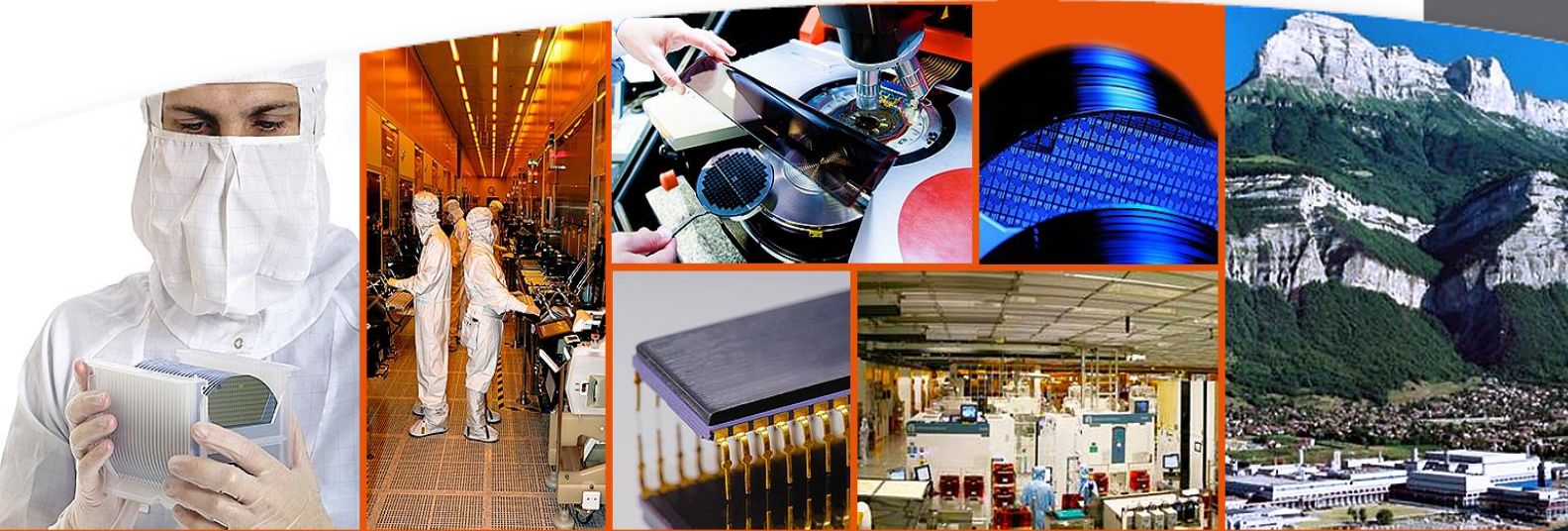


Supplier Quality Management

Software
Solutions for
Manufacturing



IT2I, München

Jochen Kinauer, Director Channel Sales

camLine
agile • efficient • reliable

- camLine Overview
- Supply chain challenges
- Supplier Quality considerations

camLine Overview



- Founded 1989
- Privately owned
- Headquarter in Petershausen (near Munich) Germany
- More than 170 employees worldwide in
 - Germany: Munich, Dresden, Dortmund
 - Singapore
 - Indonesia
 - Taiwan
 - USA

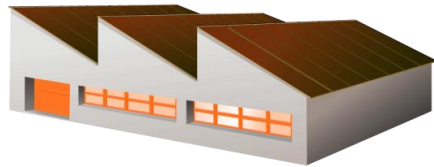




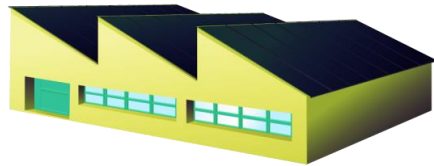
Supply chain challenges



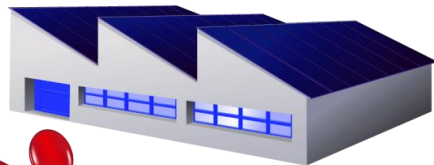
Material Management led to the idea of IQC



Supplier A



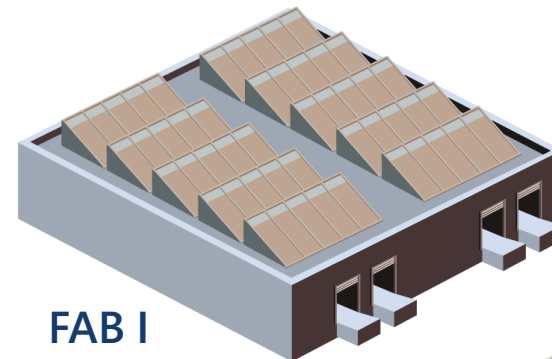
Supplier B



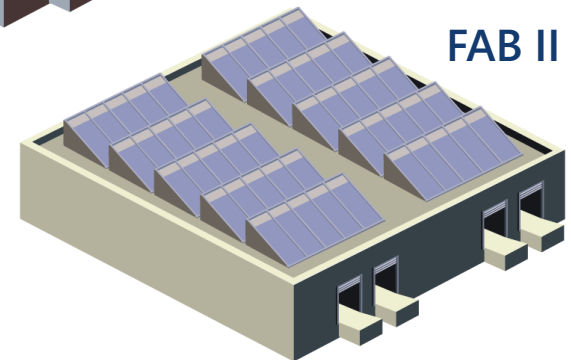
Supplier C



Sophisticated material management requires the integration of the suppliers into the quality management system



FAB I



FAB II

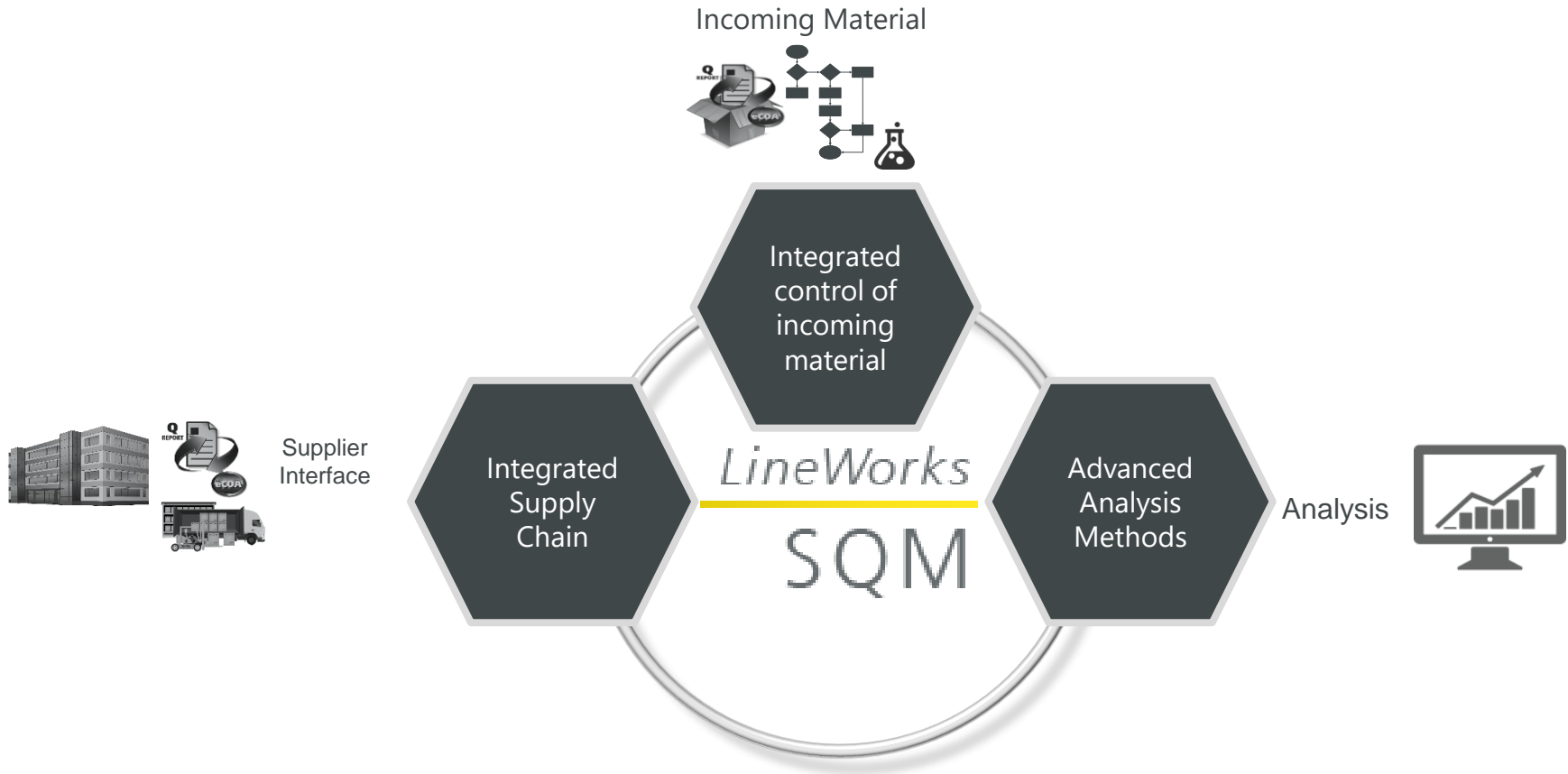
The common way to communicate quality data between supplier & manufacturer requires some bureaucracy:



SQM ...

