Doc: SIT/15573/1
July 2019

केन्द्रीय मुहर विभाग –2

संदर्भ -: के.मु.वि.-2/16: 15573 18 07 2019

विषय: मानक IS 15573:2018 के अनुसार Polyaluminium Chloride के लिए संशोधित ड्राफ्ट निरीक्षण व परीक्षण योजना (SIT)

1) यह उपरोक्त विषय के संदर्भ में है ।

2) उपरोक्त विषय पर परिपत्र एवं संशोधित ड्राफ्ट निरीक्षण व परीक्षण योजना (SIT) को टिप्पणी हेतु भेजा जा रहा है। अनुरोध है की टिप्पणी **30 जुलाई 2019** तक भेज दी जाए।

(आदित्य दास)
वैज्ञानिक सी

प्रमुख (के मू वी-2)

सभी क्षेत्रीय/शाखा कार्यालय/सी एच डी

प्रतिलिपि : **आई टी एस विभाग –** बी आई एस इंट्रानेट पर डालने हेतु

CENTRAL MARKS DEPARTMENT-2

Our Ref: CMD-2/16: 15573 18 07 2019

Subject: Modified Draft Scheme of Inspection and Testing (SIT) for Polyaluminium Chloride as per IS 15573:2018

1) This has reference to the subject mentioned above.

2) Circular and modified draft Scheme of Inspection and Testing (SIT) are enclosed with a request for comments by **30 July 2019**

(Aditya Das)
Scientist C

Head (CMD-2)

All ROs/BOs/CHD

Copy to: **ITSD** - for hosting on BIS Intranet.

Doc: SIT/15573/1
July 2019

CENTRAL MARKS DEPARTMENT-2

Our Ref: CMD-2/16:15573 15 07 2019

Subject: Modified Draft Scheme of Inspection and Testing (SIT) for Polyaluminium Chloride as per IS 15573:2018

1. This has reference to the above.

2. The existing STI for PAC as per IS : 15573:2018 (Doc: STI/15573/2 April 2018) defines the control unit in terms of Primary manufacturers i.e. those who make concentrated PAC by reaction of virgin raw material (HCl, Alumina) in their own premises and then dilute the same to get PAC as per IS;15573, and in terms of Reprocessors or Secondary manufacturers i.e. who procure concentrated PAC from primary manufacturer and dilute it to make PAC as per IS: 15573.

3. A few concerns have been raised by manufacturers regarding the quality of ISI marked PAC being supplied by reprocessors. These queries raised the issue that it is not possible to produce PAC as per IS: 15573 by mere dilution of PAC as is being done by reprocessors. Technical justification supporting this claim has also been submitted by one such manufacturer which is enclosed for reference **(Annex 1).**

4. CMD-2 had also sought information from the concerned BOs regarding which of the BIS licensees are primary manufactures and which are reprocessors. However, as per the information received, all of the 12 licensees are primary manufacturers and none are reprocessors.

5. In view of the above, it is proposed to remove the reprocessors clause from the STI. Accordingly, a draft SIT for IS 15573:2018 excluding the reprocessors clause, has been prepared and is enclosed **(Annex 2).**

6. CHD and BOs are requested to examine the same and give their comments on the matter, if any, latest by **30 July 2019.**

(Aditya Das)
Sc. C

HCMD-2
ROs/BOs/CHD

Encl:

a/a

Annex 1- Copy of technical justification provided in support of claim that it is not possible to produce PAC as per IS: 15573 by mere dilution of PAC as is being done by reprocessors

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Can Liquid PAC of Medium/ High basicity as per IS 15573:2018 be made by Diluting concentrated PAC technically?

