Cleaning System	84041085	
ITW Chemtronics Electro-Wash MX Fiber Cleaning Pen	84041105	



## Dry cleaning of end face

### Connector cleaning

- Open the guide cap from the device.
- Insert the connector ferrule into the guide.
- Push the device up to the stop twice. A "click" sound indicates the end of each cleaning cycle.



### Cleaning through adapter

- Remove guide cap from the device.
- Extend the tip of the cleaner approx. 1-2 mm and insert it into the adapter.
- Risk of tip breakage.
- Push device up to the stop twice. A "click" sound indicates the end of each cleaning cycle.



### Identification of remaining cleaning yarn

- The window indicates if there is still cleaning yarn available.  
When the cleaning yarn is used up the indicator is completely red.
- Can be used for about 500 cleaning cycles.



## 5 Cleaning of Q-XCO and FullAXS

Q-XCO LC with 1.25 mm ferrule	FullAXS LC with 1.25 mm ferrule
	

Cleaning tools for dry cleaning	Item no.	Picture
IBC cleaner, 1.25 mm	84108852	

### Dry cleaning of end face

#### Q-XCO cleaning

- Open the guide cap from the device and insert the LC ferrule into the guide.
- Push the device up to the stop twice. A "click" sound indicates the end of each cleaning cycle.



#### FullAXS cleaning

- Open the guide cap from the device and insert the LC ferrule into the guide.
- Push the device up to the stop twice. A "click" sound indicates the end of each cleaning cycle.



## 6 Cleaning of Expanded Beam Connectors



### EBC cleaning



1. Wash connector or front of bulkhead with mounted protective cap with fresh and clean water, if they are covered with excessive dirt.
2. **IMPORTANT:** Clean insert surfaces and lenses only when they are touched or otherwise contaminated.
3. Remove the protective cap. Turn grip of connector and protective cap in opposite directions, until threads are completely free.
4. Blow away dirt particles from the alignment pin, ball lenses and insert surface with clean dry air.
5. Moisten a large swab with isopropyl alcohol, electro-wash PX or equivalent. Using a back-and-forth or swirling motion, wipe the alignment pin, ball lenses, insert surface and mating surface. Use only light pressure on the ball lenses to avoid scratches.







6. If seal of grip or insert, connector threads, protective cap threads and front surfaces are dirty, then these should also be cleaned with a moistened large swab. Use again isopropyl alcohol, electro-wash PX or equivalent.
7. Moisten a small swab with isopropyl alcohol, electro-wash PX or equivalent. Using a back-and-forth or swirling motion, wipe the alignment pin hole.
8. Blow clean dry air over the lenses until remaining solvent and stray particles are removed.
9. Inspect the ball lenses to make sure any contamination is removed. If necessary, repeat steps 4 to 8 until the surfaces are clean.
10. Re-install the protective cap by turning grip of connector and protective cap in opposite directions and tighten them properly.





## 7 Cleaning of MTP connectors

MTP connector MT ferrule	MTP adapter
	

Cleaning tools for dry cleaning	Item no.	Picture
OPTIPOP R cassette for MTP MALE connectors	84097539	
OPTIPOP R cassette for MTP FEMALE connectors	84097538	

OPTIPOP R cassette refill (6 × reels)	84097551	
IBC MTP cleaner MALE and FEMALE	84097537	
MTP cleaning brush	85099339	

## Dry cleaning of end face

<p><b>MTP connector cleaning</b></p> <ul style="list-style-type: none"> <li>• Select the appropriate cleaner for male/female.</li> <li>• Depress the green lever so that a fresh area of cleaning cloth is exposed.</li> <li>• Position the ferrule against the cloth so that the fibers are in contact with the cleaning material. In the case of angled connectors, the ferrule will need to be adjusted accordingly.</li> <li>• Wipe the connector in the direction shown on the cassette.</li> <li>• Release the grip to seal off the cleaning cloth.</li> <li>• Re-inspect the ferrule with a 200 × microscope.</li> <li>• If still contaminated repeat all steps once again.</li> <li>• Ensure that the connector does not touch any hard surfaces.</li> </ul>	
<p><b>In-port MTP connector cleaning</b></p> <ul style="list-style-type: none"> <li>• Insert the IBC cleaner into the adapter where the connector is mated.</li> <li>• Rotate the tape feeder wheel as indicated on the cleaner (3 ×).</li> <li>• Inspect the connector with a 200 × microscope.</li> <li>• If still contaminated repeat steps once more.</li> </ul>	

