BMTPC
PACS
PERFORMANCE APPRAISAL CERTIFICATION

Name and Address of the Certificate Holder:
M/s Apollo Tricoat Tubes Ltd.
36, Kaushambi, Near Anand Vihar Terminal, Ghaziabad, UP,
Phone No. 91-120-4041400

Performance Appraisal Certificate No.
PAC No.: **1052-P/2020**
Issue No.: **01**
Date of issue:**13/01/2020**

APOLLO CHAUKHAT DOOR AND WINDOW FRAME SECTIONS

User should check the validity of the Certificate by contacting Member Secretary, BMBA at BMTPC or the Holder of this Certificate.

Building Materials & Technology Promotion Council
Ministry of Housing & Urban Affairs
Government of India
Core 5A, First Floor, India Habitat Centre,
Lodhi Road, New Delhi – 110 003

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PERFORMANCE APPRAISAL CERTIFICATE

FOR

APOLLO CHAUKHAT DOOR AND WINDOW FRAME SECTIONS

Issued to

M/s Apollo Tricoat Tubes Ltd

STATUS OF PAC: 1052-P/2020

S. No.	Issue No.	Date of Issue	Date of renewal	Amendment		Valid up to (Date)	Remarks	Signature of authorized signatory
				No.	Date			
1.	2.	3.	4.	5.	6.	7.	8.	9.
1	1	13/01/2020	13/01/2021			12/01/2021		

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PART – 1 CERTIFICATION

1.1 Certificate Holder: **M/s Apollo Tricoat Tubes Ltd.**
36, Kaushambi, Near Anand Vihar
Terminal, Ghaziabad, UP,
India
Phone No. 91-120-4041400

1.2 Description of Product

1.2.1 Name of the Product Apollo Tricoat Chaukhat (Door & Window frame section)

1.2.2 Brief Description –. Apollo Chaukhat Consists of Direct Formed (cold) MS Tubular door frame sections and window frame sections available in Single & Double door/window frame and four side door frame. The Products are of thickness ranging from 1.6mm to 3.0mm.

1.3 Assessment

1.3.1 Scope of Assessment – Suitable for internal & external door applications for residential, commercial and factory buildings/Industrial Buildings.

1.3.2 Scope of Inspection – Scope of inspection included verification of production unit and testing facilities available at the factory and skilled technical personnel with quality assurance plan in the factory.

1.3.3 Assessment Summary

1.3.4 The assessment has been done on basis of inspection of factory, laboratory test report, field observations and Quality Assurance Plan.

1.3.5 Manufacturing & test facilities – Manufacturing and test facilities available in the factory were found suitable & adequate to produce door MS Door/ Window Frame Sections.

1.3.6 **Quality Assurance Procedure** – The firm shall be follow Quality Assurance System for production of Apollo Chaukhat Direct Formed MS Door and Window Frames Sections.

1.4 Durability

1.4.1 The Door Frames that were inspected were fabricated and installed in 2017. None of them showed any distress and they were functional. The levels of Maintenance of these frame sections were satisfactory. As prescribed by the manufacturer.

1.5 Uses of the Apollo Chaukhat Door and Window Frame Sections & their Limitations

1.5.1 **Design Data** – The data & information provided in Part II of this Certificate shall be used for selection of the type, size, thickness etc.

1.6 Storage & handling at the user end before installation

1.6.1 **Storage** – At the user's end the MS Door/ Window Frame Sections shall be stored/stacked one over the other in order of the sizes with the largest at the bottom. They shall be stacked flat on properly covered to exclude moisture and inside a shed / building.

1.6.2 **Handling –**Apollo Chaukhat shall be handled carefully during storage or installation in order to prevent occurrence of damages to the faces and edges. The Door frame sections shall not be dragged along a stack of any surface but shall be lifted clear of stack or any surface on which they are stored

1.7 Uses of the Door and Window Frames

1.7.1 The samples tested met the requirements of Tubular Door Sections in all tests which categorize the duty of Door Frames namely Shock Resistance, Impact Indentation test/ as specified in relevant IS codes.

1.7.2 In view of the specifications of the MS Door/ Window Frame Sections and their manufacture, the manufacturer has claimed that these doors can be used in different geoclimatic conditions with suitable surface treatment such as Epoxy paint etc.