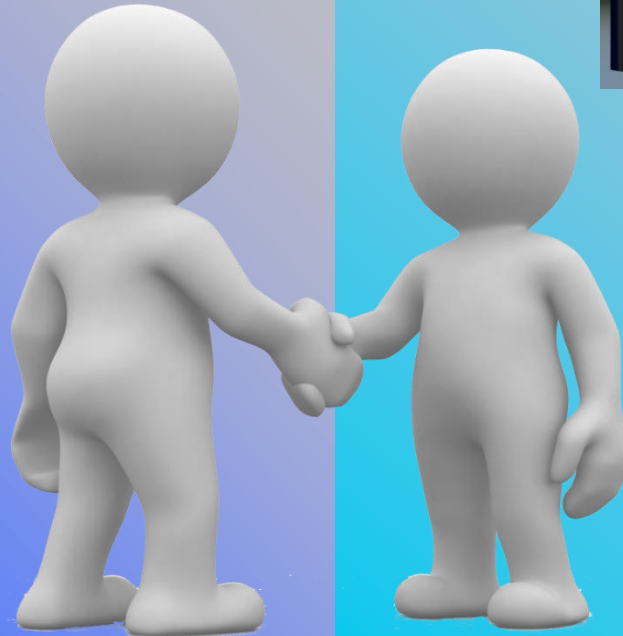
- ... provides electronic Certificate of Analysis (**eCOA**) for materials
- ... enables **paperless** business between manufacturer and suppliers
- ... eliminates delivery of **defect material**
- ... provides the manufacturer with suppliers' **quality data before shipment**
- ... helps reduce Incoming Quality Control (**IQC**)
- ... comprises a complete **quality reporting** of all suppliers
- ... supports the idea of „**Blind exchange**“ (no IQC)



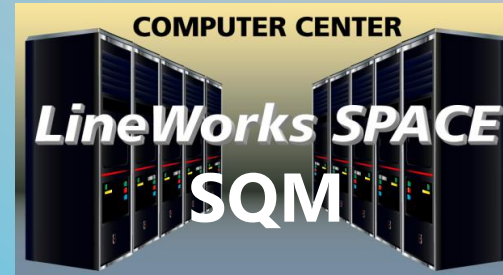


SQM – Start with Quality Agreement

Supplier



Manufacturer



SQM – material OUT OF SPEC transaction

Supplier

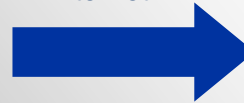


REWORK



Data Transfer

Internet

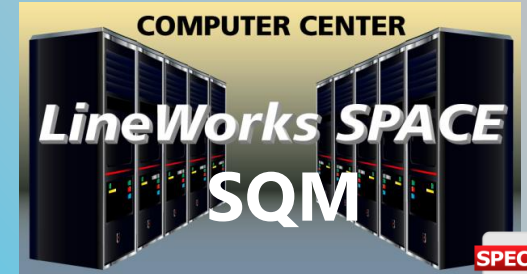


E-MAIL:
MATERIAL OUT OF SPEC



Shipment

Manufacturer



VALID
DATA

OUT OF
SPEC

REJECT



SQM – QUALITY OK transaction

Supplier

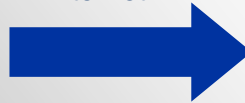


DO SHIPMENT



Data Transfer

Internet



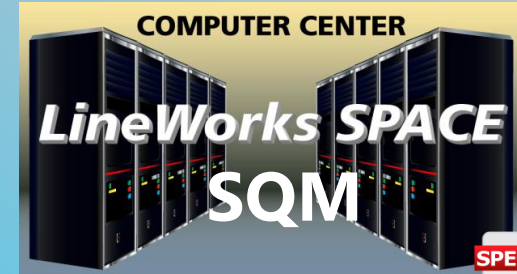
E-MAIL:
REQUEST SHIPMENT



Shipment



Manufacturer

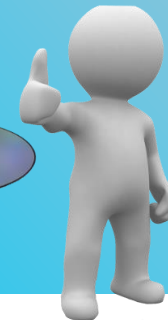
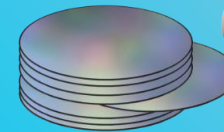


