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UK Member of the UEAtc (European Union of Agrément)

Assessment of Production

Agreed Quality Plan

for

Centech PU - Agrément Certificate 14/5169

The information held within this Quality Plan document is retained under the strictest confidence by the BBA and will only be disclosed to the named contact(s) within this document.

Document reference	14_5169 AQP 22-12-2021
Date of issue	3rd November 2014
BBA Section responsible	Construction Products
BBA Project Manager	Zakeria Hassan
Other products covered by BBA Certificates manufactured on this site:	None

Product name:

Centech PU – a high solids, solvent borne, single component, moisture triggered polyurethane.

Product range:

Centech PU available in 15 Litre pails, approximately 21.5kg, available in colours of light grey and mid grey.

Centech GFM – a glass fibre mat for use in reinforcing the system. The mat is embedded in the first resin coat.

Primer(s) – PVC/Reactivation Primer
Other primers as stocked / specified by Centaur
(primer supply/ identification to be confirmed by Centaur to BBA Inspector)

.

Production location:

Produced by: Polytech Liquid Polymers Limited

Address: Nab Quarry
Pott Shrigley
Macclesfield
Cheshire

Postcode: SK10 5SD

Telephone: 01625 575737

Contact: Mr Gary De-Maine
Title: Technical Director

E-mail: Gary.Demaine@mri-polytech.com

Is the above production site covered by ISO 9001 Registration? Yes

If YES, Registration No: 1819-QMS-001

Assessed by (organisation): ISOQAR

Scope of assessment: The procurement and supply of EPDM granules and sheet.
Manufacture and supply of polyurethane binders and similar products
Manufacture and supply of shredded rubber mulch

Purchasing data & receiving inspection and testing:

• Centaur Raw Material Approved Supply List - OP004 issue 10 - Purchasing / Document X03.3. 3 (QMS)
• Stores Control - OP005 issue 4 (QMS)

Incoming Product	Supplier	Property measured	Method of Test	Frequency of Testing	Acceptance Limits
Xylene	Hammond / Banner / Blagden Chemicals / Caldic / Brenntag / Univar	N/A	C of A only	Each batch / delivery	Within Specification
Desmodur E14 Desmodur E15 Trixene 7721 Trixene 7722 Trixene 7725	Covestro / Whitchem / Lanxess Baxenden	N/A	C of A only	Each batch / delivery	Within Specification
Desmodur Z4470 / Trixene DP9C/440 / Vestanat T 1890	Covestro / Lanxess Baxenden / Azelis / Evonik	N/A	C of A only	Each batch / delivery	Within Specification
Disflamoll DPK / TKP / Fyrol PCF Nuroz CDP PBPHOS CDPP	Azelis / Lanxess / IMCD Nuroz / Newport Polyblend	N/A	C of A only	Each batch / delivery	Within Specification
Bayferrox 318M / Ferroxide Black 863 Black Iron Oxide	Whitchem / Lanxess Rockwood / Wilfrid Smith	N/A	C of A only	Each batch / delivery	Within Specification
Tronox CR-826 / Tiona 595 / Supawhite SR2377 Rutile R218 Rutile TA42 / TA36 Venator RTC90 Scott White 10	Cornelius Univar Baltimore Innovations RBH Cathay Huntsman Chemox Pound	N/A	C of A only	Each batch / delivery	Within Specification
Preventol A6 / Mirecide TA95	Lanxess / Banner	N/A	C of A only	Each batch / delivery	Within Specification
Riasorb UV-1130 / Tinuvin 1130 / Lowite 92	Lake Coating & Minerals/ Alfa BTC/BASF Brenntag	N/A	C of A only	Each batch / delivery	Within Specification
Metatin 1230 / Jeffcat T-12 / Dabco T-9 / Tib Kat 216	Banner / Dow Baxenden / Huntsman Air Products Lawrence Industries	N/A	C of A only	Each batch / delivery	Within Specification