ISI marked PAC normally contains 1.5 -2% sulphates. Sulphate is incorporated during formulation of PAC for improving stability, efficiency of coagulation & clarification. PAC-18 which is used to make PAC-10 by diluting with water does not contain any sulphates, thus PAC-10 produced by just dilution should be free of sulphates. Technically, production of PAC-10 from PAC-18 is not a simple dilution with water but also processing it chemically with polyaluminium sulphate and/or other suitable additives to increase its stability and efficiency as a coagulant. Thus proper PAC-10 cannot be made by just dilution of PAC-18 with water as claimed by reprocessors; rather it involves process of formulation.

Further during dilution a change in concenteration of material from PAC-18 to PAC-10 can not change its ratio of Chloride to Aluminium ions; thus PAC of high basicity having lower ratio 1.03 cannot be produced without chemical reactions & processing from PAC-18 having this ratio of 1.15-1.19 as falsely claimed by reprocessors producing high basicity grade liquid PAC.

Specifications for Commercial conc. PAC (PAC-18) And PAC Liquid Medium/ High basicity as per IS 15573 :2018

Sl No.	Characteristics	Requirement as per IS 15573 : 2018 For PAC- Liquid [$Al(OH)_aCl_b(SO_4)_c$]		PAC-18 [$Al(OH)_aCl_b$]
		Medium basicity	High Basicity	Specifications
i)	*Aluminium compounds (as Al_2O_3), percent by mass; Min*	9.5	10.2	*16.5-18.5*
ii)	*Relative Basicity, percent ; Min*	35	64	*45-50*
iii)	*Chloride (as Cl) percent by mass; Max*	12.5	10.5	*19-22*
iv)	*Specific gravity at 27° C , Min*	1.18	1.20	*1.35-1.39*
v)	*Water insoluble, percent by mass; Max*	0.5	0.5	*NS*
vi)	*pH of 5 % aqueous solution, w/v; Min*	1.8-4.5	2.5-4.5	*1.8-4.5*
vii)	*Total Organic Carbon (TOC), ppm; Max*	80	80	*NS*
viii)	*Sulphate as SO_4'', % by mass, Max*	2.7	2.5	*Nil*
ix)	*Arsenic (as As), ppm; Max*	5	5	
x)	*Cadmium (as Cd), ppm; Max*	6	6	
xi)	*Chromium (as Cr), ppm; Max*	15	15	
xii)	*Iron (as Fe), ppm; Max*	80	80	
xiii)	*Lead (as Pb), ppm; Max*	30	30	
xiv)	*Manganese (as Mn), ppm; Max*	20	20	
xv)	*Mercury (as Hg), ppm; Max*	0.2	0.2	
xvi)	*Selenium (as Se), ppm, Max*	8	8	
xvii)	*Dynamic viscosity at 20°C, mPa*	3-10	3-10	

PAC-18 : $Al(OH)_aCl_b$,where a=1.05- 1.4 and a+b =3; CAS No:-1327-41-9

PAC-Liquid as per IS : 15573, { $Al(OH)_aCl_b(SO_4)_c$ },where a,b and c are variable,& (a+b+2c) =3; CAS No. 39290-78-3,
In medium basicity grade a= 1.05-1.35; but in high basicity grade a= Min 1.95 to achieve Min 64% basicity

Ratio of Chloride/ Aluminium as Al_2O_3 : In PAC-18 : 19/16.5 or 22/18.5 = **1.15 to 1.19**

In Medium Basicity, Permissible limit as per IS 15573 :- 12.5/9.5 = Max.1.32

In High Basicity, Permissible limit as per IS 15573 :- 10.5/ 10.2 = Max. **1.03**

Thus production of PAC as per IS 15573 by simple dilution of PAC-18 is not technically feasible as shown by reprocessors.

Annex -2 - Draft SIT

SCHEME OF INSPECTION AND TESTING
FOR CERTIFICATION OF POLYALUMINIUM CHLORIDE
ACCORDING TO IS 15573:2018

1. **LABORATORY** - A laboratory shall be maintained, which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare a calibration plan for the test equipments.