VALID
DATA

WITHIN
LIMITS



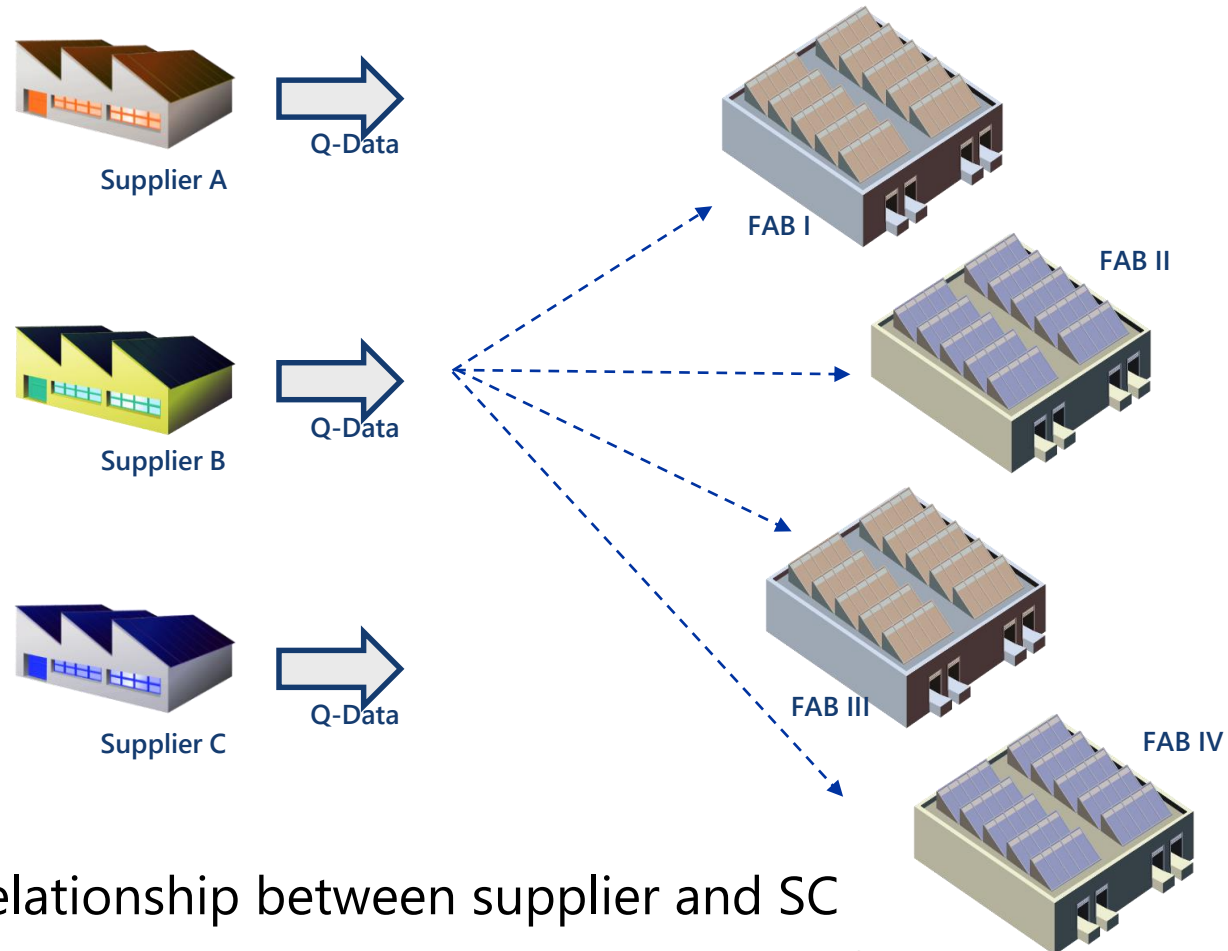
SEND eCOA



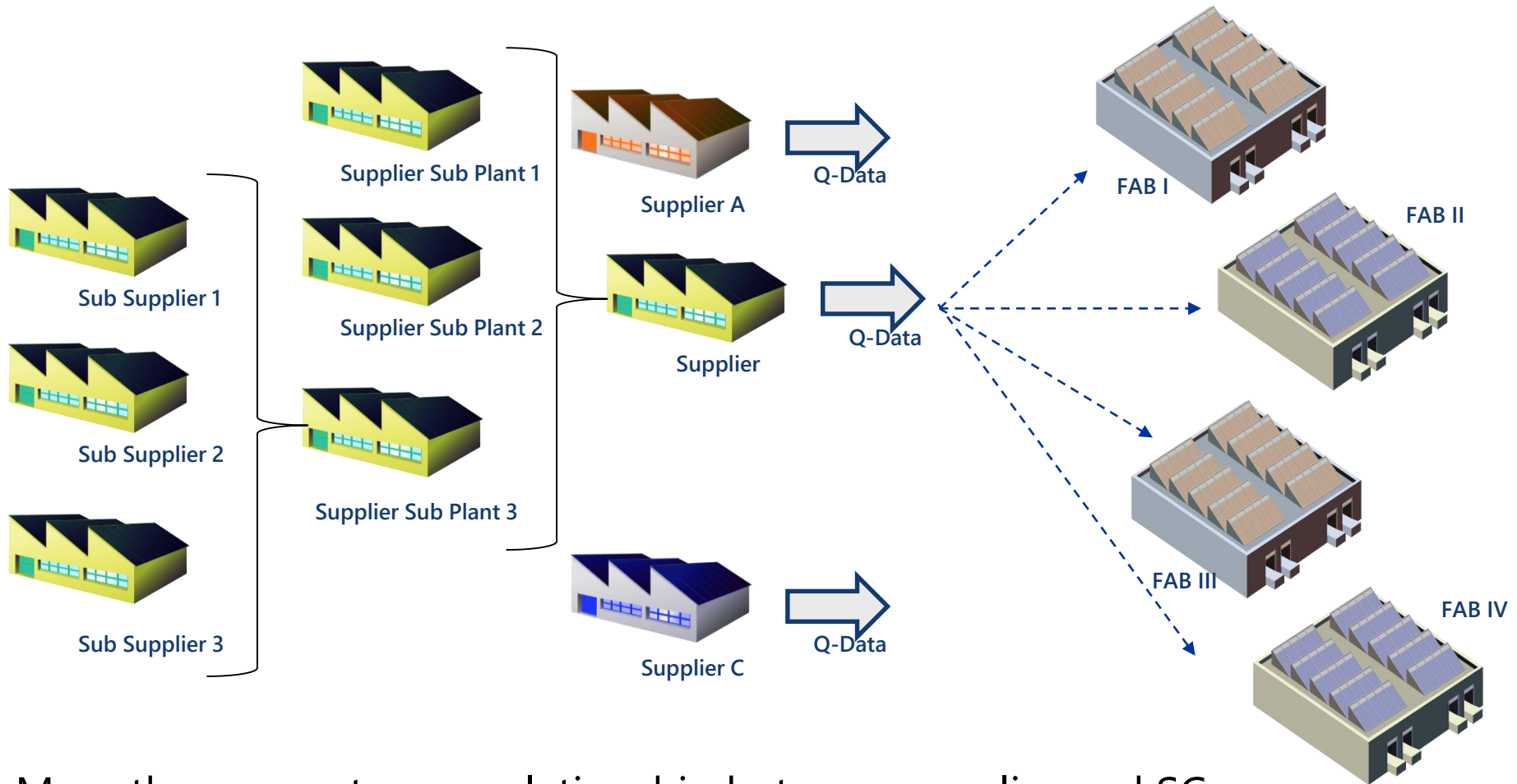
SQM insure supplier
carry only PERFECT goods!

Supplier Quality considerations







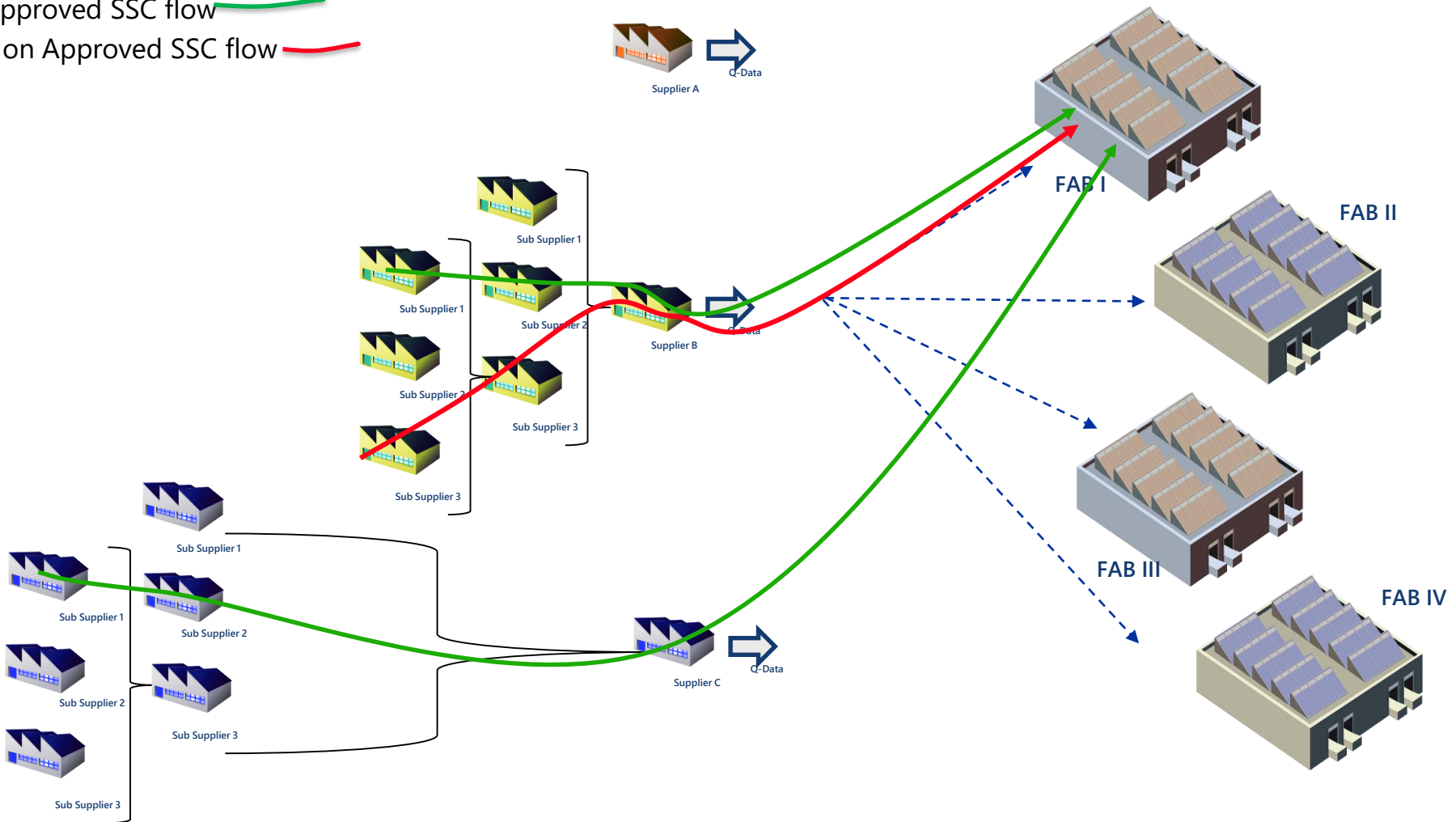
More than a one to one relationship between supplier and SC
Multiple suppliers deliver multiple products with unique Specifications !



More than a one to one relationship between supplier and SC
Multiple suppliers deliver multiple products with unique Specifications !

Approved Supplier Supply Chain flow

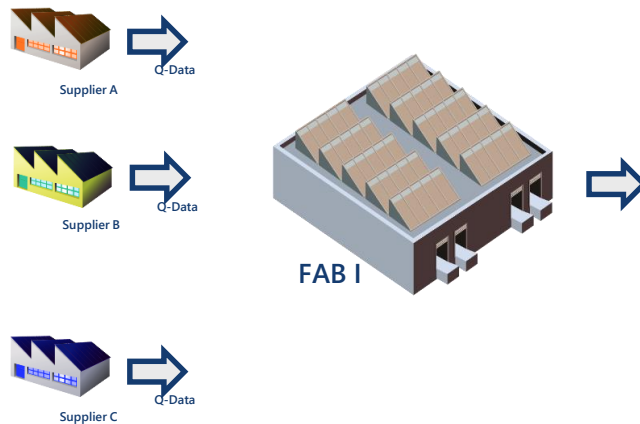
Approved SSC flow 
Non Approved SSC flow 



