

## Rules or Handbooks or Guidelines

### Appendix 4 Accepted Fluids

Please note that this Appendix 4 has been superseded by the Fluid and Processing Material Approval Request Section of the live, on-line, material data base located here <https://user.iter.org/?uid=N3SVRJ>. All items listed in this Appendix are included in the new material database together with all later submissions. New Fluid and Processing Material Acceptance requests may only be made, by the I.O. TRO for the relevant system, using the new database

Approval Process			
	Name	Action	Affiliation
Author	Vine G.	17 Jul 2017:signed	IO/DG/CP/PSP/VSP
Co-Authors			
Reviewers	Pearce R. Worth L.	31 Aug 2017:recommended 17 Jul 2017:recommended	IO/DG/CP/PSP/VSP IO/DG/CP/PSP/VSP
Approver	Lee G.- S	08 Sep 2017:approved	KFE - Korea Institute of Fusion Ene...
Information Protection Level: Non-Public - Unclassified			
RO: Croset Jean-Philippe			
Read Access	GG: MAC Members and Experts, GG: STAC Members & Experts, AD: ITER, AD: External Collaborators, AD: IO_Director-General, AD: External Management Advisory Board, AD: EUROfusion-DEMO, AD: IDM_Controller, AD: members-DA, AD: Auditors, AD: ITER Management Assessor, project administrator, RO, LG: [CCS] CC...		

#drn#

Change Log			
Appendix 4 Accepted Fluids (2ELN8N)			
Version	Latest Status	Issue Date	Description of Change
v1.0	In Work	27 Aug 2008	
v1.1	In Work	12 Jan 2009	
v1.2	In Work	18 Jun 2009	Name change from approved to accepted. Cutting fluid removed.
v1.3	Approved	02 Sep 2009	Minor textual changes for consistency with Vacuum Handbook
v1.4	Approved	29 Feb 2012	New fluids added
v1.5	Approved	05 Oct 2012	Included new cutting fluid and approved liquid dye penetrant product families (with restrictions)
v1.6	Signed	26 Jan 2015	Fluids added:-  Cutting fluids  Blasocut Castrol SYNTILO 75 EF Cut1 - Carecut S cutting fluid Garia 2608 S-12 Green Star SINTOL Micro Jokisch Foam Cut Magicutsynth-g-60 QUAKER 3755 BIO Hocut 2000 SWISSCOOL 7722 Vasco 1045  Acids 20% Sulphuric Acid solution Concentrated Nitric Acid Hydrofluoric Acid  LDP FluidLDP W divertor  Couplants Babb Co matrix UT coupling agent CGM US Paste U49  Other Demin Water Elektrolyt EH01 Neutralix NG01
v1.7	Signed	10 Feb 2015	Fluids added:-  Cutting fluids  Blasocut Castrol SYNTILO 75 EF Cut1 - Carecut S cutting fluid Garia 2608 S-12 Green Star SINTOL Micro Jokisch Foam Cut Magicutsynth-g-60 QUAKER 3755 BIO

			<p>Hocut 2000 SWISSCOOL 7722 Vasco 1045</p> <p>Acids 20% Sulphuric Acid solution Concentrated Nitric Acid Hydroflouric Acid</p> <p>LDP FluidLDP W divertor</p> <p>Couplants Babb Co matrix UT coupling agent CGM US Paste U49</p> <p>Other Demin Water Elektrolyt EH01 Neutralix NG01</p>
v1.8	Approved	11 Feb 2015	<p>Document version in header matched to IDM version</p> <p>Fluids added:-</p> <p>Cutting fluids</p> <p>Blasocut Castrol SYNTILO 75 EF Cut1 - Carecut S cutting fluid Garia 2608 S-12 Green Star SINTOL Micro Jokisch Foam Cut Magicutsynth-g-60 QUAKER 3755 BIO Hocut 2000 SWISSCOOL 7722 Vasco 1045</p> <p>Acids 20% Sulphuric Acid solution Concentrated Nitric Acid Hydroflouric Acid</p> <p>LDP FluidLDP W divertor</p> <p>Couplants Babb Co matrix UT coupling agent CGM US Paste U49</p> <p>Other Demin Water Elektrolyt EH01 Neutralix NG01</p>
v1.9	Approved	19 May 2015	<p>Fluids and other processing media added:-</p> <p>Cutting fluids:- Xtreme Cut 250</p>

			<p>Pickling and passivation:- Avesta Passivator 601 Avesta Cleaner 401 Avesta picking paste BlueOne TM 130</p> <p>Markers:- Intrama SL.250 SL2100</p> <p>Abrasive media:- Cutting wheel: Abratec TIPO 42 Cutting wheel: Sait "A30S" [Thk. 2 mm] Cutting wheel: Sait "XA24Q" [Thk. 3,2 mm] Cutting wheel: Sait "XA24Q" [Thk. 7 mm] Cutting wheel: Sait "XA46R" [Thk. 1,6 mm] Flapper wheel: Abratec LAMELLARE Flapper wheel: Abratec LAMELLARE Flapper wheel: Sait "SAITLAM UK 3A" Flapper wheel: S.L.F. Abrasivi LASER DISC Rough Wheel: Abratec TIPO 27 Rough Wheel: 3M "987C CUBITRON 2"</p>
v1.10	Approved	19 Aug 2015	<p>Temporary fixings incorporating adhesive tape added, all VQC N/A.</p> <p>3M™ Aluminum Foil Tape 431 3M™ Preservation sealing Tape 481 Delvigo DVC 48040/7 A5 weld backing strip Delvigo DVC 44040/6 A5 weld backing strip Scapa 336 Aluminium adhesive tape</p> <p>For any use on higher VQC categories, verification of full cleaning process required on sample coupons</p>
v1.11	Approved	05 Nov 2015	<p>Fluids added to previous version:-</p> <p>Metalsierra DF Cutting fluid Stratomet Protective paint (for processing equipment-not vacuum components) HC 1100-Passivator. Cleansafe 787-Cleaning agent VK Jelly / VK Jelly – Power / VK Spray / VK Spray - 1000 -Pickling and passivation K-2 Jelly / K-2 Jelly – Power / K-2 Spray / K-2 Paste -Pickling and passivation Ultrasonic couplant, Rock Oil 09060 -Ultra Sonic Testing (UT) coupling fluid Dodecane, 297879, Sigma-Aldrich -Ultra Sonic Testing (UT) coupling fluid</p>
v1.12	Approved	07 Jun 2016	<p>Fluids added:-</p> <p>Blasocut BC 935 Kombi, cutting fluid Vasco 7000, cutting fluid HE 111 Electrolytic polisher, HC 1100-K3W1, passivator HC 500, cleaning agent HE 310 Electrolytic Polisher, DR60, as LDP remover, NGL 17.40 P, ultrasonic cleaning PROSOLV HP, solvent ALCATUM / ALCATUM HO, cleaning agent</p>