1.8 Limitations of use

1.8.1 Bare Door/Window frames (i.e Non-Galvanized sections) are not recommended for use in coastal areas or areas with high humidity

1.9 Conditions of Certification

1.9.1 **Technical conditions** –Eco-friendly/ISI approved materials shall be used for the manufacture of Apollo Chaukhat door and window frame sections. The material used in the Chaukhat can be recycled after its full usages.

1.9.2 **Quality Assurance** – The Certificate Holder shall implement & maintain a quality assurance system in accordance with Scheme of Quality Assurance (SQA) given in Annexure-1.

1.9.3 Handling of User Complaints

1.9.3.1 The Certificate holder shall provide quick redressal to consumer/user complaints proved reasonable & genuine and within the conditions of warranty provided by him to customer/purchaser.

1.9.3.2 The Certificate holder shall implement the procedure included in the SQA. As part of PACS Certification he shall maintain data on such complaints with a view to assess the complaint satisfaction and suitable preventive measures taken.

1.10 Certification

1.10.1 On the basis of assessment given in Part III of this Certificate & subject to the conditions of Certification, use & limitations set out in this Certificate and if selected, installed & maintained as set out in Part I & II of this Certificate, the Apollo Chaukhat Door and Window Frame Sections s covered by this Certificate are fit for use set out in the Scope of Assessment.

Part – 2 Certificate holder's Technical Specifications

2.1 General

2.1.1 The PAC holder shall manufacturer the MS Door/ Window Frames in accordance with requirements specified. In addition he shall follow his company standards specifying requirements of various materials used in the manufacturer of MS Door/ Window Frame Sections.

2.2 Specifications for the product & design information

2.2.1 **Specifications** – The specifications for finished door frames are as per performance criteria

2.2.2 **Technical Specifications**

2.2.3 **Raw Material**

(i) Mild Steel (IS 10748) (ii) Mild Steel (IS 2062) (iii) GP Steel Sheet (IS277)	Test certificates are obtained and maintained

2.3 **Construction & Workmanship –** Apollo Chaukhat Door and Window Frame Sections are made from "Direct Form Technology" (Direct Formed Cold Rolled). Hot Rolled/Cold Rolled/ Galvanized (GP) Steel Coils are cold formed to manufacture Apollo's Chaukhat Door and Window Frame Sections. MS Coils are conforming to IS: 10748/2062/277. Sheet shall have an average thickness of 1.6 mm to 3.0mm. Door & Window section of various sizes are made via cold rolled mills i.e SDF 100X50 & 130X65, DDF 130X65, FDF 130X80 & WF 70X100 & 75X65.

Apollo Chaukhat Door and Window Frames are also fabricated as per the requirement of Household/Customer by fabricator. Section tubes are cut in pieces in required sizes (especially miter cut at intersection locations), welded & grind to obtain smooth finish. For fixing of frame in wall, holes of required size are drills in frame via these holes expansion bolts are fasten to wall to make it rigid. Door MS Door/ Window Frame Sections either of Tubular steel or Wooden, or Aluminum can easily tighten to door/ window frame with help of Self tapping screw.

The Door/Window frame surface shall be reasonably smooth, flat & free from visible defects & can painted in desired colour & Power coated to enhanced surface finish.

2.3.1 **Design & Dimensions** – The normal design & dimensions of Door/Window section & frame are given in the brochure & installation manual of the manufacturer.

2.3.2 **Performance criteria of Apollo Chaukhat Door and Window Frame Sections –** The door MS Door/ Window Frame Sections shall meet the following performance criteria when tested in accordance with IS 4351 (Clause 4, 5, 6.1, 6.2,7, 8, 9,10.2 11)

2.3.3 **Dimensions** – The normal width & height are within a limit of ± 5 mm whereas the thickness has a limit of ± 0.5 mm.
Weight on Indiviadual Lengths shall not exceed the tolerance of(+10%,-8%) and weight on lot size of 10 tonnes fall under the tolerance of ± 7.5%.