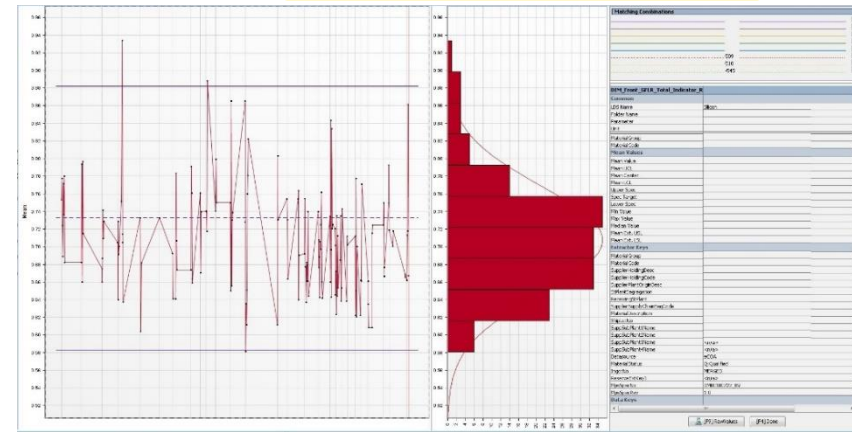
Supplier plants SPC

Critical parameter for a specific material

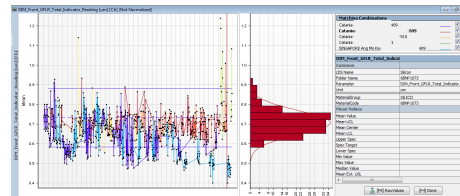
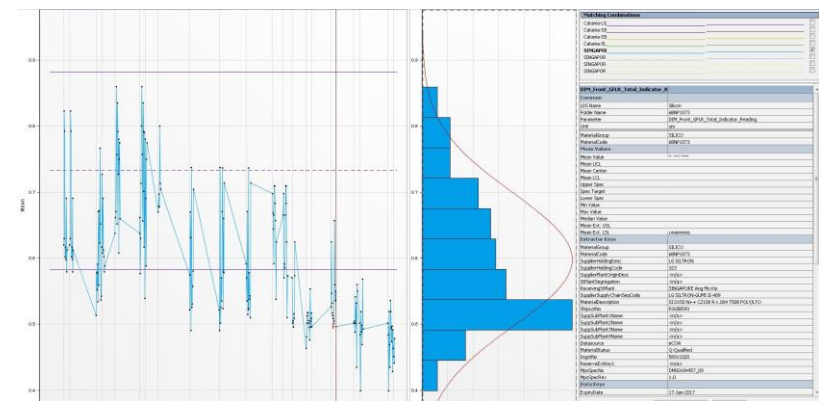
- Charts by supplier manufacturing dates
- Specification by customer plants
- Variability and histogram by supplier



Supplier 1



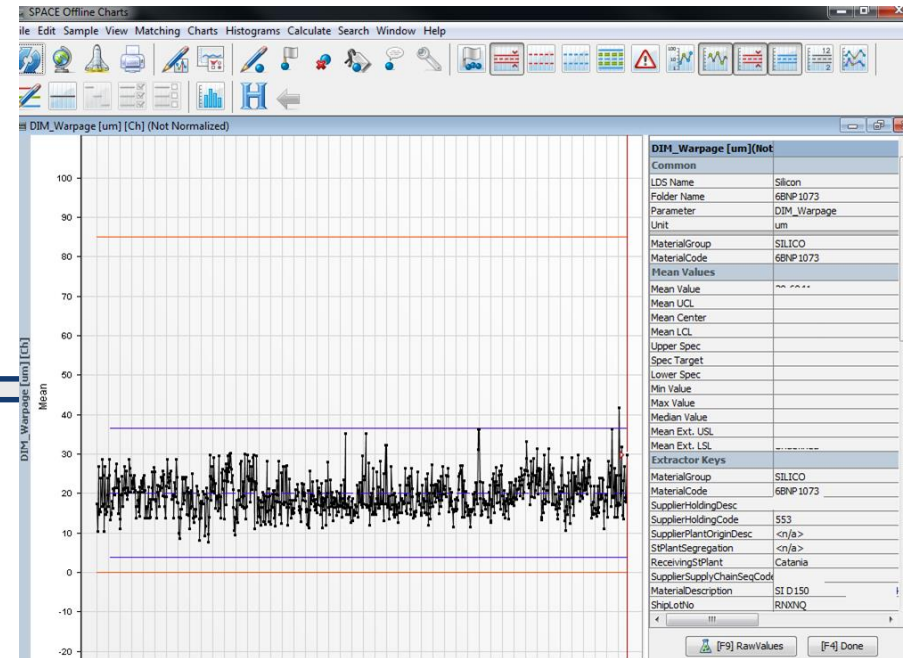
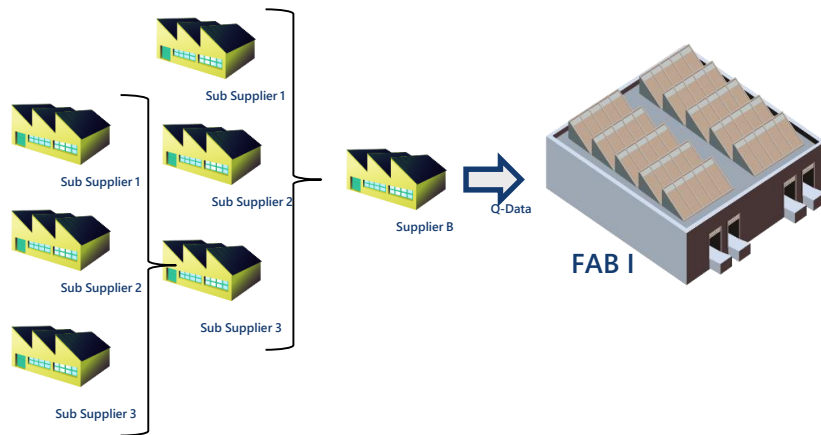
Supplier 2



Fab engineer will have more visibility to the supplier performance.

Critical parameter for a specific material

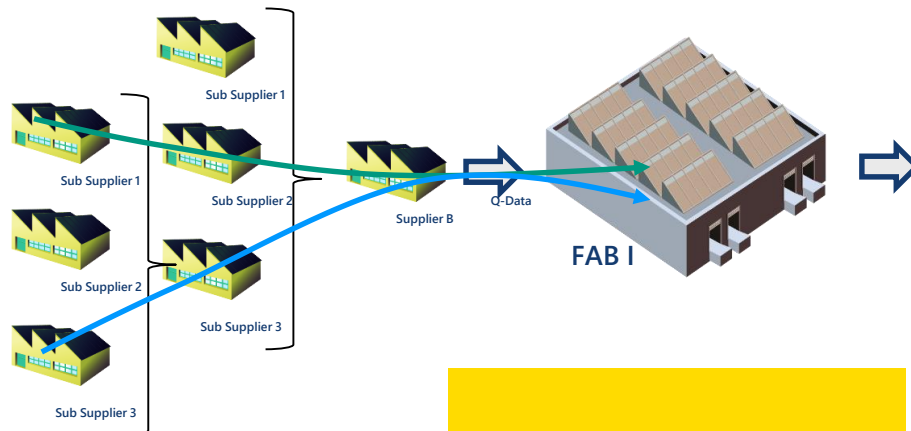
- Charts by supplier manufacturing dates
- Specification by customer plants



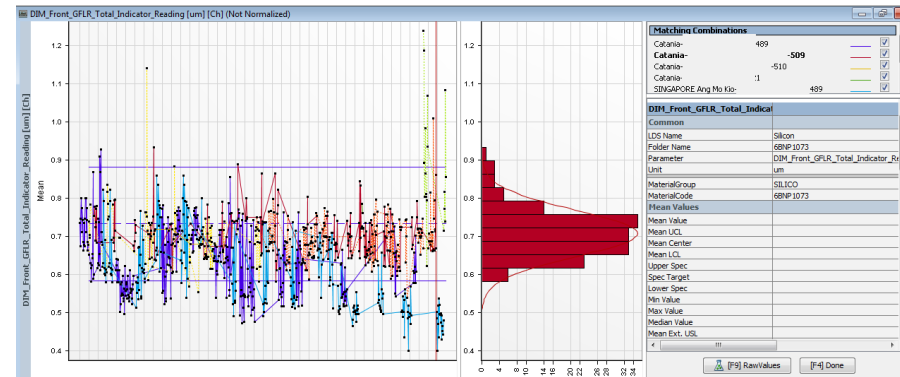
Supplier plants SPC

For a Material and Critical parameters

- Charts by supplier manufacturing dates
- Specification by customer plants
- Variability by suppliers supply chain



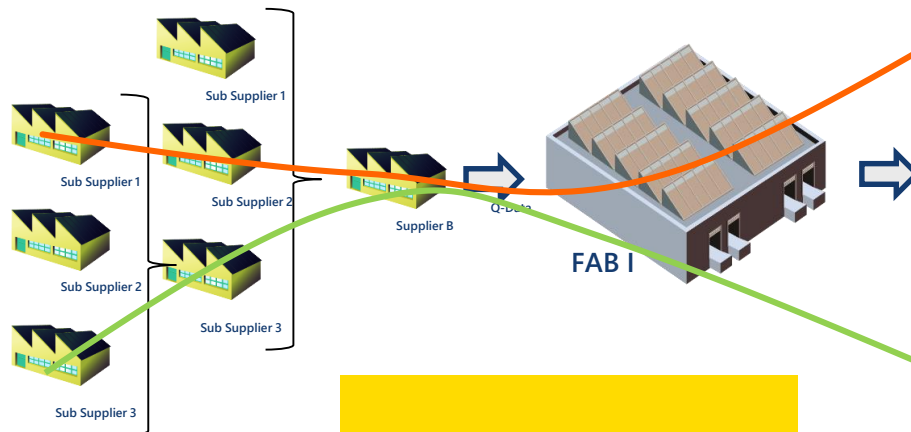
Fab engineer will have more visibility to the supplier performance.