Mircodol H600 Dolomite Power 20um / Indolo 20	Omya Dolomitwerk Jettenberg Palterntaler Minerals	N/A	C of A only	Each batch / delivery	Within Specification
Martinal ON307, 310, 313 Huber ATH HN 336 Portaflame ATH SG40, SG50, SG55	Omya Huber Sibelo Minerals	N/A	C of A only	Each batch / delivery	Within Specification
Barytes Supreme Portaryte B45 Albawhite 10	RBH / Sibelco Minerals Rakem	N/A	C of A only	Each batch / delivery	Within Specification
Desmodur MT, XP2813 / Trixene AS, ASF	Covestro Baxenden	N/A	C of A only	Each batch / delivery	Within Specification
Cabosil TS720 / Aerosil R202 HDK H18	Univar / Cabot Lawrence Indutries / Evonik IMCD	N/A	C of A only	Each batch / delivery	Within Specification
Supersiv 3A / Sylosiv A3 / Molecular Sieve 3A Powder	Baltimore Innnovations Univar Lake	N/A	C of A only	Each batch / delivery	Within Specification
Tego Airex 900 BYK 1794	Evonik / Azelis Blagden Chemicals / BYK	N/A	C of A only	Each batch / delivery	Within Specification
Antiterrra U	Blagden Chemicals / BYK	N/A	C of A only	Each batch / delivery	Within Specification
Seta H2959 Trixene 7906	Allnex/Tennants Lanxess Baxenden	N/A	C of A only	Each batch / delivery	Within Specification

Detail your procedures for the action to be taken on rejection of a delivery of a raw material in the space below:

Return to supplier

Product identification and traceability:

A unique Batch Number is allocated to every batch of material mixed. An example of the batch number is C030717X03, the first letter denotes Centaur, the next six digits are the planned date of manufacture and X03 indicates that Reactor 3 is used (this will not change).

Where practical, the traceability of used raw materials is maintained by the computer system/ batchsheet stating the batch numbers of raw materials used against the product Batch Number. The Batch Number is also included on the Product Label and Picking List.

Any Certificates of Analysis required by the Customer shall also be endorsed with the Date of Manufacture/Batch Number and Product Number if applicable.

Method of production and process control:

As stated in Quality Manual, Document X03.1 – Manufacture of Centech (Revision 10.6)

The Centech PU Manufacturing Outline Procedure is as follows:

-Charge vessel with PBPHOS CDPP via diaphragm pump and begin anchor stir.
-Add Antiterra U, Riasorb UV 1130, BYK 1794 and TibKat 216* directly to vessel.
(*First 3 of these may be pre-mixed, if desired. TibKat must be weighed separately.)

-Charge vessel with Xylene via diaphragm pump.
-Via screw feed, add first 6 bags of Portaflame SG40 (ATH), then add Rutile 218 (TiO_2), Bayferrox 318M and Preventol A6 in between further Portaflame additions.
-Add Microdol H600 and Barytes Supreme via screw feed.
-Begin high speed mixing and heating to 95°C. (When all powder mixed, an initial moisture content may be taken, if desired.)
-Apply vacuum to vessel – Target 26in Hg or until Xylene begins to boil, then isolate and hold vacuum for 20mins.
-After 20mins, return vessel to atmospheric pressure with N_2 and weigh catchment pot to determine amount of Xylene lost in the process. Add fresh Xylene to replace what has been lost.
-Repeat vacuum cycle 2 more times, then weigh catchment pot once more and replace lost Xylene with fresh solvent.
(When replacement Xylene mixed into product, an interim moisture content may be taken, if desired.)
-Add Trixene AS via diaphragm pump, and flush the line with Xylene.
-Continue stirring for 1 hour, and then take a sample for moisture content.
-If moisture content high, apply vacuum procedure as above at 3x10min intervals.
-When moisture content in spec, cool vessel to 50°C.
-When the temperature ≤ 50°C, add Desmodur E15, Desmodur E14 and Desmodur Z4470 MPA/X via diaphragm pump and flush the line with Xylene.
-Add 2 bags of Aerosil R202 via screw feed, followed by part bag of Supersiv 3A, then all remaining bags of Aerosil, and finally all remaining Supersiv.
-Mix under high sheer, checking dispersion at regular intervals.
-When Aerosil fully incorporated, add BYK 1794.
-Apply vacuum to vessel – Target highest possible vacuum or highest acceptable rise of foam, whichever is soonest. Then isolate and hold vacuum for 5mins. After 5 mins, drop vacuum to 15in Hg with N_2.
-Repeat this vacuum cycle at least 5 more times.
-When there is no significant change to the foam after the last 5min vacuum interval, return vessel to atmospheric pressure with N_2, then weigh catchment pot to determine the amount of Xylene lost during the process. (This is typically only 1 or 2Kg and may be added after the Seta addition below.)
-Cool vessel contents to ≤ 30°C, add Seta H2959 via diaphragm pump, and flush the line with Xylene.
-Use high speed mixer to incorporate additions, the take a sample to the lab.
-Lab to test viscosity.
-Whilst sample is being tested start the vacuum process to degas the product as previously described.
-If high, determine Xylene addition required to bring it down.
-Use high speed mixer to incorporate any additional Xylene and resample.
-Repeat until viscosity in spec, then test SG and prepare for packdown.