2.3.4 **Squareness** – Squareness shall not exceed 1 mm in 500 mm. Squareness of the corner must not exceed 90 degrres ±2 Degrees Radii of the corner shall be 3t max, where t is the thickness

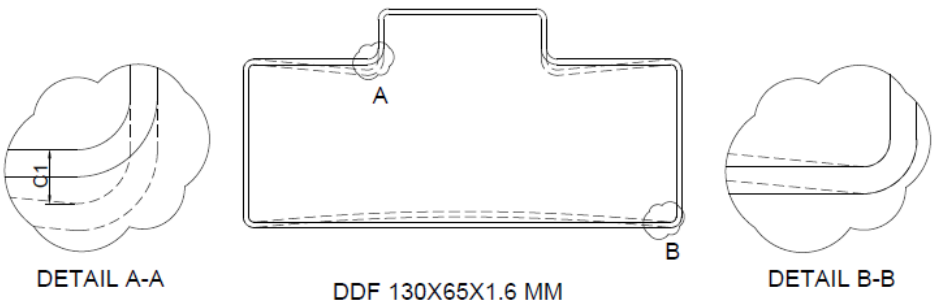
2.3.5 **General Flatness** – The twist, cupping & warping does not exceed 1.5 mm

2.3.6 **Local Planners** – The depth of deviation measured at any point does not exceed 0.5 mm.

2.3.7 **Impact indentation** – The depth of indentation does not exceed 0.5 mm and defects like cracking, tearing or delaminating are not present.

2.3.8 **Concavity/Convexity –** 1 percent of size.

MEASUREMENT OF CONCAVITY / CONVEXITY OF HOLLOW SECTION



C1= Length of external corner profile of hollow section in mm

2.3.9 Shock resistance –

a) Soft & light body impact – There is no visible damage in any part of the door frame section.

b) Soft & hard body impact - There is no visible damage in any part of the door frame section.

2.3.10 Buckling – The initial deflection does not exceed 80 mm after 5 min. of 40 kg loading and residual deflection does not exceed 5 mm after 5 min. of unloading.

2.3.11 Slamming – There is no visible damage in any part of the door frame/Sections.

2.3.12 Misuse – There is no permanent deformation of the fixing or other part of the door set so as to hinder its normal working.

2.3.13 Screw withdrawal strength – The min. load to withdraw the screw completely is 1000 N so that there is no visible damage to the surface.

2.3.14 Straightness and twist - The tubes shall be supplied either in finish straightened or mill straightened condition as agreed to between the purchaser and the manufacturer for which maximum deviation from straightness shall be as under. For tubes in finish straightened condition 1/600th of length at center of the length. For tubes in mill straightened condition 1/ZlOth of any length at the centre of the length. **Twist** shall be measured for square and rectangular sections as given in Fig. 1. The tolerances on twist shall be 2 mm plus 0.5 mm/m measured in accordance with the figure.

2.4 Grades – The grade of MS Door/ Window Frame Sections is given in table below.

Grade	Tensile Strength Min, mPa	Yield Stress Min, mPa	Elongation Percentage Min for Sizes	
			25.4 and under	Over 25.4
YST 210	330	210	12	20
YST 240	410	240	10	15

YST 310	450	310	8	10

2.5 **Size & thickness** – Apollo Chaukhat Door and Window Frame Sections MS Door/ Window Frame Sections are made to the following sizes & thickness.

S.No.	Grade	Type	Standard size mm	Thickness mm
1.	YST 210	Double Door Frame (DDF) Section	130X65	1.6mm-3.0mm
2.	YST 210	Single Door Frame (SDF) Section	100X50 130X65	1.6mm-3.0mm
3.	YST 210	Four Side Door Frame (FDF)	130X80	1.6mm-3.0mm
4.	YST 210	Window Section (WF)	75X40 70X100	1.6mm-3.0mm

2.6 **Marking –** Besides the identification mark of the PAC holder as manufacturer and any other marking he may use, the grade, type & batch number shall be marked suitably on each Door/Window Frame section.

2.6.1 Other particulars required by the purchaser may be suitably-marked as mutually agreed...

2.7 **packing details of packing of finished door for delivery**

2.7.1 Each door and window frames section shall be packed in multilayer packing material to ensure safe & defect free delivery to customers.

2.8 **Selection & installation**

2.8.1 The user/installer is responsible for the workmanship & finishing at site.

2.8.2 **Choosing grade** – The grade of Door frames shall be chosen according to place of use as indicated by the user. The higher grade door frames can be used in situations described for the

lower grade. They shall be installed with appropriated frame and hardware in accordance with good engineering practice.