Supplier plants SPC

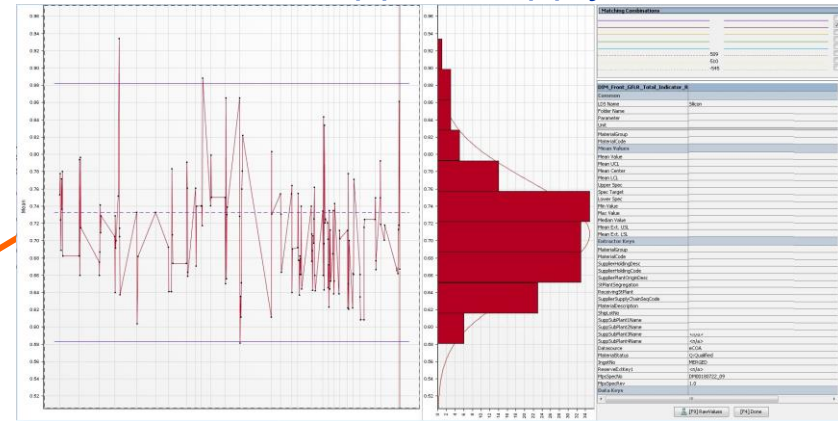
For a Material and Critical parameters

- Charts by supplier manufacturing dates
- Specification by customer plants
- Variability by suppliers supply chain
- Histogram by supplier plants

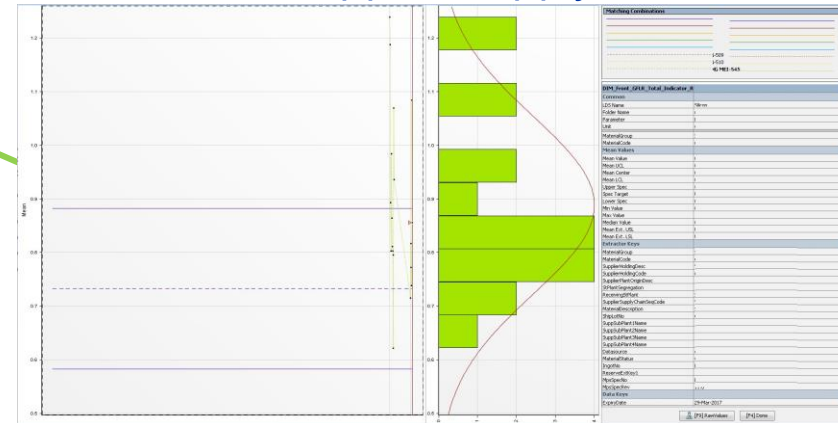


More discussion with supplier to align supplier chain performance.

Supplier Supply chain 1



Supplier Supply chain 2

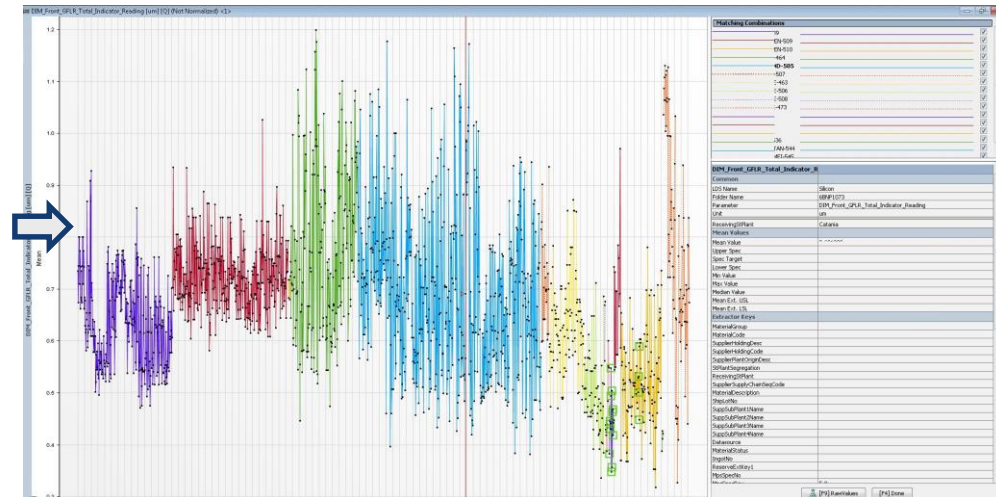
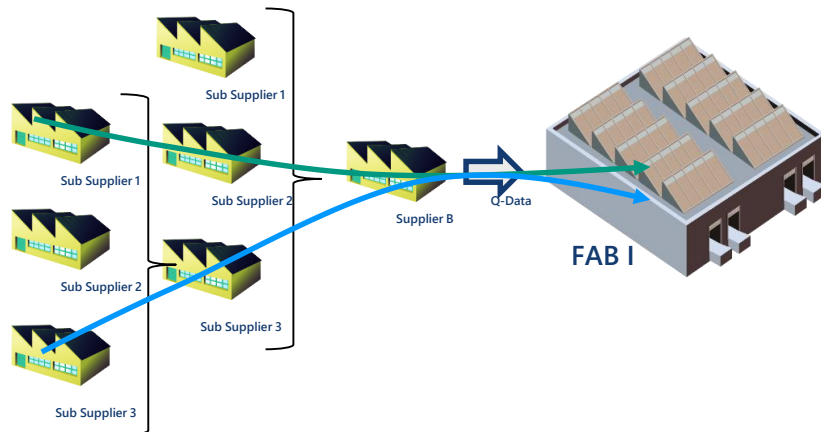


Supplier plants SPC

For a Supplier and Critical parameters

- Charts by supplier manufacturing dates
- Specification by different part number
- Variability by parts

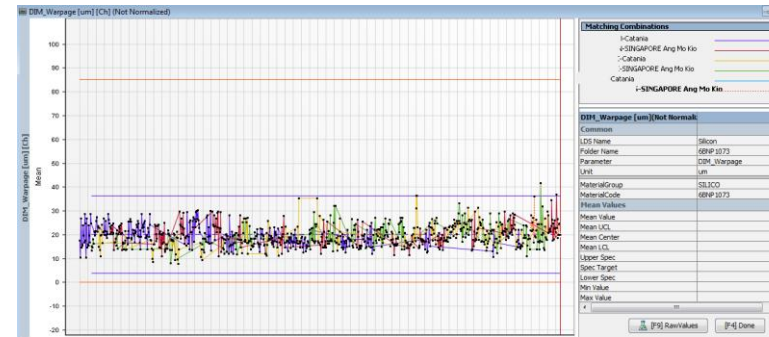
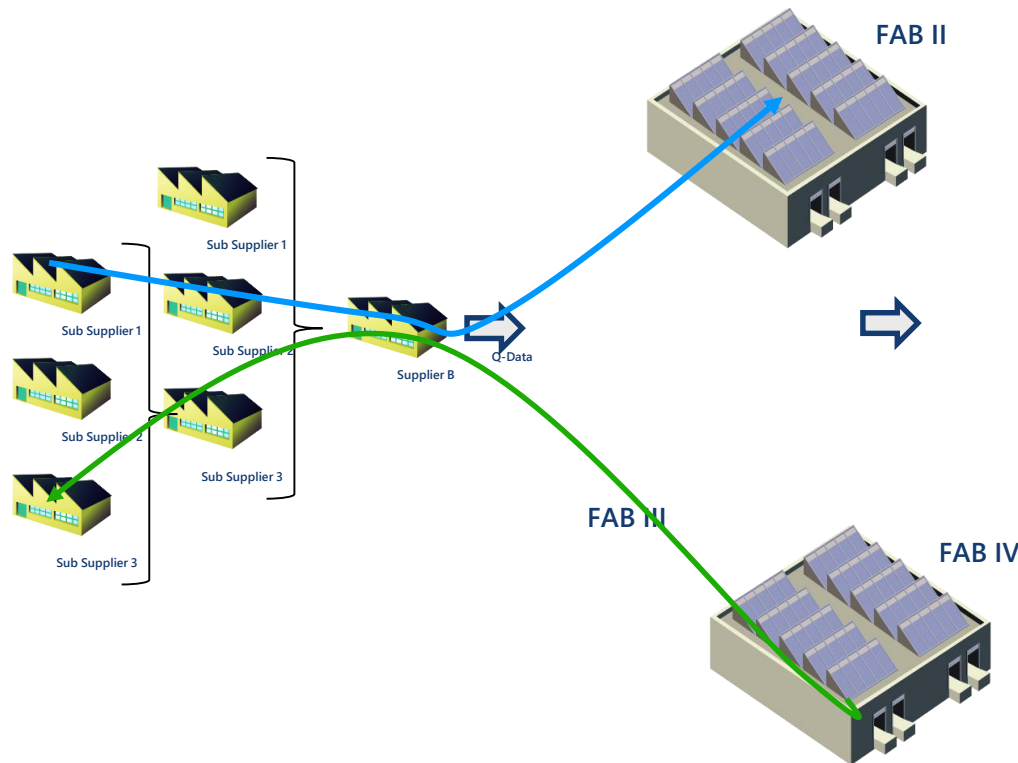
This allow customer engineer to collaboration with engineer to work with supplier across different parts purchased.