			DOWCLEN 1601, cleaning agent Kool Mist Formula 78, machining coolant Oil Eater, degreaser Rebound 7, degreaser Trim E206, machining coolant Trim Tap Heavy, cutting fluid Trim Tap Light, cutting fluid Blasocut 4000, cutting fluid
v1.13	Approved	06 Dec 2016	Abrasives media added:- Klingspor KL 315 abrasive paper PMUC 10067 3M Roloc Disc 984F Abrasive disk 3M Cloth Belts 984F. Abrasive Belt for belt grinder 3M Cubitron™ II: Cut off Wheels 3M Flap Disc 967A. Lukas Tungsten carbide burrs. Stainless steel brush 3M XT-RD-Cleaning Disc  Cleaning agent -Surtec®089 with Surtec®132 Cleaning agent -PROCIV CUP Cutting Fluid -Hocut 795 HX Cutting Fluid -SWISSCOOL 7722 Markers-Edding 750 white, Silver and Blue Pickling and passivation-PROCAP 137 Tape-3M 425 & 431 Aluminium Foil Tape Handling material-Kraitec Elastomer pad UT coupling fluids-MR 750 Ultrasonic Coupling Agent
v1.14	Approved	17 Jul 2017	Fluids / other process media added:-  Paper KL361 grain 240, grain 120 and grain 80 ; Grinding tool RB Adhesive Technologies Glue Stick, Part #229 Tacky tape SM 5142 Cleaning fluid RBS826 CitriSurf 2310 Oemeta Novamet 100 Coolant SemiSyn-200 Blue Coolant S-787_Request_Fluid_Acceptance Castrol CareCut S 600 HOCUT 795 MP Hocut 795 H Blasocut BC 25 MD Pentagon Coolcut S Blasocut BC 35 Kombi MK-SOL Soluble metal working oil Synergy 915 APIEZON T Markal paint marker Edelstahlbeize Typ 14 AveryDennison HP MPI 2121 Tesa 4613 – Utility grade Duct Tape Soundclear 60 Soundclear 40 UT Couplant for ITER Cryostat

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Appendix 4***Accepted Fluids*

	Name	Affiliation
Author/Editor	Liam Worth	Vacuum Group - CEP
Vacuum Responsible Officer	Robert Pearce	Vacuum Group - CEP

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## 4 ITER Accepted Fluids

### 4.1 Scope

This Appendix relates to fluids *accepted* to be used in the preparation and processing of materials and components which are exposed to the ITER vacuum environments, e.g. cutting fluids and cleaning solvents.

The ITER Vacuum Handbook (Section 6.1) states that

“Cutting fluids for use on VQC 1 and 3 systems shall be water soluble, non-halogenated and phosphorus and sulphur free”<sup>1</sup>.

“*Accepted* cutting fluids for use in VQC 1 and 3 vacuum applications are listed in Appendix 4. The use of other cutting fluids requires prior *acceptance*.”

“*Acceptance* for the use of any particular non-approved cutting fluid shall be obtained by submitting the Fluid *Acceptance* Request Form, stored on IDM, to the ITER Vacuum Responsible Officer (RO).”

“For VQC 2 & 4 vacuum applications it is recommended that cutting fluids be water soluble, non-halogenated and phosphorus and sulphur free<sup>1</sup>. They should be chosen from those listed in Appendix 4. Where this recommendation is not followed particular care shall be taken to ensure the appropriateness of the cleaning procedures”

The ITER Vacuum Handbook Section 24 states that

“Lists of *accepted* cleaning fluids can be found in Appendix 4”

Pursuant to this, materials which may be used freely for use on vacuum system items with the Vacuum Classifications stated are listed in the tables below.

### 4.2 Fluids not on the Accepted List

Fluids which are not on the *accepted* list may be proposed for use. If the vacuum related properties of the fluid are not sufficiently well documented for an assessment to be carried out, a programme of measurement of the relevant properties should be agreed between the proposer and the designated ITER Vacuum RO.

Details of fluids to be considered for *acceptance* should be submitted to the ITER Vacuum RO using the Fluid *Acceptance* Request Form. The proposer shall agree in advance with the ITER Vacuum RO a plan detailing the type and method of testing to qualify the material for use. The Fluid *Acceptance* Request Form along with the test data, report and supporting documentation, including any *supplier's* data (Certificates of Conformity, etc.), is to be submitted for consideration.

Fluids qualified in this way may be added to the *accepted* list.

A completed sample of the Fluid *Acceptance* Form is to be found at the end of this Appendix.

<sup>1</sup> Sulphur, phosphorus and halogen (fluoride & chloride) content below 200 ppm for each.

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### 4.3 Fluid Selection / Qualification

The fluids listed in the following tables have been considered in terms of usage for vacuum purposes.