2.8.3 **Choosing type** – Appropriate type of Door and window frame section shall be chosen depending upon the requirement of the user.

2.8.4 **Choosing size & thickness** – Appropriate size of the door frames shall be chosen to suit the wall opening.

2.8.5. **Handling –** Doors should be carefully handled during storage or installation in order to prevent occurrences of damage to the faces & edges. The Door/ Window Frame sections shall not be dragged along a stack or any surface, but shall be lifted clear of a stock or any surface on which they are stored.

2.9 **Good practice for installation & maintenance** - Good practice as per requirement of the manufacturer shall be followed for installing the MS Door/ Window Frame Sections.

2.10 **Hinges** – It is recommended that a minimum of three hinges, top hinge should be 100-150mm from the top edge of the shutter, 2nd hinge should be at 1/3rd distance from top hinge & the last one should be 2/3 distance from bottom of shutter).

2.10.1 It is recommended that the hinges & hardware chosen shall satisfy the requirements of relevant Indian Standards Codes.

2.11 **Other Hardware** – The MS Door/ Window Frame Sections shall take the hardware like hinges & locks. The construction inside is with solid strips laid side by side so that it shall also take hardware like hasp & staples (aldrop), sliding bolts (tower bolts) and nameplate screwed on to the face of the shutter.

2.12 Paint ability -- The surface of the doors frame shall be smooth & self-designed. Hollow sections may be varnished painted or oiled externally, if so agreed between the purchaser and the supplier.

2.12.1 Apollo Chaukhat Door and Window Frame Sections are finished on installation by self colour system and regularly maintained when colour deterioration is noticed. The edges of all type of MS Door/ Window Frame Sections shall also be finished as recommended by the manufacturer. At first installation, immediately after the shutter has been hung, it shall be removed from the door frame and after removing all the hardware the surfaces and the four edges, as applicable, shall

be finished as recommended in the literature of the manufacture.

2.13 Maintenance requirements

2.13.1 Generally less maintenance is required for these door MS Door/ Window Frame Sections. However, these MS Door/ Window Frame Sections shall be installed strictly as per the instructions contained in the technical literature of the PAC holder.

2.13.2 These type of door frame sections especially those in exposed & wet locations i.e. bathroom & toilet, terrace etc shall be refinished in accordance with the recommendations contained in technical literature of the PAC holder and the material manufacturer.

2.14 Skills /Training needed for installation

2.14.1 No special skills other than the normal skills of a good steel fabricator are needed for installing the MS Door/ Window Frame Sections.

2.15 Guarantees/Warranties provided by the PAC Holder-This product is guaranteed for a period of one year from the date of supply against any genuine manufacturing defect provided the products are not subject to any damage whatsoever and are not abused/misused or wrongly installed. During the period of Warranty the products shall be serviced free of cost for any defect observed and subsequent to Warranty period services shall be done at a nominal service charge together with other incidental costs as mutually agreed by the PAC holder and the purchaser.

2.16 Services provided by the PAC holder to the customer

2.17.1 The PAC holder shall provide pre-sale advisory regarding the product. Customer/user may obtain from the PAC holder details of the advice that may be provided to him.

2.17.2 The PAC holder shall also provide after sales service on customer to customer basis. These include items like pre-finishing, trouble shooting in fixing and usage of the MS Door/ Window Frame Sections. Users / Customers shall ascertain from the PAC holder the type of service and the conditions, the PAC holder is prepared to provide.

Part 3 Basis of Assessment and Brief description of Assessment Procedure

3.1 Basis of Assessment

3.1.1 The technical basis for assessment is as per the standards listed in Part V.

3.1.2 The assessment is based on the results & reports of

(i) Inspection of the factory
(ii) Inspection of the test equipment used and the test procedures followed in the laboratory of the factory
(iii) Assessment of quality assurance procedures implemented in the factory
(iv) Tests done in the factory during inspection
(v) Tests done in an independent laboratory on random samples of the finished MS Door/ Window Frame Sections taken by the IO during inspection
(vi) Inspection of Apollo Chaukhat Door and Window Frame Sections s in service

3.2 **Manufacturing process –** Raw material in form of Steel coils is received from suppliers. The raw material then undergoes a material quality test as per the relevant standards. The coils are then transformed into slits of required sizes by slitter. After this the slits are put through straitening and cleaning to remove any microscopic impurities. In a continuous process this slitten passes through relevant roll set to get directly formed door frame sections. The sections are then cut into standard or required length on the tube mills. Then the whole batch is sent to quality department to measure the quality of the final product including checking dimensions, straightness, elongation etc.