Supplier plants SPC

For a Material and Critical parameters

- Charts by supplier manufacturing dates
- Specification by customer plants
- Variability by suppliers plants
- Histogram by supplier plants

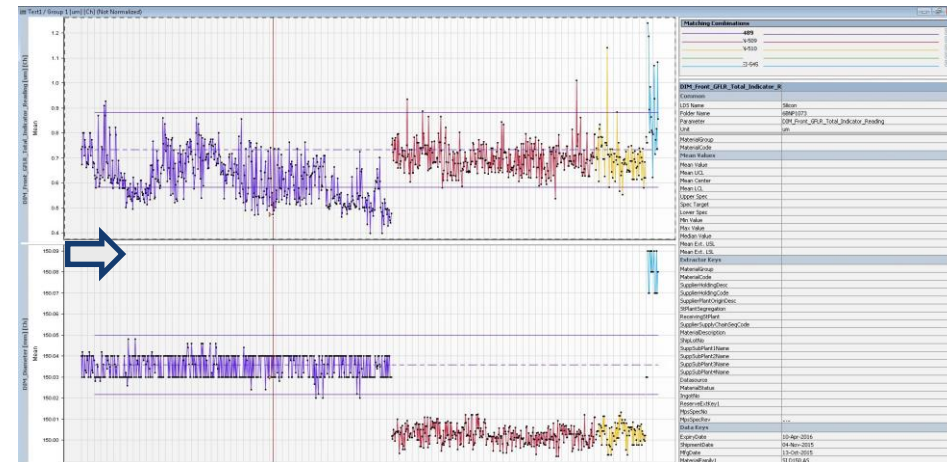
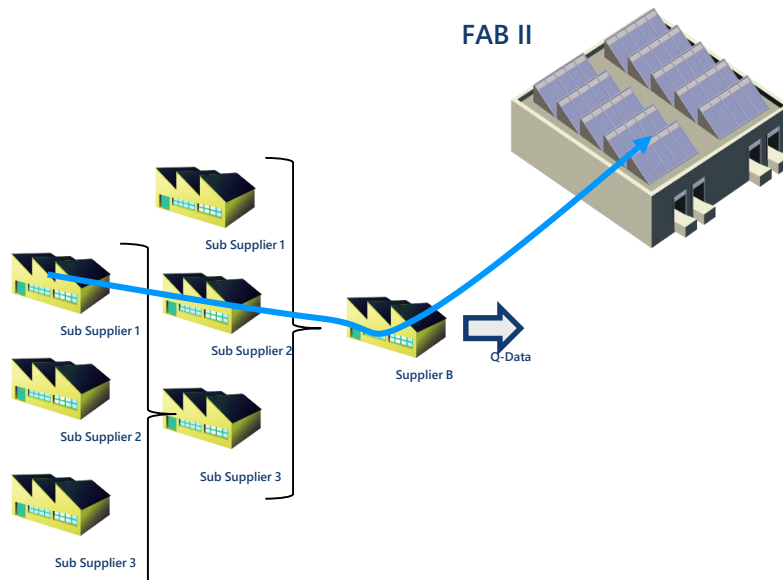


This enable customer to align material technology with supplier for multiple fab. And hence reduce production impact and enhance technology alignment.

Supplier plants SPC

For a Material and Multiple Critical parameters

- Charts by supplier manufacturing dates
- Specification by customer plants
- Variability by suppliers plants
- Multiple parameters for aligned by lot



MPC by parameter like bow and warp parameters for wafer. So that process engineer could review these kind of charts with ease to see the performance of given lot.

Supplier performance report examples

Compare supplier performance by materials & plants

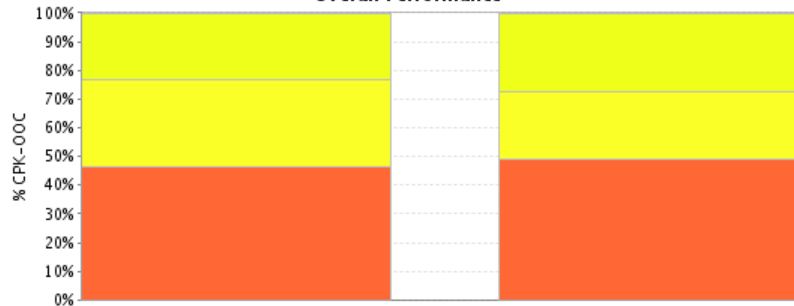
SPC Management

Material Group: SILICO Material Code: 6BNP1073

Cpk
 OOC
 all
 Criticality
 Stage
 Rolling
 Compare

Report at 30.03.16 16:22:00 on last 12 months scroll by 3

Overall Performance



supplier

- Not Capable, not Stable
- Stable
- Capable but Not stable
- Check Spec, Not Stable
- Check CL
- Check Spec and CL
- Check Spec
- Capable and Stable
- World Class

supplier		
World Class	0	0
Capable and Stable	0,00	0,00

Supplier Performance

Commodity by Part ID

Commodity by Material Description

Commodity by Part ID

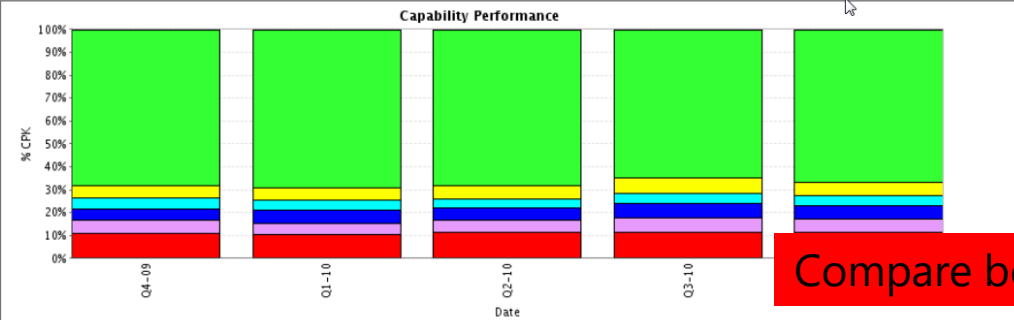
- All Commodities
- CMP_CHEMICAL
- CMP_SLURRY
- ECP_CHEMICAL
- FILM
- GAS
- PAD
- PHOTOCHEMICAL
- PROCESS_CHEMICAL
- SOURCE_CHEMICAL
- TARGET
- WAFER

Supplier Performance Report for all Commodities

commodity: *

Chart Type All cpk ooc all criticality all stage all Rolling Y Compare Trend GO

Report at 14.11.11 14:23:33 on last 9 quarters scroll by 1 Show



Compare between different commodity

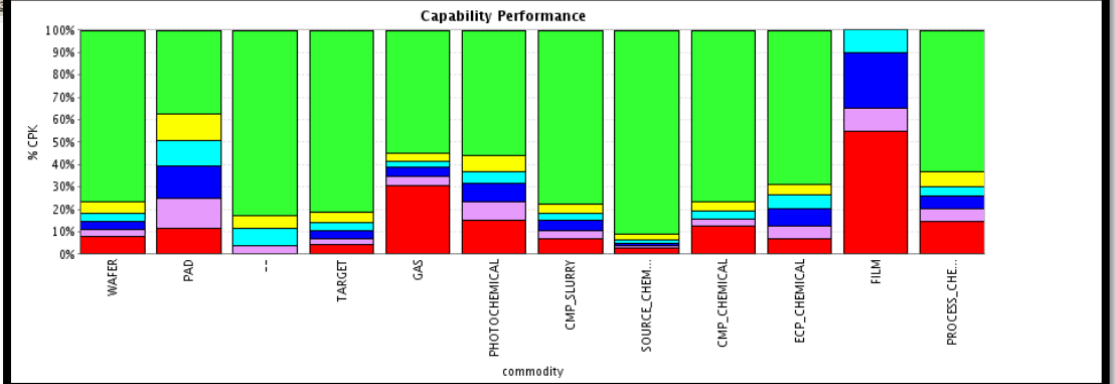
CPK Cat / %	Q4-09	Q1-10	Q2-10	Q3-10	Q4-
CPK < 1.0	390	11.12	341	10.46	390
1.0 <= CPK < 1.33	188	5.36	156	4.78	173
1.33 <= CPK < 1.67	181	5.16	192	5.88	184
1.67 <= CPK < 2.0	168	4.79	140	4.29	136

Supplier Performance Report for all Commodities

commodity: *

Chart Type All cpk ooc all criticality all stage all Rolling Y Compare Commodity GO