The properties of interest for this purpose include, *inter alia*,

- Fitness for purpose, i.e. how well it does the job for which it is used
- Easy and complete removal from the vacuum surface
- No induced degradation of the vacuum properties of the surface, e.g. increased outgassing
- No significant physical change to the surface
- Health and safety considerations



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## Fluids

Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
Cleaning fluids	Isopropyl Alcohol	✓	✓	✓	✓	✓	✓	✓	✓
	Ethyl Alcohol	✓	✓	✓	✓	✓	✓	✓	✓
	Acetone	✓	✓	✓	✓	✓	✓	✓	✓
	Axarel 9100™,	✓	✓	✓	✓	✓	✓	✓	✓
	Citrinox™	✓	✓	✓	✓	✓	✓	✓	✓
	P3 Almeco™, P36 or T5161	✓	✓	✓	✓	✓	✓	✓	✓
	<a href="#">RBS 25</a>	✓	✓	✓	✓	✓	✓	✓	✓
	RBS 35								

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	<a href="#">RBS A350</a>	✓	✓	✓	✓	✓	✓	✓	✓
	Cleansafe 787 MAR: ITER_D_RWAQR3 Datasheet:- <a href="#">ITER_D_RWH2NT</a>	✓	✓	✓	✓	✓	✓	✓	✓
	HC 500 Liquid cleaning agent (Used in electropolishing process for cryogenic piping for the pre-production cryopump) FAR <a href="#">ITER_D_RZ3F5Q</a> SDS <a href="#">ITER_D_RZ7ZFP</a> MDS <a href="#">ITER_D_RZJVUT</a> Approved cleaning procedure <a href="#">ITER_D_S2FG8X</a>	✓	✓	✓	✓	✓	✓	✓	✓
	NGL 17.40 P Precision Cleaning for Ultrasonic processes FAR <a href="#">ITER_D_SEW4QA</a>	✓	✓	✓	✓	✓	✓	✓	✓

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	DOWCLEN <sup>*</sup> 1601 Cleaning Fluid FAR <a href="#">ITER_D_STQSEK</a>	✓	✓	✓	✓	✓	✓	✓	✓
	Oil Eater Manufacture of ITER-style vacuum flanges. FAR <a href="#">ITER_D_Q8DUKT</a> SDS <a href="#">ITER_D_SRFUYV</a> Cleaning Aqueous wash with Rebound 7 followed by DI water rinse	✓	✓	✓	✓	✓	✓	✓	✓
	CitriSurf 2310 MAR : <a href="#">ITER_D_UHXTT3</a>	✓	✓	✓	✓	✓	✓	✓	✓
	RBS826 Cleaning fluid MAR : <a href="#">ITER_D_TF3G4P</a>							✓	✓

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	Rebound 7 Manufacture of ITER-style vacuum flanges. Aqueous wash followed by DI water rinse FAR <a href="#">ITER_D_QCK53E</a> SDS <a href="#">ITER_D_SRF2G7</a>	✓	✓	✓	✓	✓	✓	✓	✓
	Surtec®089 with Surtec®132 FAR:- <a href="#">ITER_D_TTWQVK</a>	✓	✓	✓	✓	✓	✓	✓	✓
	PROCIV CUP FAR <a href="#">ITER_D_STHJGP</a>	✓	✓	✓	✓	✓	✓	✓	✓
Cutting fluids	<a href="#">Castrol CareCut S 125</a>	✓	✓	✓	✓	✓	✓	✓	✓
	<a href="#">Vasco 1045</a>	✓	✓	✓	✓	✓	✓	✓	✓

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	Vasco 7000 MAR <a href="#">ITER_D_RFQND9</a> MDS <a href="#">ITER_D_RAW9TK</a> Chemical Analysis <a href="#">ITER_D_RZBSEF</a> SDS <a href="#">ITER_D_RF4MWR</a>	✓	✓	✓	✓	✓	✓	✓	✓
	<a href="#">Alusol M-FX</a> Only approved for use for the processing of base material which is subject to subsequent machining / cleaning operations utilising accepted water miscible fluids.	†	†	†	†	†	†	†	†
	<a href="#">Hocut 2000</a>	✓	✓	✓	✓	✓	✓	✓	✓
	Hocut 795 HX Soluble Metalworking Oil FAR:- <a href="#">ITER_D_4H3QL6</a> Use accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	Fluid Blasocut BC 35 Kombi SW <a href="#">ITER_D_HY3BCT</a>	✓	✓	✓	✓	✗	✗	✗	✗
	Blasocut Kombi 935 MAR: <a href="#">ITER_D_RGD6JH</a> Chemical analysis <a href="#">ITER_D_RZKU4T</a> Safety datasheet <a href="#">ITER_D_=RGCLWS</a>	✓	✓	✓	✓	✓	✓	✓	✓
	Blasocut 4000 Cleaning: Remove with water or solvent wipes FAR <a href="#">ITER_D_N54G6D</a>	✗	✗	✓	✓	✓	✓	✓	✓
	CASTROL SYNTILO 75 EF <a href="#">ITER_D_PVM8M6</a>	✓	✗	✗	✗	✗	✗	✗	✗
	Garia 2608 S-12 <a href="https://user.iter.org/?uid=LXQXBA">https://user.iter.org/?uid=LXQXBA</a> Only for use on non-vacuum facing surfaces (which must be protected) and all surfaces cleaned post machining.	†	✗	†	✗	✗	✗	✗	✗

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	Green Star SINTOL MICRO <a href="#">ITER_D_Q3N7N7</a>	†	×	×	×	×	×	×	×
	Thread Cutting Oil Jokisch Foam Cut <a href="#">ITER_D_PNPSKN</a>	†	†	†	†	†	†	†	†
	Magicutsynth-g-50 <a href="#">ITER_D_N3Q69Y</a>	×	×	†	†	†	†	†	†
	QUAKER 3755 BIO <a href="#">ITER_D_NR4E2J</a>	×	×	†	†	†	†	†	†
	Metalsierra DF Metalworking fluid FAR:- <a href="#">ITER_D_RMNBXQ</a> Chemical analysis <a href="#">ITER_D_RMLNX3</a> Product data sheet <a href="#">ITER_D_RKLNT9</a> Safety data sheet <a href="#">ITER_D_RKLN7</a>	✓	✓	✓	✓	✓	✓	✓	✓