## Wet cleaning of end face

### MTP connector cleaning

- Apply an approved cleaning fluid to a small area of lint-free cleaning cloth.
- Wipe the connector over the damp area.
- For female MTP connectors use the cleaning brush and fluid to remove any debris from the pin holes or pins.
- Wipe the connector over a dry area of cloth and allow it to dry.
- Let the ferrule air-dry before inspecting with a 200 × microscope.



### In-port MTP connector cleaning

- Insert the IBC cleaner into the adapter where the connector is mated.
- Rotate the tape feeder wheel as indicated on the cleaner (3 ×).
- Inspect the connector with a 200 × microscope.
- If still contaminated repeat steps once more.



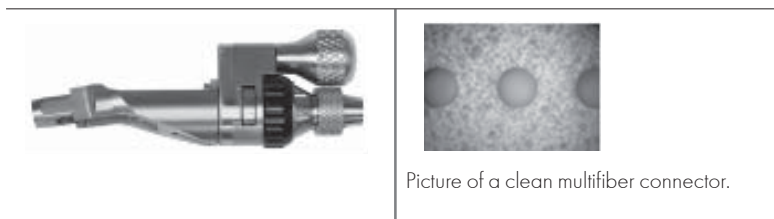
## 8 End face inspection of fiber optic connector

Requirements	Recommended products
<ul style="list-style-type: none"><li>• Min. 200 × magnification</li><li>• Monitor inspection (safety)</li></ul>	JDSU/Westover





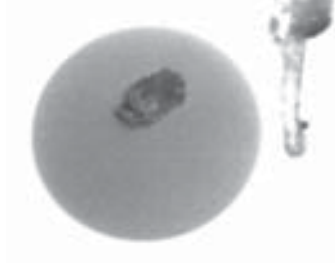
For end face inspection of different fiber optic connectors, specific adapters are necessary.

### Example for MTP adapter



Picture of a clean multifiber connector.

Note: A MTP/MPO contain at least 12 fibers, every fiber needs to be individually optical inspected according the mentioned parameters at the beginning of the document.

OK	
NOT OK	
NOT OK	



## 9 Ordering information from other supplier

Cleaning tools for ODC connectors	Supplier	Supplier item no.
IBC brand cleaning tool for 1.25 mm ferrules	US Conec Ltd.	IBC - 12910

Cleaning tools for ODC connectors	Supplier	Supplier item no.
IBC Brand Cleaning Tool for 1.25 mm ferrules	US Conec Ltd.	IBC - 12910
IBC Brand Cleaning Tool for 2.50 mm ferrules	US Conec Ltd.	IBC - 9392
ITW Chemtronics QbE Cleaning System	ITW Chemtronics	QbE
ITW Chemtronics Electro-Wash MX Fiber Cleaning Pen	ITW Chemtronics	FW2150