3.3 Factory inspection

3.3.1 The factory was inspected by technical representatives of the Council. During inspection the entire manufacturing process along with the equipment and machinery were inspected. The manufacturing process was found to confirm to the process description given in Annexure. The in-process inspection and the inspection of the finished MS Door/ Window Frame Sections were in accordance with the SQA approved as a part of the requirements for grant of this PAC. These were found suitable to produce door MS Door/ Window Frame Sections satisfying the criteria specified.

3.4 Laboratory Tests done for assessment

3.4.1 Testing of samples

3.4.2 **In the factory** – The tests listed in the report i.e. Mechanical Tests and Measurement for dimensions & squareness, General flatness, Local planeness, Misuse & Screw withdrawal strength were done by the IO in the factory on random samples of Door frame sections. The tests were conducted using standard test methods covered by standards listed in clauses of IS 1608. The samples passed in all the tests conducted.

3.4.2 **In independent laboratory** – The performance test for Door MS Door/ Window Frame Sections specified in IS 4020 (Parts I to 16): 1998 MS Door shutters – Method of tests and listed below were got done in an independent laboratory on random samples of door Frames Sections taken by the IO. The samples conform to the tests as per performance requirements and specifications given by the manufacturer with respect to all tests which characterize the duty of s.

PART-4 STANDARD CONDITIONS

This certificate holder shall satisfy the following conditions:

4.1 The certificate holder shall continue to have the product reviewed by BMBA.

4.2 The product shall be continued to be manufactured according to and in compliance with the manufacturing specifications and quality assurance measures which applied at the time of issue or revalidation of this certificate. The Scheme of Quality Assurance separately approved shall be followed.

4.3 The quality of the product shall be maintained by the certificate holder.

4.4 The product user should install, use and maintain the product in accordance with the provisions in this Certificate.

4-5 This certificate does not cover uses of the product outside the scope of this appraisal.

4.6 The product is appraised against performance provisions contained in the standards listed in Part-V. Provisions of any subsequent revisions or provisions introduced after the date of the certificate do not apply.

4.7 Where reference is made in this Certificate to any Act of Parliament of India, Rules and Regulations made there under, statutes, specifications, codes of practice, standards etc. of the Bureau of Indian Standards or any other national standards body and the International Organization for Standardization (ISO), manufacturer's company standards, instruction/manual etc., it shall be construed as reference to such publications in the form in which they were in force on the date of grant of this Certificate (and indicated in Part V to this Certificate)

4.8 The certificate holder agrees to inform BMBA of their distributors / licensees whenever appointed by him and agrees to provide to BMBA a six monthly updated list there of.

4.9 The certificate holder agrees to provide to BMBA feed back on the complaints received, the redressal provided, and the time taken to provide redressal on complaint to complaint basis as soon as redressal is provided. BMBA agrees to provide the certificate holder the user feed back received by it, if any.

4.10 If at any time during the validity period, PACH is unable to fulfill the conditions in his PAC, he should on his own initiative suspend using the PAC and notify Chairman, TAC the date from which he has suspended its use, the reason for suspension and the period by which he will be able to resume. He shall not resume without the prior permission of BMBA. He shall also inform, simultaneously, his agents, licensees, distributors, institutional, government, public sector buyers, other buyers and all those whom he has informed about his holding the PAC. He shall also inform all those who buy his product(s) during the period of suspension. He shall provide to BMBA at the earliest the list of who have been so informed by him.

4.11 In granting this Certificate, BMBA takes no position as to:

(a) The presence or absence of patent or similar rights relating to the product;
(b) The legal right of the Certificate holder to market, install or maintain the product;
(c) The nature of individual installations of the product, including methods of workmanship.

4.12 BMTPC and the Board of Agreement of BMTPC (BMBA) take no position relating to the holder of the Performance Appraisal Certificate (PACH) and the users of the Performance Appraisal Certificate (PAC) respecting the patent rights / copy rights asserted relating to the product / system / design / method of installation etc. covered by this PAC. Considerations relating to patent / copy rights are beyond the scope of the Performance Appraisal Certification Scheme (PACS) under which this PAC has been issued. PACH and users of this PAC are expressly advised that determination of the Claim / validity of any such patent rights / copy rights and the risk of infringement of such rights are entirely the responsibility of PACH on the one hand and that of the users on the other.