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
Cutting fluids	SWISSCOOL 7722 FAR: <a href="#">ITER_D_NFJ2N8</a> Approved for the spider application only	†	†	†	†	†	†	†	†
	SWISSCOOL 7722 FAR:- <a href="#">ITER_D_TTWU7X</a> Use accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓
	Xtreme Cut 250 MAR:- <a href="https://user.iter.org/?uid=QT8QGH">https://user.iter.org/?uid=QT8QGH</a> Chemical analysis:- <a href="https://user.iter.org/?uid=QQ6LSM">https://user.iter.org/?uid=QQ6LSM</a> Subject to accepted cleaning procedure	✗	✗	✓	✓	✓	✓	✓	✓
	Hangsterfer's S787 Cutting Fluid MAR: <a href="#">ITER_D_SGMMPE</a>				✓	✓	✓	✓	✓
	Castrol CareCut S 600 MAR: <a href="#">ITER_D_UCWFVD</a>	✓	✓	✓	✓	✓	✓	✓	✓

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	HOCUT 795 MP MAR : <a href="#">ITER_D_TR7XRQ</a>			✓	✓	✓	✓	✓	✓
	Hocut 795-H MAR : <a href="#">ITER_D_UDSBHL</a>			✓	✓	✓	✓	✓	✓
	Blasocut BC 25 MD MAR : <a href="#">ITER_D_UFCFJC</a>				✓	✓	✓	✓	✓
	Pentagon Coolcut S MAR : <a href="#">ITER_D_UJ8YF4</a>			✓	✓	✓	✓	✓	✓
	Blasocut BC 35 Kombi MAR : <a href="#">ITER_D_U4EZRD</a>	✓	✓	✓	✓	✓	✓	✓	✓
	MK_SOL_LUBE MAR : <a href="#">ITER_D_U4F3YE</a>	✓	✓	✓	✓	✓	✓	✓	✓
	Hocut 795MP MAR : <a href="#">ITER_D_UVF5MT</a>								

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	Synergy 915 MAR : <a href="#">ITER_D_UXSKL9</a>			✓	✓	✓	✓	✓	✓
	Trim Tap Heavy FAR <a href="#">ITER_D_N9XD58</a> SDS <a href="#">ITER_D_T3BGTK</a> (manufacture of ITER-style vacuum flanges) Cleaning: Aqueous wash with Rebound 7 followed by DI water rinse	✓	✓	✓	✓	✓	✓	✓	✓

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	Trim Tap Light FAR <a href="#">ITER_D_Q5UH9M</a> SDS <a href="#">ITER_D_T3C35D</a> (manufacture of ITER-style vacuum flanges) Cleaning: Aqueous wash with Rebound 7 followed by DI water rinse	✓	✓	✓	✓	✓	✓	✓	✓
Machining Coolant	Kool Mist Formula 78 (manufacture of ITER-style vacuum flanges) FAR ITER_D_RCAFRL SDS <a href="#">ITER_D_SYC4EU</a> Cleaning: Aqueous wash with Rebound 7 followed by DI water rinse	✓	✓	✓	✓	✓	✓	✓	✓
	Oemeta Novamet 100 Coolant MAR : <a href="#">ITER_D_U8W2E5</a>			✓	✓	✓	✓	✓	✓

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	SemiSyn-200 Blue			✓	✓	✓	✓	✓	✓
	MAR : <a href="#">ITER_D_UVF66V</a>								
	Trim E206 (manufacture of ITER-style vacuum flanges)								
	Cleaning: Aqueous wash with Rebound 7 followed by DI water rinse FAR <a href="#">ITER_D_RZEV86</a> SDS <a href="#">ITER_D_SZWMS6</a>	✓	✓	✓	✓	✓	✓	✓	✓
Solvents	Nefras S2-80/120								
	Wiping of Dome divertor parts for degreasing after machining FAR <a href="#">ITER_D_JREV32</a>	✓	✓	✓	✓	✓	✓	✓	✓
	PROSOLV HP								
	Degreasing of Copper & Tungsten for IVT Phase I FAR <a href="#">ITER_D_ST35B5</a>	✓	✓	✓	✓	✓	✓	✓	✓

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		1A	1B	2A	2B	3A	3B	4A	4B
Acids	Nitric acid (65%) FAR <a href="https://user.iter.org/?uid=PNAPTE">https://user.iter.org/?uid=PNAPTE</a> <a href="https://user.iter.org/?uid=PNHPFU">https://user.iter.org/?uid=PNHPFU</a> <a href="https://user.iter.org/?uid=PQA6AW">https://user.iter.org/?uid=PQA6AW</a>	✓	✓	✓	✓	✓	✓	✓	✓
	Sulphuric Acid (20% solution) FAR <a href="https://user.iter.org/?uid=PJRKC5">https://user.iter.org/?uid=PJRKC5</a> <a href="https://user.iter.org/?uid=PK32SY">https://user.iter.org/?uid=PK32SY</a> <a href="https://user.iter.org/?uid=PKZE6A">https://user.iter.org/?uid=PKZE6A</a>	✓	✓	✓	✓	✓	✓	✓	✓
	Nitric Acid Concentrated FAR <a href="https://user.iter.org/?uid=D29SZG">https://user.iter.org/?uid=D29SZG</a> <a href="https://user.iter.org/?uid=CZMVE5">https://user.iter.org/?uid=CZMVE5</a> <a href="https://user.iter.org/?uid=DBQPL9">https://user.iter.org/?uid=DBQPL9</a> <a href="https://user.iter.org/?uid=DBQPL9">https://user.iter.org/?uid=DBQPL9</a>	†	†	†	†	†	†	†	†