Report at 14.11.11 14:23:33 on last 9 quarters scroll by 1 Show



camLine

Supplier Performance SPC Engineering Queries Upload

Queries

Latest Shipments

Search Shipments

Lot Search Result

From 02.11.11 13:35:12 To 14.11.11 13:35:12 Show

Page size of 20 Rows of 112 page 1 of 6

Lot Id	Parsing Date	Material ID	Material Descr	Supplier Name	Mfg Site	Result	Flag	Detail
755-E-2000	14.11.11 13:34:06	XX-9999	XX-9999	aneSoft	Singapore	Fail	N	Sample
755-E-2001	14.11.11 13:34:06	XX-9999	XX-9999	aneSoft	Singapore	Fail	N	Sample
755-E-1572	14.11.11 13:32:50	XX-9999	XX-9999	aneSoft	Singapore	Fail	N	Sample
755-E-1573	14.11.11 13:32:50	XX-9999	XX-9999	aneSoft	Singapore	Success	N	Sample
755-E-1572	14.11.11 13:32:40	XX-9999	XX-9999	aneSoft	Singapore	Fail	N	Sample
755-E-1573	14.11.11 13:32:40	XX-9999	XX-9999	aneSoft	Singapore	Success	N	Sample
755-E-1573	14.11.11 13:31:11	XX-9999	XX-9999	aneSoft	Singapore	Success	N	Sample
755-E-1999	14.11.11 13:31:11	XX-9999	XX-9999	aneSoft	Singapore	Success	N	Sample
755-E-1573	10.11.11 04:31:02	XX-9999	XX-9999	aneSoft	Singapore	Success	N	Sample
755-E-1999	10.11.11 04:31:02	XX-9999	XX-9999	aneSoft	Singapore	Success	N	Sample
755-E-1572	10.11.11 04:30:53	XX-9999	XX-9999	aneSoft	Singapore	Fail	N	Sample
755-E-1573	10.11.11 04:30:53	XX-9999	XX-9999	aneSoft	Singapore	Success	N	Sample
755-E-2000	10.11.11 04:30:34	XX-9999	XX-9999	aneSoft	Singapore	Fail	N	Sample
755-E-2001	10.11.11 04:30:34	XX-9999	XX-9999	aneSoft	Singapore	Fail	N	Sample
755-E-2000	10.11.11 04:28:16	XX-9999	XX-9999	aneSoft	Singapore	Success	N	Sample
755-E-2001	10.11.11 04:28:16	XX-9999	XX-9999	aneSoft	Singapore	Success	N	Sample
755-E-2000	10.11.11 04:27:57	XX-9999	XX-9999	aneSoft	Singapore	Success	N	Sample

Shipment Detail Report

Lot ID: 755-E-2000

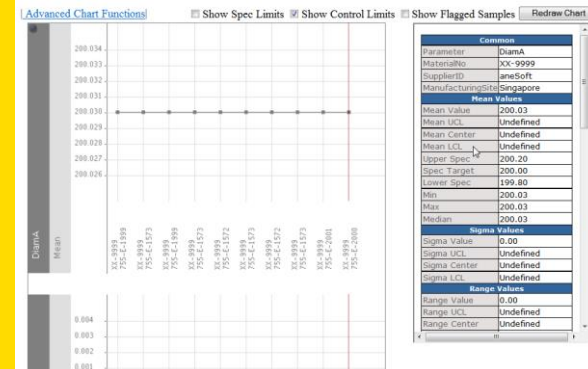
[Click here to flag all samples.](#)

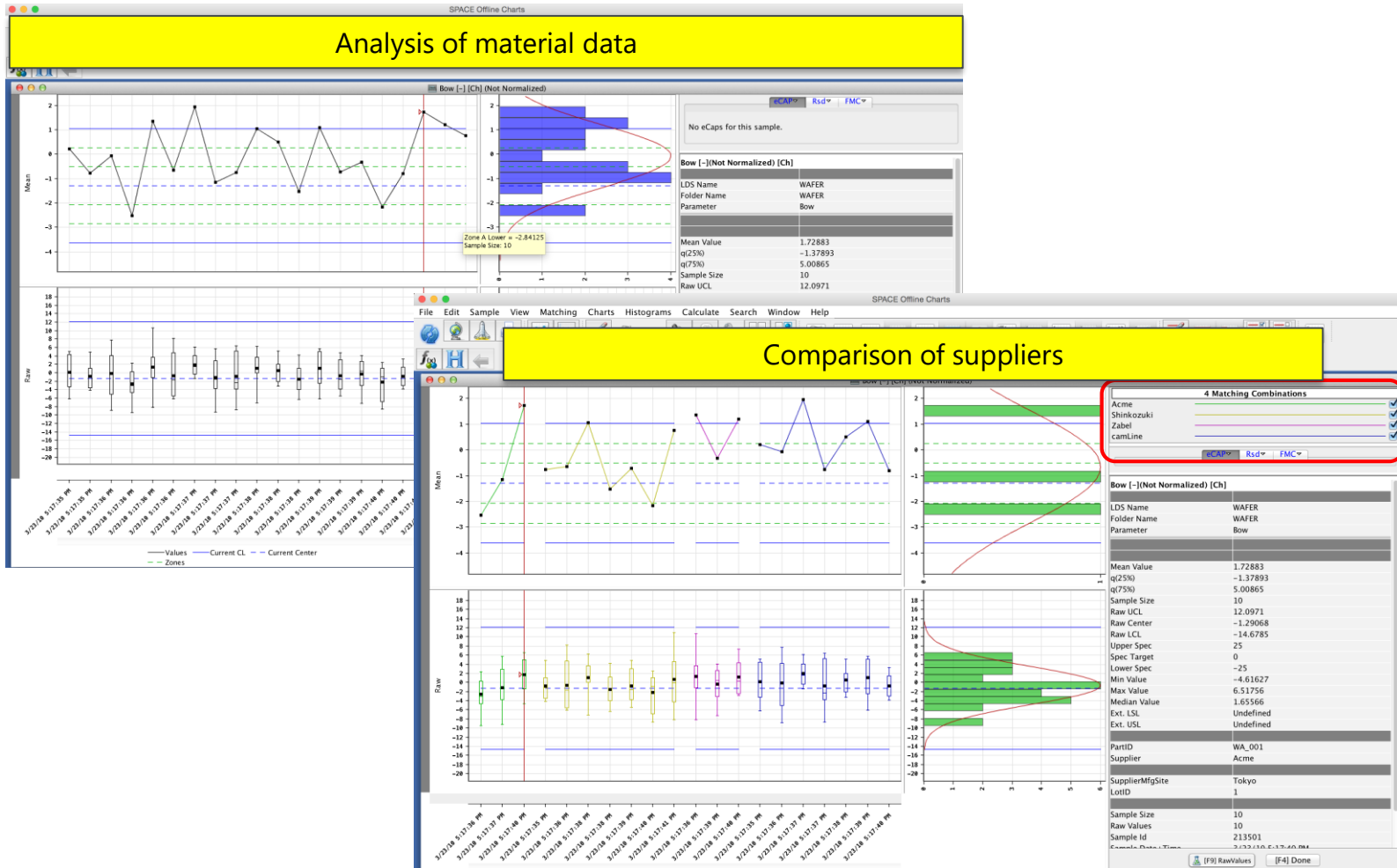
Page size of 13 Rows of 13 page 1 of 1

Lot Id	Type	Parsing Date	Material No	Supplier Id	Result	Flag
755-E-2000	0	14.11.11 13:34:06	XX-9999	aneSoft	Fail	N

SampleID	ParameterName	Alias	Error Code	Error Message	Flag	Chart	CKC
4,579,326	DiamA	--	0	SUCCESS	N		
-2	Dopant_Epi	--	0	SUCCESS	N		
4,579,334	Epi_Res	--	3	Mean value above upper control limit.	N		
4,579,333	Epi_STIR_25x25	--	0	SUCCESS	N		
4,579,331	Epi_STIR_PUA_0.20um	--	0	SUCCESS	N		
4,579,330	Epi_TTV	--	0	SUCCESS	N		
4,579,329	Epi_Thickness	--	0	SUCCESS	N		
4,579,327	Epi_Warp	--	0	SUCCESS	N		
4,579,332	LPD_0.13um	--	0	SUCCESS	N		
4,579,335	Oi	--	0	SUCCESS	N		
-2	Sub_Dopant	--	0	SUCCESS	N		
4,579,328	Sub_Res	--	0	SUCCESS	N		
4,579,336	Sub_Thk	--	0	SUCCESS	N		

Offline Chart Report
Parameter name: DiamA - on 2011/11/14 13:46:57





SPC Engineering Details

Commodity: *

Chart Type criticality stage Rolling

Report at on last quarters scroll by

Page size of Rows of 6208 page

SPC Engineering
Commodity by Part ID
Commodity by Material Description

Commodity by Mat Desc
 All Commodities
 CMP_CHEMICAL
 CMP_SLURRY
 ECP_CHEMICAL
 FILM
 GAS
 PAD
 PHOTOCHEMICAL
 PROCESS_CHEMICAL
 SOURCE_CHEMICAL
 TARGET
 WAFER