2. **TEST RECORDS -** The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. **PACKING AND MARKING** -The Standard Mark as given in Schedule of the license shall be incorporated, on the label attached with Polyaluminium Chloride and the labeling/ marking and packing shall be done as per the provision of the Indian Standard, provided always the Polyaluminium Chloride thus marked conforms to all the requirement of the specification.

3.1 In addition, BIS licence no (CM/L---) and details of BIS website shall be marked as follows: “For details of BIS certification please visit www bis.gov.in”

4. **CONTROL UNIT –** For the purpose of this scheme, the entire quantity of Polyaluminium Chloride manufactured from the same consignment of virgin raw materials in a reaction vessel at a time shall constitute a control unit.

5. **LEVELS OF CONTROL –** The Analysis and test as indicated in Table 1 and at the levels of control specified therein shall be carried out on the whole production of the factory covered by this Scheme and appropriate records and charts maintained in accordance with Paragraph 2 above. All the production which conform to the Indian Standard and covered by this license shall be marked with the Standard Mark.

5.1 All production which conforms to the Indian Standard and covered in the licence should be marked with Standard mark.

6. **STORAGE –** Instructions for storage as given in the Indian Standard shall be complied.

7. **REJECTION -** Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016. A separate record shall be maintain in giving information relating to the rejection of the production not conforming to the requirement of the specification and the method of its disposal. Such material shall in no case be stored together with that conforming to the specification.

SCHEME OF INSPECTION AND TESTING
FOR CERTIFICATION OF POLYALUMINIUM CHLORIDE
ACCORDING TO IS 15573:2018
Table 1 Level of Control

(1)				(2)	(3)		(4)
Test Details				**Test equipment requirement R:required (or) S: Sub-contracting permitted**	**Levels of Control**		**Remarks**
Clause	**Requirements**	**Test Method**			**No. of Samples**	**Frequency**	
		Clause	**Reference**				
5.1, 5.5.1 & 5.1.2	Description	5.1	IS 15573:2018	R	One	Each control unit	In case of failure, entire control unit shall be considered unfit for marking
5.2 & Table 1	Aluminium as Al_2O_3	Annex A	-do-	R	-do-	-do-	-do-
-do-	Relative Basicity	Annex B	-do-	R	-do-	-do-	-do-
-do-	Chloride as Cl	Annex C	-do-	R	-do-	-do-	-do-
-do-	Sulphate as SO_4	Annex D	-do-	R	-do-	-do-	-do-

-do-	Specific Gravity at 25^0 C		Annex E	-do-	R	-do-	-do-	-do-
-do-	Viscosity (Dynamic) at 20^0C		--	IS 9316 (Pt 2) IS 6213 (Pt 4)	R	-do-	-do-	-do-
-do-	Bulk Density		Annex F	IS 15573:2018	R	-do-	-do-	-do-
-do-	Toxic Substances							
-do-	1	Mercury (as Hg)	Annex G	-do-	R	-do-	-do-	-do-
-do-	2	Arsenic (as As)	Annex H	-do-	R	-do-	-do-	-do-
-do-	3	Cadminium (as Cd)	Annex J	-do-	R	-do-	-do-	-do-
-do-	4	Lead (as Pb)	Annex K	-do-	R	-do-	-do-	-do-
-do-	5	Iron (as Fe)	Annex L	-do-	R	-do-	-do-	-do-
-do-	6	Manganese (as Mn)	Annex M	-do-	R	-do-	-do-	-do-
-do-	7	Chromium as (Cr)	Annex N	-do-	R	-do-	-do-	-do-
-do-	8	Selenium (as Se)	Annex P	-do-	R	-do-	-do-	-do-
-do-	Total organic carbon (TOC)		Annex Q	-do-	R	-do-	-do-	-do-
-do-	Insolubles, percent by mass		Annex R	-do-	R	-do-	-do-	-do-
-do-	pH of 5% solution		Annex S	-do-	R	-do-	-do-	-do-

Note-1: Whether test equipment is required or sub-contracting is permittedin column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer maydefine the control unit/batch/lot and submit his own levels of control in column 3 with proper justification.