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		1A	1B	2A	2B	3A	3B	4A	4B
Acids	Hydrofluoric acid (in the manufacture of Divertor components prior to HIP) FAR <a href="https://user.iter.org/?uid=JQH3BW">https://user.iter.org/?uid=JQH3BW</a> <a href="https://user.iter.org/?uid=JQH73T">https://user.iter.org/?uid=JQH73T</a> <a href="https://user.iter.org/?uid=JQHPUH">https://user.iter.org/?uid=JQHPUH</a>	†	†	†	†	†	†	†	†
Alkaline solution	ALCATUM / ALCATUM HO Degreasing of Copper & Tungsten for IVT Phase I FAR <a href="#">ITER_D_STLR2W</a>	✓	✓	✓	✓	✓	✓	✓	✓
Demin Water	Demin Water <a href="https://user.iter.org/?uid=N3PDHF">https://user.iter.org/?uid=N3PDHF</a>	✓	✓	✓	✓	✓	✓	✓	✓
Etch and neutralise	Elektrolyt EH01 FAR <a href="https://user.iter.org/?uid=JEZ7DD">https://user.iter.org/?uid=JEZ7DD</a>	✓	✓	✓	✓	✗	✗	✗	✗
	Neutralix NG01 FAR <a href="https://user.iter.org/?uid=JF7ME6">https://user.iter.org/?uid=JF7ME6</a>	†	†	†	†	†	†	†	†

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		1A	1B	2A	2B	3A	3B	4A	4B
Lubricant	APIEZON Medium Temperature Approved for VQC N/A only MAR : <a href="#">ITER_D_TF84U8</a>								
Pickling and passivation	Avesta Passivator 601 FAR:- <a href="https://user.iter.org/?uid=NVPBLQ">https://user.iter.org/?uid=NVPBLQ</a> Datasheets:- <a href="https://user.iter.org/?uid=NW5VLQ">https://user.iter.org/?uid=NW5VLQ</a> <a href="https://user.iter.org/?uid=P3WC76">https://user.iter.org/?uid=P3WC76</a> Subject to accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓
	Avesta Cleaner 401 FAR:- <a href="https://user.iter.org/?uid=NSE9MN">https://user.iter.org/?uid=NSE9MN</a> Datasheets:- <a href="https://user.iter.org/?uid=NSEM4">https://user.iter.org/?uid=NSEM4</a> <a href="https://user.iter.org/?uid=NSH4DX">https://user.iter.org/?uid=NSH4DX</a> Subject to accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓

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		1A	1B	2A	2B	3A	3B	4A	4B
Pickling and passivation	Avesta picking paste BlueOne TM 130 FAR:- <a href="https://user.iter.org/?uid=NQ4Y7N">https://user.iter.org/?uid=NQ4Y7N</a> Datasheets:- <a href="https://user.iter.org/?uid=NQTMJC">https://user.iter.org/?uid=NQTMJC</a> <a href="https://user.iter.org/?uid=NS77X8">https://user.iter.org/?uid=NS77X8</a> Subject to accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓
	HC 1100 Passivation solution for Stainless Steel (cryogenic piping for the pre-production cryopump) FAR:- <a href="#">ITER_D_RXJZB7</a> Datasheet :- <a href="#">ITER_D_RYMSKU</a>	✓	✓	✓	✓	✓	✓	✓	✓

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		1A	1B	2A	2B	3A	3B	4A	4B
	HC 1100-K3W1 Stainless steel passivator (cryogenic piping for the pre-production cryopump) FAR <a href="#">ITER_D_RZ5MBE</a> MDS <a href="#">ITER_D_RZ7JP4</a> SDS <a href="#">ITER_D_RZK5GK</a> Cleaning procedures <a href="#">ITER_D_S2FG8X</a> to be used	✓	✓	✓	✓	✓	✓	✓	✓
	VK Jelly / VK Jelly – Power / VK Spray / VK Spray – 1000 FAR:- <a href="https://user.iter.org/?uid=RUGXSS">https://user.iter.org/?uid=RUGXSS</a>			✓	✓	✓	✓	✓	✓
	Edelshahlbeize Typ 14 MAR : <a href="#">ITER_D_U7VKQS</a>	✓	✓	✓	✓	✓	✓	✓	✓
	K-2 Jelly / K-2 Jelly – Power / K-2 Spray / K-2 Paste FAR:- <a href="#">ITER_D_RVVJ9S</a>			✓	✓	✓	✓	✓	✓

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		1A	1B	2A	2B	3A	3B	4A	4B
	PROCAP 137 FAR:- <a href="#">ITER_D_STGBAW</a> Use with approved cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓
Liquid Dye Penetrant product families	<b>Sherwin Inc. USA: NDT Europa BV:</b> Developer: D100 Cleaner: DR62 Penetrant: DP51 <i><b>For VQC 1A/B This product is restricted and may only be used if component / system under test is subsequently baked at <math>T \geq 200</math> °C for a minimum of 24 hours prior to vacuum leak testing.</b></i> <i><b>For VCQ2A, 3A&amp; 4A this product may only be used to accepted procedures on the prior acceptance of a deviation request from the ITER Vacuum Handbook to cover the proposed area of use.</b></i>	†	†	†	✓	†	✓	†	✓

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		1A	1B	2A	2B	3A	3B	4A	4B
	DR60 as remover of dye penetrant FAR <a href="#">ITER_D_S7UXTC</a> Accepted for this application on basis of post-use impregnation processes. Other uses will require approved cleaning process	x	x	✓	✓	x	x	x	x