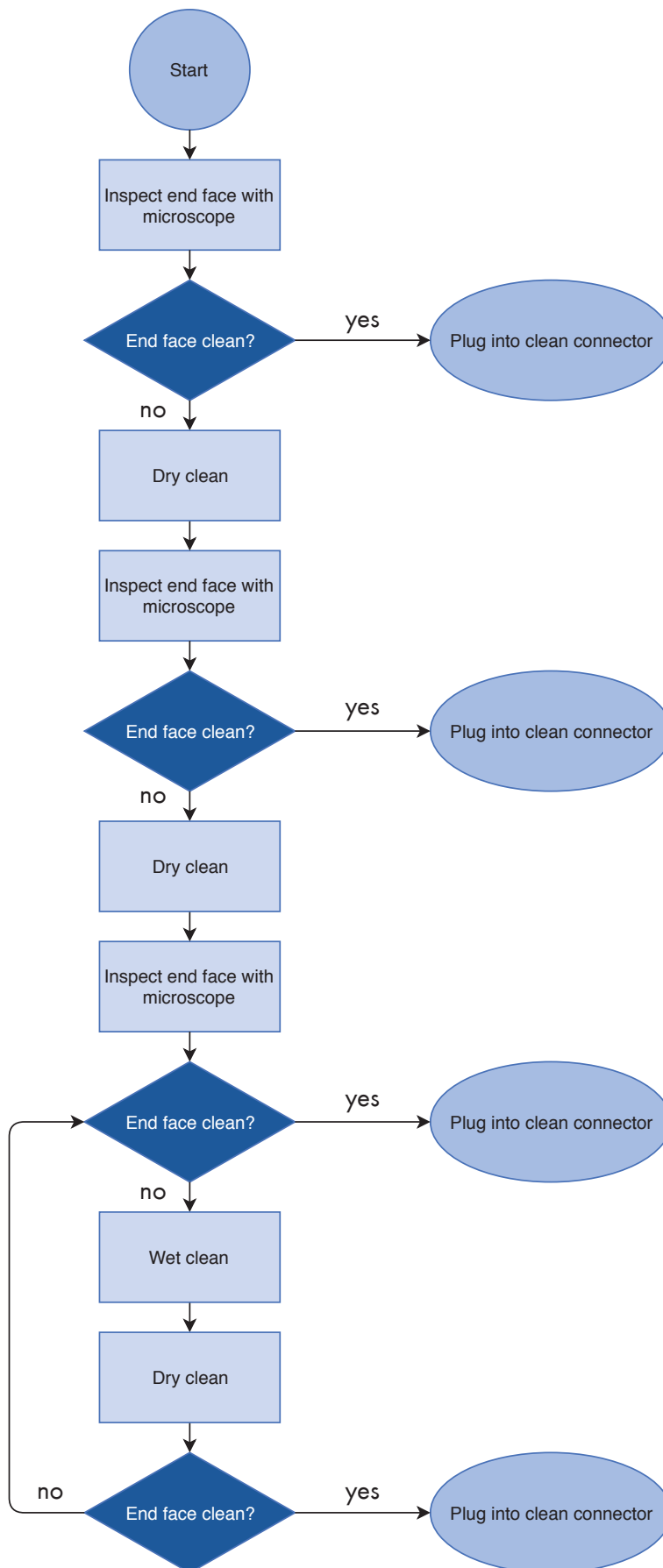
Cleaning tools for EBC connectors	Supplier	Supplier item no.
Large swab	ITW Texwipe	TX759B MicroAbsorbant™
Small swab	ITW Texwipe	TX770E MicroAbsorbant™
Isopropyl alcohol	Various	-
Electro-wash PX	ITW Chemtronics	ES810, ES1210

Cleaning tools for MTP connectors	Supplier	Supplier item no.
MTP cleaning tool IBC-7104	US Conec Ltd.	IBC-7104
OPTIPOP R cassette for MTP MALE connectors	US Conec Ltd.	Optipop 6339
OPTIPOP R cassette for MTP FEMALE connectors	US Conec Ltd.	Optipop 6338
OPTIPOP R cassette refill (6 × reels)	US Conec Ltd.	Optipop 6232

## 10 Supplier information

Supplier	Contact information
US Conec Ltd.	1138 25th Street Southeast Hickory, NC 28602, USA <a href="http://www.usconec.com">www.usconec.com</a>
ITW Chemtronics	Please check the supplier website for the local office at <a href="http://www.chemtronics.com">www.chemtronics.com</a> .
JDSU	Please check the supplier website for the local office at <a href="http://www.chemtronics.com">www.chemtronics.com</a> .
ITW Texwipe	Please check the supplier website for the local office at <a href="http://www.chemtronics.com">www.chemtronics.com</a> .

# 11 General procedure for inspection and cleaning



## 12 Revision history

Revision	Description of detailed changes	Manager/Engineer	Applicable date
Rev. A	Author	DIC 4453	12.12.2012
Rev. B	Correction and adaption of text	BOA 4321	18.12.2012
Rev. C	Correction and adaption of text	BOA 4321	23.01.2013
Rev. D	Correction and adaption of text	DIC 4453	30.04.2013
Rev. E	Correction and adaption of text	DIC 4453	12.12.2014
Rev. F	Correction and adaption of text	BOA 4321	23.06.2015
Rev. G	Correction and adaption of text	BOA 4321	02.09.2015
Rev. H	Correction and adaption of text	NED 4570	16.11.2017

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