Formulations

The following formulations show the two-colour versions of the products i.e. Light and Mid Grey.

The first processing stages of each formulation require a portion of the carrier solvent to be distilled to allow the removal of moisture from the materials in the vessel at that point. The amount of moisture present can vary depending on a number of factors and as a consequence the amount of solvent required to be distilled will also vary. Any solvent that is removed by distillation is replaced, so that the amount of materials in the vessel remains in the correct proportion at the end of the distillation stage. i.e. There is no net change. This distillation solvent is not included in the formulations below because it is a waste product, not part of the completed batch.

The first column shows the absolute amounts used in a typical batch. This is the best format to understand the proportions in the batch because it highlights the fact that the only variable additions are the solvent and the catalyst.

The catalyst level is controlled by Centaur and will change periodically, as necessary, according to seasonal variations. The solvent level is controlled by MRI, as there is an allowance within the process instructions for the addition of small amounts of solvent at the very last stage of manufacture should it be necessary to reduce the viscosity. The viscosity spec will change, seasonally, in line with the test criteria below, according to instructions from Centaur.

The second column shows the percentage ranges of the actual finished product, i.e. the proportions of the materials which end up in the tin at the end of production, based on the lowest and highest levels of the variables mentioned above.

CENTECH PU Light Grey (Rev.13.1)
(a.k.a. Caltech Ultra Light Grey)

Raw Materials	Weight Used in a Typical Batch	Percentage Weight of Materials in Finished Product
Xylene	360-520	10.0-14.0
PBPHOS CDPP	230	6.2-6.6
Anti Terra U	15	0.40-0.43
Tinuvin 1130 Riasorb UV-1130 / Lowite 92	21	0.48-0.54
BYK 1794 / Tego Airex 900	8	0.21-0.25
Tib Kat 216	3.5-6.0	0.09-0.17
Portaflame SG40	875	23.6-24.8
Tronox CR-826 / Tiona 595 / Supawhite SR2377 / Rutile R218 / Rutile TA42 / TA36 Venator RTC90 / Scott White 10	115	3.11-3.26
Bayferrox 318M/Ferroxide Black 863/Black Iron Oxide	10	0.27-0.29
Preventol A6/Mirecide TA95	8.5	0.21-0.23
Microdol H600/Dolomite Powder 20µm/Indolo 20	475	12.8-13.5
Barytes Supreme/Portaryte B45/Albawhite 10	250	6.77-7.22
Trixene AS	29	0.78-0.83
Desmodur E15 /Trixene SC7721	445	12.0-12.7
Desmodur E14 / Trixene SC7722	445	12.0-12.7
Desmodur Z4470 / Trixene DP9C-440/Vestanat 1890	79	6.2-6.6
Aerosil R202/CabosilTS720/HDK H18	40	1.08-1.15
Supersiv 3A/Sylosiv A3/Molecular Sieve 3A Powder	19	0.48-0.54
Seta H2959	106	2.8-3.1
Final Product Weight	**3531.5-3694.0**	**100.00**

CENTECH PU Mid Grey (Rev. 13.1)
(a.k.a. Caltech Ultra Mid Grey)

Raw Materials	Weight Used in a Completed Batch	Percentage Weight of Materials in Finished Product
Xylene	360-520	10.0-14.0
PBPHOS CDPP	230	6.2-6.6
Anti Terra U	15	0.40-0.43
Tinuvin 1130 Riasorb UV-1130 / Lowite 92	21	0.48-0.54
BYK 1794 / Tego Airex 900	8	0.21-0.25
Tib Kat 216 / Fomrez UL-28	3.5-6.0	0.09-0.17

Portaflame SG40	875	23.6-24.8
Tronox CR-826 / Tiona 595 / Supawhite SR2377 / Rutile R218 / Rutile TA42 / TA36		
Venator RTC90 / Scott White 10	94	2.54-2.67
Bayferrox 318M/Ferroxide Black 863/Black Iron Oxide	31	0.83-0.88
Preventol A6/Mirecide TA95	8.5	0.21-0.23
Microdol H600/Dolomite Powder 20µm/Indolo 20	475	12.8-13.5
Barytes Supreme/Portaryte B45/Albawhite 10	250	6.77-7.22
Trixene AS	29	0.78-0.83
Desmodur E15 /Trixene SC7721	445	12.0-12.7
Desmodur E14 / Trixene SC7722	445	12.0-12.7
Desmodur Z4470 / Trixene DP9C-440/Vestanat 1890	79	6.2-6.6
Aerosil R202/CabosilTS720/HDK H18	40	1.08-1.15
Supersiv 3A/Sylosiv A3/Molecular Sieve 3A Powder	19	0.48-0.54
Seta H2959	106	2.8-3.1
Final Product Weight	**3531.5-3694.0**	**100.00**