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	<b>CGM CIGIEMME</b> Developer : Rotrivel U (R2.82) 02011200 Cleaner: Velnet / Solnet (R2.60) 02011000 Penetrant: Rotvel Avio B (R2.72) 02021800  <i>For VQC 1A/B This product is restricted and may only be used if component / system under test is subsequently baked at <math>T \geq 200</math> °C for a minimum of 24 hours prior to vacuum leak testing.</i>  <i>For VCQ2A, 3A&amp; 4A this product may only be used to accepted procedures on the prior acceptance of a deviation request from the ITER Vacuum Handbook to cover the proposed area of use.</i>	†	†	†	✓	†	✓	†	✓

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		1A	1B	2A	2B	3A	3B	4A	4B
	<b>GS CHEM Co LTD</b> Developer: DA (P101017D) Cleaner: RA (P101015C) Penetrant: PA (P101016P)  <i><b>For VQC 1A/B This product is restricted and may only be used if component / system under test is subsequently baked at <math>T \geq 200</math> °C for a minimum of 24 hours prior to vacuum leak testing.</b></i>  <i><b>For VCQ2A, 3A&amp; 4A this product may only be used to accepted procedures on the prior acceptance of a deviation request from the ITER Vacuum Handbook to cover the proposed area of use.</b></i>	†	†	†	✓	†	✓	†	✓

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	<b>EISHINKAGAKU corp. Japan</b> Developer: R-1S (NT) Special Cleaner: R-1M (NT) Special Penetrant: R-1A (NT) Special  <i><b>For VQC 1A/B This product is restricted and may only be used if component / system under test is subsequently baked at <math>T \geq 200</math> °C for a minimum of 24 hours prior to vacuum leak testing.</b></i>  <i><b>For VCQ2A, 3A&amp; 4A this product may only be used to accepted procedures on the prior acceptance of a deviation request from the ITER Vacuum Handbook to cover the proposed area of use.</b></i>	†	†	†	✓	†	✓	†	✓

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	<p>MAGNAFLUX</p> <p>Dye penetrant testing of Tungsten monoblocks for ITER IVT</p> <p><a href="https://user.iter.org/?uid=JP6EW8">https://user.iter.org/?uid=JP6EW8</a></p> <p>Penetrant: Zyglo ZL-27A, fluorescent post emulsifiable penetrant</p> <p>Cleaner: Zyglo ZR-10C, hydrophilic remover</p> <p>Developer: Zyglo ZP-4B, dry powder developer</p> <p>Fluid to be removed by hot demineralised water rinse followed by baking.</p>	†	†	†	†	†	†	†	†
Ultra Sonic Testing (UT) coupling fluids	<p>Babb Co matrix UT coupling agent</p> <p>FAR <a href="https://user.iter.org/?uid=PTZ2WR">https://user.iter.org/?uid=PTZ2WR</a></p> <p><a href="https://user.iter.org/?uid=PUW2LU">https://user.iter.org/?uid=PUW2LU</a></p> <p>Part to be cleaned to an accepted procedure after UT</p>	†	†	†	†	†	†	†	†
	<p>CGM US Paste U49</p> <p>FAR <a href="https://user.iter.org/?uid=PUXQHP">https://user.iter.org/?uid=PUXQHP</a></p> <p><a href="https://user.iter.org/?uid=PVAE22">https://user.iter.org/?uid=PVAE22</a></p> <p>Remove residues with clean cloth and acetone.</p>	†	†	†	†	†	†	†	†

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		1A	1B	2A	2B	3A	3B	4A	4B
Ultra-Sonic Testing (UT) coupling fluids	09060, Rock Oil, Vacuum test data <a href="https://user.iter.org/?uid=RRAZ87">https://user.iter.org/?uid=RRAZ87</a> <a href="#">ITER_D_RMSL86</a>	✓	✓	✓	✓	✓	✓	✓	✓
	Dodecane, 297879, Sigma-Aldrich Vacuum test data <a href="#">ITER_D_RRAZ87</a> <a href="#">ITER_D_RMSL86</a>	✓	✓	✓	✓	✓	✓	✓	✓
	Soundclear Grade 60 MAR : <a href="#">ITER_D_U2WF3L</a> (can be recommended for use as component is baked)	✓	✓	✓	✓	✓	✓	✓	✓
	Soundclear Grade 40 MAR : <a href="#">ITER_D_U348TX</a> (can be recommended for use as component is baked)	✓	✓	✓	✓	✓	✓	✓	✓

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		1A	1B	2A	2B	3A	3B	4A	4B
	Pentagon Ultra 30 for use as UT couplant (approved for this application only, on basis of post –use surface removal by machining) MAR : <a href="#">ITER_D_UVC2BJ</a>			✓					
	MR 750 Ultrasonic Coupling Agent FAR:- <a href="#">ITER_D_TX5XPV</a> Cleaning as per ITER approved procedure document no. ITER CR-LTTS-602.	✓	✓	✓	✓	✓	✓	✓	✓

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
Markers	Intrama SL.250 SL2100 MAR <a href="https://user.iter.org/?uid=QZSP86">https://user.iter.org/?uid=QZSP86</a> Outgassing test report_MarkerPen_Intrama.SL.250 <a href="https://user.iter.org/?uid=QXVLSU">https://user.iter.org/?uid=QXVLSU</a> Outgassing test report_MarkerPen_Intrama.SL.2100 <a href="https://user.iter.org/?uid=QXM5QJ">https://user.iter.org/?uid=QXM5QJ</a> Material acceptance report <a href="https://user.iter.org/?uid=HK7F54">https://user.iter.org/?uid=HK7F54</a> Subject to accepted cleaning procedure	✓	✓	✓					
	Markal Certified Valve Action Paint Marker MAR : <a href="https://user.iter.org/?uid=UBF44E">ITER_D_UBF44E</a> (Certified for <200ppm halogen - agreed but should not be used on thin wall boundaries with material < 1.5mm.)			✓	✓				