4.13 It should be noted that any recommendations relating to the safe use of the product which are contained or referred to in this Certificate are the minimum standards required to be met with when the product is installed, used and maintained. They do not purport in any way to restate or cover all the requirements of related Acts such as the Factory Act, or of any other statutory or Common Law duties of care, or of any duty of care which exist at the date of this Certificate or in the future, nor is conformity with the provisions of this Certificate to be taken as satisfying the requirements of related Acts.

4.14 In granting this Certificate, BMTPC and BMBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the use of this product.

4.15 The certificate holder indemnifies BMBA, its officers and officials involved in this assessment against any consequences of actions taken in good faith including contents of this certificate. The responsibility fully rests with the certificate holder and user of the product.

4.16 The responsibility for conformity to conditions specified in this PAC lies with the manufacturer who is granted this PAC. The Board (BMBA) will only consider requests for modification or withdrawal of the PAC.

4.17 The PAC holder shall not use this certificate for legal defense in cases against him or for legal claims he may make from others.

Place: New Delhi
Date of issue: 13.1.2020

Chairman TAC & for and on behalf of
Member Secretary, BMBA
Dr. Shailesh Kr. Agrawal
Chairman, TAC
& Member Secretary, BMBA
Building Materials and Technology Promotion Council
Ministry of Housing and Urban Affairs, Govt. of India
Core 5A, 1st Floor, India Habitat Centre
Lodhi Road, New Delhi-110003

Part – 5 List of Standards & codes used in Assessment

These Standards are referred for carrying out a particular test only and not specify the requirement for the whole product as such.

5.1 Indian Standards

5.1.1 **IS 4020: 1998 (Part 1 to 16)** – Door shutters -Method of tests.

5.2 **Company Standards of the PAC holder** – The branded design and specifications of the raw materials and finished products are as specified by manufacturer. The PAC holder has to make available the company standards to the consumers according to which testing has been done.

CERTIFICATION

In the opinion of Building Materials & Technology Promotion Council's Board of Agreement (BMBA), **Apollo Chaukhat Door and Window Frame Sections** bearing the mark manufactured by M/s Apollo Tricoat Tubes Ltd. is satisfactory if used as set out above in the text of the Certificate. This Certificate **PAC No. 1052-P/2020** is awarded to **M/s Apollo Tricoat Tubes Ltd.**, Ghaziabad, Uttar Pradesh.

The period of validity of this Certificate is for a period of One year i.e. from 13/01/2020 to 12/01/2021 as shown on Page 1 of the PAC.

This Certificate consists of a cover page and pages 1 to 23.

Embossing Seal of BMBA

On behalf of BMTPC Board of Agreement, Chairman, Technical Assessment Committee (TAC) of BMBA & Member Secretary, BMTPC Board of Agreement (BMBA) Under Ministry of Housing and Urban Affairs, Government of India

Dr. Shailesh Kr. Agrawal
Chairman, TAC
& Member Secretary, BMBA
Building Materials and Technology Promotion Council
Ministry of Housing and Urban Affairs, Govt. of India
Core 5A, 1st Floor, India Habitat Centre
Lodhi Road, New Delhi-110003

Place: New Delhi
Date: 13.1.2020

PART 6 **ABBREVIATIONS**

BMBA	Board of Agreement of BMTPC
BMTPC	Building Materials and Technology Promotion Council
CPWD	Central Public Works Department
ED	Executive Director of BMTPC
IO	Inspecting Officer
MS	Member Secretary of BBA
PAC	Performance Appraisal Certificate
PACH	PAC Holder
PACS	Performance Appraisal Certification Scheme
SQA	Scheme of Quality Assurance
TAC	Technical Assessment Committee (of BMBA)

Performance Appraisal Certification Scheme - A Brief

Building Materials & Technology Promotion Council (BMTPC) was set up by the Government of India as a body under the Ministry of Housing &Urban Poverty Alleviation to serve as an apex body to provide inter-disciplinary platform to promote development and use of innovative building materials and technologies laying special emphasis on sustainable growth, environmental friendliness and protection, use of industrial, agricultural, mining and mineral wastes, cost saving, energy saving etc. without diminishing needs of safety, durability and comfort to the occupants of buildings using newly developed materials and technologies.