In-process inspection and testing:

Centech PU: (MRI)

Property measured	Method used	Frequency	Acceptance limits	Action upon rejection
Water content	Karl Fischer - LB36	As specified in the manufacture protocol	<90ppm	Continue process to removing moisture until in spec
Visual properties	Visual inspection	Once	Smooth, free flowing grey liquid	Stir 10mins, then retest
Filler dispersion test 1	Visual inspection - LB41	As necessary to pass test	No visible undispersed powder.	Stir 10mins, then retest
Filler dispersion test 2	Hegman Grind – LB37	When visual test passed, then as necessary.	No visible undispersed powder.	Stir 10mins, then retest
Viscosity (Mid Grey)	Brookfield RVT 4/10 – LB38	As necessary to pass test	6000 – 7500*cps (winter) 7000 – 8500*cps (summer)	If high, dilute into spec with Xylene. Low result highly unlikely, but if it does occur, add small amount of Fumed Silica to raise viscosity.
(Light Grey)			5000 – 6500*cps (winter) 6000 – 7500*cps (summer)	

***Final inspection limits.**

Final inspection and testing:

Centech PU (MRI)

Property measured	Method used	Frequency	Acceptance limits	Action upon rejection
Colour	Compare with previous batches – LB42	Once	Matches previous batches. Clear	Indication only – contact Centaur

			difference between mid and light grey.	in the event of a difference. Centaur will manage the release of the batch so that different coloured topcoats are not used on same job
Specific Gravity	SG cup – LB39	Once	1.45 - 1.53	Contact Centaur for approval if batch is physically ok
Cure time	Drying recorder – LB43	Once	2 - 5 hours	Contact Centaur and quarantine the batch. Await further instruction pending lab investigations.
Underwater cure	Water submersion - LB44	Once	No reaction	Contact Centaur and quarantine the batch. Await further instruction pending lab investigations.
Water spray resistance	Spray water onto fresh coating – LB45	Once	No reaction	Contact Centaur and quarantine the batch. Await further instruction pending lab investigations.

CTL acceptance criteria: (All products) C of A from MRI only.

Calibration:

Refer to Quality Management System – Standard Operating Procedure / OP013 Calibration / REF 011 Calibration Schedule Register.

Packaging:

15L metal tins, lacquer lined with ring latch lids.
36 metal tins on a wooden 4-way pallet (1200mm x 1000mm)
Pallet covered with a polythene cover and shrink-wrapped

Labelling:

Front label includes all relevant CLP information (hazard symbols, storage conditions and declaration of contents). On the back, is the marketing label* and transport hazard labels are on either side. Label states product name, pack size and manufacturing batch number.

Centaur Technologies Ltd for Centech PU

Use of the BBA symbol:

Centech PU - BBA logo on label of product tins

Training:

Refer to Quality Management System – Standard Operating Procedure / OP012 Training (Current Version Supplied) and Certificate of Training for the Manufacture of Centech PU

Complaints:

MRI Polytech

Refer to Quality Management System – Standard Operating Procedure / OP002 Sales Control & Customer Complaints (Current Version Supplied) and Customer Complaints Data Base

By Centaur

- On receipt of a complaint it is logged and given a Complaint Number
- Initial details of the complaint are taken including; the concern raised, complainant's details, applicator details, Batch Numbers, application method, weather conditions.
- The complaint will then be initially assessed by a member of the Management Team and if required will be investigated on site by the Technical Support Manager or other nominated person.
- Any actions arising from the complaint are completed and logged.

For BBA internal use only	
BBA Cert(s): 14/5169	N. Sharma Approved by: Date:01/03/2021

Quality policy: We undertake to have the product produced and placed on the market as described above. We will advise the BBA of any changes and receive agreement from the BBA before the changes are implemented.

Signed G.D. [illegible] Dated 03/03/2021

Title Chemist

End of Quality Plan

Appendix – Document Revisions

Revision No	Reason for re-issue	Date
1	The text describing the formulations was corrected	30/03/2021
2	Change of ownership from MRI polytech to Polytech Liquid Polymers.	20/05/2021 ZH
3	Increase the viscosity spec/changes to In-process inspection and testing: MRI	03/06/2021 ZH
4	Raw materials Riasorb and Preventol has been increased to 19 and 8.5 kg, respectively. Formulation numbers were updated to 13.1 and Thasorb 1130 name change to Riasorb 1130 as agreed before. Additional information added to production method …"vacuum process"	22/12/2021 ZH