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	Edding 750 White, Silver & Blue FAR:- <a href="#">ITER_D_AFEQ97</a> Cleaning as per approved procedure ; ITER-CR-LTTS-602			✓	✓	✓	✓	✓	✓
Protective paint (on material processing equipment)	Stratomet Protective paint FAR:- <a href="#">ITER_D_R7TFB7</a> Chemical analysis:- <a href="#">ITER_D_R6CD9Z</a> Safety data sheet:- <a href="#">ITER_D_R6CCRZ</a>	✓	✓	✓	✓	✓	✓	✓	✓
Abrasive media	Cutting wheel Abratec TIPO 42 MAR:- <a href="https://user.iter.org/?uid=QZRF3E">https://user.iter.org/?uid=QZRF3E</a> Outgassing report :- <a href="https://user.iter.org/?uid=GGREMQ">https://user.iter.org/?uid=GGREMQ</a> Subject to accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓

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		1A	1B	2A	2B	3A	3B	4A	4B
	Cutting wheel: Sait "A30S" [Thk. 2 mm] MAR:- <a href="https://user.iter.org/?uid=QURJQL">https://user.iter.org/?uid=QURJQL</a> Outgassing report:- <a href="https://user.iter.org/?uid=HK7F54">https://user.iter.org/?uid=HK7F54</a> Subject to accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓
	Cutting wheel: Sait "XA24Q" [Thk. 3,2 mm] MAR:- <a href="https://user.iter.org/?uid=QURJQL">https://user.iter.org/?uid=QURJQL</a> Outgassing report:- <a href="https://user.iter.org/?uid=HK7F54">https://user.iter.org/?uid=HK7F54</a> Subject to accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓

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		1A	1B	2A	2B	3A	3B	4A	4B
	Cutting wheel: Sait "XA24Q" [Thk. 7 mm] MAR:- <a href="https://user.iter.org/?uid=QURJQL">https://user.iter.org/?uid=QURJQL</a> Outgassing report:- <a href="https://user.iter.org/?uid=HK7F54">https://user.iter.org/?uid=HK7F54</a> Subject to accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓
	Cutting wheel: Sait "XA46R" [Thk. 1,6 mm] MAR:- <a href="https://user.iter.org/?uid=QURJQL">https://user.iter.org/?uid=QURJQL</a> Outgassing report:- <a href="https://user.iter.org/?uid=HK7F54">https://user.iter.org/?uid=HK7F54</a> Subject to accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓
	Flapper wheel: Abratec LAMELLARE MAR:- <a href="https://user.iter.org/?uid=QZRF3E">https://user.iter.org/?uid=QZRF3E</a> Outgassing report:- <a href="https://user.iter.org/?uid=GJ584M">https://user.iter.org/?uid=GJ584M</a> Subject to accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓

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		1A	1B	2A	2B	3A	3B	4A	4B
	Flapper wheel: Sait "SAITLAM UK 3A" MAR:- <a href="https://user.iter.org/?uid=QURJQL">https://user.iter.org/?uid=QURJQL</a> Outgassing report:- <a href="https://user.iter.org/?uid=HK7F54">https://user.iter.org/?uid=HK7F54</a> Subject to accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓
	Flapper wheel; S.L.F. Abrasivi LASER DISC – "SERIE 10-ALU DISC" MAR:- <a href="https://user.iter.org/?uid=QURJQL">https://user.iter.org/?uid=QURJQL</a> Outgassing report:- <a href="https://user.iter.org/?uid=HK7F54">https://user.iter.org/?uid=HK7F54</a> Subject to accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓
	Rough Wheel: Abratec TIPO 27 MAR:- <a href="https://user.iter.org/?uid=QZRF3E">https://user.iter.org/?uid=QZRF3E</a> Outgassing report ; - <a href="https://user.iter.org/?uid=HD5Z3U">https://user.iter.org/?uid=HD5Z3U</a> Subject to accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓

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		1A	1B	2A	2B	3A	3B	4A	4B
	Rough Wheel: 3M “987C CUBITRON 2” MAR:- <a href="https://user.iter.org/?uid=QURJQL">https://user.iter.org/?uid=QURJQL</a> Outgassing report:- <a href="https://user.iter.org/?uid=HK7F54">https://user.iter.org/?uid=HK7F54</a> Subject to accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓
	Klingspor KL 361 Abrasive paper. PMUC 10067 FAR:- <a href="#">ITER_D_TXD2ZJ</a> Cleaning with alcohol after usage	✓	✓	✓	✓	✓	✓	✓	✓
	3M Roloc Disc 984F Abrasive Disc FAR:- <a href="#">ITER_D_4H8PDW</a> Area to be cleaned with solvent after processing	✓	✓	✓	✓	✓	✓	✓	✓
	3M Cloth Belts 984F Abrasive Belt for belt grinder FAR:- <a href="#">ITER_D_4HBVE3</a> Must be followed by cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓

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		1A	1B	2A	2B	3A	3B	4A	4B
	3M™ Abrasive Products, High Performance Cut off Wheels, Depressed Center Grinding Wheels, Grind Wheels Type 27, Cubitron™ II  FAR:- <a href="#">ITER_D_4HD79D</a> Must be followed by cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓
	3M Flap Disc 967A Flap disc FAR:- <a href="#">ITER_D_T79GNQ</a> Area to be cleaned with solvent after operations with flapper	✓	✓	✓	✓	✓	✓	✓	✓
	3M XT-RD-Cleaning Disc FAR:- <a href="#">ITER_D_4H3ZHJ</a> Must be followed by cleaning with solvent	✓	✓	✓	✓	✓	✓	✓	✓
	Tungsten carbide burrs Lukas Abrasive Pencil FAR:- <a href="#">ITER_D_T8FBAG</a>	✓	✓	✓	✓	✓	✓	✓	✓
	Stainless steel brush FAR:- <a href="#">ITER_D_T8FUKG</a>	✓	✓	✓	✓	✓	✓	✓	✓
	Paper KL361 grain 240, grain 120 and grain 80 ; Grinding tool RB 317 LX-R grain 80 FAR : <a href="#">ITER_D_UAMCD5</a>	✓							