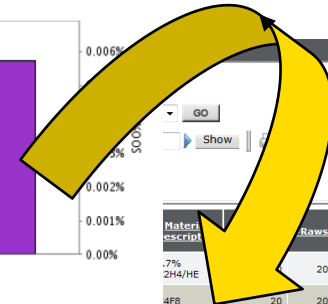
SPC Engineering Report for all Commodities
Commodity: *

Chart Type criticality stage Rolling Compare

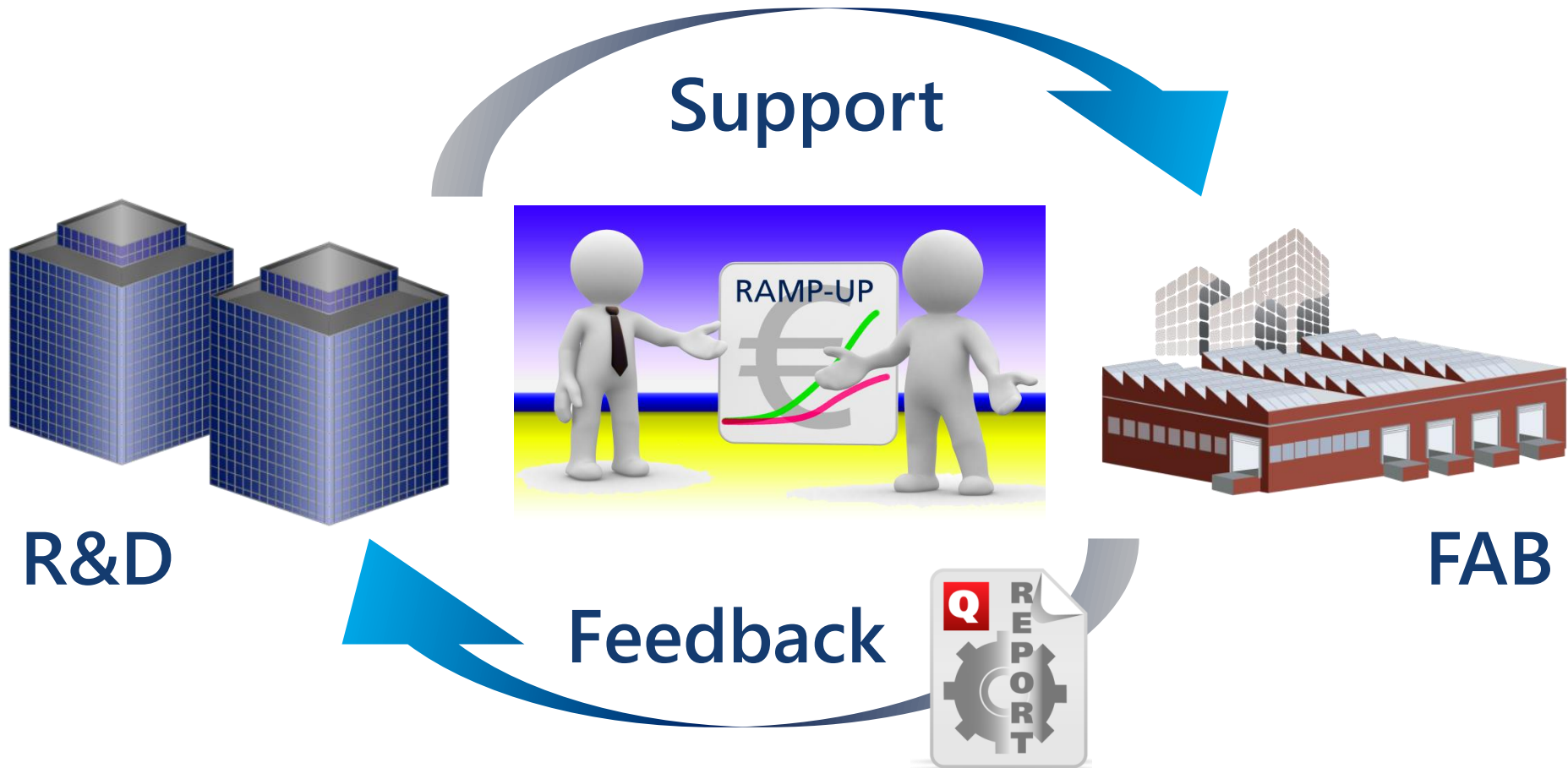
Report at on last quarters scroll by

Material %OOS Index (All Datapoints)

	Q4-09	Q1-10	Q2-10	Q3-10	Q4-10
Total points loaded	386,620	451,914	363,042	343,320	470,095
Total OOS points	47	8	10	0	27
Total %OOS points	0.012156	0.001770	0.002754	0.000000	0.005743



Material description	Raw	#OOS	%OOS	#OOS Raw	#OOC (1)	#OOC (others)	#OOC (all)					
7% 2H4/HE	20	--	--	20	0	0	0					
4F8	20	--	--	20	0	0	0					
H2F2	20	20	--	20	0	0	0					
4F8	20	20	--	20	0	0	0					
2F6	37	37	0.000000	37	0	0	0					
F6	26	26	0.000000	26	0	0	0					
4F6	20	20	--	20	0	0	0					
WAFER	28.12.10 23:00:00	AD_0.Sum	XXXXXXXX	XXXXXXXX	2ERWF-1409	84	2,184	0.000000	2,184	19	0	19
WAFER	28.12.10 23:00:00	AD_0.Sum	XXXXXXXX	XXXXXXXX	2ERWF-1411	545	14,170	0.000000	14,170	0	0	0
WAFER	28.12.10 23:00:00	AD_0.Sum	XXXXXXXX	XXXXXXXX	2ERWF-1101	97	97	0.000000	97	0	0	0
WAFER	28.12.10 23:00:00	AD_0.Sum	XXXXXXXX	XXXXXXXX	2ERWF-1102	308	308	0.000000	308	0	0	0

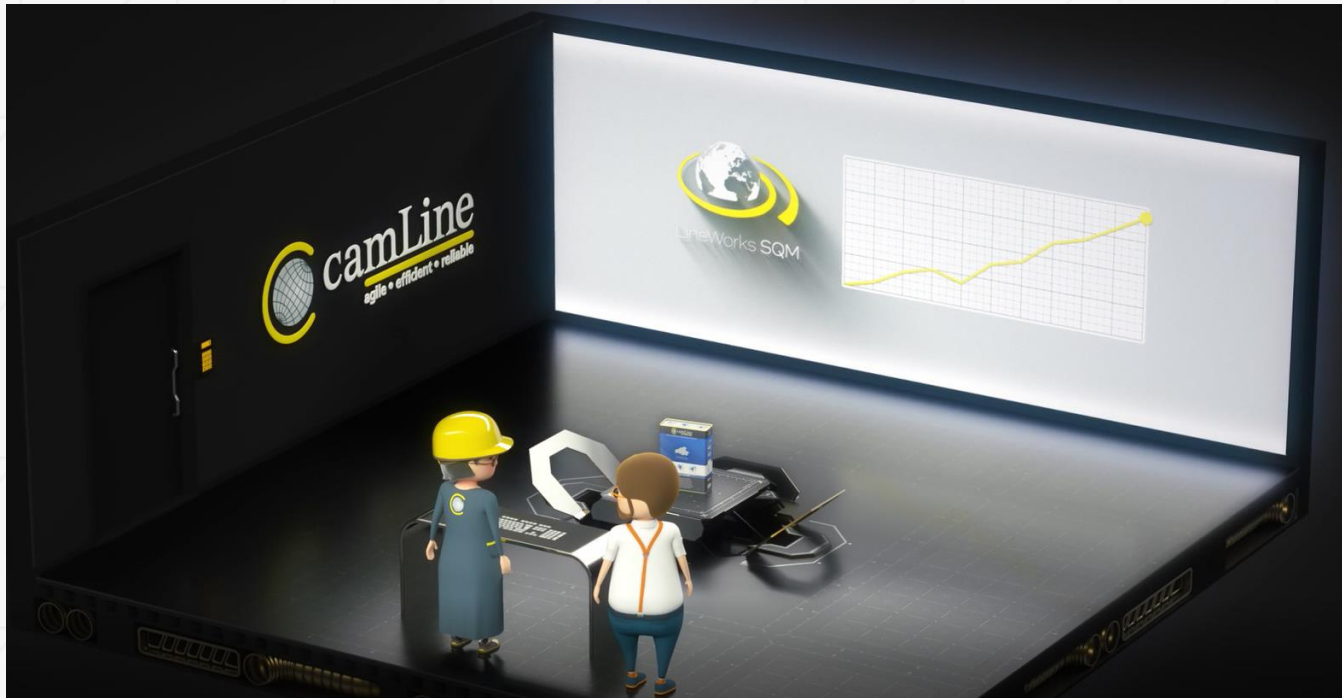


LineWorks SQM ...

- ... is the central component in camLine's customer solution to improve their manufacturing quality
- ... extend supplier collaboration with STC (Ship to Control limit)
- ... with up to 900 suppliers controlled in real time

Additional Informationen about SQM can be found at Youtube camLineTV

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for Manufacturing
Excellence



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F: +49 49 8137935-235

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camLine
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