During the years government, public and private sector organisations independently or under the aegis of BMTPC have developed several new materials and technologies. With liberalization of the economy several such materials and technologies are being imported.

However, benefits of such developments have not been realized in full measure as understandably the ultimate users are reluctant to put them to full use for want of information and data to enable them to make informed choice.

In order to help the user in this regard and derive the envisaged social and economic benefits the Ministry of Housing &Urban Poverty Alleviation has instituted a scheme called Performance Appraisal Certification Scheme (PACS) under which a Performance Appraisal Certificate (PAC) is issued covering new materials and technologies. PAC provides after due investigation, tests and assessments, amongst other things information to the user to make informed choice.

To make the PACS transparent and authentic it is administered through a Technical Assessment Committee (T AC) and the BMTPC Board of Agreement (BMBA) in which scientific, technological, academic, professional organisations and industry interests are represented.

The Government of India has vested the authority for the operation of the Scheme with BMTPC through Gazette Notification No. 1-16011/5/99 H-II in the Gazette of India No. 49 dated 4th December, 1999.

Builders and construction agencies in the Government, public and private sectors can help serve the economic, development and environmental causes for which the people and Government stand committed by giving preference to materials and technologies which have earned Performance Appraisal Certificates.

Further information on PACS can be obtained from the website: www.bmtpc.org

ANNEXURE-I

QUALITY ASSURANCE PLAN FOR APOLLO CHAUKHAT DOOR AND WINDOW FRAME SECTIONS

S. NO.	PARAMETER TO BE INSPECTED	REQUIREMENT SPECIFIED	TEST METHOD	FREQUENCY OF TESTING
I.	**VISUAL**			
I	Visual Inspection	Should be free from any defect like improper finishing, all type of surface defects, mismatching colour of panels, screw fixing etc.	As per IS-2202 1986	5% in every lot
II.	**PERFORMANCE TEST:**			
1	Dimensional and Squareness Test	± 5 mm in dimensions and ± 0.5 mm in thickness. Squareness shall not exceed 1mm in 500 mm	As per IS-4020(Part-2) 1998	3 nos. at the time of initial validation
2	General Flatness Test	No warping, cupping	As per IS-4020(Part-3) 1998	-do-
3	Local Planeness test	Shall be less than 0.5 mm	As per IS-4020(Part-4) 1998	-do-
4	Impact Indentation Test	Shall not cause any visible damage and depth of depression shall not exceed 0.5 mm	As per IS-4020(Part-5) 1998	-do-
5	Edge Loading Test	1) @ 100 kg. full test load deflection not to exceed 7.0 mm 2) Residual deflection shall not exceed 0.5 mm	As per IS-4020(Part-7) 1998	-do-
6	Shock Resistance Test	Shall not cause any visible damages or deteriorations	As per IS-4020(Part-8) 1998	-do-
7	Buckling Resistance Test	@ 40 kg. full test load deflection not to exceed 80 mm Residual deflection after removal of load shall be less than 5 mm	As per IS-4020(Part-9) 1998	-do-
8	Slamming Test	No permanent deformation allowed	As per IS-4020(Part-10) 1998	-do-
9	Misuse Test	No permanent formation with wooden slip at 20 kgf. Force	As per IS-4020(Part-11)	-do-

			1998	
10	Screw withdrawal Resistance Test	Withdrawal force shall not be less than 100 kgf.	As per IS-4020(Part-16) 1998	-do-
III.	**MATERIAL TEST REQUIREMENT**			
	SMC SHEET			
1	Glass Content	Min 25%	As per IS-13411 1992	3 nos.
	PU FOAM			
1	Density	40-45 Kg/m3	ASTM D 1622	3 nos.

The Test report of sample taken by Inspection Members are as follow

Mechanical Test Report

Specified Temp. 10^0C to 35^0C
Testing Temp. 28^0C

Lab Code : M19K225-1
Testing Date : 18.11.2019
Protocol Used : IS:1608-P-1:2018

Parameter	Results
Tensile Strength	406.71 N/mm^2
Yield Strength	298.69 N/mm^2
Elongation	33.16 %