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	Tetrabor lapping paste (water/polyalcohol based) FAR:- <a href="https://user.iter.org/?uid=QF6X54">https://user.iter.org/?uid=QF6X54</a> Datasheets:- Safety <a href="https://user.iter.org/?uid=QED2DQ">https://user.iter.org/?uid=QED2DQ</a> <a href="https://user.iter.org/?uid=QEJ42W">https://user.iter.org/?uid=QEJ42W</a> <a href="https://user.iter.org/?uid=QERFGW">https://user.iter.org/?uid=QERFGW</a> <a href="https://user.iter.org/?uid=QF2HJZ">https://user.iter.org/?uid=QF2HJZ</a> <a href="https://user.iter.org/?uid=QEH9AG">https://user.iter.org/?uid=QEH9AG</a> <a href="https://user.iter.org/?uid=QF7K99">https://user.iter.org/?uid=QF7K99</a> Subject to accepted cleaning procedure	✓	✓	✓	✓	✓	✓	✓	✓

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	HE 111 Electrolytic polisher (cryogenic piping for the pre-production cryopump) FAR <a href="#">ITER_D_RN4QKV</a> Cleaning procedures <a href="#">ITER_D_S2FG8X</a> to be used SDS <a href="#">ITER_D_RN6FUA</a>	✓	✓	✓	✓	✓	✓	✓	✓
	HE 310 Electrolytic Polisher (cryogenic piping for the pre-production cryopump) FAR <a href="#">ITER_D_RYS3HQ</a> SDS <a href="#">ITER_D_RYTRXG</a> Cleaning procedures <a href="#">ITER_D_S2FG8X</a> to be used	✓	✓	✓	✓	✓	✓	✓	✓

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
Adhesive tapes	3M™ Aluminum Foil Tape 431 FAR:- <a href="#">ITER_D_R23U88</a> For use on VQC N/A surfaces only with solvent clean. Before use on higher VQC categories, verification of full cleaning process cleaning required on sample coupons								
	3M™ Preservation sealing Tape 481 FAR:- <a href="#">ITER_D_R24JEX</a> For use on VQC N/A surfaces only with solvent clean. Before use on higher VQC categories, verification of full cleaning process cleaning required on sample coupons								

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
Adhesive tapes	Delvigo DVC 48040/7 A5 weld backing strip FAR:- <a href="#">ITER_D_R477ZK</a> For use on VQC N/A surfaces only with solvent clean. Before use on higher VQC categories, verification of full cleaning process cleaning required on sample coupons								
	Delvigo DVC 44040/6 A5 weld backing strip FAR:- <a href="#">ITER_D_R25TST</a> For use on VQC N/A surfaces only with solvent clean. Before use on higher VQC categories, verification of full cleaning process cleaning required on sample coupons								

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	Scapa 336 Aluminium adhesive tape FAR:- <a href="#">ITER_D_R4AZFV</a> For use on VQC N/A surfaces only with solvent clean. Before use on higher VQC categories, verification of full cleaning process cleaning required on sample coupons								
	AveryDennison HP MPI 2121 MAR : <a href="#">ITER_D_UDWANR</a> (Recommended as component is cleaned and baked after use)	✓							
	Tesa 4613 – Utility grade Duct Tape (use of cryostat) MAR : <a href="#">ITER_D_UPXQCQ</a> (Ok for VQC 2 but avoid to use on thin walled bellows or lips <1.5 mm thick)			✓					

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Type	Name / type	Applicable to Vacuum Quality Classification							
		1A	1B	2A	2B	3A	3B	4A	4B
	3M 425 & 431 Aluminium Foil Tape FAR: <a href="#">ITER_D_U33P6M</a>			✓	✓	✓	✓	✓	✓
Handling / transport materials	Kraitec anti-slip elastomer pads FAR:- <a href="#">ITER_D_4GRXXK</a>	✓	✓	✓	✓	✓	✓	✓	✓
Adhesives	Adhesive Technologies Glue Stick, Part 229 MAR : <a href="#">ITER_D_UHDX7N</a> (glue pucks for laser tracking to tie plate)			✓	✓				
	TACKY TAPE SM5142 (vacuum bag tape sealant) MAR : <a href="#">ITER_D_TX66XF</a>			✓					

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<b><i>Request for Acceptance of Fluid</i></b>						Ref No: fluid-01 (Assigned by Vacuum RO)			
Fluid submitted for <i>acceptance</i> :		Cut ace 123							
Proposed Use:		Metal Cutting fluid							
VQC of proposed use:		1A	1B	2A	2B	3A	3B	4A	4B
		✓							
Chemical Composition / suppliers data sheet		Yes	Attached Copy (electronic if available)						
Agreed test plan:		No	Attached Copy (electronic if available)						
Vacuum Test data Available:		Yes	Attached Copy (electronic if available)						
Solubility in water (at ambient temperature)									
Cleaning method (if applicable)		Rinse in de mineralised water							
Vapour pressure (at 100 °C)		No	Pa						
Supporting information		Evaporates in air leaving oily residue							
Requested by	L.Pressure			Date Submitted		29/07/08			
Affiliation:	US DA			E-Mail	L.Pressure@iter.org				
Fluid Acceptance Status: ( <i>To be completes by ITER Vacuum Group RO</i> )									
Acceptance for VQC:		1A	1B	2A	2B	3A	3B	4A	4B
		✓	✓	✓	✓	✓	✓	✓	✓
Limits / Restrictions (Attached Doc.)		Fluid to be removed by hot demineralised water rinse (Cut ace 123 .doc IDM Ref 15R8UI)							
ITER Vacuum RO		Acceptor:		H.M. Self					
		Date: 09/08/08							

Grey boxes to be completed by requesting officer. Boxes in Red to be completed by ITER Vacuum RO.